

STP 31-18D34-SM-TG

**Soldier's Manual/Trainer's
Guide MOS 18D Special
Forces Medical Sergeant
Skill Levels 3 and 4**

OCTOBER 2003

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SOLDIER’S MANUAL and TRAINER’S GUIDE

MOS 18D

**Soldier’s Manual/Trainer’s Guide MOS 18D Special Forces
Medical Sergeant Skill Levels 3 and 4**

Skill Levels 3 and 4

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081-837-0002	Put On Sterile Gown and Gloves	3-1137

Subject Area 27: NBC

081-833-0082	Triage Casualties on an Integrated Battlefield	3-1139
081-833-0083	Treat a Nerve Agent Casualty in the Field	3-1141
081-833-0084	Treat a Blood Agent (Cyanide) Casualty in the Field	3-1143
081-833-0085	Treat a Choking Agent Casualty in the Field	3-1144
081-833-0086	Treat a Blister Agent Casualty (Mustard, Lewisite, Phosgene Oxime) in the Field	3-1146
081-833-0093	Set Up a Casualty Decontamination Station	3-1148
081-833-0095	Decontaminate a Casualty	3-1151
081-833-4553	Manage Chemical Casualties	3-1160
081-833-4557	Manage a Biological Casualty	3-1164
081-833-4559	Manage Radiation Casualties	3-1170
081-833-4564	Manage an Incapacitating Agent Casualty	3-1172

Subject Area 28: Environmental Conditions

081-833-4003	Manage Allergic Reactions	3-1174
081-833-4117	Manage Nutritional Deficiencies	3-1176
081-833-4160	Manage a Heat Casualty	3-1181
081-833-4162	Manage Cold Injuries	3-1184
081-833-4205	Manage Near Drowning	3-1188
081-833-4233	Manage Suspected Barotrauma	3-1192
081-833-4683	Manage High Altitude Illness	3-1195

Subject Area 29: Special Forces Medic Skills

081-833-4000	Establish a Pharmacy	3-1198
081-833-4652	Plan the Medical Aspect of Civic Action Programs	3-1200
081-833-4661	Organize a Hospital in a Special Operations Environment	3-1202
081-833-4665	Select Hospital Sites in an Operational Area	3-1204
331-201-4000	Prepare a Multi-Echelon Casualty Evacuation Plan	3-1207
331-201-4001	Prepare the S-5 Portion of a Detachment Briefback	3-1209
331-201-4003	Prepare the Medical Portion of an Area Study	3-1210

Subject Area 30: Senior Special Forces Medic Skills

081-833-4624	Supervise the Ongoing Medical Portion of an Area Study	3-1212
081-833-4632	Supervise a Substance Abuse Program	3-1214
081-833-4633	Supervise a Pediatric Health Care Program	3-1216
081-833-4635	Supervise a Malaria Control Program	3-1218
081-833-4636	Supervise a Rabies Control Program	3-1220
081-833-4637	Supervise Immunization Programs	3-1222
081-833-4638	Supervise Field Sanitation Programs	3-1224
081-833-4639	Supervise Field Food Service Facility Inspection	3-1226
081-833-4640	Supervise Veterinary Immunization Programs	3-1228
081-833-4647	Supervise Evacuation Routes Between Medical Facilities	3-1230
081-833-4663	Supervise UW Aid Station Operations	3-1232
081-833-4666	Supervise Hospital Operations	3-1234

Glossary	Glossary-1

Supporting References	References-1

Questionnaire	Questionnaire-1

PREFACE

This soldier's training publication (STP) is for skill levels (SLs) 3 and 4 soldiers holding military occupational specialty (MOS) 18D in career management field (CMF) 18 and their trainer and first-line supervisor. It contains standardized training objectives (in the form of task summaries) that can be used to train and evaluate soldiers on critical tasks that support unit missions during wartime and military operations other than war (MOOTW).

Noncommissioned officers (NCOs) holding MOS 18D, SLs 3 and 4, should have access to this STP. Trainers and first-line supervisors must ensure it is available in the soldiers' work areas, unit learning centers, unit libraries, and the National Guard. However, there is no requirement for each soldier to be provided an individual copy. Commanders will ensure this STP is readily available to all soldiers.

All tasks in this STP are applicable to both the Active Component (AC) and Reserve Component (RC) soldiers. However, due to differences in tables of organization and equipment (TOEs) and missions, some tasks may not apply to all Special Forces (SF) units.

The users of this STP are encouraged to recommend changes and submit comments for its improvement. They should key comments to specific page, paragraph, and line of the text in which the change is recommended. They should provide reasons for each comment to ensure understanding and complete evaluation. They should prepare comments on Department of the Army (DA) Form 2028 and forward them to Commander, United States Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), ATTN: AOJK-DT-SFI, Fort Bragg, North Carolina 28307-5000.

Unless this STP states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

Introduction

1-1. General. This soldier's manual (SM) identifies the individual MOS training requirement for soldiers in MOS 18D. Commanders, trainers, and soldiers should use it to plan, conduct, and evaluate individual training in units. This manual is the primary MOS reference to support the self-development and training of every soldier.

Commanders, trainers, and soldiers use this manual with the soldier's manuals of common tasks (SMCTs) (STPs 21-1-SMCT and 21-24-SMCT), Army Training and Evaluation Programs (ARTEPs), and Field Manual (FM) 25-101 to establish effective training plans and programs that integrate soldier, leader, and collective tasks.

The Army's mission is to mobilize and deploy units trained to accomplish wartime missions and MOOTW. Successful mission accomplishment requires emphasis on individual training. Individual training must focus on performance under the conditions and to the standards expected in wartime. This STP, in conjunction with STP 31-18-SM-TG, identifies the individual MOS training requirements for soldiers in MOS 18D, Skill Levels 3 and 4. It is designed to be used by commanders, trainers, and soldiers to plan, conduct, and evaluate individual training in units. This manual is the primary reference to support that portion of the Individual Training Evaluation Program (ITEP) requiring commanders to routinely evaluate a soldier's ability to perform MOS-specific tasks critical to the unit's mission. Army Regulation (AR) 350-37 describes the ITEP in detail.

1-2. Task Summaries. Task summaries outline the wartime performance requirements of each critical task in the SM. They provide the soldier and the trainer with the information necessary to prepare, conduct, and evaluate critical task training. As a minimum, task summaries include information you must know, and the skills that you must perform to standard for each task. The format for the task summaries included in this SM is as follows:

- **Task Title.** The task identifies the action to be performed.
- **Task Number.** A 10-digit number identifies each task or skill. Include this task number, along with the task title, in any correspondence relating to the task.
- **Conditions.** The task conditions identify all the equipment, tools, references, job aids, and supporting personnel which the soldier needs to perform the task in wartime. This section identifies any environmental conditions which can alter task performance such as visibility, temperature, and wind. This section also identifies any specific cues or events (a chemical attack or identification of a threat vehicle) which trigger task performance.
- **Standards.** The task standards describe how well and to what level you must perform a task under wartime conditions. Standards are typically described in terms of accuracy, completeness, and speed.
- **Training and Evaluation.** This section may contain all or part of the following: training information outline, evaluation preparation subsection, and evaluation guide. The training information outline includes detailed training information. The evaluation preparation subsection indicates necessary modifications to task performance in order to train and evaluate a task that cannot be trained to the wartime standard under wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications and any instructions that should be given to the soldier before evaluation. The evaluation guide identifies the specific actions, known as performance measures, that the soldier must do to successfully complete the task. These actions are listed in a "Pass/Fail" format for easy evaluation. Each evaluation guide contains a feedback statement that indicates the requirements (for example, number of performance measures "passed") for receiving a "GO" on the evaluation.

NOTE: This manual contains repetitive feedback statements in all its task summaries that read as follows: *Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.*

- **References.** This section identifies references that provide more detailed and thorough explanations of task performance requirements than that given in the task summary description.

Additionally, some task summaries include safety statements and notes. Safety statements (danger, warning, caution) alert users to the possibility of immediate death, personal injury, or damage to equipment. Notes provide a small, extra supportive explanation of hint relative to the performance measures.

1-3. Soldier's Responsibilities. Each soldier is responsible for performing individual tasks that the first-line supervisor identifies based on the unit's mission-essential task list (METL). The soldier must perform the task to the standards listed in the SM. If a soldier has a question about performing a task, or which task in this manual he must perform, it is the soldier's responsibility to ask the first-line supervisor for clarification. The first-line supervisor knows how to perform each task or can direct the soldier to the appropriate training materials.

1-4. NCO Self-Development and the Soldier's Manual. Self-development is one of the key components of the leader development program. It is a planned progressive and sequential program followed by leaders to enhance and sustain their military competencies. It consists of individual study, research, professional reading, practice, and self-assessment. Under the self-development concept, the NCO, as an Army professional, is responsible for remaining current in all phases of the MOS. The SM is the NCO's primary source to use in maintaining MOS proficiency.

An important resource for NCO self-development is the Army Correspondence Course Program (ACCP). Refer to DA Pamphlet 351-20 for information on enrolling in this program and for a list of courses or write to Army Institute for Professional Development, U.S. Army Training Support Center, ATTN: ATIC-IPS, Newport News, VA 23628.

Unit learning centers are valuable resources for planning out self-development programs. They can help access enlisted career maps, training support products, and extension training materials.

1-5. Training Support. This manual includes an appendix and information that provides additional training support information:

- **Appendix.** This appendix contains a sample of DA Form 5164-R (Hands-On Evaluation) that the trainer uses to keep a record of the performance measures. It also provides thorough instructions to the trainer on how to complete the form.
- **Glossary.** The glossary is a two-part list of acronyms (including abbreviations) and definitions.
- **References.** The references are divided into two parts—documents needed and sources used. Documents needed are required references that are necessary for the soldier to do the task. These references are listed in the CONDITIONS section and at the end of the task summary. Sources used are related references that provide more detailed information and a more thorough explanation of task performance. These references are listed at the end of the task summary.

CHAPTER 2

Training Guide

2-1. General. The MOS Training Plan (MTP) identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the MTP should be used as a guide for conducting unit training and not a rigid standard. The MTP consists of two parts. Each part is designed to assist the commander in preparing a unit training plan which satisfies integration, cross training, training up, and sustainment training requirements for soldiers in this MOS.

Part One of the MTP shows the relationship of an MOS skill level between duty position and critical tasks. These critical tasks are grouped by task commonality into subject areas.

Section I lists subject area numbers and titles used throughout the MTP. These subject areas are used to define the training requirements for each duty position within an MOS.

Section II identifies the total training requirement for each duty position within an MOS and provides a recommendation for cross training and train-up/merger training.

- **Duty Position column.** This column lists the duty positions of the MOS, by skill level, which have different training requirements.
- **Subject Area column.** This column lists, by numerical key (see Section I), the subject areas a soldier must be proficient in to perform in that duty position.
- **Cross Train column.** This column lists the recommended duty position for which soldiers should be cross trained.
- **Train-up/Merger column.** This column lists the corresponding duty position for the next higher skill level or MOSC the soldier will merge into on promotion.

Part Two lists, by general subject areas, the critical tasks to be trained in an MOS and the type of training required (resident, integration, or sustainment).

- **Subject Area column.** This column lists the subject area number and title in the same order as Section I, Part One of the MTP.
- **Task Number column.** This column lists the task numbers for all tasks included in the subject area.
- **Title column.** This column lists the task title for each task in the subject area.
- **Training Location column.** This column identifies the training location where the task is first trained to soldier training publications standards. If the task is first trained to standard in the unit, the word "Unit" will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (ANCOC, BNCOC, etc.), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

SFQC	SPECIAL FORCES QUALIFICATION COURSE
SOJT	Supervised On-The-Job Training

Figure 2-1. Training Locations

- **Sustainment Training Frequency column.** This column indicates the recommended frequency at which the tasks should be trained to ensure soldiers maintain task proficiency. Figure 2-2 identifies the frequency codes used in this column.

BA	- Biannually
AN	- Annually
SA	- Semiannually
QT	- Quarterly
MO	- Monthly
BW	- Bi-weekly
WK	- Weekly

Figure 2-2. Sustainment Training Frequency Codes

- **Sustainment Training Skill Level column.** This column lists the skill levels of the MOS for which soldiers must receive sustainment training to ensure they maintain proficiency to soldier's manual standards.

2-2. Subject Area Codes.**Skill Level 3**

- 1 Laboratory
- 2 Administrative
- 3 Basic Medical Skills
- 4 Nursing
- 5 Preventive Medicine
- 6 Dental
- 7 Veterinary Medicine
- 8 Dermatologic Conditions
- 9 HEENT Conditions
- 10 Cardiovascular Conditions
- 11 Pulmonary Conditions
- 12 Gastrointestinal Conditions
- 13 Genitourinary Conditions
- 14 OBGYN Conditions
- 15 Orthopedic Conditions
- 16 Endocrine Conditions
- 17 Neurologic Conditions
- 18 Psychiatric Conditions
- 19 Communicable Diseases
- 20 Endoparasitic Diseases
- 21 Vector-borne Diseases
- 22 Pediatrics
- 23 Trauma
- 24 Anesthesia
- 25 Surgical Procedures
- 26 CMS
- 27 NBC
- 28 Environmental Conditions
- 29 Special Forces Medic Skills
- 30 Senior Special Forces Medic Skills

2-3. Duty Position Training Requirements.

2-4. Critical Tasks List.**MOS TRAINING PLAN
18D34****CRITICAL TASKS**

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
Skill Level 3					
1. Laboratory	081-821-1013	Perform a Gram Stain	SFQC	AN	3-4
	081-821-1018	Perform ABO Grouping and Confirmation Tests	SFQC	BA	3-4
	081-821-1019	Perform an Rh Typing	SFQC	AN	3-4
	081-821-1020	Perform A Test For Rh Variant (Weak D)	SFQC	AN	3-4
	081-821-1023	Perform a Crossmatch Procedure	SFQC	AN	3-4
	081-821-1033	Perform a Rapid Plasma Reagin (RPR) Test	SFQC	BA	3-4
	081-821-1036	Perform a WBC Count on Whole Blood	SFQC	BA	3-4
	081-821-1040	Perform a Microhematocrit Determination	SFQC	BA	3-4
	081-821-1042	Perform A Macroscopic Examination of Feces and Test for Occult Blood	SFQC	AN	3-4
	081-821-1056	Perform a Potassium (Sodium) Hydroxide Preparation of Skin Scrapings	SFQC	BA	3-4
	081-821-1064	Perform a Qualitative HCG Test	SFQC	BA	3-4
	081-821-1065	Perform A Microscopic Examination of Pinworm Preparations	SFQC	BA	3-4
	081-821-1066	Perform Concentration Techniques For Ova And Parasites (Con-Trate Method)	SFQC	BA	3-4
	081-821-1075	Perform a Microscopic Examination For Acid-Fast Bacteria	SFQC	BA	3-4
	081-821-1083	Perform a Wright's Stain Using Camco Quik Stain	SFQC	BA	3-4
	081-833-0032	Obtain A Blood Specimen Using A Vacutainer	SFQC	BA	3-4
	081-833-4568	Perform User Maintenance of Lab Equipment	SFQC	BA	3-4
	081-833-4572	Prepare Laboratory Specimens for Transport	SFQC	BA	3-4
	081-833-4574	Perform RBC Count/Morphology	SFQC	BA	3-4
	081-833-4583	Perform a Throat Culture	SFQC	BA	3-4
	081-833-4593	Interpret a Dark Field Microscopic Examination	SFQC	BA	3-4
	081-833-4594	Interpret a Culture	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4670	Perform a Urinalysis	SFQC	BA	3-4
	081-833-4675	Perform a Giemsa Stain for the Presence of Blood Parasites	SFQC	BA	3-4
2. Administrative	081-833-4682	Write a SOAP Note	SFQC	BA	3-4
	081-833-4688	Maintain Medical Records	SFQC	BA	3-4
	331-201-4012	Prepare a Physical Performance Improvement Program	SFQC	BA	3-4
	331-201-4013	Obtain Medical Equipment and Supplies	SOJT	BA	3-4
	331-201-4014	Account for Medical Supplies	SFQC	BA	3-4
3. Basic Medical Skills	081-830-3016	Intubate a Patient	SFQC	AN	3-4
	081-830-4053	Perform Exhale Carbon Dioxide Monitoring	SFQC	BA	3-4
	081-830-4061	Perform Pulse Oximetry Monitoring	SFQC	BA	3-4
	081-831-0007	Perform a Patient Care Handwash	SFQC	BA	3-4
	081-831-0008	Put On Sterile Gloves	SFQC	BA	3-4
	081-831-0033	Initiate a Field Medical Card	SFQC	BA	3-4
	081-833-0088	Prepare An Injection For Administration	SFQC	BA	3-4
	081-833-3006	Perform a Needle Cricothyroidotomy	SFQC	BA	3-4
	081-833-3011	Apply Pneumatic Antishock Garment	SFQC	AN	3-4
	081-833-4001	Perform X Rays	SFQC	BA	3-4
	081-833-4002	Perform a Complete Physical Examination	SFQC	BA	3-4
	081-833-4006	Manage Anaphylaxis	SFQC	BA	3-4
	081-833-4007	Manage Insect Bites or Stings	SFQC	BA	3-4
	081-833-4013	Administer Medications	SFQC	BA	3-4
	081-833-4014	Determine Death	SFQC	BA	3-4
	081-833-4016	Dispense a Medication	SFQC	BA	3-4
	081-833-4022	Perform Emergency Measures for Poisonous Ingestion	SFQC	BA	3-4
	081-833-4039	Manage Snakebite	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4041	Perform 3-Lead Electrocardiography for Emergency Cardiac Care	SFQC	BA	3-4
	081-833-4069	Perform Blood Transfusion	SFQC	BA	3-4
	081-833-4070	Manage Blood Transfusion Reactions	SFQC	BA	3-4
	081-833-4071	Initiate an Intraosseous Infusion	SFQC	BA	3-4
	081-833-4080	Dispense Common Fluid and Electrolyte Solutions	SFQC	BA	3-4
	081-833-4167	Maintain a Patient's Airway	SFQC	BA	3-4
	081-833-4413	Apply Cold Therapy for the Management of Soft Tissue Injuries	SFQC	BA	3-4
	081-833-4415	Apply Heat Therapy for the Management of Soft Tissue Injuries	SFQC	BA	3-4
	081-833-4490	Construct a Field Suction Device	SFQC	BA	3-4
	081-833-4492	Assess Wound Healing	SFQC	BA	3-4
	081-833-4678	Assess Blood Replacement Requirements	SFQC	BA	3-4
	081-833-4681	Prepare a Patient for Evacuation Using Special Equipment	SFQC	BA	3-4
	081-833-4687	Perform Field Interpretation of X Rays	SFQC	BA	3-4
	081-833-4690	Manage Pain	SFQC	BA	3-4
	081-833-4691	Remove the Pneumatic Antishock Garment	SFQC	BA	3-4
	081-833-4692	Initiate an Intraosseous Sternal Infusion System	SFQC	BA	3-4
	081-833-4693	Remove an Intraosseous Sternal Infusion Tube	SFQC	BA	3-4
4. Nursing	081-833-0054	Irrigate Eyes	SFQC	BA	3-4
	081-833-4015	Attend Death	SFQC	BA	3-4
	081-833-4017	Monitor a Patient's Vital Signs	SFQC	BA	3-4
	081-833-4043	Manage a Continuous Intravenous Infusion	SFQC	BA	3-4
	081-833-4097	Manage a Patient with a Nasogastric Tube	SFQC	BA	3-4
	081-833-4099	Measure a Patient's Intake and Output	SFQC	BA	3-4
	081-833-4101	Perform Gavage	SFQC	BA	3-4
	081-833-4131	Develop a Dietary Program	SFQC	BA	3-4
	081-833-4175	Perform Pulmonary Nursing Care	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4308	Provide Contraceptive Counseling	SFQC	BA	3-4
	081-833-4485	Administer Oxygen Therapy	SFQC	BA	3-4
	081-833-4488	Establish Isolation Precautions	SFQC	BA	3-4
	081-833-4489	Perform a Sterile Dressing Change	SFQC	BA	3-4
	081-833-4491	Irrigate a Wound	SFQC	BA	3-4
	081-833-4495	Perform Urinary Catheterization	SFQC	BA	3-4
	081-833-4496	Perform Nasogastric Intubation	SFQC	BA	3-4
	081-833-4499	Perform Urinary Catheter Care	SFQC	BA	3-4
	081-833-4689	Manage a Debilitated Patient	SFQC	BA	3-4
5. Preventive Medicine	081-833-4498	Establish a Malaria Prevention and Control Program	SFQC	BA	3-4
	081-833-4500	Establish a Rabies Control Program	SFQC	BA	3-4
	081-833-4501	Conduct Pest Control Operations with Chemical and Non-Chemical Means	SFQC	BA	3-4
	081-833-4502	Establish an Immunization Program	SFQC	BA	3-4
	081-833-4504	Establish a Field Sanitation Program	SFQC	BA	3-4
6. Dental	081-833-4451	Examine a Patient's Oral Cavity	SFQC	BA	3-4
	081-833-4456	Manage Fractured and Avulsed Teeth	SFQC	BA	3-4
	081-833-4457	Place Temporary Restorations	SFQC	AN	3-4
	081-833-4458	Perform Excavation of Carious Material	SFQC	BA	3-4
	081-833-4460	Manage Gingivitis	SFQC	BA	3-4
	081-833-4462	Manage Periodontitis	SFQC	BA	3-4
	081-833-4464	Manage Necrotizing Ulcerative Gingivitis	SFQC	BA	3-4
	081-833-4466	Manage Pericoronitis	SFQC	BA	3-4
	081-833-4468	Manage Oral Herpetic Lesions	SFQC	BA	3-4
	081-833-4470	Manage a Periodontal Abscess	SFQC	BA	3-4
	081-833-4472	Manage a Periapical Abscess	SFQC	BA	3-4
	081-833-4476	Perform Dental Extractions	SFQC	BA	3-4
	081-833-4478	Administer Local Dental Anesthesia	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4484	Manage Complications of Dental Extractions	SFQC	BA	3-4
	081-840-0012	Prepare Intermediate Restorative Material (IRM)	SFQC	BA	3-4
7. Veterinary Medicine	081-833-4597	Perform Physical Restraint on Domestic and Companion Animals	SFQC	AN	3-4
	081-833-4599	Perform Chemical Restraint on Domestic and Companion Animals	SFQC	AN	3-4
	081-833-4601	Perform Physical Examination of Animals	SFQC	AN	3-4
	081-833-4611	Manage Equine Conditions	SFQC	BA	3-4
	081-833-4613	Prepare Domestic and Wild Animals for Consumption	SFQC	BA	3-4
	081-833-4614	Manage Laminitis	SFQC	BA	3-4
	081-833-4616	Manage Lameness	SFQC	AN	3-4
	081-833-4617	Manage Choke and Bloat in a Ruminant Animal	SFQC	AN	3-4
	081-833-4618	Perform a Necropsy	SFQC	BA	3-4
	081-833-4619	Treat Zoonotic Diseases in Livestock and Domestic Animals	SFQC	BA	3-4
	081-833-4620	Manage Domestic Animals	SFQC	BA	3-4
	081-833-4621	Treat Ectodermal/Endoparasitic Diseases in Domestic Animals	SFQC	AN	3-4
	081-833-4622	Establish a Veterinary Immunization Program	SFQC	AN	3-4
	081-833-4623	Medicate Domestic Animals	SFQC	AN	3-4
	081-833-4625	Administer an Intravenous Infusion to an Animal	SFQC	AN	3-4
	081-833-4626	Manage (Nonsurgically) Obstetric Complications in Domestic Animals	SFQC	BA	3-4
	081-833-4628	Manage Poisoned Animals	SFQC	BA	3-4
	081-833-4629	Administer Local/Regional Anesthesia in Animals	SFQC	BA	3-4
	081-833-4630	Treat for Shock in Animals	SFQC	BA	3-4
8. Dermatologic Conditions	081-833-4027	Manage Common Skin Conditions	SFQC	BA	3-4
	081-833-4028	Assess Common Skin Conditions	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4030	Manage Common Bacterial Skin Conditions	SFQC	BA	3-4
	081-833-4032	Manage Common Viral Skin Conditions	SFQC	BA	3-4
	081-833-4034	Manage Common Fungal Skin Conditions	SFQC	BA	3-4
	081-833-4036	Manage Common Parasitic Skin Conditions	SFQC	BA	3-4
9. HEENT Conditions	081-833-4179	Manage Tonsillitis	SFQC	BA	3-4
	081-833-4210	Assess Conditions of the EENT	SFQC	BA	3-4
	081-833-4213	Manage Conjunctivitis	SFQC	BA	3-4
	081-833-4218	Manage Trachoma	SFQC	BA	3-4
	081-833-4220	Manage Hyphema	SFQC	BA	3-4
	081-833-4221	Manage a Corneal Abrasion and/or a Foreign Body in the Eye	SFQC	BA	3-4
	081-833-4224	Manage Subconjunctival Hemorrhage	SFQC	BA	3-4
	081-833-4226	Manage Otitis Media	SFQC	BA	3-4
	081-833-4227	Manage Otitis	SFQC	BA	3-4
	081-833-4229	Manage Epistaxis	SFQC	BA	3-4
	081-833-4230	Manage Sinusitis	SFQC	BA	3-4
	081-833-4234	Remove a Foreign Body from the External Auditory Canal	SFQC	BA	3-4
10. Cardiovascular Conditions	081-833-4040	Detect Abnormal Cardiac Sounds	SFQC	BA	3-4
	081-833-4042	Manage Abnormal Blood Conditions	SFQC	BA	3-4
	081-833-4044	Manage Anemia	SFQC	BA	3-4
	081-833-4046	Assess Cardiovascular Diseases	SFQC	BA	3-4
	081-833-4047	Manage Cardiac Arrest	SFQC	BA	3-4
	081-833-4048	Manage Angina Pectoris	SFQC	BA	3-4
	081-833-4050	Manage Hypertension	SFQC	BA	3-4
	081-833-4052	Manage Tachycardia	SFQC	BA	3-4
	081-833-4054	Manage Myocardial Infarction	SFQC	BA	3-4
	081-833-4058	Manage Bradycardia	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4061	Manage Endocarditis	SFQC	BA	3-4
	081-833-4062	Manage Pericarditis	SFQC	BA	3-4
	081-833-4064	Manage Congestive Heart Failure	SFQC	BA	3-4
	081-833-4066	Manage a Cerebrovascular Accident	SFQC	BA	3-4
11. Pulmonary Conditions	081-833-4164	Assess Respiratory Diseases	SFQC	BA	3-4
	081-833-4165	Manage Adult Respiratory Distress Syndrome	SFQC	BA	3-4
	081-833-4166	Manage Acute or Chronic Bronchitis	SFQC	BA	3-4
	081-833-4169	Manage Pneumonia	SFQC	BA	3-4
	081-833-4174	Manage Pulmonary Atelectasis	SFQC	BA	3-4
	081-833-4176	Manage Chronic Obstructive Pulmonary Disease	SFQC	BA	3-4
	081-833-4180	Manage Pleurisy	SFQC	BA	3-4
	081-833-4182	Manage Tuberculosis	SFQC	BA	3-4
	081-833-4186	Manage Asthma	SFQC	BA	3-4
	081-833-4190	Manage Pulmonary Edema	SFQC	BA	3-4
	081-833-4284	Manage Viral Upper Respiratory Infection	SFQC	BA	3-4
	081-833-4287	Manage Influenza	SFQC	BA	3-4
12. Gastrointestinal Conditions	081-833-4021	Manage Shigellosis	SFQC	BA	3-4
	081-833-4082	Assess Diseases of the Gastrointestinal Tract	SFQC	BA	3-4
	081-833-4083	Manage Gastroesophageal Reflux	SFQC	BA	3-4
	081-833-4084	Manage (Non-Surgically) Gastritis	SFQC	BA	3-4
	081-833-4086	Manage (Non-Surgically) Peptic Ulcer	SFQC	BA	3-4
	081-833-4087	Treat Constipation	SFQC	BA	3-4
	081-833-4088	Manage (Non-Surgically) Bowel Obstruction	SFQC	BA	3-4
	081-833-4089	Manage Diarrheal Conditions	SFQC	BA	3-4
	081-833-4091	Manage Gastrointestinal Tract Conditions	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4093	Manage Bacterial Gastroenteritis	SFQC	BA	3-4
	081-833-4095	Manage Viral Gastroenteritis	SFQC	BA	3-4
	081-833-4098	Manage Hemorrhoids	SFQC	BA	3-4
	081-833-4102	Assess Diseases of the Abdomen	SFQC	BA	3-4
	081-833-4103	Manage (Nonsurgically) Conditions of the Abdomen	SFQC	BA	3-4
	081-833-4104	Manage (Nonsurgically) Cholecystitis	SFQC	BA	3-4
	081-833-4105	Manage Acute and Non-Acute Abdomen	SFQC	BA	3-4
13. Genitourinary Conditions	081-833-4132	Assess Diseases and Conditions of the Genitourinary System	SFQC	BA	3-4
	081-833-4134	Manage Urinary Tract Infection	SFQC	BA	3-4
	081-833-4135	Manage Sexually Transmitted Diseases	SFQC	BA	3-4
	081-833-4136	Manage Epididymitis	SFQC	BA	3-4
	081-833-4138	Manage Phimosis/Paraphimosis	SFQC	BA	3-4
	081-833-4142	Manage Urolithiasis	SFQC	BA	3-4
	081-833-4144	Manage Prostatitis	SFQC	BA	3-4
	081-833-4146	Manage Testicular Masses	SFQC	BA	3-4
	081-833-4148	Manage Testicular Torsion	SFQC	BA	3-4
14. OBGYN Conditions	081-833-4302	Assess Gynecological Infections	SFQC	BA	3-4
	081-833-4304	Manage Gynecological Infections	SFQC	BA	3-4
	081-833-4306	Manage Bartholin's Gland Abscess	SFQC	BA	3-4
	081-833-4310	Perform a Pelvic Exam	SFQC	BA	3-4
	081-833-4312	Assess Normal Intrauterine Pregnancy	SFQC	BA	3-4
	081-833-4314	Monitor Progress of Normal Pregnancy	SFQC	BA	3-4
	081-833-4316	Assist in Natural Childbirth	SFQC	BA	3-4
	081-833-4322	Manage Spontaneous Abortion	SFQC	BA	3-4
	081-833-4328	Manage Medical Complications of Pregnancy	SFQC	BA	3-4
15. Orthopedic	081-833-4365	Apply a Cast	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
Conditions	081-833-4374	Assess Common Orthopedic Diseases/Conditions	SFQC	BA	3-4
	081-833-4377	Manage Arthritis	SFQC	BA	3-4
	081-833-4386	Manage Osteomyelitis	SFQC	BA	3-4
	081-833-4388	Manage Bursitis	SFQC	BA	3-4
	081-833-4394	Remove Fluid From a Joint For Diagnosis	SFQC	BA	3-4
	081-833-4397	Manage Common Foot Disorders	SFQC	BA	3-4
	081-833-4404	Manage Ingrown Toenail	SFQC	BA	3-4
	081-833-4420	Manage Musculoskeletal Low Back Pain	SFQC	BA	3-4
16. Endocrine Conditions	081-833-4238	Assess Endocrine Diseases	SFQC	BA	3-4
	081-833-4240	Manage Simple Goiter	SFQC	BA	3-4
	081-833-4241	Manage Diabetic Emergencies	SFQC	BA	3-4
	081-833-4242	Manage Diabetes Mellitus	SFQC	BA	3-4
	081-833-4243	Manage Hyperglycemia	SFQC	BA	3-4
	081-833-4244	Manage Hypoglycemia	SFQC	BA	3-4
17. Neurologic Conditions	081-833-4150	Assess Nervous System Disorders	SFQC	BA	3-4
	081-833-4152	Manage Loss of Consciousness	SFQC	BA	3-4
	081-833-4154	Manage Vertigo	SFQC	BA	3-4
	081-833-4156	Manage Headache	SFQC	BA	3-4
	081-833-4158	Manage a Seizure	SFQC	BA	3-4
	081-833-4288	Manage Aseptic Meningitis/Encephalitis	SFQC	BA	3-4
	081-833-4292	Manage Bacterial Meningitis and Encephalitis	SFQC	BA	3-4
18. Psychiatric Conditions	081-833-4429	Manage Behavioral Disorders	SFQC	AN	3-4
	081-833-4437	Manage Mood Disorders	SFQC	BA	3-4
	081-833-4439	Manage a Suicidal Patient	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4440	Manage an Intoxicated or Overdosed Patient	SFQC	BA	3-4
	081-833-4441	Manage Substance Withdrawal	SFQC	BA	3-4
	081-833-4445	Manage Combat Stress Behavior	SFQC	BA	3-4
19. Communicable Diseases	081-833-4106	Manage Uncomplicated Viral Hepatitis	SFQC	BA	3-4
	081-833-4265	Manage Cryptosporidiosis	SFQC	BA	3-4
	081-833-4267	Manage Toxoplasmosis	SFQC	BA	3-4
	081-833-4269	Manage Anthrax	SFQC	BA	3-4
	081-833-4271	Manage Lassa Fever	SFQC	BA	3-4
	081-833-4273	Manage Scarlet Fever	SFQC	BA	3-4
	081-833-4280	Assess Viral Infectious Diseases	SFQC	BA	3-4
	081-833-4281	Manage Viral Infectious Diseases	SFQC	BA	3-4
	081-833-4290	Assess Bacterial Infectious Diseases	SFQC	BA	3-4
	081-833-4294	Manage Tetanus	SFQC	BA	3-4
	081-833-4295	Manage Poliomyelitis	SFQC	BA	3-4
	081-833-4296	Manage Leprosy	SFQC	BA	3-4
	081-833-4297	Manage Necrotizing Subcutaneous Infection	SFQC	BA	3-4
	081-833-4298	Manage Clostridial Cellulitis, Myositis, and Myonecrosis	SFQC	BA	3-4
	081-833-4686	Manage Acquired Immunodeficiency Syndrome	SFQC	BA	3-4
20. Endoparasitic Diseases	081-833-4019	Manage Giardiasis	SFQC	BA	3-4
	081-833-4020	Manage Amebiasis	SFQC	BA	3-4
	081-833-4275	Assess Endoparasitic Diseases	SFQC	BA	3-4
	081-833-4277	Manage Tissue Nematodes	SFQC	BA	3-4
	081-833-4279	Manage Trematodes	SFQC	BA	3-4
	081-833-4684	Manage Cestodes	SFQC	BA	3-4
	081-833-4685	Manage Intestinal Nematodes	SFQC	BA	3-4
21. Vector-borne	081-833-4247	Manage Rabies	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
Diseases	081-833-4248	Assess Vector-Borne Diseases	SFQC	BA	3-4
	081-833-4249	Manage Hemorrhagic Fever	SFQC	BA	3-4
	081-833-4250	Manage Trypanosomiasis	SFQC	BA	3-4
	081-833-4252	Manage Dengue	SFQC	BA	3-4
	081-833-4253	Manage Relapsing Fever	SFQC	BA	3-4
	081-833-4254	Manage Filariasis	SFQC	BA	3-4
	081-833-4256	Manage Rocky Mountain Spotted Fever	SFQC	BA	3-4
	081-833-4257	Manage Lyme Disease	SFQC	BA	3-4
	081-833-4258	Manage Yellow Fever	SFQC	BA	3-4
	081-833-4260	Manage Leishmaniasis	SFQC	BA	3-4
	081-833-4261	Manage Q Fever	SFQC	BA	3-4
	081-833-4262	Manage Plague	SFQC	BA	3-4
	081-833-4264	Manage Onchocerciasis	SFQC	BA	3-4
	081-833-4266	Manage Leptospirosis	SFQC	BA	3-4
	081-833-4268	Manage Rat Bite Fever	SFQC	BA	3-4
	081-833-4270	Manage Typhus	SFQC	BA	3-4
	081-833-4274	Manage Malaria	SFQC	BA	3-4
22. Pediatrics	081-833-4340	Assess Common Pediatric Diseases	SFQC	BA	3-4
	081-833-4341	Manage Common Viral Pediatric Diseases	SFQC	BA	3-4
	081-833-4342	Manage Common Bacterial Pediatric Diseases	SFQC	BA	3-4
	081-833-4343	Manage Common Fungal Pediatric Diseases	SFQC	BA	3-4
	081-833-4348	Manage Croup	SFQC	BA	3-4
	081-833-4350	Manage Epiglottitis	SFQC	BA	3-4
	081-833-4352	Manage Dehydration in a Pediatric Patient	SFQC	BA	3-4
	081-833-4354	Perform Physical Examination of Infants and Pediatrics	SFQC	BA	3-4
	081-833-4355	Manage Infectious/Noninfectious Diarrhea in a Pediatric Patient	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
23. Trauma	081-831-0035	Manage a Convulsive and/or Seizing Patient	SFQC	BA	3-4
	081-833-0048	Manage an Unconscious Casualty	SFQC	AN	3-4
	081-833-0080	Triage Casualties on a Conventional Battlefield	SFQC	AN	3-4
	081-833-3007	Perform a Needle Chest Decompression	SFQC	BA	3-4
	081-833-3014	Perform a Neurological Examination on a Patient With Suspected Central Nervous System Injuries	SFQC	AN	3-4
	081-833-4023	Manage a Burned Casualty	SFQC	BA	3-4
	081-833-4025	Manage Bite Injuries	SFQC	BA	3-4
	081-833-4072	Manage Hemorrhagic/Hypovolemic Shock	SFQC	BA	3-4
	081-833-4073	Manage Shock	SFQC	BA	3-4
	081-833-4075	Manage Electrical and Lightning Injuries	SFQC	BA	3-4
	081-833-4140	Manage Trauma of the Genitourinary Tract	SFQC	BA	3-4
	081-833-4149	Perform Initial Assessment and Management of Trauma Patient	SFQC	BA	3-4
	081-833-4153	Manage a Casualty with a Closed Head Injury	SFQC	BA	3-4
	081-833-4155	Manage a Casualty with an Open Head Injury	SFQC	BA	3-4
	081-833-4157	Manage Increased Intracranial Pressure	SFQC	BA	3-4
	081-833-4159	Evaluate a Casualty With a Head Injury	SFQC	BA	3-4
	081-833-4178	Manage Hemothorax	SFQC	BA	3-4
	081-833-4184	Manage Pneumothorax	SFQC	BA	3-4
	081-833-4194	Manage a Nonpenetrating Injury to the Chest	SFQC	BA	3-4
	081-833-4196	Manage a Penetrating Injury to the Chest	SFQC	BA	3-4
	081-833-4197	Manage Inhalation/Aspiration Injuries	SFQC	BA	3-4
	081-833-4211	Manage Trauma to the Ear, Nose, and Throat	SFQC	BA	3-4
	081-833-4223	Manage Eye Trauma	SFQC	BA	3-4
	081-833-4225	Manage Burns to the Eyes	SFQC	BA	3-4
	081-833-4359	Manage Pelvic Fractures	SFQC	BA	3-4
	081-833-4361	Manage Skull Fracture	SFQC	BA	3-4
	081-833-4362	Manage an Open or Closed Fracture	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4364	Improvise Common External Traction Devices	SFQC	BA	3-4
	081-833-4372	Manage a Cervical Fracture/Dislocation	SFQC	BA	3-4
	081-833-4390	Manage Common Dislocations	SFQC	BA	3-4
	081-833-4411	Manage Common Soft Tissue Injuries of the Extremities	SFQC	BA	3-4
	081-833-4412	Manage Contusions	SFQC	BA	3-4
	081-833-4416	Manage Abrasions	SFQC	BA	3-4
	081-833-4421	Manage Crush Syndrome	SFQC	BA	3-4
	081-833-4424	Manage Traumatic Amputations	SFQC	BA	3-4
	081-833-4449	Manage Maxillofacial Trauma	SFQC	BA	3-4
	081-833-4508	Manage Nonpenetrating Injuries to the Abdomen	SFQC	BA	3-4
	081-833-4512	Manage Penetrating Injuries to the Abdomen	SFQC	BA	3-4
	081-833-4514	Perform Venous Cutdown	SFQC	BA	3-4
	081-833-4524	Perform a Closed Tube Thoracostomy	SFQC	BA	3-4
	081-833-4528	Perform a Cricothyroidotomy	SFQC	BA	3-4
	081-833-4531	Manage Penetrating Trauma	SFQC	BA	3-4
	081-833-4534	Perform Ligation or Clamping to Control Hemorrhage	SFQC	BA	3-4
	081-833-4679	Perform Tactical Combat Casualty Care	SFQC	BA	3-4
	081-833-4680	Prepare a Patient for Transport	SFQC	BA	3-4
24. Anesthesia	081-833-4522	Prepare a Patient for General Anesthesia	SFQC	BA	3-4
	081-833-4542	Record Surgical and Anesthetic Procedures	SFQC	BA	3-4
	081-833-4547	Administer Regional Anesthesia	SFQC	AN	3-4
	081-833-4548	Administer Parenteral General Anesthesia	SFQC	AN	3-4
	081-833-4550	Administer Local Anesthesia	SFQC	AN	3-4
	081-833-4551	Manage a Patient Through Recovery Following General Anesthesia	SFQC	BA	3-4
25. Surgical Procedures	081-833-4425	Perform Amputations	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4493	Perform an Escharotomy	SFQC	BA	3-4
	081-833-4516	Perform a Delayed Primary Closure	SFQC	BA	3-4
	081-833-4518	Perform Wound Debridement	SFQC	BA	3-4
	081-833-4530	Perform Suturing	SFQC	BA	3-4
	081-833-4537	Drain Abscesses	SFQC	AN	3-4
	081-833-4539	Manage Compartment Syndrome Surgically	SFQC	BA	3-4
	081-833-4545	Prepare a Patient for Surgery	SFQC	BA	3-4
26. CMS	081-825-0007	Operate a Steam Sterilizer	SFQC	BA	3-4
	081-833-0007	Establish a Sterile Field	SFQC	BA	3-4
	081-833-4486	Perform Field Expedient Sterilization or Disinfection	SFQC	BA	3-4
	081-833-4487	Prepare Items For Sterilization	SFQC	BA	3-4
	081-833-4497	Store Sterile Supplies	SFQC	BA	3-4
	081-833-4544	Establish a Sterile Operating Room	SFQC	BA	3-4
	081-837-0001	Perform the Surgical Hand and Arm Scrub	SFQC	AN	3-4
	081-837-0002	Put On Sterile Gown and Gloves	SFQC	AN	3-4
27. NBC	081-833-0082	Triage Casualties on an Integrated Battlefield	SFQC	BA	3-4
	081-833-0083	Treat a Nerve Agent Casualty in the Field	SFQC	AN	3-4
	081-833-0084	Treat a Blood Agent (Cyanide) Casualty in the Field	SFQC	AN	3-4
	081-833-0085	Treat a Choking Agent Casualty in the Field	SFQC	AN	3-4
	081-833-0086	Treat a Blister Agent Casualty (Mustard, Lewisite, Phosgene Oxime) in the Field	SFQC	AN	3-4
	081-833-0093	Set Up a Casualty Decontamination Station	SFQC	BA	3-4
	081-833-0095	Decontaminate a Casualty	SFQC	AN	3-4
	081-833-4553	Manage Chemical Casualties	SFQC	BA	3-4
	081-833-4557	Manage a Biological Casualty	SFQC	BA	3-4
	081-833-4559	Manage Radiation Casualties	SFQC	AN	3-4
	081-833-4564	Manage an Incapacitating Agent Casualty	SFQC	AN	3-4
28. Environment	081-833-4003	Manage Allergic Reactions	SFQC	BA	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
al Conditions	081-833-4117	Manage Nutritional Deficiencies	SFQC	BA	3-4
	081-833-4160	Manage a Heat Casualty	SFQC	BA	3-4
	081-833-4162	Manage Cold Injuries	SFQC	BA	3-4
	081-833-4205	Manage Near Drowning	SFQC	BA	3-4
	081-833-4233	Manage Suspected Barotrauma	SFQC	BA	3-4
	081-833-4683	Manage High Altitude Illness	SFQC	BA	3-4
29. Special Forces Medic Skills	081-833-4000	Establish a Pharmacy	SFQC	BA	3-4
	081-833-4652	Plan the Medical Aspect of Civic Action Programs	SFQC	BA	3-4
	081-833-4661	Organize a Hospital in a Special Operations Environment	SFQC	BA	3-4
	081-833-4665	Select Hospital Sites in an Operational Area	SFQC	BA	3-4
	331-201-4000	Prepare a Multi-Echelon Casualty Evacuation Plan	SFQC	BA	3-4
	331-201-4001	Prepare the S-5 Portion of a Detachment Briefback	SFQC	BA	3-4
30. Senior Special Forces Medic Skills	331-201-4003	Prepare the Medical Portion of an Area Study	SFQC	BA	3-4
	081-833-4624	Supervise the Ongoing Medical Portion of an Area Study	SFQC	AN	3-4
	081-833-4632	Supervise a Substance Abuse Program	SFQC	BA	3-4
	081-833-4633	Supervise a Pediatric Health Care Program	SFQC	BA	3-4
	081-833-4635	Supervise a Malaria Control Program	SFQC	BA	3-4
	081-833-4636	Supervise a Rabies Control Program	SFQC	BA	3-4
	081-833-4637	Supervise Immunization Programs	SFQC	BA	3-4
	081-833-4638	Supervise Field Sanitation Programs	SFQC	BA	3-4
	081-833-4639	Supervise Field Food Service Facility Inspection	SFQC	BA	3-4
	081-833-4640	Supervise Veterinary Immunization Programs	SFQC	BA	3-4
	081-833-4647	Supervise Evacuation Routes Between Medical Facilities	SFQC	AN	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	081-833-4663	Supervise UW Aid Station Operations	SFQC	AN	3-4
	081-833-4666	Supervise Hospital Operations	SFQC	BA	3-4

CHAPTER 3**MOS/Skill Level Tasks**

Skill Level 3

Subject Area 1: Laboratory

Perform a Gram Stain**081-821-1013**

Conditions: You have a culture with one or more organisms growing in it. Necessary materials and equipment: a Bunsen burner, Gram stain reagents, an inoculating loop, an inoculating needle, glass slides, water, a staining rack, a diamond point pen or lead pencil, needle, syringe, disposable transfer pipets, a timer, and a logbook.

Standards: A smear is prepared and stained so that Gram-negative organisms appear pink to red and Gram-positive organisms appear blue to purple with 100 percent accuracy.

Performance Measures**GO** **NO GO**

1. Label a slide with a lead pencil or diamond point pen.	_____	_____
2. Prepare the smear.	_____	_____
a. From a liquid specimen or medium, if applicable.		
(1) Place 1 drop in the center of a labeled slide using a sterile pipet, syringe, or loop.		
(2) Spread inoculum to about the size of a dime.		
(3) Allow the smear to completely air-dry.		
b. From a colony on an agar plate, if applicable.		
(1) Place a small drop of water in the center of the labeled slide.		
(2) Touch the top center of the colony with a sterile inoculating needle and transfer a small amount of bacteria to the drop of water.		
(3) Mix the bacteria and water with the needle and spread it to about the size of a dime.		
(4) Allow the smear to completely air-dry.		
c. From a swab, if applicable.		
(1) Roll the swab across the center of a dry labeled slide.		
(2) Allow the smear to completely air-dry.		
3. Use either of the following methods to fix the smear:	_____	_____
a. Methanol.		
(1) Flood the smear with methanol and allow it to stand for 1 minute.		
(2) Tilt the slide to drain off excess methanol and allow it to completely air-dry.		
b. Heat. Gently heat the smear by passing it through the burner flame two or three times.		
CAUTION: Do not overheat the slide.		
4. Stain the slide.	_____	_____
a. Flood the slide with crystal violet for 1 minute.		
b. Rinse the smear with tap water.		
c. Flood the slide with Gram's iodine for 1 minute.		
d. Rinse the smear with tap water.		
e. Rinse the slide with decolorizer for 2 to 5 seconds.		

Performance Measures**GO** **NO GO**

- f. Rinse the smear with tap water.
- g. Flood the slide with safranin for 30 to 60 seconds.
- h. Rinse the smear with tap water.
- i. Blot the smear dry by placing it between paper towels or allow the smear to air-dry.

NOTE: Test each new batch of reagents with known Gram-positive and Gram-negative organisms. Quality control slides may be prepared by adding a drop of a 24-hour culture to a glass slide and allowing the broth to dry. Fix each slide and store them in a box until ready for QC testing. A slide containing separate drops of Gram-positive and Gram-negative organisms should be stained each day to test the quality of the Gram stain reagent. Alternatively, a mixture containing both Gram-negative and Gram-positive organisms can be used to prepare the control slides.

5. Examine the smears (Figure 1) under oil immersion for--
 - a. Gram stain reaction.
 - b. Cell shape.
 - c. Arrangements.

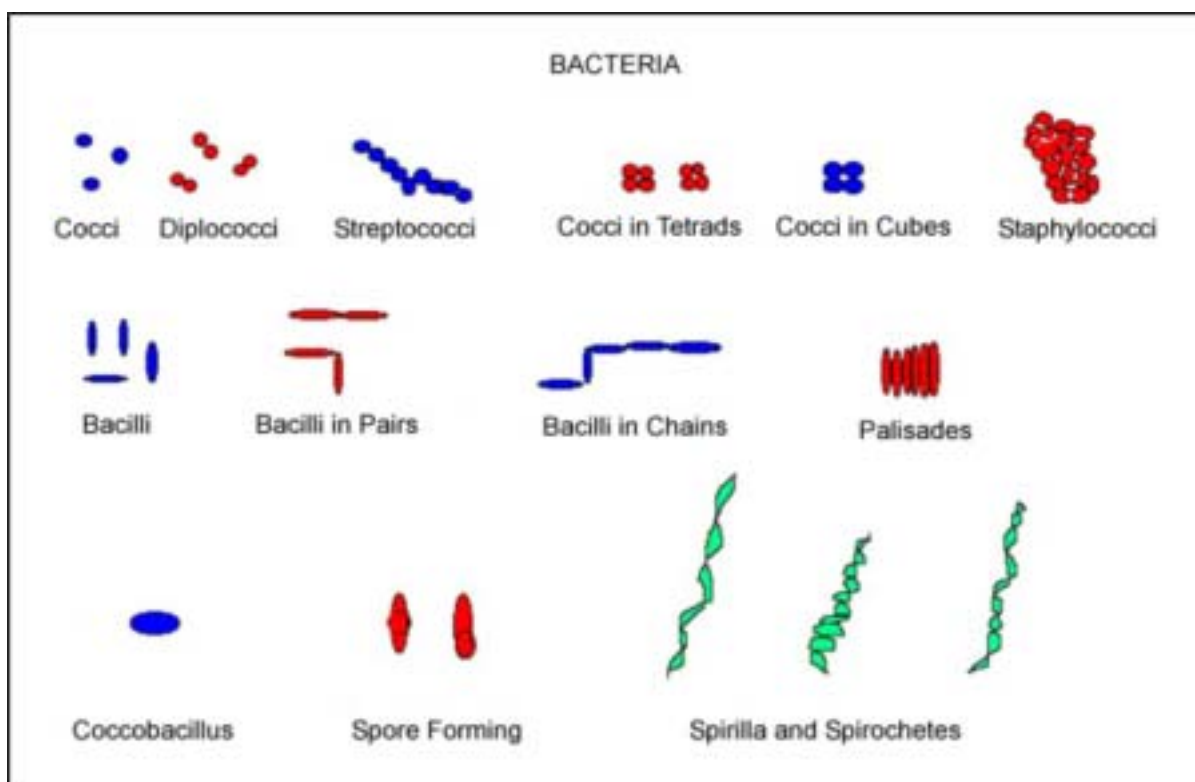


Figure 1. Bacteria

6. Record the results in the logbook and on the laboratory request form.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

STP 8-91K15-SM-TG

Perform ABO Grouping and Confirmation Tests

081-821-1018

Conditions: You have patient or donor blood specimens. Necessary materials and equipment: 10 x 75 mm test tubes, a test tube rack, an indelible marker, disposable transfer pipets, reagents, a processing worksheet, a logbook, a centrifuge (calibrated to 1000 RCF @ 3175 rpm), and an AABB Technical Manual (TM 8-227-3).

Standards: The ABO group is determined by performing cell grouping and serum grouping with 100 percent accuracy.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepare the equipment and the specimen.	_____	_____
a. Obtain a test tube rack.		
b. Place the patient/donor blood tube and serum tube in the rack.		
c. Prepare a 2 to 5 percent cell suspension from the blood tube.		
d. Obtain five test tubes, label them properly, and place them in the rack.		
(1) Label tube # 1, "A" with the patient ID number.		
(2) Label tube # 2, "B" with the patient ID number.		
(3) Label tube # 3, "A,B" with the patient ID number.		
(4) Label tube # 4, "AC" with the patient ID number.		
(5) Label tube # 5, "BC" with the patient ID number.		
2. Prepare the specimen for group testing.	_____	_____
a. Add 1 drop of "Anti-A" reagent and 1 drop of the patient's cell suspension to the tube marked "A".		
b. Add 1 drop of "Anti-B" reagent and 1 drop of the patient's cell suspension to the tube marked "B".		
c. Add 1 drop of "Anti-A,B" reagent and 1 drop of the patient's cell suspension to the tube marked "A,B".		
d. Add 2 drops of the patient's serum and 1 drop of "A" cells to the tube marked "AC".		
e. Add 2 drops of the patient's serum and 1 drop of "B" cells to tube marked "BC".		
3. Perform the ABO group test.	_____	_____
a. Mix each tube by gentle shaking.		
b. Centrifuge the test tubes for 15 seconds.		
c. Examine each tube for hemolysis.		
d. Examine each tube for agglutination.		
(1) Write "+" on the worksheet for agglutination.		
(2) Write "O" on the worksheet for no agglutination.		
NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+; and annotate hemolysis.		
4. Interpret the results of the tests and determine the blood group. (See Tables 1 and 2.)	_____	_____
5. Record the results in the logbook and on the laboratory request form.	_____	_____

Performance Measures

GO NO GO

Table 1. Example of Expected Results

ABO Blood Group	Anti-A	Anti-B	Anti-A, B	A Cells	B Cells
A	3+	0	4+	0	2+
B	0	2+	3+	2+	0
AB	1+	2+	2+	0	0
O	0	0	0	3+	3+

Table 2. Antigens and Antibodies Present

ABO Blood Group	Antigens Present	ABO Antibodies Present
A	A	Anti-B
B	B	Anti-A
AB	A and B	No AB antibodies
O	No AB antigens	Anti-A and Anti-B

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
TM 8-227-3

Related
STP 8-91K15-SM-TG

Perform an Rh Typing**081-821-1019**

Conditions: You have a patient's blood specimen. Necessary materials and equipment: 10 x 75 mm test tubes, an indelible marker, a test tube rack, disposable transfer pipets, prepared reagents: anti-Rh (D) typing serum and 22 percent bovine albumin (control), a processing worksheet, a logbook, a centrifuge (calibrated to 1000 RCF @ 3175 rpm), and an AABB Technical Manual (TM 8-227-3).

Standards: The Rh type of an unknown blood sample is determined with 100 percent accuracy.

Performance Measures**GO** **NO GO**

1. Prepare the equipment and the specimen.	_____	_____
a. Obtain a test tube rack.		
b. Place the patient's blood specimen tube in the rack.		
c. Prepare a 2 to 5 percent cell suspension from the patient's blood.		
d. Obtain two test tubes, properly label the tubes, and place them in the rack.		
(1) Label tube #1, "D" with the patient's ID number.		
(2) Label tube #2, "DC" with the patient's ID number.		
2. Prepare the sample for Rh typing.	_____	_____
a. Add 1 drop of "Anti-D" and 1 drop of the patient's cell suspension to the tube marked "D".		
b. Add 1 drop of Rh control (22 percent bovine albumin) and 1 drop of the patient's cell suspension to the tube marked "DC".		
3. Perform the Rh (D) typing test.	_____	_____
a. Mix the test tubes by gentle shaking.		
b. Centrifuge the test tubes for 15 seconds.		
c. Examine each test tube for hemolysis.		
d. Examine each test tube for agglutination.		
(1) Write "+" on the worksheet for agglutination.		
(2) Write "0" on the worksheet for no agglutination.		
4. Interpret the results of the test and determine the Rh type.	_____	_____
NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+; and annotate hemolysis. If the patient specimen is <2+ AND the anti-D reagent is polyclonal or chemically modified, OR the control tube has agglutination, proceed with the test for Rh variant (weak D).		
5. Perform the test for the Rh variant (weak D antigen) if no agglutination is seen in BOTH the Anti-D and control tube.	_____	_____
NOTE: The terms Rh positive and Rh negative refer to the presence or absence of the red cell antigen "D".		
6. Record the results in the logbook and on the laboratory request form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
TM 8-227-3

Related
STP 8-91K15-SM-TG

Perform A Test For Rh Variant (Weak D)**081-821-1020**

Conditions: You have just performed an Rh typing. Your results were negative. Necessary materials and equipment: two test tubes labeled "D" and "DC" (control) from the Rh (D) typing test, a centrifuge (calibrated to 1000 RCF at 3175 rpm), a test tube rack, disposable transfer pipets, prepared reagents, antihuman globulin (AHG) and check cells, saline, gauze, a processing worksheet, a logbook, a 37 degrees C incubator, and an AABB Technical Manual (TM 8-227-3).

Standards: The presence or absence of Rh variant (weak D) is determined with 100 percent accuracy.

Performance Measures**GO** **NO GO**

1. Prepare the tubes for weak D antigen testing.
 - a. Incubate the tubes labeled "D" and "DC" for 15 to 30 minutes at 37 degrees C.
 - b. Upon removal from the incubator, centrifuge the tubes for 15 seconds.
 - c. Examine each test tube for hemolysis.
 - d. Read for agglutination.
 - (1) If the "D" tube is positive and the "DC" tube is negative, record the results and discontinue the procedure. The specimen is Rh positive.
 - (2) If no agglutination is visible in either tube, record "0" and continue testing.

NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+.

- e. Wash the cells in both tubes at least four times with saline to remove protein and any unbound antibodies.

NOTE: If the RBCs are not washed correctly, the unbound antibodies or protein may neutralize the antihuman globulin and cause a false negative result.

- f. Remove all saline from the last wash by blotting the tubes with gauze.

2. Perform the weak D antigen test.
 - a. Add 2 drops of antihuman globulin (AHG) to both test tubes.
 - b. Mix the test tubes by swirling.
 - c. Centrifuge the test tubes for 15 seconds.
 - d. Examine each test tube for hemolysis.
 - e. Examine each test tube for agglutination.

NOTE: Current standards do not require the use of optical aids, but their use may enhance sensitivity and consistency.

- (1) Write "+" on the worksheet for agglutination.
- (2) Write "0" on the worksheet for no agglutination.

NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+. Repeat the entire procedure starting with task 081-821-1019 if the "DC" tube shows any agglutination.

- f. Add 1 drop of check cells to all negative tubes to confirm the reactivity of the antiglobulin reagent.

NOTE: Check cells are group "O" cells that have been sensitized with IgG. If the tubes do not show agglutination after the addition of check cells, repeat the entire procedure starting with task 081-821-1019.

3. Interpret the results and determine the blood type.
4. Record the results in the logbook and on the laboratory request form.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required
TM 8-227-3

Related
STP 8-91K15-SM-TG

Perform a Crossmatch Procedure**081-821-1023**

Conditions: You have a patient's blood specimen tube and completed SF 518, Medical Record--Blood or Blood Component Transfusion. Necessary materials and equipment: 10 x 75 mm test tubes, an indelible marker, a test tube rack, disposable transfer pipets, gauze, saline, reagents, a worksheet, a centrifuge (calibrated to 1,000 RCF @ 3,175 rpm), a logbook, a 37 degree C incubator, and an AABB Technical Manual (TM 8-227-3, The Technical Manual of the American Association of Blood Banks).

Standards: The compatibility or incompatibility of donor units of blood with that of a recipient is determined with 100 percent accuracy and incompatibilities are evaluated.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Verify the need to perform a crossmatch procedure.	_____	_____
a. Check that the transfusion request (SF 518) is properly filled out.		
b. Verify the number of units needed for the transfusion.		
NOTE: There must be one SF 518 for each unit requested.		
c. Check that the name and ID number on the blood tubes match the request form.		
d. Ensure that the phlebotomist's initials are on the tube with the appropriate date and time.		
2. Determine the recipient's ABO group. (See Task No. 081-821-1018.)	_____	_____
3. Determine the recipient's Rh type. (See Task No. 081-821-1019.)	_____	_____
4. Select the donor blood to perform the testing.	_____	_____
a. Obtain the donor units that are the same blood group and type as that of the recipient.		
b. Select the order of preference of the donor blood, if the group and type matching the recipient is not available.		
(1) If the recipient is Group O, give only Group O blood.		
(2) If the recipient is Group A, give Group A blood first and then Group O packed cells.		
(3) If the recipient is Group B, give Group B blood first and then Group O packed cells.		
(4) If the recipient is Group AB, give Group AB blood first, and then Group A packed cells or Group B packed cells or Group O packed cells as a last resort, in that order.		
(5) Rh positive blood should be selected for Rh positive recipients.		
(6) Rh negative blood should be saved for Rh negative recipients (this includes individuals who are weak D positive).		
5. Prepare the equipment.	_____	_____
a. Obtain the test tube rack.		
b. Place the patient's blood specimen tube and serum tube in the rack.		
c. Obtain two test tubes. Label tube #1, "XM" (Crossmatch) with the patient ID number and first donor unit number. Label tube #2 "XM" (Crossmatch) with the patient ID and second donor unit number. Place both tubes in the rack.		
d. Prepare a 2 to 5 percent cell suspension from a segment of each donor unit and from the recipient's cells.		
6. Add 2 drops of recipient's serum and 1 drop of donor's cell suspension to the tubes labeled "XM".	_____	_____
7. Prepare the test tubes for an immediate spin (saline phase).	_____	_____

Performance Measures**GO** **NO GO**

- a. Mix the test tubes.
- b. Centrifuge the test tubes for 15 seconds.
- c. Examine each test tube for hemolysis.
- d. Examine each test tube for agglutination.

NOTE: If the antibody detection tests (AB screen) are negative and the recipient has no history of clinically significant anti-bodies, the immediate spin crossmatch may be performed **ONLY** for the detection of ABO incompatibilities. The antiglobulin phase of testing rarely uncovers clinically significant antibodies in a recipient whose antibody screening test is negative and who has no history of clinically significant antibodies.

(1) Write "+" on the worksheet for agglutination.

(2) Write "O" on the worksheet for no agglutination.

NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+.; and annotate hemolysis.

WARNING: If a positive reaction occurs in the crossmatch, stop the crossmatch procedure. The blood is not compatible.

8. Perform the albumin phase.

- a. Add 2 drops of 22 percent bovine albumin to tubes labeled "XM" (only if no agglutination appeared after the saline phase).
- b. Mix the tubes.

WARNING: If a positive reaction occurs in the crossmatch, stop the crossmatch procedure. The blood is not compatible.

9. Continue testing the tubes labeled "XM".

- a. Incubate the test tubes for 15 to 30 minutes at 37 degrees C.
- b. Centrifuge the test tubes for 15 seconds.
- c. Examine each test tube for hemolysis.
- d. Examine each test tube for agglutination.
- (1) Write "+" on the worksheet for agglutination.
- (2) Write "O" on the worksheet for no agglutination.

NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+.

10. Perform the final testing of the "XM" tubes.

- a. Wash the tubes four times with saline.
- b. Remove all saline from the last wash by blotting with gauze.
- c. Add 2 drops of antihuman globulin (AHG) to each tube.
- d. Mix each tube gently.
- e. Centrifuge each test tube for 15 seconds.
- f. Examine each test tube for hemolysis.
- g. Examine each test tube for agglutination.

NOTE: Current standards do not require the use of optical aids before a crossmatch may be considered compatible, but their use may enhance sensitivity and consistency.

(1) Write "+" on the worksheet for agglutination.

(2) Write "O" on the worksheet for no agglutination.

NOTE: Grade the degree of agglutination: +/-, 1+, 2+, 3+, or 4+.

- h. Add check cells to all negative tubes to confirm the reactivity of the antihuman globulin reagent.

NOTE: If the negative tubes do not show agglutination after adding check cells, repeat the bovine albumin phase (steps 8 through 10g).

11. Obtain and record the results in the logbook and on the transfusion request form, SF 518.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

SF 518

TM 8-227-3

Related

STP 8-91K15-SM-TG

Perform a Rapid Plasma Reagin (RPR) Test
081-821-1033

Conditions: You have a properly collected serum specimen tube and a laboratory request form.
Necessary materials and equipment: a card rotator machine (calibrated to 100 rpm) with a humidifier cover, a bottle of water for the humidifier cover, a needle dropper, an ampule of RPR antigen, gauze, a test tube rack, a test tube marker, dispenstirs, controls, a test card, a logbook, and a clock or watch.

Standards: The presence or absence of reaginic antibodies is determined and accurate results are reported.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform an RPR card test.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Allow the reagents and specimen to reach room temperature.	_____	_____
2. Use a dispenstir to dispense 1 drop of unknown serum and reactive and nonreactive controls into separate 18 mm circles on the RPR card.	_____	_____
3. Use the flat end of the dispenstir to spread each specimen to the limits of the circle.	_____	_____
4. Mix and dispense 1 drop of antigen into each specimen on the card. NOTE: The needle should deliver 30 drops of antigen, ± 1 drop, per 0.5 ml. Dispense the first few drops of antigen on the corner of the card to rid the needle of bubbles.	_____	_____
5. Place the card on the rotator, cover with a humidifier lid, and rotate for 8 minutes. NOTE: The rotator speed should be 100 rpm (± 5 rpm).	_____	_____
6. Examine macroscopically for agglutination by tilting and rotating each card by hand. a. Write "REACTIVE" on the worksheet for characteristic clumping of carbon particles. b. Write "NONREACTIVE" on the worksheet for no clumping of carbon particles. NOTE: A slight roughness is considered nonreactive.	_____	_____
7. Obtain the correct results for the controls and the unknown. NOTE: Reactive specimens should be confirmed by a test specific for treponemal antibody (FTA-Fluorescent Treponemal Antibody test). False positives can be caused by other diseases: infectious mononucleosis, leprosy, lupus erythematosus, or viral pneumonia.	_____	_____
8. Record the results in the logbook and on the laboratory request form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91K15-SM-TG

Perform a WBC Count on Whole Blood**081-821-1036**

Conditions: You have a properly collected blood sample and a laboratory request form. Necessary materials and equipment: a WBC Unopette, a hemacytometer with coverslip, a microscope, a tally counter, a moisture chamber, a clock, and a logbook.

Standards: The count difference between all nine squares on one side of the hemacytometer is not greater than 10 cells and the difference between the two sides of the hemacytometer does not exceed 15 cells.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Inspect the equipment.	_____	_____
a. Check the hemacytometer and coverslip for nicks, scratches, and cleanliness. Replace if necessary.		
b. Ensure that the WBC Unopette reservoir and capillary pipet are in usable condition.		
c. Ensure that the tally counter is operable; if not, replace it.		
2. Prepare the blood for the count.	_____	_____
a. Puncture the Unopette reservoir with the protective shield over the capillary pipet.		
b. Touch the tip of the capillary pipet to the blood specimen and allow the pipet to fill by capillary action.		
NOTE: The filled capillary pipet must be free of bubbles.		
c. Wipe excess blood from the outside of the pipet without touching the tip.		
d. Squeeze the reservoir slightly, cover the overflow chamber of the pipet with the index finger, and insert the capillary pipet into the reservoir.		
e. Simultaneously, remove the finger from the overflow chamber and release pressure from the reservoir to draw the blood into the diluent.		
f. Squeeze the reservoir several times to rinse the pipet and to thoroughly mix the blood with the diluent.		
g. Let the reservoir stand for at least 10 minutes to allow the red cells to hemolyze.		
NOTE: The leukocyte count should be performed within 3 hours.		
3. Prepare the diluted specimen for count.	_____	_____
a. Mix diluted blood by inverting the reservoir to resuspend the cells.		
b. Convert to a dropper assembly by withdrawing the pipet from the reservoir and reseating it securely with the capillary tube exposed.		
c. Clean the capillary bore by inverting the reservoir and gently squeezing the sides to discard 3 to 4 drops.		
4. Prepare the hemacytometer.	_____	_____
a. Charge both sides of the hemacytometer by gently squeezing the sides of the reservoir to expel the contents until the chambers are properly filled.		
b. Place the hemacytometer in a moist chamber (Petri dish containing a damp gauze).		
c. Allow the cells to settle for 3 to 5 minutes.		
5. Perform a WBC count.	_____	_____
a. Check under low power, low light for even distribution of cells.		
b. Count all 9 square millimeters of the counting chamber. Count the WBCs lying within the square and those touching the extreme upper and far right lines.		

Performance Measures**GO** **NO GO**

NOTE: There should be no more than a 10 cell difference among the 9 squares counted.

c. Count the second chamber in the same manner.

NOTE: There should be no more than a 15 cell difference between the two sides of the chamber.

6. Calculate the WBC count.

a. Add up the total number of WBCs in both counting chambers.

b. Divide the sum by two to get the average number of cells counted.

c. Multiply the average number of cells by the "K" factor and by 10 to the 6th power to obtain the WBCs/L.

FORMULA: Avg # cells counted x "K" factor x 1,000,000 (10 to the 6th power) = WBCs/L .

K FACTOR:

Dilution factor = 100

Area factor = 0.111

Depth factor = 10

K factor = dilution factor x area factor x depth factor

K factor = 100 x 0.111 x 10

K factor = 111

7. Report and record the results as WBCs/L in the logbook and on the laboratory request form.

Normal values:

Adult 4.0 to 11.0 x 10 (to the 9th power) WBCs/L

Newborn 10.0 to 30.0 x 10 (to the 9th power) WBCs/L

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91K15-SM-TG

Perform a Microhematocrit Determination

081-821-1040

Conditions: You have a properly collected blood specimen and a laboratory request form. Necessary materials and equipment: a control, a logbook, and either a microhematocrit centrifuge (calibrated to 10,000 rpm), microhematocrit reader, sealing putty, and capillary tubes or a Compur M1100 minicentrifuge, capillary tubes, and operator's manual.

Standards: Duplicate hematocrit determinations are performed with the control reading being within +/- 2 percent of the known reading, and the unknown samples being within +/- 2 percent of each other.

Performance Steps

NOTE: The hematocrit is the ratio of red blood cells to plasma expressed as a percent of whole blood.

1. Microhematocrit Centrifuge/Reader Method, if applicable.

a. Prepare the blood specimen collected in EDTA tubes.

NOTE: If blood was collected in capillary tubes, remove them from the reverse side of the laboratory request form and proceed to step 1b.

(1) Mix the control or specimen by gently inverting the tube several times before removing the stopper.

(2) Fill two capillary tubes 3/4 full without bubbles.

NOTE: The test should be performed in duplicate to correlate the results and to balance the centrifuge.

(3) Seal the tubes by plunging the dry ends into a putty pad.

b. Centrifuge the capillary tubes.

(1) Put one tube opposite the other with the sealed ends toward the rubber gasket.

(2) Centrifuge the tubes for 5 minutes

c. Read the results by using the microhematocrit reader.

(1) Place the tube in the groove of the plastic holder with the sealed end toward the center and the black index line intersecting the red blood cell-clay interface.

(2) Match the red vertical line on the plastic holder with the numeral "100" on the outer circle of the microhematocrit reader.

(3) Rotate the inner circle while holding the outer circle stationary until the black spiral indicator line matches the plasma/air interface line within the tube.

(4) Rotate both the inner and outer circles of the reader clockwise simultaneously until the black spiral indicator line matches the RBC plasma interface line excluding the buffy coat.

(5) Run the control and unknown in duplicate.

(6) Report and record the results in percentage on the laboratory request form and in the logbook.

2. Compur M1100 Method, if applicable.

a. Prepare the blood specimen collected in the EDTA tubes.

(1) Mix the control/specimen by gently inverting the tube several times before removing the stopper.

(2) Completely fill two M1100 capillary pipets with blood.

b. Centrifuge the capillary tubes.

(1) Raise the minicentrifuge rotor center post to the upper position by pressing in the lock release levers.

(2) Place the tubes in the rotor with their lower, outer ends against the seals and the inner ends resting against the center post.

(3) Seal the tubes into place by pressing the center post down until it locks into position.

(4) Close the cover.

(5) Start the rotor by sliding the ON/OFF switch to the right; it will automatically shut off when complete.

(6) Allow the rotor to stop.

c. Read the results.

Performance Steps

- (1) Read the hematocrit values through the clear window in the cover directly on the percent scales marked on the rotor next to the capillary tubes.
- (2) Slide the ON/OFF switch to the left.
- (3) Press the cover, release the button, and raise the cover.
- (4) Raise the rotor center post.
- (5) Remove the capillary tubes and discard.
- (6) Report and record the results in percentages on the laboratory request form and in the logbook.

Normal Values:

- Males: 40 to 54 percent Volume Packed Red Cells (mean 47 percent VPRC)
- Females: 37 to 47 percent Volume Packed Red Cells (mean 42 percent VPRC)

NOTE: Critical values are less than 18 percent or greater than 61 percent.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform a microhematocrit determination and hemoglobin estimate.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepare the blood specimen.	_____	_____
2. Centrifuge the capillary tubes in duplicate.	_____	_____
3. Read the results.	_____	_____
4. Report and record the results in percentages.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
STP 8-91K15-SM-TG

Perform A Macroscopic Examination of Feces and Test for Occult Blood**081-821-1042**

Conditions: You have a freshly collected stool specimen without preservatives and a laboratory request form. Necessary materials and equipment: an occult blood developer kit with manufacturer's instructions, disposable transfer pipettes, applicator sticks, and a watch which indicates seconds.

Standards: The fecal specimen is examined for visible parasites, color, consistency, mucous, and gross and occult blood. Accurate results are reported.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determine the consistency and color of the specimen and record the results.	—	—
2. Examine the specimen for mucous (white patches) on the surface and record the results.	—	—
3. Perform a visual inspection for red and/or tarry spots and patches (gross blood), then record the results.	—	—
4. Perform a survey for visible parasites.	—	—
5. Perform the test for occult blood. This is useful in mass screening for colorectal cancer.	—	—

NOTE: The manufacturer's instructions must be referred to for the particular brand of test in the inventory. Slight variations in the following procedure are to be found due to different source companies.

- Label the test envelope with the patient's identification.
- Collect a small portion of the stool sample on one end of an applicator stick.
- Apply a thin smear inside the first box (labeled "A" or "1" depending on the kit).
- If indicated, apply a second thin smear inside the second box (labeled "B" or "2").
- Close the cover.
- Open the flap on the backside of the kit and apply 2 drops of developer to the paper directly over each smear.
- Read the results within 60 seconds.

NOTE: After reading the results, add developer to the positive and negative performance monitors. A blue color should appear in the positive monitor within 10 seconds. No blue color will appear in the negative monitor. If the positive and negative controls are as expected, the test envelope and reagent are good and the results of the patient's specimen are presumed valid.

(1) Positive - Any trace of blue on or at the edge of the smears.

(2) Negative - No detectable blue on or at the edge of the smears.

NOTE: Refer to the manufacturer's instructions for specific times and quantitation. The principle of this test is the general reaction:

Hemoglobin reacts with pseudo peroxide to yield H₂O₂ which reacts with benzidine orthotoluidine guaiac in the presence of oxygen to yield the color blue.

6. Record all results on the laboratory request form.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
STP 8-91K15-SM-TG

Perform a Potassium (Sodium) Hydroxide Preparation of Skin Scrapings**081-821-1056**

Conditions: You have a properly collected specimen (sample of skin, nail, or scalp scrapings) and a laboratory request form. Necessary materials and equipment: 10 percent potassium hydroxide (KOH) (or 10 percent sodium hydroxide [NaOH]), glass microscope slides, cover slips, a Bunsen burner or incinerator, and a microscope.

Standards: The specimen is examined for fungal elements and accurate results are reported.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform a KOH prep.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Place the clinical scrapings into 1 or 2 drops of 10 percent KOH or 10 percent NaOH on a glass slide.	—	—
2. Cover with a coverslip.	—	—
3. Gently heat the slide over a flame for a few seconds. Do not boil. NOTE: If heat is not used, allow the preparation to stand for 15 to 30 minutes, preferably longer, before reading.	—	—
4. Examine the specimen first under low power.	—	—
5. Identify spores and mycelium under high-power magnification (Figure 1).	—	—

Performance Measures

GO NO GO

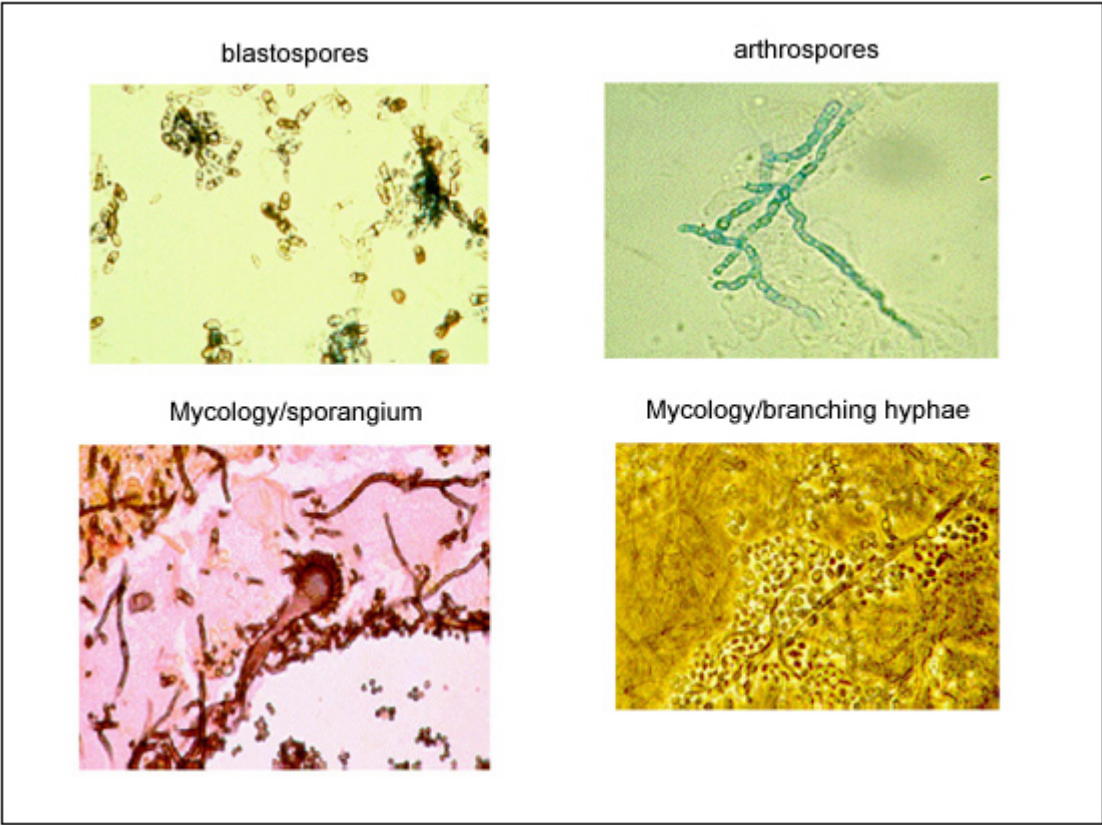


Figure 1. Fungal Structures
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6. Record and report results on the laboratory request form. _____
- a. If fungal structures are seen, report "Fungal Structures Present." _____
- b. If no fungal structures are seen, report "No Fungal Structures Observed." _____
7. Confirm positive slides with supervisor. _____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
ATLAS OF HUMAN PARASITOLOGY
STP 8-91K15-SM-TG

Perform a Qualitative HCG Test
081-821-1064

Conditions: You have a properly collected first morning urine specimen and a laboratory request form. Necessary materials and equipment: Tandem Icon II HCG (human chorionic gonadotrophin) test kit including the test cylinder, antibody conjugate (bottle A), substrate reagent (bottle B), wash concentrate (bottle C), and package insert; transfer pipettes; reagent station; and a Tandem Icon II HCG control set (urine).

Standards: A urine pregnancy test is performed on a specimen and controls. Results are reported with 100 percent accuracy.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform a diagnostic pregnancy screening test.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepare the specimen and reagents.	_____	_____
a. Allow the specimen and reagents to warm to room temperature and gently mix each by swirling.		
b. Dipstick urine for specific gravity.		
NOTE: Centrifuge turbid specimens at 1,000 rpm for 3 minutes and use the supernatant for the test.		
2. Perform the urine pregnancy test.	_____	_____
a. Place 5 drops of the urine specimen onto the center of the Icon HCG membrane allowing it to drain through the membrane before adding the next reagent (usually 5 to 10 seconds).		
b. Place 3 drops of antibody conjugate (bottle A) onto the center of the Icon HCG membrane and wait at least 1 minute for complete drainage and antibody reaction.		
c. Direct wash solution onto the inner wall of the cylinder so that it flows onto the membrane. Fill the cylinder up to the ridged line and wait for complete drainage before adding the next reagent.		
d. Dispense 3 drops of substrate reagent (bottle B) onto the center of the membrane, and wait 2 minutes for the color to develop.		
e. Stop the color development by adding wash solution to the cylinder up to the fill line.		
f. With the "P" facing you, observe for color development at the test zone and positive reference zone.		
3. Interpret urine pregnancy test results.	_____	_____
a. No blue spot at the test zone indicates a negative result.		
NOTE: If the specific gravity is = or < 1.005, add this comment to the report: Specific gravity = or < 1.005, results may be invalid; please resubmit.		
b. A blue spot in the test zone, regardless of the color intensity, indicates a positive result.		
c. For the test to be valid, the reference zone must also appear as a blue spot within 2 minutes after adding the substrate. If no color appears, the test is invalid.		
NOTE: A light blue color that develops over the entire membrane indicates that inadequate washing has occurred. Random blue specks should not be interpreted as a positive result.		
4. Record and report the results on the laboratory request form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91K15-SM-TG

Perform A Microscopic Examination of Pinworm Preparations
081-821-1065

Conditions: A patient has a laboratory request form requiring a check for pinworms. Necessary materials and equipment: clear cellulose tape (3/4" wide is best), microscope slides, tongue depressor, cotton, toluene or xylene, and a microscope.

Standards: The collection of the specimen is correct and yields a sample suitable for determining the presence or absence of *Enterobius vermicularis* (*E. vermicularis*) eggs.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepare the collection slide.	_____	_____
a. Anchor one end of the cellulose tape to the underside of the microscope slide.		
b. Fold the tape over the near end of the slide and smooth the adhesive down along the full length of the slide.		
c. Attach a paper tab to the free end of the tape for labeling.		
d. Store in the refrigerator.		
2. Collect the specimen.	_____	_____
a. Using the paper tab, pull the tape back from the slide leaving the fold over the underside attached.		
b. Loop the tape over a tongue depressor to hold it steady.		
c. Press the sticky tape surface against the perianal skin. Press open the perianal folds to gain access to eggs in the crevices.		
d. Use a limited area of the tape surface to decrease the area for microscopic examination.		
e. Smooth the tape back into place using a piece of cotton.		
CAUTION: The eggs will stick to you and are infective for several hours after being passed.		
3. Perform a microscopic examination of the slide.	_____	_____
a. Lift the tape from the slide, and place a drop of toluene or xylene on the slide. Smooth the tape back into position.		
NOTE: Slides may be stored up to several weeks in the refrigerator before being examined; however, do not put the toluene or xylene on the slide until ready for examination as distortion to the eggs occurs.		
b. Search the slide for eggs using low power magnification and reduced light.		
4. Record and report the results.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91K15-SM-TG

Perform Concentration Techniques For Ova And Parasites (Con-Trate Method)
081-821-1066

Conditions: You have a properly collected fecal specimen and a laboratory request form. Necessary materials and equipment: Feka Con-Trate System containing filtering devices, disposable centrifuge tubes with caps, Muco Pen X (reagent A) and Ethyl Acetate (reagent B), manufacturer's instructions for Con-Trate Fecal Concentration, cotton-tipped applicator sticks, microscope slides, 22 x 40 mm coverslips, 10 percent formalin, a centrifuge, disposable transfer pipettes, a tube rack, a squirt bottle, Lugol's iodine, and a vortex mixer.

Standards: A fecal specimen is microscopically examined with accurate results reported.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected stool sample which he must examine for the presence of ova and parasites.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Perform the concentration procedure.	_____	_____
a. Strain about 3 ml of the specimen suspension through the disposable filtering device into a 15 ml conical centrifuge tube.		
b. Fill the tube to 12 milliliters (ml) with 10 percent formalin.		
c. Centrifuge at 2,000 revolutions per minute (rpm) for 5 minutes.		
d. Remove the tubes, and pour off the supernatant.		
e. Prepare slides for acid-fast bacteria (AFB) staining by placing 1 drop of the sediment on a glass slide and allowing it to air dry.		
f. Add formalin to the 8 ml mark on the tube.		
WARNING: Formalin may be fatal if swallowed and harmful if inhaled. Exposure may create a cancer risk and may cause blindness. Keep away from heat, sparks, or flame. Avoid breathing vapor. Use only with adequate ventilation. Wash thoroughly after handling.		
g. Add ethyl acetate to the 12 ml tube, stopper the tube, and vortex.		
WARNING: Ethyl acetate is flammable. Keep away from heat, sparks, or flame. It is harmful if swallowed or inhaled. Use only with adequate ventilation. Avoid contact with eyes. Wash thoroughly after handling.		
h. Allow the tube to stand for 3 minutes.		
i. Centrifuge at 2,000 rpm for 5 minutes.		
j. Ream the plug with an applicator stick and decant the supernatant.		
CAUTION: Do not allow debris or ethyl acetate to contaminate the sediment.		
2. Perform the microscopic examination.	_____	_____
a. Transfer 1 drop of the sediment to a glass slide.		
b. Add 1 drop of Lugol's iodine and cover with a coverslip.		
c. Scan the whole slide on low (10x) power.		
d. Identify using high-dry (40x) objective. Scan at least 75 fields under high dry.		
3. Record and report the results on the laboratory request form.	_____	_____
a. If organisms are recovered, report by genus and species.		
b. If no organisms are seen, report "No ova parasites seen."		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91K15-SM-TG

Perform a Microscopic Examination For Acid-Fast Bacteria
081-821-1075

Conditions: You have a properly collected patient specimen in a sterile disposable container and a laboratory request form. Necessary materials and equipment are: Kinyoun's stain reagents, microscope slides, a Bunsen burner or incinerator, an inoculating loop, a microscope, and immersion oil.

Standards: An unconcentrated specimen is stained adequately with Kinyoun's stain to cause acid-fast organisms to appear as red-colored rods, coccobacilli, or filaments.

Performance Measures	GO	NO GO
CAUTION: Acid-fast bacteria (AFB) are highly infectious. Handle specimens and smears with care. Use face masks and gloves, and wash hands immediately after performing the AFB examination. Perform these procedures in a biosafety cabinet, if available.		
1. Prepare a smear of the specimen on a glass slide. Air-dry and fix the smear by passing it briefly through a flame.	_____	_____
2. Stain the smear. a. Flood the fixed smear with Kinyoun's carbol-fuchsin stain for 3 minutes. b. Wash the smear gently with running water. c. Decolorize it with Kinyoun's acid-alcohol reagent until no color appears in the washing. This should take about 2 minutes. d. Wash the smear gently with running water. e. Counterstain with Kinyoun's methylene blue reagent for 30 seconds. f. Wash the smear gently with running water. g. Allow the smear to air-dry.	_____	_____
3. Examine the smear using the oil immersion objective. Scan the length of the slide at least three times in the stained area (about 300 fields).	_____	_____
NOTE: Acid-fast organisms will appear as red-colored coccobacilli, rods, or filaments. Some may appear beaded. The background will be bluish.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required	Related STP 8-91K15-SM-TG

Perform a Wright's Stain Using Camco Quik Stain
081-821-1083

Conditions: You have a properly collected blood sample and a laboratory request form. Necessary materials and equipment: Wright's stain (Camco Quik Stain), glass slides, capillary tubes, a staining rack, distilled water, a microscope, immersion oil, and 95 percent methanol.

Standards: The blood smear has buff-pink-colored red blood cells (RBCs), orange-red eosinophils, blue lymphocytes, and pink granules in the neutrophils with no precipitate and is stained with sufficient color.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Prepare the glass slides by cleaning them in 95 percent methanol.	_____	_____
2. Prepare the blood smear.	_____	_____
a. Place a drop at a point midway between the sides of the slide and a short distance from one end.		
b. Place the edge of the spreader slide on the specimen slide at a 30-degree angle.		
c. Pull the spreader slide toward the drop of blood until contact is made.		
d. Push the spreader slide toward the opposite end of the specimen slide, drawing the blood behind it into a thin film.		
e. Allow the smear to air-dry. The smear should have three areas represented.		
(1) The thick area has--		
(a) An increase of smaller cells with rouleaux formation.		
(b) Poor cellular characteristics.		
(2) The thin area has--		
(a) An area of choice for reading a differential.		
(b) Cellular characteristics which are at their best.		
(c) RBCs that are touching without overlapping.		
(3) The feathered edge has--		
(a) An increase in larger cells.		
(b) Cellular distortion with gaps between the RBCs.		
3. Write with a lead pencil the name or identification number of the patient in the thick area of the smear or on the frosted end of the slide.	_____	_____
4. Stain the slide.	_____	_____
NOTE: For best results, blood smears should be stained within 2 hours after they are prepared.		
a. Fix the smear, and let it air-dry.		
b. Cover the slide with Wright's stain, and allow it to remain on the smear for 5 to 10 seconds. The Wright's stain is polychromatic; dyes in the stain will produce multiple colors when applied to cells. The stain is composed of two main parts--Methylene-blue and eosin.		
(1) Methylene-blue is an alkaline dye that has an affinity for the acidic portions of the cell--deoxyribonucleic acid (DNA) in the nucleus and ribonucleic acid (RNA) in the cytoplasm. It stains varying shades of blue to purple.		
(2) Eosin is the acidic portion of the dye that has an affinity for the basic portions of the cell. It stains in varying shades from orange to pink.		
NOTE: The stain should cover the slide but should not be allowed to overflow the edges. A blue-green metallic sheen should be on the surface. The exact time that the stain is applied may vary with each batch of stain.		
c. Rinse the slide thoroughly with distilled water for 15 to 20 seconds.		
d. Wipe the stain from under the slide, and allow it to air-dry.		

Performance Measures	<u>GO</u>	<u>NO GO</u>

5. Examine the smear under the oil immersion objective (Figure 1).	_____	_____

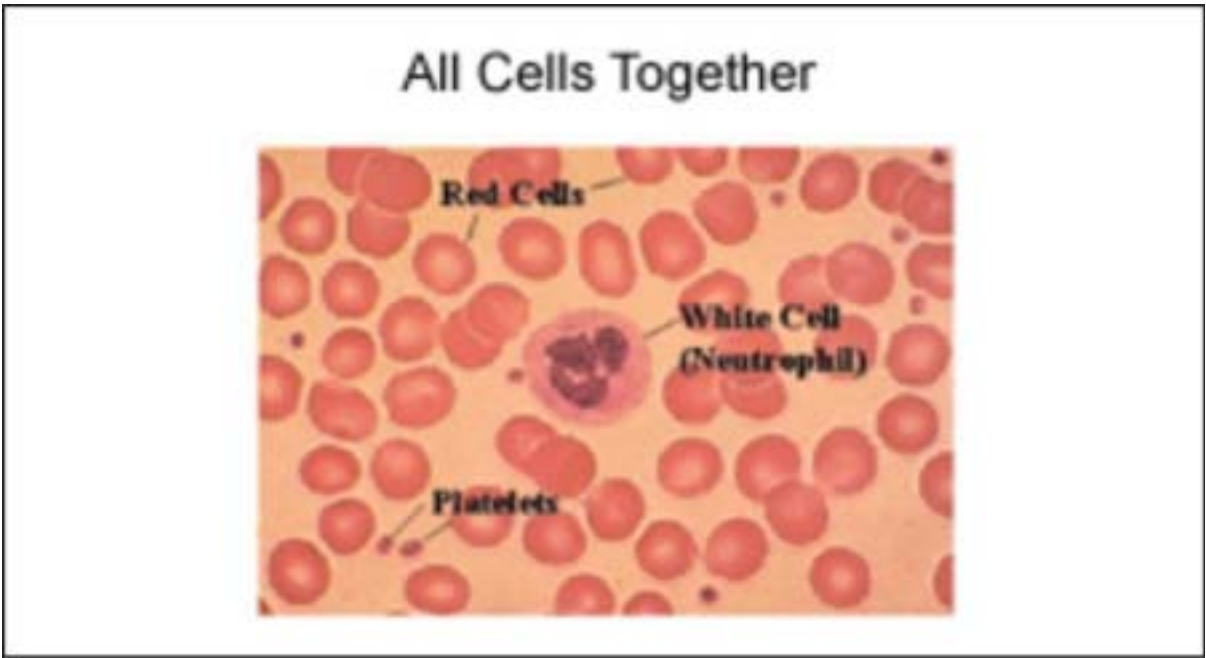


Figure 1. Smear

6. Recognize discrepancies with staining and the way to correct those discrepancies.	_____	_____
a. For darker stained leukocytes, dip the slide in distilled water for 1 minute or more after staining.		
b. For lighter stained leukocytes, decrease the Wright's stain time.		
7. Ensure that the staining reactions are sufficient.	_____	_____
a. RBCs appear buff pink to orange.		
b. White blood cells (WBCs) have a blue nucleus with a lighter stained cytoplasm.		
8. Report and record the results on the laboratory request form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	STP 8-91K15-SM-TG

Obtain A Blood Specimen Using A Vacutainer

081-833-0032

Conditions: Necessary materials and equipment: blood specimen tubes, constricting band, vacutainer adapter, vacutainer needles, disinfectant pads, sterile 2 x 2 gauze sponges, betadine or alcohol, adhesive bandage strips, protective pad, labels, and gloves.

Standards: Obtain a blood specimen without causing injury to the patient or violating aseptic technique.

Performance Steps

1. Verify the request to obtain a blood specimen. Select the proper blood specimen tube for the test to be performed.
2. Label the blood specimen tube with the information necessary to identify the patient.
3. Perform a patient care handwash.

WARNING: Gloves should be worn for self-protection against transmission of contaminants whenever handling body fluids.

4. Assemble the vacutainer adapter, the needle, and the blood specimen tube.
 - a. Inspect the needle for nicks or barbs. Replace the needle if it is flawed or dull.
 - b. Insert the end of the specimen tube with a rubber stopper into the vacutainer holder, and advance the tube until it is even with the guideline.

NOTE: The needle is now partially imbedded into the stopper. If the tube is pushed beyond the guideline, the vacuum of the tube may be broken.

5. Identify the patient.
 - a. Ask the patient his or her name and compare the name to the bed card and identification band or tags.
 - b. If the specimen is being obtained from an outpatient, identify the patient by asking his or her name and comparing the name with the medical records or the laboratory request.

NOTE: Ask the patient about allergies to such things as iodine or alcohol.

6. Explain the procedure and purpose for collecting the blood specimen to the patient.
7. Position the patient.
 - a. Assist the patient into a comfortable sitting or lying position.

WARNING: Never try to draw blood from a standing patient.

- b. The patient should be positioned so the arm is well supported and stabilized by using a pillow, table, or other flat surface.
 - c. Place a protective pad under the elbow and forearm.
8. Expose the area for venipuncture.
9. Select and palpate one of the prominent veins (Figure 1) in the bend of the arm (antecubital space).

Performance Steps

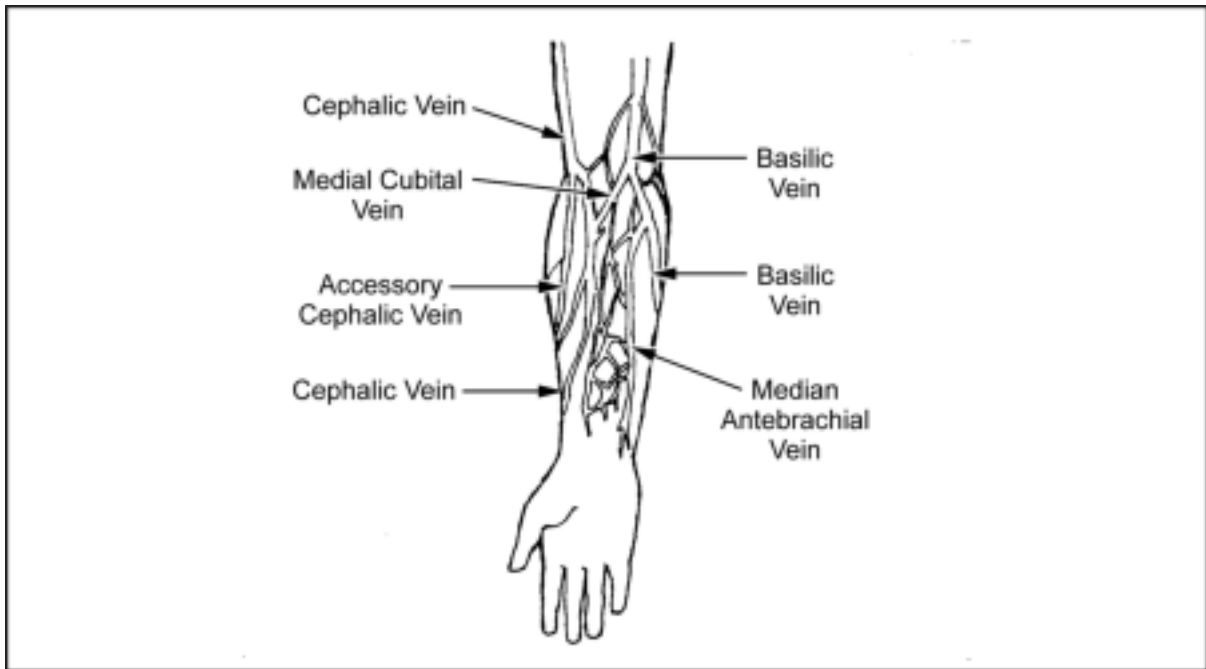


Figure 1. Venipuncture in the Antecubital Space

- a. The first choice is the median cubital vein. It is well supported and least apt to roll.
- b. The second choice is the cephalic vein.
- c. The third choice is the basilic vein. Although it is often the most prominent, it tends to roll easily and makes venipuncture difficult.

WARNINGS: 1. Avoid veins that are infected, irritated, injured, or have an intravenous (IV) running distal to the proposed venipuncture site. 2. Do not use the vacutainer to draw blood from small or fragile veins, because this can cause the vein walls to collapse. Use a needle and syringe instead.

10. Prepare the sponges for use.
 - a. Open the betadine or alcohol and 2 X 2 gauze sponge packages.
 - b. Place them within easy reach (still in the packages).
11. Apply the constricting band with enough pressure to stop venous return without stopping the arterial flow (a radial pulse will be present).
 - a. Wrap latex tubing around the limb about 2 inches above the proposed venipuncture site.
 - b. Stretch the tubing slightly, and pull one end so that it is longer than the other.
 - c. Form a loop with the longer end, and draw the loop under the shorter end so that the tails of the tubing are turned away from the proposed site.

NOTE: If a commercial band is used, wrap it around the limb as in step 11a and then secure the band by overlapping the Velcro ends.

- d. Instruct the patient to form a fist, clench and unclench several times, and then hold the fist in a clenched position.
12. Palpate the selected vein lightly with the index finger, moving an inch or two in either direction so that the size and direction of the vein can be determined. The vein should feel like a spongy tube.
13. With a disinfectant-soaked pad, cleanse the area around the puncture site by using an outward circular motion.

CAUTION: After cleansing the skin, do not repalpate the area.

WARNING: Do not leave the constricting band on for more than 2 minutes.

Performance Steps

14. Prepare to puncture the vein.
 - a. Grasp the vacutainer unit, and remove the protective needle cover.
 - b. Position the needle directly in line with the vein. Using the free hand, grasp the patient's arm below the expected point of entry.
 - c. Place the thumb of the free hand about 1 inch below the expected point of entry, and pull the skin taut toward the hand.
15. Puncture the vein (Figure 2).

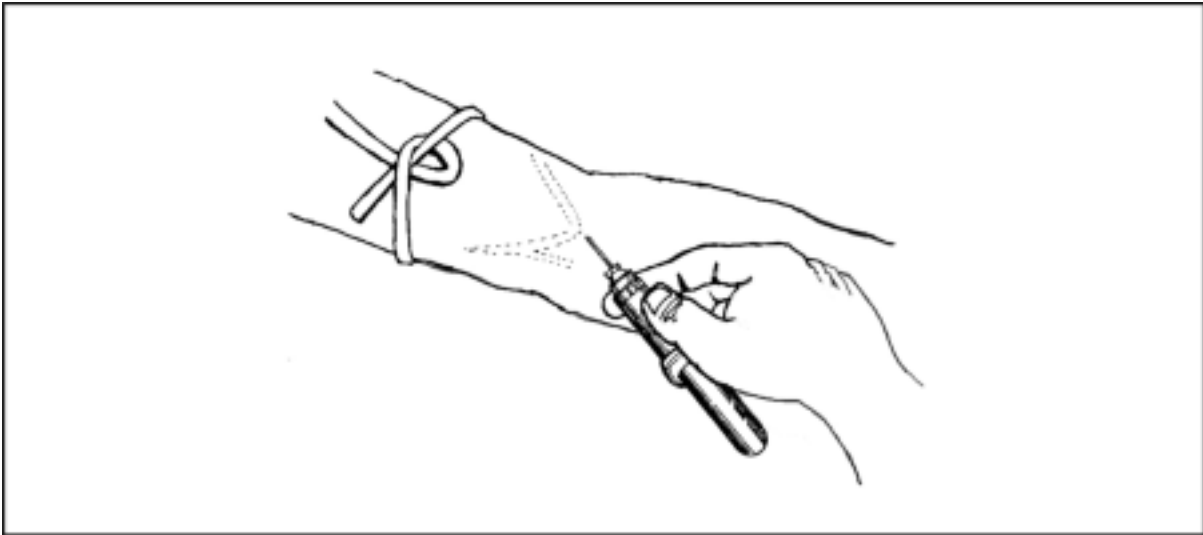


Figure 2. Vacutainer Puncture of the Vein

- a. Place the needle, bevel up, in line with the vein, and pierce the skin at a 15- to 30-degree angle.
- b. Decrease the angle until the needle is almost parallel to the skin surface. Direct it toward the vein, and pierce the vein wall.

NOTE: A faint "give" will be felt when the vein is entered, and blood will appear in the hub of the needle.

- (1) If the venipuncture is unsuccessful, pull the needle back slightly (not above the skin surface) and try to pierce the vein again.

CAUTION: If the needle is withdrawn above the skin surface, quickly release the constricting band and stop the procedure. Begin again with a new needle.

- (2) If the venipuncture is still unsuccessful, release the constricting band, place a gauze sponge lightly over the site, quickly withdraw the needle, and immediately apply pressure to the site.
- (3) Notify the supervisor before trying to enter another vein.
- c. Instruct the patient to unclench the fist.

16. Collect the specimen.

- a. Single specimen sample.
 - (1) With the dominant hand, hold the vacutainer unit and the needle steady.
 - (2) Place the index and middle fingers of the free hand behind the flange of the vacutainer, and ease the tube as far forward as possible. Blood will enter the tube.

WARNING: If the unit and needle are not held steady while pushing in the tube, the needle may either slip out of the vein or puncture the opposing vein wall.

- (3) After the tube is about two-thirds full of blood or the flow of blood stops, prepare to withdraw the needle.
- b. Multiple specimen samples (multiple tubes).
 - (1) Follow steps 16a(1) and 16a(2) for collecting a single specimen.

Performance Steps

- (2) Remove the first tube, and insert another tube into the vacutainer.
- (3) Repeat this procedure until the desired number of tubes are filled or blood stops flowing.
- (4) Release the constricting band using the nondominant hand.
- (5) After the last tube is about two-thirds full of blood or the flow stops, prepare to withdraw the needle.

NOTE: If the blood flow starts to slow down between samples, remove the constricting band.

- 17. Withdraw the needle.
 - a. Release the constricting band by pulling on the long, looped end of the tubing or pulling the Velcro fasteners open.

WARNING: Never withdraw the needle before removing the constricting band because this will cause blood to be forced out of the venipuncture site with resulting blood loss and/or hematoma formation.

- b. Place a gauze sponge lightly over the venipuncture site.
- c. Keeping the patient's arm fully extended, withdraw the needle smoothly and quickly. Immediately apply firm manual pressure over the venipuncture site with the sponge.
- d. Instruct the patient to elevate the arm slightly and to keep the arm fully extended. Continue to apply firm manual pressure to the site for 2 to 3 minutes.

- 18. Remove the specimen tube from the vacutainer.
 - a. Replace the protective cover over the needle.

NOTE: Dispose of the uncapped needle in accordance with (IAW) local standing operating procedures (SOP).

WARNING: If accidentally punctured by a used needle, force the puncture site to bleed, wash it thoroughly, and report the incident to your supervisor immediately.

- b. Pull the tube from the vacutainer.
- c. If the tube contains an anticoagulant, gently invert the tube several times to mix it with the blood.

- 19. Apply an adhesive bandage strip to the venipuncture site after the bleeding has stopped. Adhesive bandage strips do not take the place of pressure and, therefore, are not applied until the bleeding has stopped.

- 20. Provide for the patient's safety and comfort.
 - a. Remove the protective pad.
 - b. Assist the patient to assume a comfortable position.

- 21. Dispose of and/or store the equipment.
 - a. Collect all the equipment, and remove it from the area.
 - b. Place the used gauze sponge, alcohol or betadine sponge, and the protective pad in the trash receptacle.
 - c. Store the constricting band and vacutainer adapter IAW local SOP, and dispose of the needle and syringe IAW local SOP.

- 22. Remove the gloves.

- 23. Perform a patient care handwash.

- 24. Complete the laboratory request.
 - a. Patient identification.
 - b. Requesting physician's name.
 - c. Ward number, clinic, or dispensary.
 - d. Date and time of specimen collection.
 - e. Test(s) requested.
 - f. Specimen source--blood.
 - g. Remarks. Write in the admission diagnosis or the type of surgery in this section.

Performance Steps

- h. Complete the "urgency" box. (Routine, today, preoperative [preop], immediately [stat], or as soon as possible [ASAP].)

NOTE: There are many lab request slips which are used for requesting specific blood tests. All slips must be checked for the minimum information, as given.

25. Forward the specimen to the laboratory (lab).

- a. Attach the lab request to the specimen tube(s) with a rubber band or paper clip.

NOTE: Ensure that the lab requests and blood tubes are appropriately labeled with infectious warning labels IAW local SOP.

- b. Arrange for the specimen to be sent to the lab or transport the specimen to the lab IAW local SOP.

26. Perform a patient care handwash.

27. Record the procedure on the appropriate form.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Select the proper blood specimen tube.	_____	_____
2. Label the blood specimen tube.	_____	_____
3. Perform a patient care handwash.	_____	_____
4. Assemble the vacutainer unit, needle, and blood specimen tube.	_____	_____
5. Identify the patient.	_____	_____
6. Explain the procedure and purpose for collecting the blood.	_____	_____
7. Position the patient.	_____	_____
8. Expose the venipuncture site.	_____	_____
9. Select and palpate the vein.	_____	_____
10. Prepare sponges for use.	_____	_____
11. Apply the constricting band.	_____	_____
12. Palpate the selected vein.	_____	_____
13. Clean the venipuncture site.	_____	_____
14. Prepare to puncture the vein.	_____	_____
15. Puncture the vein.	_____	_____
16. Collect the specimen.	_____	_____
17. Withdraw the needle.	_____	_____
18. Remove the specimen tube from the vacutainer.	_____	_____
19. Apply an adhesive bandage strip to the site.	_____	_____
20. Provide for the patient's safety and comfort.	_____	_____
21. Dispose of and/or store equipment.	_____	_____
22. Remove the gloves.	_____	_____
23. Perform a patient care handwash.	_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
24. Complete the laboratory request.	_____	_____
25. Forward the specimen to the laboratory.	_____	_____
26. Perform a patient care handwash.	_____	_____
27. Record the procedure on the appropriate form.	_____	_____
28. Do not violate aseptic technique.	_____	_____
29. Do not cause further injury to the patient.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	STP 8-91K15-SM-TG

Perform User Maintenance of Lab Equipment

081-833-4568

Conditions: As a Special Forces medical sergeant in a clinical environment and given the medical equipment set medical laboratory (lab) and Department of the Army (DA) Forms 2404, Equipment Inspection and Maintenance Worksheet, and 2407, Maintenance Request.

Standards: Perform user maintenance of lab equipment so that the equipment is cleaned and all deficiencies are noted and referred for higher-level maintenance in accordance with the technical manual for the individual piece of equipment.

Performance Steps

1. Determine user responsibilities for maintenance.
2. Recognize the four prominent causes of equipment failure.
 - a. Improper preventive maintenance.
 - b. Equipment abuse.
 - c. Failure to recognize warning signs.
 - d. Technical failures.
3. Perform user maintenance on all medical equipment before, during, and after operation.
4. Maintain the lightweight field microscope.
 - a. Eyepiece:
 - (1) Breathe on the eyepiece to "fog" lens.
 - (2) Wipe the eyepiece with lens paper in a circular motion.
 - (3) If this does not completely clean the lens, apply a small amount of alcohol and wipe dry.
 - b. Objective lenses:
 - (1) Unscrew and remove the objective.
 - (2) Clean the objective with a gauze pad and a trace of alcohol.

NOTE: Clean the oil immersion lens after each use.

- c. Top condenser lens: Clean the top condenser lens only when necessary with a gauze pad and alcohol.
 - d. Mechanical parts:
 - (1) Keep free of dirt.
 - (2) Lightly lubricate exposed gears with Vaseline or lightweight grease.
 - e. Electrical parts:
 - (1) Inspect the electrical cord and power pack for cracks or breaks in the insulation.
 - (2) If corrosion occurs on electrical contacts, they may be cleaned with a small amount of immersion oil or petrolatum.
5. Maintain the hemoglobinometer.
 - a. Eyepiece:
 - (1) Unscrew the eyepiece from the mount.
 - (2) Clean the eyepiece with a gauze pad and alcohol.
 - b. Prism:
 - (1) Remove the two screws holding the base plate to the upper case.
 - (2) Clean the prism with a soft cloth or camel hairbrush.
 - (3) Do not use solvent on the prism.
 - (4) If the prism is scratched, turn in the unit for replacement.
 - (5) Reinstall the prism, and insert the screws holding the base plate to the upper case.
 - c. Blood chamber, cover plate, and clip: Clean the blood chamber, cover plate, and clip to eliminate error caused by uneven scattering of light by dirt, smears, and so on.

NOTE: Clean the blood chamber after each use.

- d. Adjust the illumination.

Performance Steps

- (1) Move the slide away from the eyepiece until it is directly below the arrow at the end of the top scale.
- (2) Depress the button on the bottom of the instrument, and look into the eyepiece to check the field of illumination.
- (3) If adjustment is required, place a coin in the slot on the button and turn it until the field is evenly lit.

6. Maintain the minicentrifuge.

WARNING: Only use solvents with an alcohol base to clean the minicentrifuge. Any other type of solvents will damage the plastic.

- a. Clean the clear plastic cover with alcohol and a soft cloth.
- b. Remove the rotor.
 - (1) Release the lock release levers.
 - (2) Raise the center post.
 - (3) Lift the rotor out.
- c. Clean the rotor and center post with alcohol and a gauze pad.
- d. Replace the rotor by reversing the procedure for removal.
- e. Clean the six outer seals with a soft, dry cloth.

WARNING: Never apply alcohol or other petroleum-based products to the rubber seals. The seals will deteriorate and fail.

7. Maintain the refractometer/total solids (TS) meter.

- a. Clean the prism surface and cover plate with a moist, soft cloth.

NOTE: Prism surface and cover should be cleaned after each use.

- b. Clean the eyepiece with lens paper.
- c. Zero the TS meter.
 - (1) Take a reading using distilled water.
 - (2) If the reading varies from zero by 0.05 percent (1/2 of a division), push a jeweler's screwdriver through the cement seal, and adjust the reading.
 - (a) Turn the screw clockwise to increase the reading.
 - (b) Turn the screw counterclockwise to decrease the reading.

NOTE: The final motion must be clockwise. If the reading must be decreased, go slightly beyond the desired adjustment and finish in a clockwise motion.

- (3) Seal the hole with caulking compound after the correct reading has been obtained.

8. Prepare DA Forms 2404 and 2407 to report equipment malfunctions.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a set of lab equipment on which he must perform user maintenance.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined user responsibilities for maintenance.	_____	_____
2. Recognized the four prominent causes of equipment failure.	_____	_____
3. Performed user maintenance on all medical equipment before, during, and after operation.	_____	_____
4. Maintained the lightweight field microscope.	_____	_____
5. Maintained the hemoglobinometer.	_____	_____
6. Maintained the minicentrifuge.	_____	_____
7. Maintained the refractometer.	_____	_____
8. Prepared DA Forms 2404 and 2407 to report equipment malfunctions.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

DA FORM 2404

DA FORM 2407

Related

Prepare Laboratory Specimens for Transport

081-833-4572

Conditions: As a Special Forces (SF) medical sergeant in a clinical environment and given medical equipment set SF tactical, medical equipment set medical laboratory (lab), and book set SF medical.

Standards: Prepare lab specimen for transport in accordance with federal regulations.

Performance Steps

1. Prepare specimens to be shipped.
2. Place specimens in appropriate containers.
3. Package specimens in accordance with federal regulations.
4. Provide specimen information to the receiving lab.
 - a. Patient identification.
 - b. Suspected disease or condition.
 - c. Type of specimen.
 - d. Body area from which specimen was collected.
 - e. Sending facility identification.
 - f. Type of test requested.
 - g. Name of the person requesting the test.
5. Place appropriate warning labels on infectious material.
6. Ship specimens in accordance with federal regulations.
7. Follow all precautions when shipping infectious material.
8. Ship two of each specimen at a minimum.
9. Maintain a log of all specimens sent to include:
 - a. Date specimen was prepared.
 - b. Patient identification.
 - c. Specimen identification.
 - d. Date specimen was shipped.
 - e. Test requested.
 - f. Name of the person requesting the test.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must prepare lab specimens for transport.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Prepared specimens to be shipped.	—	—
2. Placed specimens in appropriate containers.	—	—
3. Packaged specimens in accordance with federal regulations.	—	—
4. Provided required specimen information to the receiving lab.	—	—
5. Placed appropriate warning labels on infectious material.	—	—
6. Shipped specimens in accordance with federal regulations.	—	—
7. Followed all precautions when shipping infectious material.	—	—

Performance Measures

GO

NO GO

8. Shipped two of each specimen at a minimum.

9. Maintained a log of all specimens sent.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform RBC Count/Morphology

081-833-4574

Conditions: Given a properly collected blood sample, a microscope, a hemacytometer and a coverslip, diluting fluid, a tally counter, a red blood cell (RBC) pipette, aspirator tubing, wipes, a clock, a Petri dish, a logbook, and a laboratory (lab) request form.

Standards: Achieve test results within +/- 2 standard deviations.

Performance Steps

1. Inspect the equipment.
 - a. Check the hemacytometer, coverslip, and pipette for nicks and scratches.
 - b. Ensure that the tally counter is operable.
2. Prepare the blood for count by using either the Unopette system or the pipette method.
 - a. Prepare the blood for count by using the Unopette system.
 - (1) Using the protective shield on the capillary pipette, puncture the diaphragm of the reservoir.
 - (2) Remove the shield from the pipette assembly by twisting.
 - (3) Holding the pipette almost horizontally, touch the tip of the pipette to the blood.

NOTE: The pipette will fill by capillary action. Filling will cease automatically when the blood reaches the end of the capillary bore in the neck of the pipette.

- (4) Wipe the outside of the capillary pipette to remove excess blood that would interfere with the dilution factor.
- (5) While simultaneously maintaining pressure on the reservoir, squeeze the reservoir slightly to force out some air.
- (6) Cover the opening of the overflow chamber of the pipette with the index finger, and seat the pipette securely in the reservoir neck.
- (7) Release the pressure on the reservoir, and then remove the finger from the pipette opening.

NOTE: At this time, negative pressure will draw blood into the reservoir.

- (8) Squeeze the reservoir gently two to three times to rinse the capillary bore forcing the diluent up into, but not out of, the overflow chamber, releasing pressure each time to return the mixture to the reservoir.
- (9) Place the index finger over the upper portion of the opening, and gently invert several times to thoroughly mix the blood with the diluent.
- (10) Let the mixture stand for 10 minutes before charging the hemacytometer.
- (11) To charge the hemacytometer, convert the Unopette to a dropper assembly by withdrawing the pipette from the reservoir and reseating it securely in the reverse position.
- (12) Invert the reservoir, and discard the first 3 to 4 drops of mixture before charging the hemacytometer.

- b. Prepare the blood for count by using the pipette method.

- (1) Draw blood to the 0.5 mark on the RBC pipette.

NOTE: The blood column must be free of bubbles.

- (2) Wipe off any excess blood on the outside of the pipette tip.
- (3) Do not touch the opening of the pipette with the wipe.
- (4) Draw diluting fluid to the 101 mark.
- (5) Wipe the outside of the pipette as in steps a.(2) and a.(3).
- (6) Place the pipette between the thumb and forefinger, and rotate it in a figure-of-eight motion for 3 minutes.
- (7) Discard the first 2 to 3 drops of mixture before charging the hemacytometer.

3. Prepare the hemacytometer.
 - a. Charge both sides of the hemacytometer.
 - b. Place the hemacytometer in a Petri dish.

Performance Steps

- c. Allow the cells to settle for 10 minutes.

4. Perform the RBC count.

- a. Using low-power focus on the ruled section of the counting chamber, locate the center 1 square millimeter area for counting RBCs.
- b. Switch to high power, and locate the square in the upper left-hand corner.
- c. Count all the RBCs lying within the square and those touching the centerline of the upper and right-hand triple lines.

NOTE: RBCs touching the left-hand and bottom-centerlines are not counted.

- d. Count the remaining three corners and center.
- e. If there is a variation of more than 25 cells between any of the five areas, repeat the test.
- f. Count the second chamber in the same manner.

5. Calculate the RBC count.

- a. Add up the total number of RBCs in both counting chambers.
- b. Divide the sum by two.
- c. Multiply by the K factor (constant) of 10,000.
- d. Record the results as number of RBCs $\times 10$ (to the 12th power) red blood cells per liter (RBCs/L).

6. Perform a Wright's stain of a blood sample. (See task 081-821-1083, Perform a Wright's Stain Using a Camco Quick Stain.)

7. Recognize the significance of abnormal RBC morphology.

- a. Anisocytosis: Variation in the size of the RBCs.
 - (1) Macrocyte:
 - (a) Diameter: 9 microns or greater.
 - (b) May be found in liver disease.
 - (2) Microcyte:
 - (a) Diameter: 6 microns or less.
 - (b) Found in thalassemia and other anemias.
- b. Poikilocytosis: Variation in the shape of the RBCs.
 - (1) Sickle shaped: associated with sickle cell disease.
 - (2) Ovalocytes and elliptocytes: associated with hereditary elliptocytosis.
 - (3) Spherocytes:
 - (a) These will have a smaller surface and thus reduced oxygen (O_2) carrying ability.
 - (b) Associated with hemolytic anemia and hereditary spherocytosis.
 - (4) Bizarre forms:
 - (a) Irregularly contracted cells.
 - (b) Indicative of disease process.
 - (5) Crenated cells:
 - (a) Mechanically produced irregularities caused by improper slide preparation.
 - (b) Not reported.
- c. Hemoglobin variations:
 - (1) Hypochromasia:
 - (a) Decreased hemoglobin concentration.
 - (b) Found in iron-deficiency anemia.
 - (2) Target cells:
 - (a) An abnormal, thin erythrocyte with a centrally stained area.
 - (b) Associated with liver disease and certain hemoglobinopathies.
 - (3) Polychromasia: immature cytoplasm (ribonucleic acid [RNA] present).
- d. Inclusions:
 - (1) Basophilic stippling.
 - (a) Heavy metal poisoning.
 - (b) Certain anemias and alcoholism.
 - (2) Howell-Jolly bodies:

Performance Steps

- (a) Nuclear remnants less than 1 micron in diameter.
 - (b) They stain dark violet with Wright's stain.
 - (c) They are implicated in certain anemic conditions and other forms of nuclear maturation defects.
 - (3) Cabot's rings:
 - (a) Nuclear remnants.
 - (b) Severe pernicious anemia (B-12 deficiency).
 - e. Differences in coloration:
 - (1) Hypochromic:
 - (a) A decrease in the color of the RBC indicating a decrease in their hemoglobin content.
 - (b) May be found in iron deficient anemia and other anemias.
 - (2) Hyperchromic:
 - (a) Deep coloration of RBCs.
 - (b) Probably a problem with the stain.
 - f. Rouleaux formations: A phenomenon where the erythrocytes adhere to one another presenting a "stack of coins" appearance. It occurs in conditions characterized by increased amounts of fibrinogen and globulin.
8. Record findings as:
- a. Normocytic/normochromic (N/N):
 - (1) Normocytic: normal cell size and shape.
 - (2) Normochromic: normal hemoglobin content and coloration.
 - b. Abnormal:
 - (1) Use the specific terminology for the noted abnormality.
 - (2) Grade the degree of all abnormalities.
 - (a) Slight: abnormal forms seen intermittently.
 - (b) Moderate: few abnormal forms seen in most fields.
 - (c) Marked: several abnormal forms seen in each field.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform ABO (blood typing system) grouping and confirmation tests.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Inspected the equipment for defects and damage and replaced anything that did not work or was damaged.	—	—
2. Correctly prepared the blood for counting by using either the Unopette or the pipette. a. Used the correct amount of blood and diluent. b. Wiped the outside tip of the Unopette or pipette without losing any solution. c. Mixed the solution, and allowed it to stand for the correct amount of time.	—	—
3. Prepared the hemacytometer. a. Filled both chambers completely without overfilling. b. Placed the hemacytometer in a damp Petri dish, and allowed it to stand undisturbed for 10 minutes.	—	—
4. Performed the RBC count. a. Counted the RBCs in the five areas. b. Counted all the RBCs lying within the square and those touching the center line of the upper and right-hand triple lines. c. If there was a variation of more than 25 cells between any of the five areas, repeated the test. d. Counted the second chamber in the same manner.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
5. Calculated the RBC count.	_____	_____
6. Performed a Wright's stain of a blood sample. (See task 081-821-1083.)	_____	_____
7. Recognized the significance of abnormal RBC morphology.	_____	_____
8. Recorded all findings on the proper form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91K15-SM-TG

Perform a Throat Culture
081-833-4583

Conditions: As a Special Forces (SF) medical sergeant in a clinical environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book set.

Standards: Perform a throat culture so that the presence or absence of group A beta hemolytic streptococcal is correctly determined.

Performance Steps

1. Inoculate the appropriate media.
NOTE: Swab specimens are inoculated directly to the first quadrant and streaked for isolation using a sterile inoculating loop. Stab the blood agar plate (BAP) two to three times in each quadrant.
2. Incubate the inoculated media. The BAP is incubated at 35 degrees Centigrade in increased carbon dioxide (CO2) for 18 to 24 hours.
3. Visually examine the culture media for evidence of growth.
 - a. Determine the predominant colony type on each agar plate.
 - b. Determine the hemolytic pattern of each colony type.NOTE: Group A streptococci form small translucent colonies with wide zones of beta hemolysis.
- c. Perform a Gram stain each different colony type seen on the plate media.
4. Perform differential testing as indicated by the Gram stain and growth pattern.
NOTE: Group A streptococci are usually susceptible to most antibiotics and are not routinely tested for antibiotic susceptibility
5. Record and report the results in the logbook and on the laboratory request form.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform a throat culture.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Inoculated the appropriate media.	_____	_____
2. Incubated the inoculated media.	_____	_____
3. Visually examined the culture media for evidence of growth.	_____	_____
4. Performed differential testing as indicated by the Gram stain and growth pattern.	_____	_____
5. Recorded and reported the results in the logbook and on the laboratory request form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Interpret a Dark Field Microscopic Examination

081-833-4593

Conditions: As a Special Forces (SF) medical sergeant in a clinical environment and given SF tactical medical equipment set, medical equipment set medical laboratory (lab), SF medical book set, lab request form, and logbook.

Standards: Interpret the darkfield microscopic examination so that any spirochetes present in the wet preparation are identified.

Performance Steps

1. Identify borrelia species.
 - a. Borrelia is a spiral, threadlike organism measuring 0.2 to 0.5 micrometer (um) in width and 8 to 16 um in length.
 - b. Borrelia has 4 to 10 spirals with most organisms having 5.
 - c. The spirals are large and wavy with a distance of about 2.5 um between them.
 - d. Occasional axial terminal filaments are seen, giving the appearance of flagella.
 - e. The actively motile spirochetes have a corkscrew movement along with a side-to-side motion.
2. Identify treponema species.
 - a. Treponema appear as very fine, delicate spirals having a flexible cylindrical body measuring 0.25 um in diameter and 5 to 16 um in length.
 - b. The organisms have from 8 to 15 regular spirals.
 - c. Motility is generally slow, although the organism rotates rapidly on its axis.
 - d. During the rotation, the organism bends to form circular and "s" shapes.
3. Identify leptospira species.
 - a. Leptospira measure approximately 0.15 millimeters (mm) in diameter and 7 to 20 um in length.
 - b. There are generally 12 to 18 spirals in each organism.
 - c. Unique to this organism, the third terminal of the organism is quite flexible and is often seen in the shape of a hook.
4. Record all findings on the lab request form and in the logbook.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must interpret a darkfield microscopic examination.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified borrelia species.	_____	_____
2. Identified treponema species.	_____	_____
3. Identified leptospira species.	_____	_____
4. Recorded all findings on the lab request form and in the logbook.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Interpret a Culture

081-833-4594

Conditions: As a Special Forces (SF) medical sergeant in a clinical environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book.

Standards: Interpret the culture, and determine colonial morphology on the basis of colony shape, size, texture, and color.

Performance Steps

1. Identify colonies by shape.
 - a. Circular.
 - b. Undulate.
 - c. Lobate.
 - d. Radiated lobated.
 - e. Crenated.
 - f. Dentated.
 - g. Concentric.
 - h. Regular myceloid.
 - i. Irregular (curled undulated edges).
 - j. Irregular (filamentous).
 - k. Irregular (rhizoid).
2. Identify colonies by size.
 - a. Dwarf = smaller than 0.5 millimeters (mm).
 - b. Pinpoint = 0.5 mm.
 - c. Small = 1 mm.
 - d. Medium = 2 mm.
 - e. Large = 3 mm.
 - f. Spreading = 6 mm.
3. Identify colonies by texture.
 - a. Smooth.
 - b. Rough.
 - c. Mucoid.
4. Identify colonies by color. Colonies vary in color from clear white to violet.
5. Identify colonies by elevation.
 - a. Flat.
 - b. Raised.
 - c. Convex.
 - d. Umbilicated.
 - e. Umbonate.
 - f. Papillary.
 - g. Convex rugose.
6. Identify colonies by biochemical reaction as follows:
 - a. Hemolytic.
 - b. Nonhemolytic.
7. Identify specific colony types on the basis of their morphology.
 - a. Staphylococcus (staph) Aureus colonies are usually opaque, circular, smooth, raised and 1 to 3 mm in diameter. They may or may not be pigmented. They vary in color from white to golden. On blood agar, beta hemolysis (clear halos) is seen around growing colonies.

Performance Steps

- b. Streptococci (general category) colonies are usually small, slightly granular, circular, convex and translucent. The most important characteristic of streptococci is their hemolytic property. Hemolytic streptococci will leave clear halos around growing colonies.
- c. Pneumococci (general category) colonies are usually small, round colonies surrounded by a zone of alpha hemolysis.
- d. *Neisseria gonorrhoeae* (*N. gonorrhoeae*) colonies are grown on Thayer-Martin media. Colonies are smooth, glistening, translucent and soft. No pigmentation is usually present, however, some strains may show an iridescent bluish-gray coloration.
- e. *Bacillus anthracis* (Anthrax) produces nonhemolytic colonies having a "cut-glass" appearance in transmitted light with dull, irregular edges.
- f. *Clostridium perfringens* (associated with "gas gangrene") is strictly anaerobic and will not grow in the presence of oxygen (O₂). They may show hemolysis. They present a characteristic double zone or target appearance.
- g. *Escherichia coli* (*E. coli*) is a facultative anaerobe with colonies 2 to 3 mm, typically low, convex, smooth, colorless to opaque. The colonies tend to bunch together.
- h. *Shigella* (general category) produces colonies that are usually 2 mm, circular, convex, and whitish-clear with a smooth surface.
- i. *Vibrio cholerae* colonies are usually 1 to 2 mm, round, slightly convex, translucent, and grayish-yellow in appearance. On blood agar, they will have a surrounding greenish zone.
- j. *Haemaphysalis influenzae* (*H. influenzae*) colonies are usually smooth, raised, slimy, mucoid, confluent, and nonhemolytic.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a series of cultures that he must interpret.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified colonies by shape.	_____	_____
2. Identified colonies by size.	_____	_____
3. Identified colonies by texture.	_____	_____
4. Identified colonies by color.	_____	_____
5. Identified colonies by elevation.	_____	_____
6. Identified colonies by biochemical reaction.	_____	_____
7. Identified specific colony types based on their morphology.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

ATLAS OF HUMAN PARASITOLOGY

Perform a Urinalysis

081-833-4670

Conditions: Given a properly collected specimen, a laboratory request form, a clock or watch, a refractometer, applicator sticks, reagent strips (N-Multistix), sulfosalicylic acid (SSA) test materials, clinitest materials, acetest materials, ictotest materials, a microscope, glass slides and coverslips, a centrifuge, distilled water, test tubes (13 x 100 millimeters [mm] and 15 x 85 mm), disposable transfer pipettes, and a logbook.

Standards: Determine the color, appearance, potential of hydrogen (pH), specific gravity, protein, glucose, ketones, bilirubin, nitrite, urobilinogen, blood, and leukocyte esterase are determined from a urine specimen, and perform a microscopic examination.

Performance Steps

1. Record the appearance and color of the urine on the laboratory request form.

- a. Appearance:

- (1) If the specimen appears clear, write "CLEAR" on the form.
 - (2) If the specimen is not clear but can be seen through, write "HAZY" on the form.
 - (3) If the specimen is opaque and cannot be seen through, write "CLOUDY" on the form.

- b. Report the color as shades of yellow, and report any color change that occurs on standing.

NOTE: Normal color varies because of varying amounts of pigment called urochrome. Normal color is straw-yellow amber. Abnormal colors can result from diet, medication, and/or disease. Red in males indicates fresh blood from the lower urinary tract. Orange is caused by medication such as pyridium, which is used to treat urinary tract infections. Brown indicates hemoglobin; black, malaria (blackwater fever); colorless, polyuria (absence of urochrome).

2. Determine and record the specific gravity, pH, protein, glucose, ketones, bilirubin, nitrite, urobilinogen, blood, and leukocyte esterase.

- a. Dip the reagent strip in the specimen, and remove it.

- b. At the number of seconds specified in the instructions accompanying the reagent strips, compare each reagent area with the corresponding color chart on the bottle label.

3. Perform the following confirmation tests for positive reactions on the reagent strip (if available) or when indicated by patient's condition:

- a. Specific gravity--refractometer method:

- (1) Place 1 to 2 drops of urine on the refractometer.
 - (2) Point the refractometer toward a uniform, bright light source.
 - (3) Look through the refractometer, and read the scale.
 - (4) Report the value from the left-hand scale at the juncture of the dark and light areas.

NOTE: Normal values are 1.003 to 1.033.

- b. Protein--SSA test procedure.

- (1) Add 10 drops of centrifuged urine to a 13- x 100-mm test tube.
 - (2) Layer 10 drops of SSA (3 percent) over the surface of the urine. (Equal amounts of urine and SSA also can be used.)
 - (3) Observe for turbidity, which will confirm a positive result.
 - (4) Grade the degree of turbidity.
 - (a) Negative--no turbidity.
 - (b) Trace--faintly visible turbidity.
 - (c) 1+--definite turbidity.
 - (d) 2+--heavy turbidity but no floccules.
 - (e) 3+--heavy cloud with floccules.
 - (f) 4+--heavy cloud with heavy floccules.

- c. Glucose--clinitest procedure.

- (1) Place 5 drops of urine into a 15- x 85-mm test tube.
 - (2) Add 10 drops of water to the test tube.

Performance Steps

- (3) Drop in a clinitest tablet.
- (4) Read the results 15 seconds after boiling stops. Observe during the test for pass-through.

CAUTION: Do not shake the tube while it is boiling.

- (5) Mix the tube by gentle shaking.
- (6) Compare the color of the solution with the color chart.

d. Ketones--acetest procedure.

- (1) Place one acetest tablet onto a clean, dry piece of white paper.
- (2) Drop 1 drop of urine on top of the tablet.
- (3) After 30 seconds, compare the color of the tablet to the acetest chart.
 - (a) Positive--purple color.
 - (b) Negative--tan color.

e. Bilirubin--ictotest procedure.

- (1) Place the special ictotest mat on a paper towel.
- (2) Drop 10 drops of urine onto the test mat.
- (3) Place one ictotest tablet in the center of the moistened mat.

CAUTION: Do not touch the tablet with your fingers.

- (4) Place 1 drop of water onto the tablet, and wait 5 seconds.
- (5) Place a second drop of water onto the tablet so that both drops run off the tablet onto the mat.
- (6) Observe for a blue to purple color of the mat at 60 seconds, which indicates the presence of bilirubin.

NOTE: Normal urine displays a slightly pink to red color on the mat.

- (7) Read the results by comparing the color of the mat to the color chart.

4. Perform a microscopic examination of the urine specimen.

- a. Centrifuge the urine specimen at 1,500 to 2,000 revolutions per minute (rpm) for 5 minutes.
- b. Pour off the supernatant, mix remaining contents, and place a drop of the remaining sediment on a glass slide covering it with a coverslip.
- c. Examine the entire area of the slide under the coverslip by using low-power magnification with subdued light to locate any casts. (Figure 1 shows casts found in urine.) (Figure 1 is reprinted from *Urinary Sediment: A Textbook Atlas* with permission from the American Society for Clinical Pathology Press.)

Performance Steps

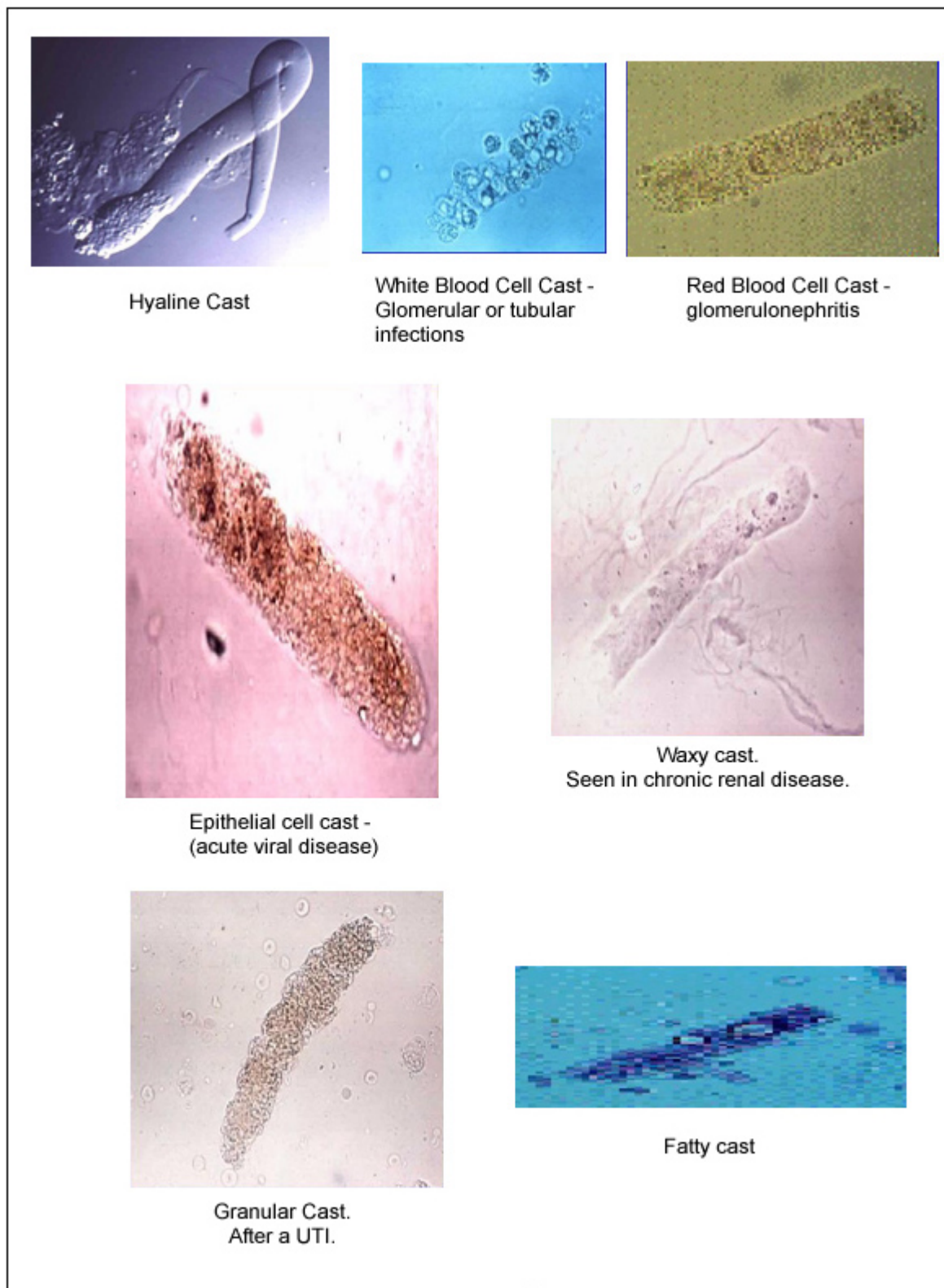


Figure 1. Casts Found in Urine

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Performance Steps

NOTE: Confirm the casts under high power with subdued light.

- d. Record and report the number of casts per low-power field (#/LPF).
- e. is reprinted from "Urinary Sediment: A Textbook Atlas" with permission from the American Society for Clinical Pathology Press.) Scan 10 to 15 fields under high-dry (40x) magnification to identify the specific types of cells present. (Figure 2 shows cells found in urine.) (Figure 2

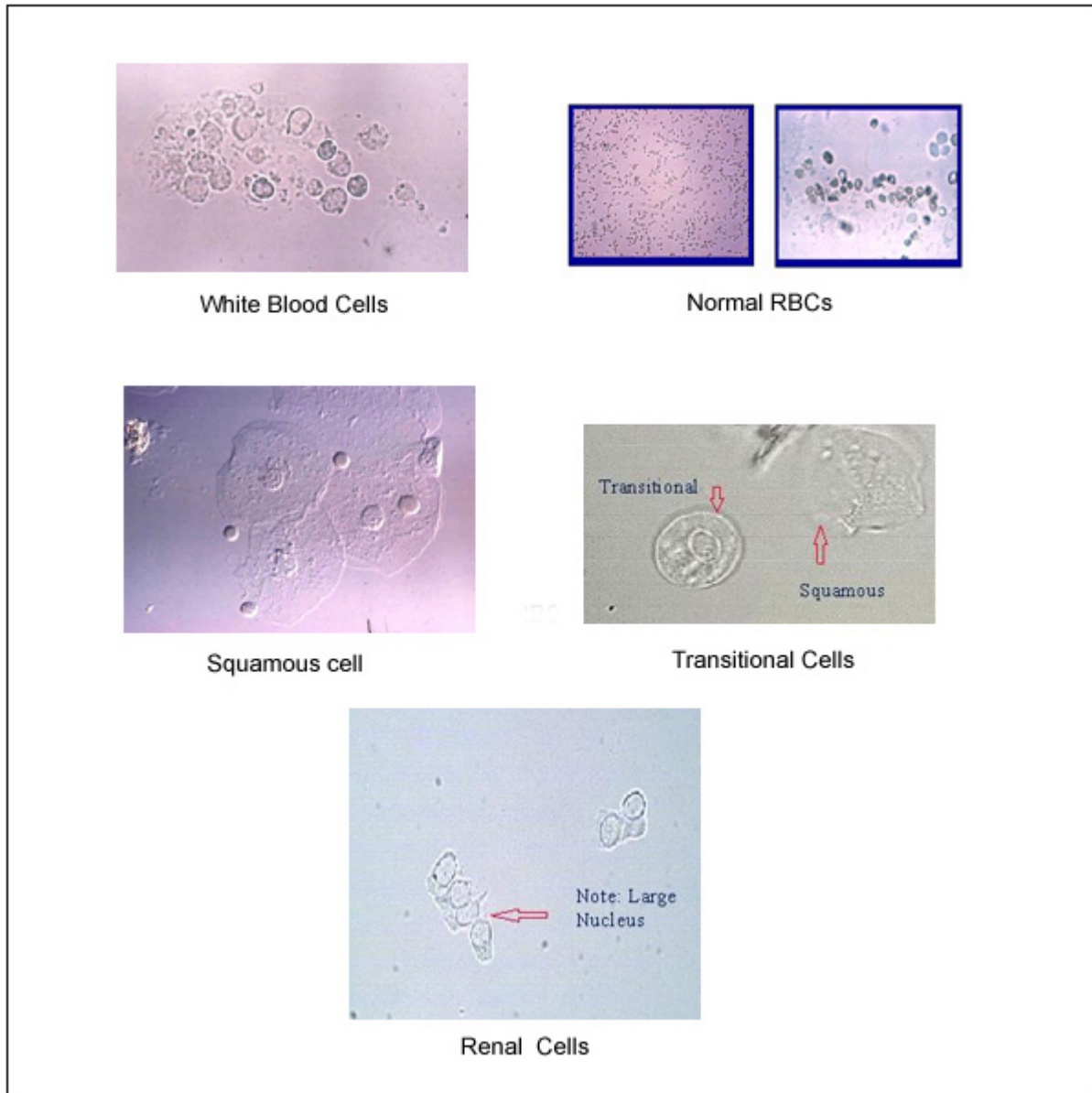


Figure 2. Cells Found in Urine

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- f. Record and report the count of cells as the number seen per high-power field (#/HPF).
- g. Record and report elements such as mucous threads, parasites, crystals, and yeast as "OCCASIONAL," "FEW," or "MANY." (Figure 3 shows normal crystals in acidic urine, and Figure 4 shows abnormal crystals in acidic urine.) (Figures 3 and 4 are reprinted from "Urinary Sediment: A Textbook Atlas" with permission from the American Society for Clinical Pathology Press.)

Performance Steps

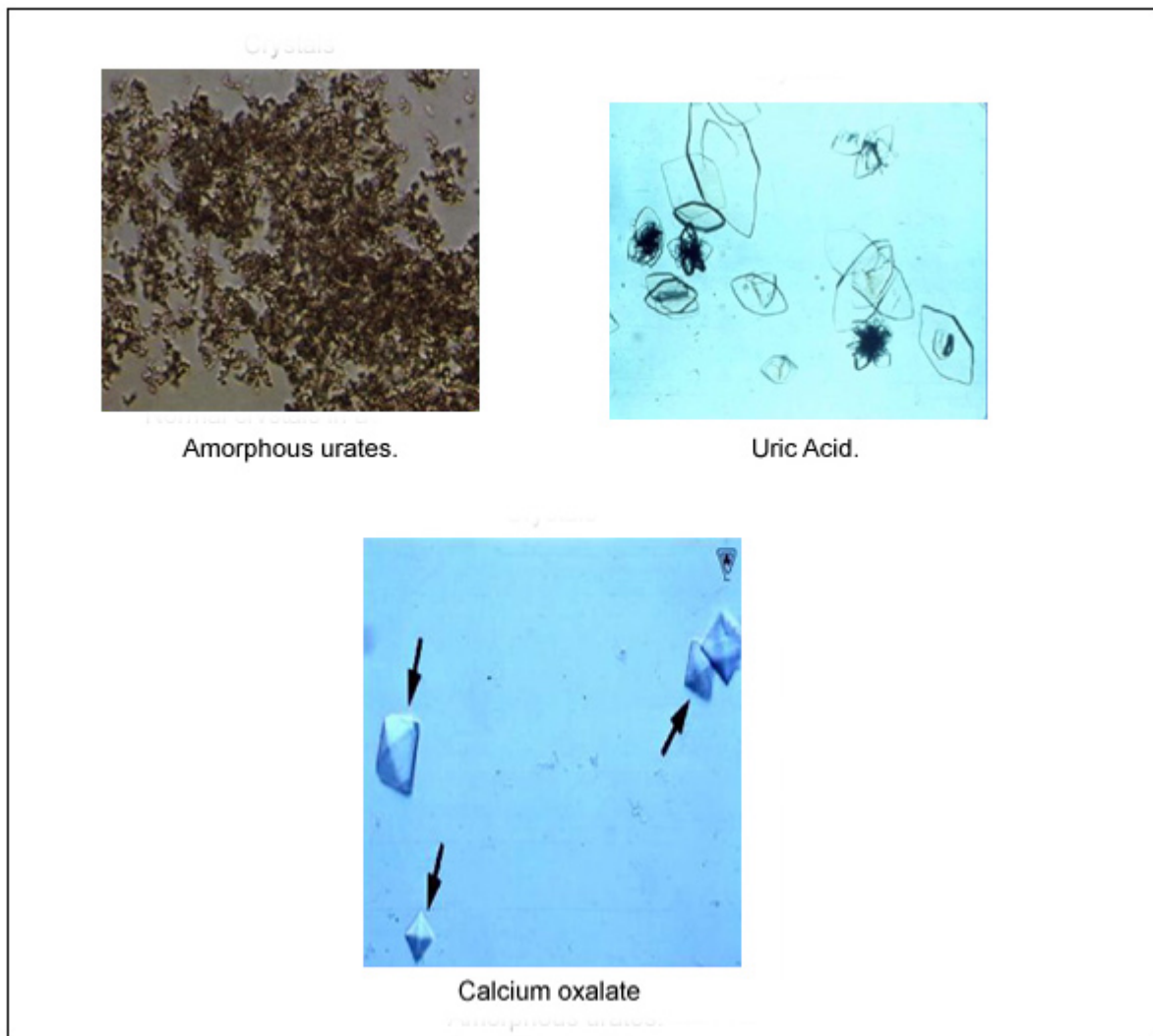


Figure 3. Normal Crystals in Acidic Urine
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Performance Steps

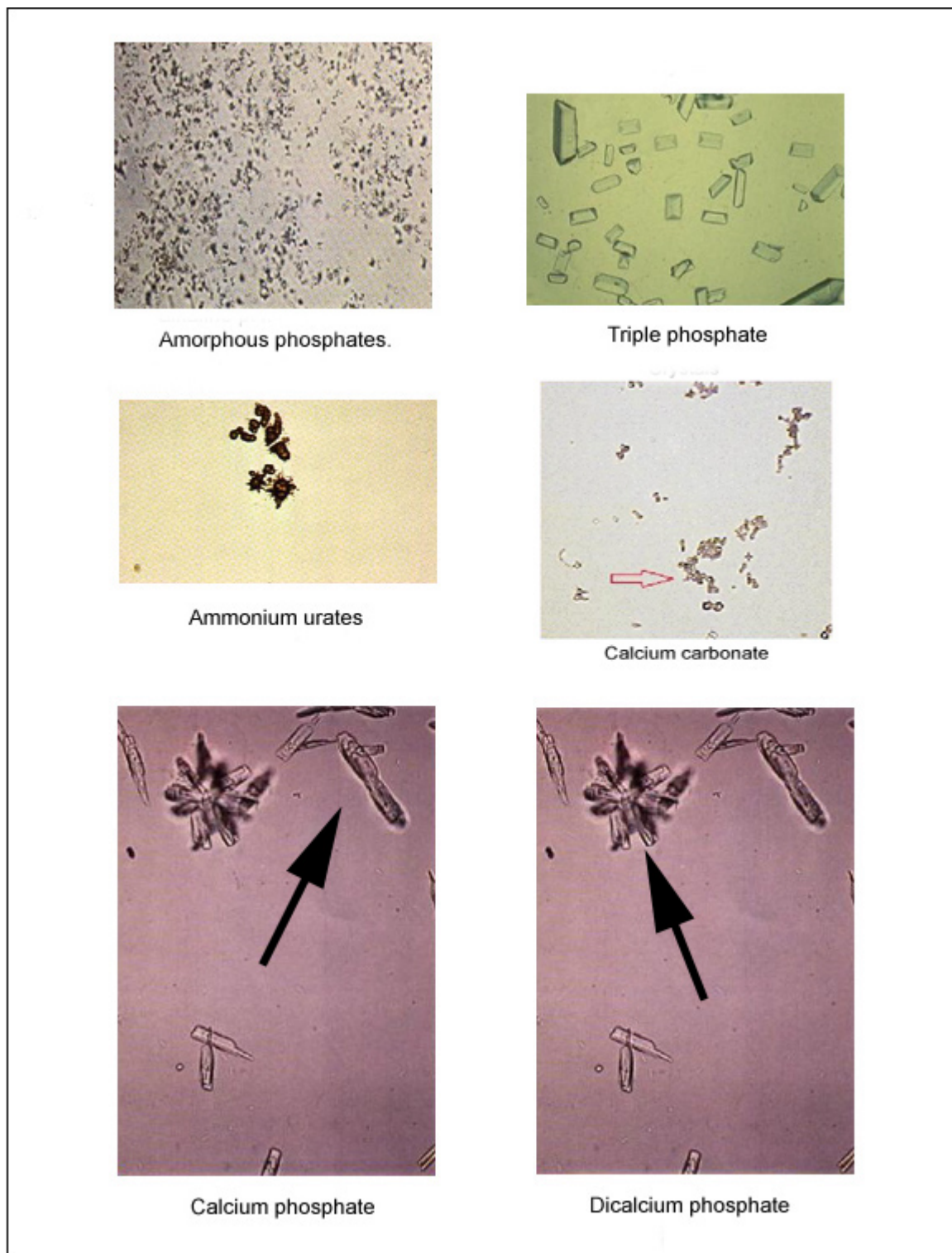


Figure 3. Normal Crystals in Acidic Urine (Continued)
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Performance Steps

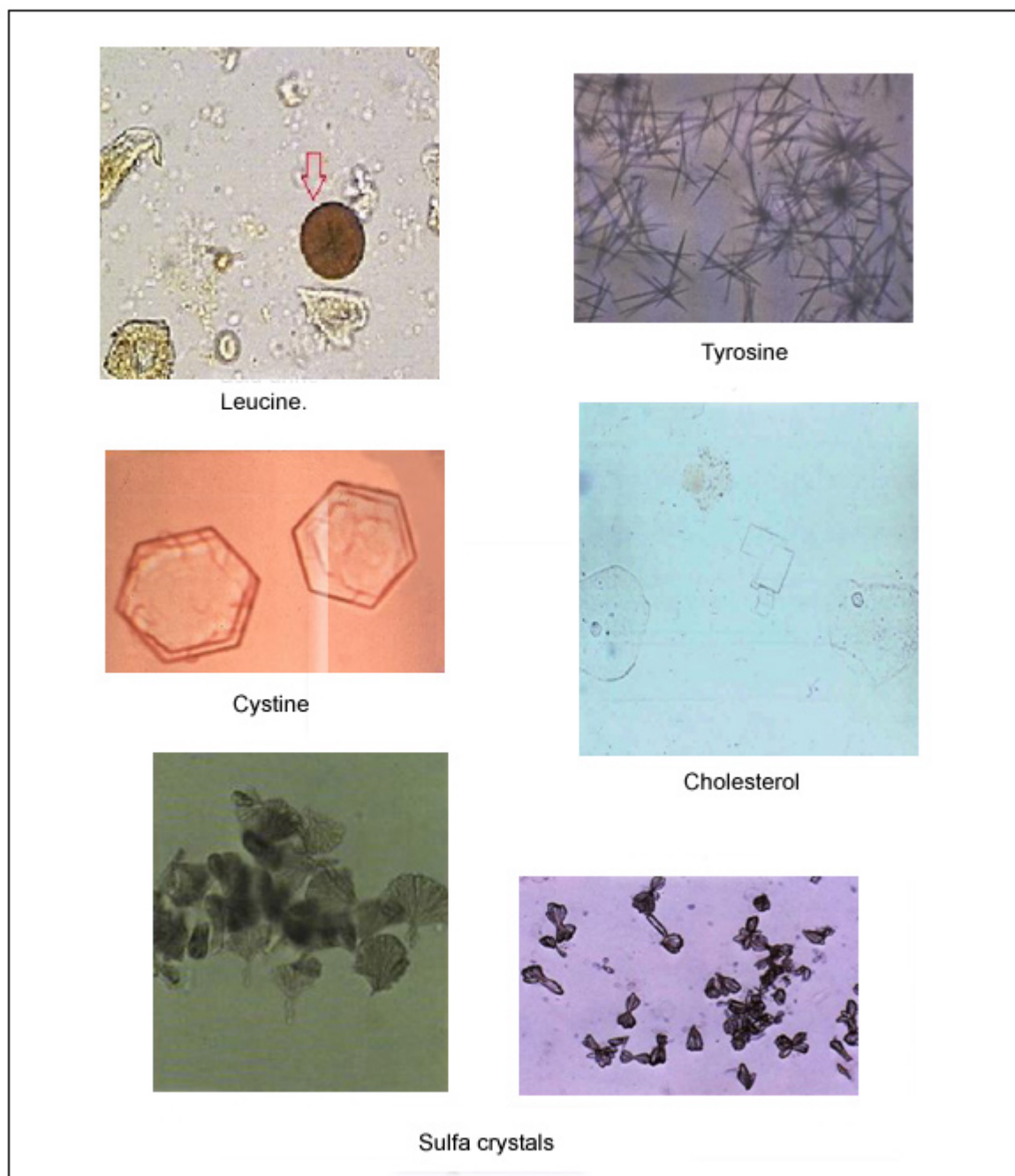


Figure 4. Abnormal Crystals in Acidic Urine

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- h. Grade the amount of bacteria seen from "-" to "4+."
- NOTE: Sperm is reported verbally.
5. Identify the clinical significance of abnormal results.
 - a. Proteinuria.
 - (1) Renal damage or disease.
 - (2) Multiple myeloma (specifically Bence Jones protein).

Performance Steps

- (3) Strenuous exercise.
- b. Glycosuria.
 - (1) Diabetes mellitus.
 - (2) Central nervous system damage.
 - (3) Pregnancy with undiagnosed diabetes mellitus.
 - (4) Metabolism disorders.
- c. Ketonuria.
 - (1) Starvation.
 - (2) Diabetic acidosis.
- d. Blood.
 - (1) Hematuria-intact RBCs.
 - (a) Renal disease or calculi.
 - (b) Exposure to toxic drugs or chemicals.
 - (c) Trauma.
 - (d) Strenuous exercise or menstruation.
 - (2) Hemoglobinuria-lysed RBCs.
 - (a) Severe burns.
 - (b) Transfusion reactions.
 - (c) Infections.
 - (d) Strenuous exercise.
 - (3) Myoglobinuria-protein found in muscle tissue.
 - (a) Muscular trauma.
 - (b) Lengthy coma.
 - (c) Muscle-wasting diseases.
 - (d) Extreme muscular exertion.
- e. Bilirubinuria.
 - (1) Cirrhosis.
 - (2) Hepatitis.
- f. Increased urobilinogen.
 - (1) Liver disease.
 - (2) Hemolytic disorders.
- g. Nitrites. Some bacteria reduce nitrate to nitrite, which is not a normal constituent of urine.
 - (1) Cystitis.
 - (2) Antibiotic therapy.
 - (3) Urinary tract infections.
 - (4) Specimen contamination from improper preservation.
- h. Specific gravity (sp. gr.).
 - (1) Diabetes insipidus (sp. gr. < 1.003).
 - (2) Hydration (normal sp. gr.) and dehydration (sp. gr. > 1.033).
- i. Leukocytes--urinary tract infections.

6. Obtain and report the correct results for a given specimen with 100 percent accuracy.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected urine sample on which he must perform a urinalysis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recorded the appearance and color of the urine on the laboratory request form.	—	—
2. Determined and recorded the specific gravity, pH, protein, glucose, ketones, bilirubin, nitrite, urobilinogen, blood, and leukocyte esterase.	—	—
3. Performed confirmation tests for positive reactions on the reagent strip (if available) or when indicated by patient condition.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Performed microscopic examination.	_____	_____
5. Identified the clinical significance of abnormal results.	_____	_____
6. Obtained and reported the correct results for a given specimen with 100 percent accuracy.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	ISBN 089189103X
	STP 8-91K15-SM-TG

Perform a Giemsa Stain for the Presence of Blood Parasites

081-833-4675

Conditions: As a Special Forces (SF) medical sergeant in a clinical environment and given a properly collected blood specimen, a Camco Wright-Giemsa stain, distilled water, glass slides, coverslips, staining dishes, water, lintless cloths, 95 percent ethanol, rubber gloves, methanol, timer, microscope, immersion oil, mounting medium, capillary tubes, the SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book set.

Standards: Perform a Giemsa stain to determine the presence or absence of blood parasites, and report accurate results.

Performance Steps

1. Prepare the glass slides by cleaning them in 95 percent ethanol and wiping them until completely dry.
2. Prepare the blood smears.
 - a. Prepare the thin smear.
 - (1) Place a small drop of blood at a point midway between the sides of the slide and a short distance from one end.
 - (2) Place the edge of another slide (spreader) on the specimen slide at a 30-degree angle.
 - (3) Slide the spreader slide toward the drop of blood until contact is made.
 - (4) Immediately push the spreader slide toward the opposite end of the specimen slide, drawing the blood behind it. The smear should cover one-half to two-thirds of the slide.
 - b. Prepare the thick smear.
 - (1) Place 3 or 4 drops of the blood specimen at the end of a slide.
 - (2) Use a corner of another slide to stir the drop over an area about the size of a dime. It is approximately the proper thickness if ordinary newsprint is just legible when looking through the freshly prepared smear. At least two thick and two thin smears should be prepared for each specimen.

NOTE: When dealing with a malaria specimen and the situation allows, stain a positive control slide.

- c. Allow the smear to air-dry in a flat position.
 3. Using a lead pencil, write the name or identification number of the patient in the thick area of the thin smear.
 4. Stain the smear within 24 hours after air-drying, and examine for uniform staining qualities.
 - a. Fix the thin smear in methanol for 3 to 5 seconds.
- CAUTION: Do not allow the thick smear to come in contact with the methanol or near the methanol vapors, as this will fix the cells.
- b. Allow the smear to air-dry.
 - c. Dip the thick smear in distilled water three to five times to ensure that the stain will be adequately absorbed and to lyse the intact red blood cells (RBCs).
 - d. Allow the smear to air-dry.
 - e. Place the entire slide in staining solution for 10 seconds.
 - f. Dip the entire slide in distilled water for 20 seconds or more (for desired color balance).
- NOTE: Time will depend on the age, thickness, and density of the smear.
- g. Remove the slides from the water and air-dry the slides by standing them on end on absorbent paper.
- CAUTION: Do not blot the slides dry. This may damage the blood smears.
5. Examine the entire smear under the oil immersion objective.
 - a. If malarial parasites are present in the thick smear, report "Plasmodium species seen." Confirm by reading the thin smear (Figure 1), and report by genus and species.

Performance Steps

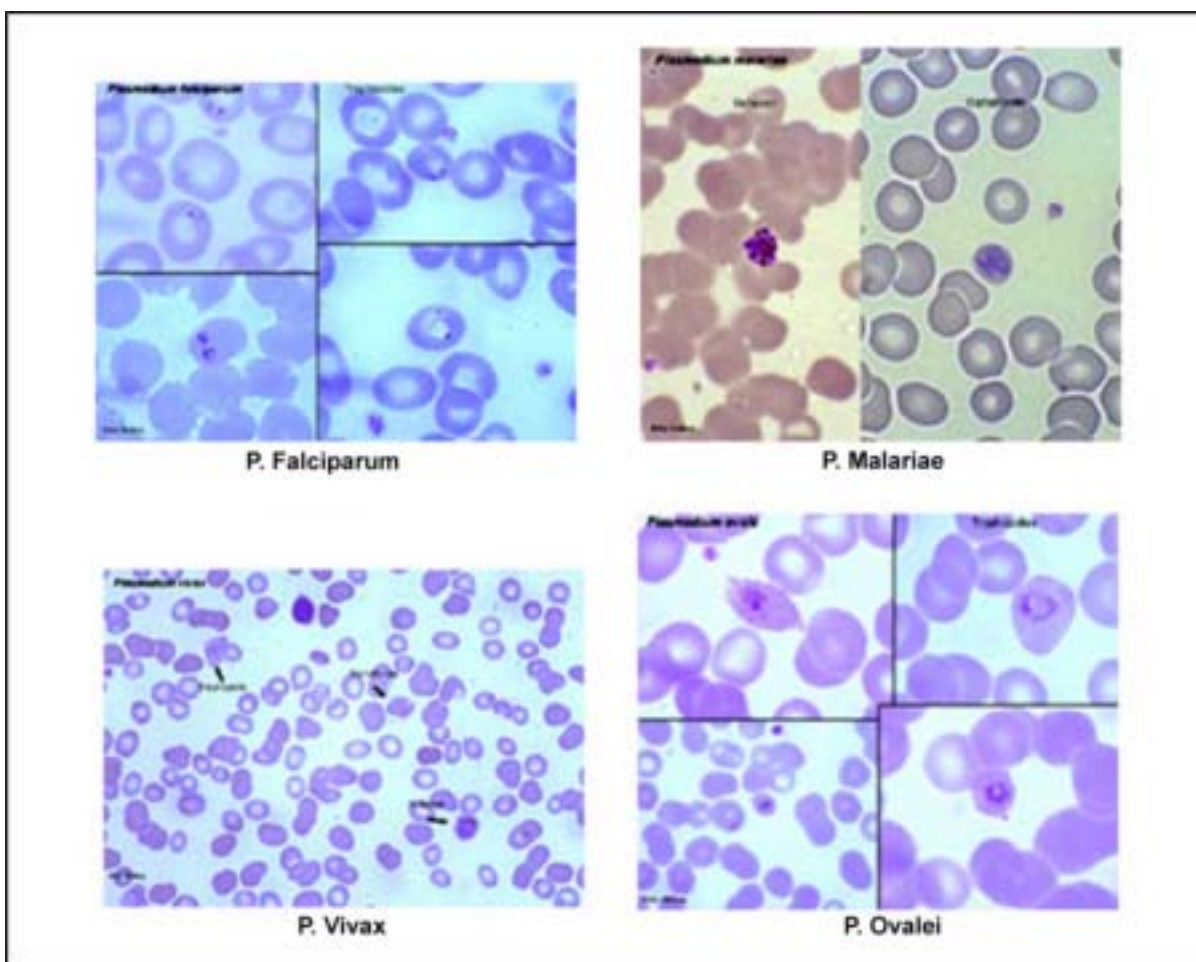


Figure 1. Malaria

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- b. If no malarial parasites are present, report "No Plasmodium species seen."
- c. If other blood parasites (Figure 2) are present, report by genus and species.

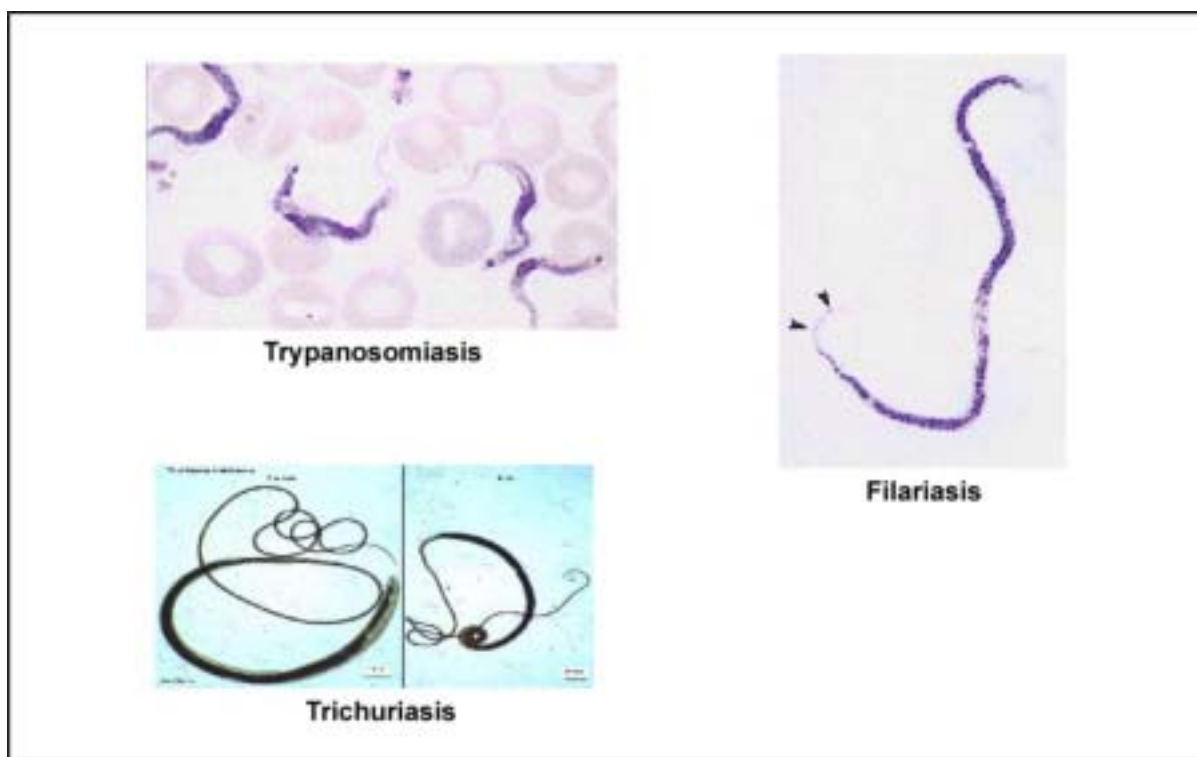
Performance Steps

Figure 2. Blood Parasites

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6. Record the results in the logbook and on the laboratory request form.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a properly collected blood sample on which he must perform a Giemsa stain.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepared the glass slides by cleaning them in 95 percent ethanol and wiping them until completely dry.	—	—
2. Prepared the blood smears.	—	—
3. Using a lead pencil, wrote the name or identification number of the patient in the thick area of the thin smear.	—	—
4. Stained the smear within 24 hours after air-drying, and examined the smear for uniform staining qualities.	—	—
5. Examined the entire smear under the oil immersion objective.	—	—
6. Recorded the results in the logbook and on the laboratory request form.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
ATLAS OF HUMAN PARASITOLOGY
STP 8-91K15-SM-TG

Subject Area 2: Administrative

Write a SOAP Note

081-833-4682

Conditions: As a Special Forces medic in a clinical environment and given Standard Form (SF) 600, Health Record--Chronological Record of Medical Care, and a pen.

Standards: Document patient history and physical examination (exam) by using the SOAP (subjective findings, objective findings, assessment, plan) format.

Performance Steps

1. Use a new Standard Form 600 for each patient.
2. Fill out, or have the patient fill out, all pertinent patient identification information in the appropriate block.
3. Record what the patient says under Subjective findings (S).
 - a. Start with the patient's age, race, sex, and chief complaint.
 - b. Always solicit the following history (AMPLE) at a minimum.
 - (1) Allergies: to food, medications, and so on.
 - (2) Medications the patient is taking.
 - (3) Previous illnesses or injuries that the patient has had.
 - (4) Last food or drink.
 - (5) Events leading up to the illness or injury.
 - c. With patients whose main complaint is pain, remember OPQRST. (See task 081-833-4690, Manage Pain.)
 - (1) Onset: When did or does the pain start?
 - (2) Palliative or provocative: Does anything make the pain better or worse?
 - (3) Quality: How does the pain feel: sharp, dull, stabbing, or achy?
 - (4) Radiation and region: Where is the pain? Does the pain radiate?
 - (5) Severity: Have the patient rate the severity of pain by using a scale of 1 to 10, with 10 being the worst pain that the patient has experienced.
- NOTE: Ask the patient what their worst pain was so that a comparison can be made.
 - (6) Temporal relationship of the pain: Does it occur at night, during the day, or after meals?
- d. Record any other pertinent history, symptoms, and other information that the patient relates.
4. Record any observable findings under Objective findings (O).
 - a. Patient's vital signs (at a minimum temperature, pulse, and respiration).
 - b. All pertinent positive and negative physical findings, signs, and laboratory results.
5. Record the diagnosis or the most probable diagnosis under Assessment (A).
 - a. Always include a differential diagnosis.
 - b. List the differential diagnosis by order of probability.
6. List the treatment and/or diagnostic plan for the patient under Plan (P).
 - a. Include labs requested to confirm or rule out the assessment and differential diagnosis.
 - b. Pharmacologic measures.
 - c. Nursing care.
 - d. Patient education.
 - e. Consults with other health care providers.
 - f. Schedule for follow-up care.
7. Sign and date the SOAP note under the last step of Plan.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must document patient history and physical exam.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Documented patient information on a new Standard Form 600.	_____	_____
2. Filled out or requested the patient fill out all pertinent patient identification information in the appropriate block.	_____	_____
3. Recorded the information in the proper SOAP note format.	_____	_____
a. Recorded what the patient said under Subjective findings (S).		
b. Recorded any physical findings, signs, and laboratory results under Objective findings (O).		
c. Recorded the diagnosis, or the most probable diagnosis, under Assessment (A). If necessary, included a differential diagnosis.		
d. Listed the appropriate treatment and/or diagnostic plan for the patient under Plan (P).		
4. Used correct medical terminology and abbreviations.	_____	_____
5. Corrected any errors by making a single line through the error and initialing above the error.	_____	_____
6. Signed and dated the SOAP note under the last step of Plan.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Maintain Medical Records

081-833-4688

Conditions: Given medical records and local standing operating procedure (SOP).

Standards: Identify and correct discrepancies on the record jacket and within the record, and file the record in the terminal digit file.

Performance Steps

1. Ensure that records are properly filed in the terminal digit file.
 - a. Medical records are filed on the basis of the last four digits of the patient's social security number.
 - b. Records are filed sequentially in numerical order.
 - c. If files are removed, they are replaced with a charge out file.

NOTE: Medical forms accumulated during the absence of the medical record are placed in the charge out file until the medical record is returned.

- (1) The charge out file should be marked with the patient's name, rank, and social security number.
 - (2) The charge out file should also be marked with the destination of the medical record or the reason for its removal.
2. Ensure that record jackets (Figure 1) are serviceable and properly marked. Initiate a new record jacket if needed.

Performance Steps

LAST NAME FIRST MI 0 1 2 3 4 5 6 7 8 9 R S 10 1

PART I Master Problem List
Exposure to ionizing radiation, asbestos, etc.)
Immunization
Laboratory/Histology/ECG

PART II Chronological documentation of care
(including consults, histories, physicals, etc.)

PART III Boards
Authorizations/Release of Information

PART IV Codes (Inpatient documents)
Field Medical Card
Privacy Act

PATIENT IDENTIFICATION

OUTPATIENT MEDICAL RECORD (OMR)

For use of this form, see AR 40-46, the proponent agency is the OTSG

☐ HEALTH RECORD

☐ OUTPATIENT TREATMENT RECORD

Specify Service & Rank for Military & Retired Military Member

ACTIVE DUTY ☐
RETIRED MILITARY ☐
NONMILITARY ☐

NOTE TO PHYSICIAN:

PERSONNEL RELIABILITY PROGRAM (PRP)	RECORDS MAINTENANCE AREA CODE
FLIGHT STATUS	
RADIATION SCREENING	
MEDICAL RECORDS	
BLOOD TYPE	
MEDICAL CONDITION	DATE LAST DEBTS CHECK

PROPERTY OF US GOVERNMENT. POSSESSION BY INDIVIDUAL WITHOUT PROPER AUTHORIZATION IS PROHIBITED.
IF FOUND RETURN TO ANY US POST OFFICE. POSTMASTER FORWARD TO: DEPARTMENT OF THE ARMY, OFFICE OF
THE SURGEON GENERAL, WASHINGTON, D.C. 20310-2017.

DA FORM 8006, NOV 91

1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

S R 9 8 7 6 5 4 3 2 1 0

Figure 1. Medical Record Jacket

- 3. Ensure that forms within the medical record are properly filed. Refer to local SOP.
 - a. Check the form for the required patient identification data.
 - b. Determine on which side of the folder to file the form.

Performance Steps

- c. File the form in the proper sequence on its respective side.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a real or training medical record that he must maintain.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Properly filed records by using the terminal digit file.	_____	_____
2. Checked that record jackets are serviceable and properly marked. Initiated a new record jacket, if needed.	_____	_____
3. Checked that forms within the medical record are properly filed in accordance with (IAW) Army Regulation (AR) 40-66 (Medical Record Administration and Health Care Documentation).	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
AR 40-66

Related

Prepare a Physical Performance Improvement Program

331-201-4012

Conditions: As a Special Forces (SF) medical sergeant in a garrison environment and given book set SF medical and FM 21-20, Physical Fitness Training.

Standards: Develop a physical performance improvement program that is mission-specific, consistent, progressive, sustainable, and well-balanced and provides for sufficient recovery.

Performance Steps

1. Determine the physical requirements on the basis of the following:
 - a. Unit standards.
 - b. Mission requirements.
2. Develop a program that trains the specific physical requirements.
 EXAMPLE: If your mission analysis indicates that you must be able to move 12 miles in 3 hours carrying 80 pounds of equipment and supplies, then your training should focus on ruck marching and not sprints.
 - a. Perform the specific activity required, such as walking or climbing.
 - b. Train the specific muscle group used in the activity with other related activities (cross training).
3. Ensure that the program trains the target activities regularly.
 - a. Train the specific activity (specific muscle group) one to three times per week if it is anaerobic.
 - b. Train the specific activity (specific muscle group) three to five times per week if it is aerobic.
4. Ensure the program is progressive and provides overload. Remember the acronym "FITT" (frequency, intensity, time, and type).
 NOTE: The workload of each exercise session must exceed the normal demands placed on the body to bring about a training effect.
 - a. Increase the number of repetitions or sets of anaerobic activities.
 - b. Increase the distance, duration, or number of times per week aerobic activities are performed.
 NOTE: Do not increase aerobic or anaerobic training by more than 10 percent per week to avoid injury.
5. Ensure your program is well balanced and provides variety by including:
 - a. Cardiorespiratory endurance activities.
 - b. Muscular strength activities.
 - c. Muscular endurance activities.
 - d. Flexibility activities.
 - e. Body composition education and testing. Improving the first three items above will have a positive impact on body composition. For more information on nutrition, see task 081-833-4131, Develop a Dietary Program.
6. Ensure the program is sustainable.
 - a. Set goals to arrive at for "peak" performance levels.
 - b. Take breaks from specific activities after peak events or at predesignated "down" times.
7. Ensure the program allows for sufficient recovery.
 - a. Anaerobic activity should not comprise more than 10 to 20 percent of total weekly training.
 - b. Schedule for at least one complete day of rest per week and 1 to 2 complete weeks of rest per year.
8. Ensure team members are given factual information regarding performance improvement. Include the following:
 - a. Dehydration is the single biggest detriment to good physical performance. Soldiers should drink "early and often" (4 to 8 ounces every 15 minutes) during the performance of any physical activity that lasts over 30 minutes.

Performance Steps

- b. Sports drinks do work. Scientific studies have shown that consumption of sports drinks containing carbohydrates do increase both time at maximum effort and sustained time to fatigue.
- c. Sufficient sleep is essential to physical performance. Most adults require at least 8 hours of sleep per night to ensure adequate recovery.
- d. Excess body fat is severely detrimental to good aerobic performance. For every pound of excess body fat, maximum VO₂ (the maximal rate at which oxygen can be taken up and used during exercise) decreases almost 1 percent.
- e. Alcohol consumption greater than 1 to 2 drinks per day is detrimental to physical performance. Alcohol acts as a diuretic and heavy consumption leads to severe dehydration.
- f. Tobacco use is detrimental to physical performance. Tobacco causes peripheral vasoconstriction and hypertension, not to mention cancer.
- g. The following ergonomic aids have proven to be effective in increasing time at maximum effort, time to fatigue, or both. (Based on research conducted at the United States Army Research Institute of Environmental Medicine.)
 - (1) Creatine acts as a precursor to ATP production. It does cause water weight gain, but otherwise is shown to be safe.

NOTE: The effectiveness of creatine phosphate is controversial. Some studies indicate it is effective, while other studies indicate it has no effect.

- (2) Caffeine is a methylxanthine that increases cardiac output, dilates bronchial smooth muscle, increases alertness, and other central nervous system (CNS) effects. Caffeine is generally recognized as safe when used alone; however, it has been implicated in causing heat-related problems, cardiac dysrhythmias, and left ventricular hypertrophy (long term) when taken with products containing ephedrine or phenylpropanolamine.
- (3) Ephedrine is an adrenergic agent with effects similar to those of caffeine. As stated above, it has been implicated in cardiac dysrhythmias and left ventricular hypertrophy when taken with caffeine.

NOTE: These are the only legal ergonomic aids that scientific studies conducted by agencies other than the manufacturer have shown to be effective.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must prepare a physical performance improvement program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined the physical requirements.	—	—
2. Developed a program that trains the specific physical requirements.	—	—
3. Ensured that the program trains the target activities regularly.	—	—
4. Ensured that the program is progressive and provides overload.	—	—
5. Ensured that your program is well balanced and provides variety.	—	—
6. Ensured that the program is sustainable.	—	—
7. Ensured that the program allows for sufficient recovery.	—	—
8. Ensured that team members are given factual information regarding performance improvement.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
AR 600-60
DA FORM 705
FM 21-20

Obtain Medical Equipment and Supplies

331-201-4013

Conditions: As a Special Forces medical sergeant in a field or garrison environment and given a requirement to order medical supplies by using the proper supply channels, AR 40-61, Medical Logistics Policies and Procedures, and Department of the Army (DA) Pamphlet (Pam) 710-2-1, Using Unit Supply System [Manual Procedures]).

Standards: Properly request and obtain all required medical equipment and supplies.

Performance Steps

1. Determine the annual, quarterly, or mission medical supply budget.
2. Determine recurring quarterly or annual budget requirements.
3. Determine the available amount of funds, following deduction of the recurring requirements.
4. Manage the medical supply budget to ensure that the budget constraints are followed.
5. Prioritize the supplies to be purchased with the available budget.

NOTE: Using the law of averages, soldiers are more likely to die from disease and non-battle injury than from wounds. It therefore makes more sense to spend limited supply funds for preventive medicine items first.

6. Look up the item on the Army Master Data File (AMDF) or Medical Material Supply Catalog.
7. Request, cancel, and follow-up supplies on DA Forms 2765-1, Request for Issue and Turn-In, or 2765-1, Request for Issue and Turn-In.
8. Post requisitions/cancellations and follow-ups on DA Form 2064, Document Register for Supply Actions.
9. Receive supplies from higher source of supply.
 - a. Inspect the condition of incoming supplies.
 - b. Ensure the incoming supplies have the correct document numbers.
 - c. Verify the amount delivered with the document.
 - d. Post received supplies to DA Form 2064.

10. Distribute supplies to subordinate units.
 - a. Prioritize which units will receive limited supplies.

NOTE: If all units have an equally high priority, divide the supplies equally and distribute them to the units.

- b. Gain the approval of the commander at the unit level of the supply activity for the prioritized list.
- c. Distribute the supplies.

Evaluation Preparation: This task is best evaluated by performance of the steps on the job. If the task must be evaluated in the training environment, give the soldier a scenario in which he must obtain medical equipment and supplies.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined the annual, quarterly, or mission medical supply budget.	—	—
2. Determined recurring quarterly or annual budget requirements.	—	—
3. Determined the available amount of funds, following deduction of the recurring requirements.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Managed the medical supply budget to ensure that the budget constraints are followed.	—	—
5. Prioritized the supplies.	—	—
6. Looked up the item on the Army Master Data File or Medical Material Supply Catalog.	—	—
7. Requested, canceled, and followed-up supplies on DA Forms 2765-1 or 3161.	—	—
8. Posted requisitions/cancellations and follow-ups on DA Form 2064.	—	—
9. Inspected supplies received from higher.	—	—
a. Inspected the condition of incoming supplies.		
b. Ensured they have the correct document numbers.		
c. Verified the amount delivered with the document.		
10. Posted received supplies to DA Form 2064.	—	—
11. Distributed supplies to subordinate units.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

AR 40-61
DA PAM 710-2-1

Related

AR 725-50
DA FORM 2765
DA FORM 3161
DA PAM 710-2-2

Account for Medical Supplies
331-201-4014

Conditions: As a Special Forces Medical Sergeant in a central supply or clinical environment and given AR 40-61, Medical Logistics Policies and Procedures, DA Pam 710-2-1, Using Unit Supply System (Manual Procedures), and DA Pam 710-2-2, Supply Support Activity Supply System: Manual Procedures, the soldier must account for medical supplies.

Standards: The soldier must account for medical supplies with 100 percent accuracy.

Performance Steps

1. Notify all personnel affected by the inventory in advance.
 NOTE: This is not required at the level of the Special Forces operational detachment A (SFODA).
 - a. Send written notification of the time and date of the inventory.
 - b. Ensure that enough advance notification is allowed so each affected unit had enough time to request any required supplies.
2. Gather all supply accounting/accountable records.
 - a. Assemble all DA Forms 1296, Stock Accounting Records.
 - b. Have all DA Forms 2062, Hand Receipts, and DD Forms 1150, Request for Issue or Turn-In, available.
3. Make inventory count cards.
4. Assemble inventory count personnel.
5. Conduct the inventory.
 - a. Close or reduce supply operations for the duration of the inventory.
 - b. Record the inventory on DA Form 2000-3, Installation Inventory Count Card.
 - c. Post inventory from DA Form 2000-3 to DA Form 1296.
6. Reconcile supply account records by making necessary adjustments to stock accounting records.
7. Turn in excess and unserviceable supplies and equipment to the source of supply.
8. Conduct destruction of expired or unserviceable medications in accordance with (IAW) Army and local regulations.
9. Stock medical supplies and issue supplies to authorized personnel only.

Evaluation Preparation: This task is best evaluated by performance of the steps during actual duty performance. If training evaluation is required, give the soldier a scenario in which he must account for medical supplies.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Notified all personnel affected by the inventory in advance.	—	—
2. Gathered all supply accounting/accountable records.	—	—
3. Made inventory count cards.	—	—
4. Assembled inventory count personnel.	—	—
5. Closed or reduced supply operations for the duration of the inventory.	—	—
6. Recorded the inventory on DA Form 2000-3.	—	—
7. Posted inventory from DA Form 2000-3 to DA Form 1296.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
8. Reconciled supply account records by making necessary adjustments to stock accounting records.	—	—
9. Turned in excess and unserviceable supplies and equipment to the source of supply.	—	—
10. Conducted destruction of expired or unserviceable medications IAW Army and local regulations.	—	—
11. Stocked medical supplies and issue supplies to authorized personnel only.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

AR 40-61
DA PAM 710-2-1
DA PAM 710-2-2

Related

AR 710-2
AR 725-50
AR 735-5
DA FORM 2000-3
DA FORM 2062
DD FORM 1150

Subject Area 3: Basic Medical Skills

Intubate a Patient

081-830-3016

Conditions: You have an unconscious, nonbreathing casualty with no gag reflex. A qualified assistant is performing CPR. Suction equipment is available and ready for use. A laryngoscope and endotracheal (ET) tube have been prepared. You are not in an NBC environment. Necessary materials and equipment: bag-valve-mask (BVM) resuscitator or oxygen with demand valve, gloves, oral bite block or J tube, suction equipment, adhesive tape, benzoin, stethoscope, pressure manometer, and a 10 cubic centimeter (cc) syringe.

Standards: Complete in sequence all the steps necessary to establish an ET tube airway without causing further injury to the patient.

Performance Steps

CAUTION: Wear gloves to protect yourself against the transmission of contaminants whenever handling body fluids.

1. Put on gloves.
2. Oxygenate the patient with the bag-valve-mask for 1 minute.
CAUTION: Do not deprive the patient of oxygen for longer than 20 seconds at any time during the procedure.
3. Position the patient's head by hyperextending the neck.
4. Open the patient's mouth, and hold it open.
5. Insert the laryngoscope blade (Figure 1).

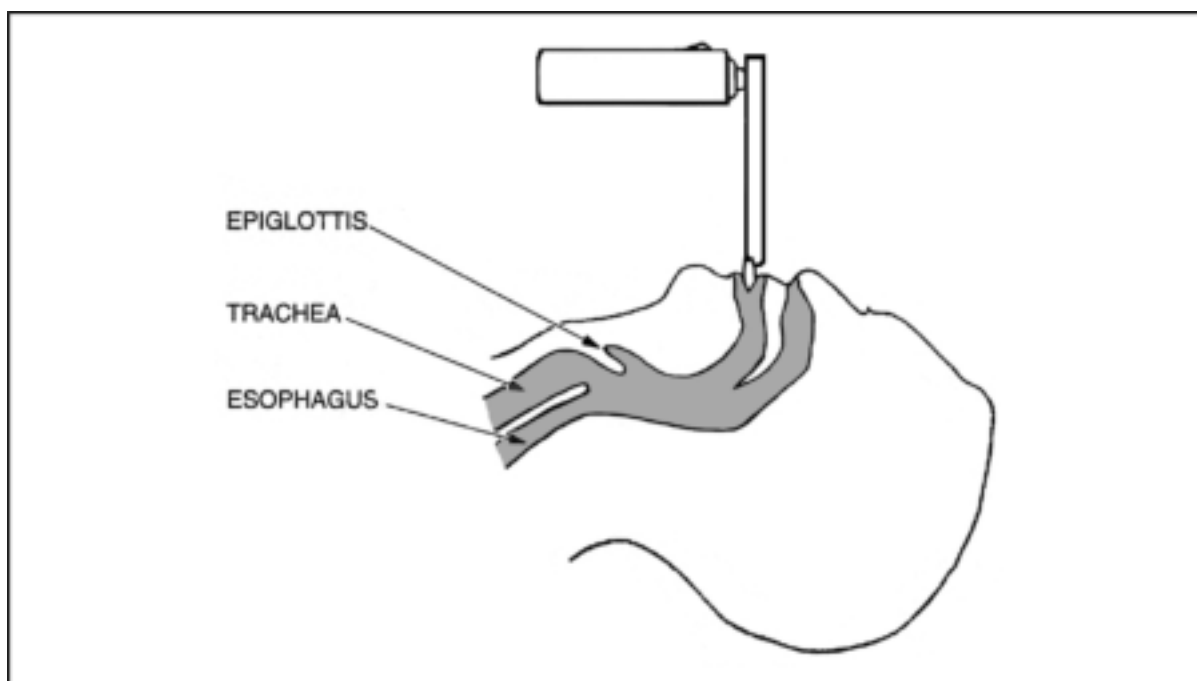
Performance Steps

Figure 1. Inserting the Laryngoscope

- a. Stand or kneel at the top of the casualty's head.
- b. Hold the laryngoscope with your left hand.
- c. Open and lock the blade at a 90-degree angle to turn the light on.
- d. Place the blade into the right side of the casualty's mouth.
- e. Move the laryngoscope to the center of the patient's mouth by moving the patient's tongue to the left side of his or her mouth with the laryngoscope blade.
- f. Advance the blade a short distance to observe the epiglottis (Figure 2).

Performance Steps

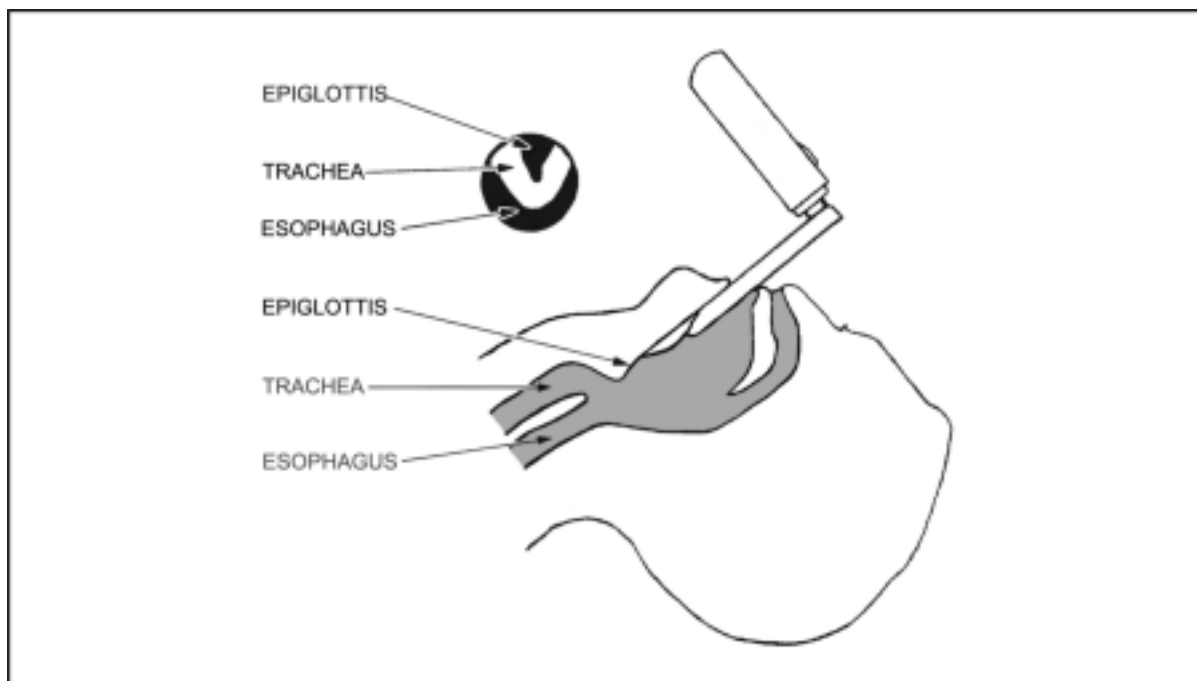


Figure 2. View of the Epiglottis

6. Retract the epiglottis, and inspect the vocal cords (Figure 3).
 - a. When using a curved laryngoscope blade (McIntosh), apply anterior pressure to the vallecula with the tip of the laryngoscope blade to fold back the epiglottis and expose the vocal cords.
 - b. When using a straight laryngoscope blade (Miller), hook the blade tip under the epiglottis and pull up to fold back the epiglottis and expose the vocal cords.

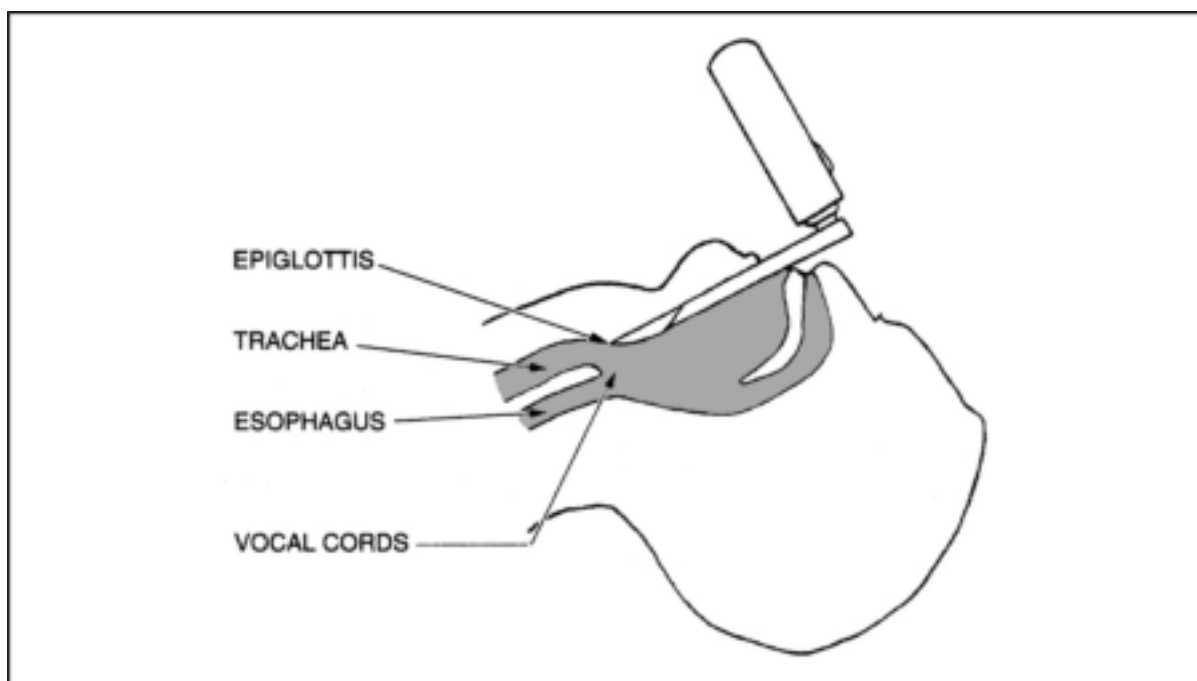
Performance Steps

Figure 3. View of the Vocal Cords

WARNING: Exert upward traction on the handle to expose the glottic opening. Never use the handle with a prying motion. Do not use the patient's teeth as a fulcrum.

7. Insert the ET tube into the trachea.
 - a. Grasp the ET tube with the right hand.
 - b. Insert the ET tube, and carefully guide the tip of the tube between the vocal cords until the cuff is just below the level of the vocal cords (Figure 4).

Performance Steps

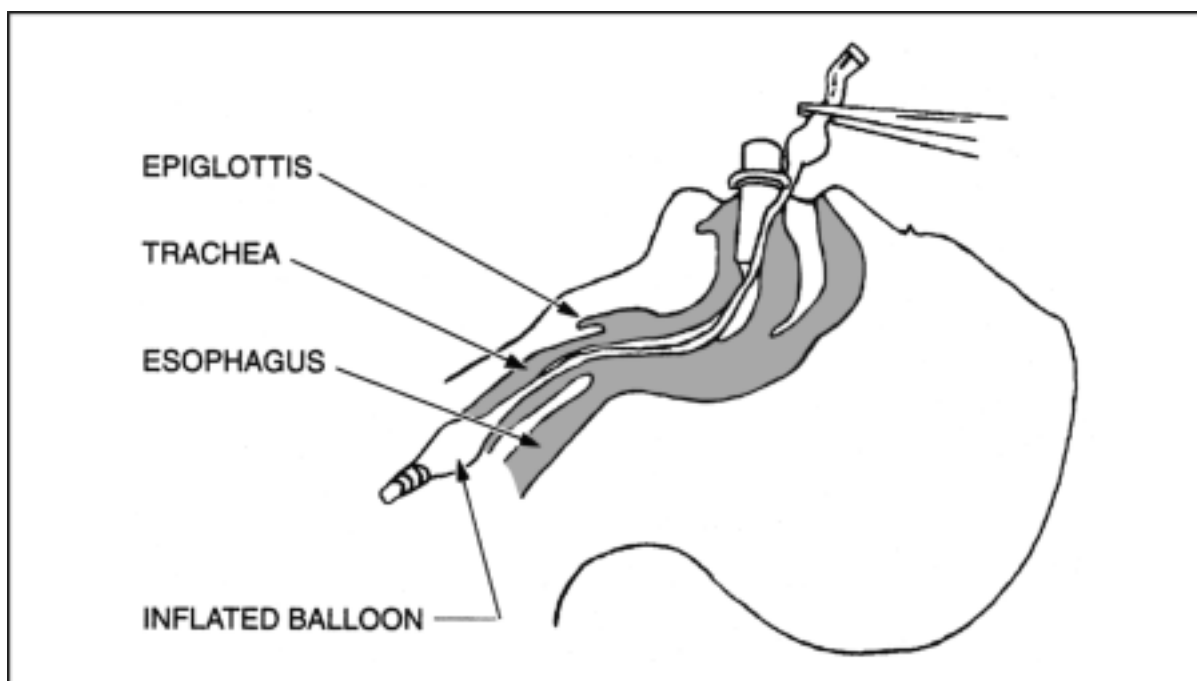


Figure 4. Placement of the ET Tube

8. Remove the laryngoscope.
9. Remove the stylet from the ET tube.
 - a. Hold the ET tube securely with the right hand.
 - b. Pull the stylet straight out with the left hand.
10. Inject the required amount of air to inflate the cuff (5 to 10 cc) by pressing the plunger of the syringe (Figure 5).

Performance Steps

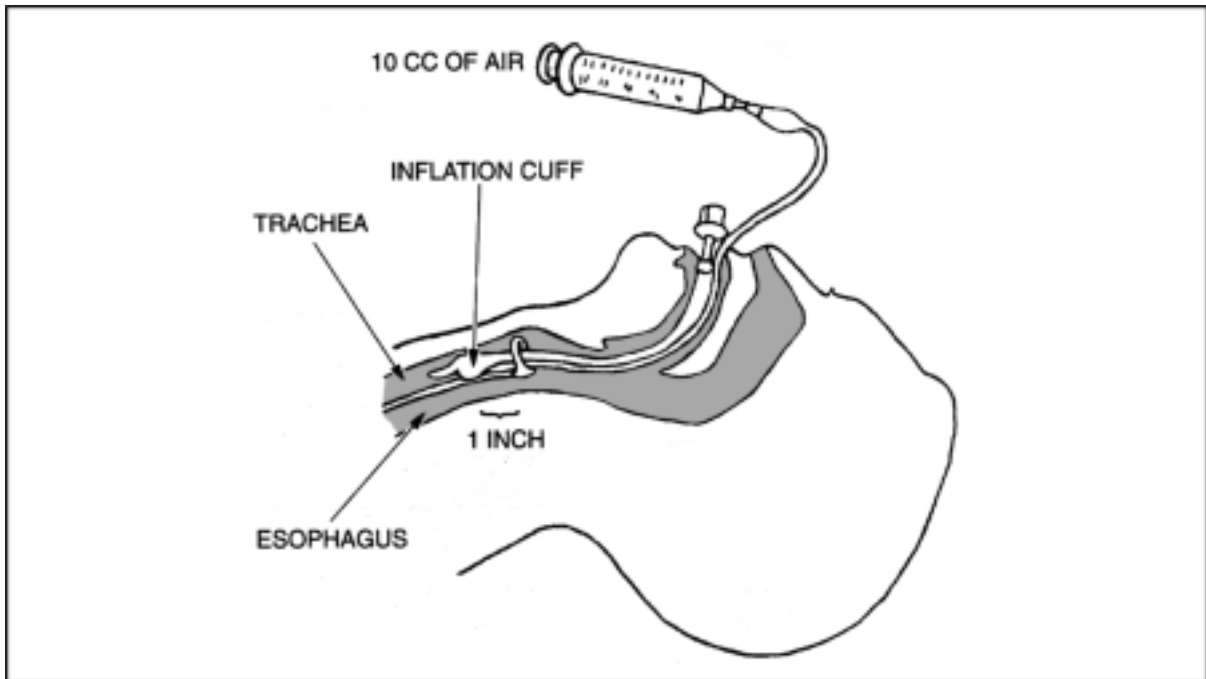


Figure 5. Inflating the Cuff

11. Check placement of the ET tube.
 - a. Place the resuscitative equipment over the end of the ET tube and blow air into the tube to inflate the lungs.
 - b. Instruct an assistant to auscultate the lung fields and epigastric area while you bag the casualty through the ET tube.
 - (1) If the patient's chest rises and bilateral breath sounds are heard without any abnormal sounds heard over the epigastric area, proceed to step 12.
 - (2) If sound is heard over only one lung field, then you must partially deflate the cuff, withdraw the tube a little, reinflate the cuff, and listen again.
- NOTE: A misplaced ET tube is most likely to be in the right main stem bronchus.
- (3) If a rushing sound is heard over the epigastric area, withdraw the tube completely, reoxygenate the patient, and wait at least three minutes before repeating the procedure.

12. Check cuff pressure.
 - a. Use a pressure manometer.
 - (1) Connect a pressure manometer to the pilot balloon to ensure the cuff pressure is less than 25 cm Hg. Either inflate or deflate the pilot balloon to achieve the desired pressure.
 - (2) Remove the pressure manometer from the pilot balloon.
 - b. Use the minimal leak technique.

NOTE: Benzoin may be applied to the skin to prevent the tape from coming off.

- (1) Suction the patient thoroughly first.
- (2) Attach and partially deflate the cuff using a 10 cc syringe.
- (3) During the positive pressure ventilation, add air until only a slight leak is heard around the cuff during peak inspiration.

NOTE: Due to possible prolonged intubation, it is recommended that you use a tube with a high-volume/low pressure cuff to prevent possible necrosis at the cuff site. Using cuff pressures above 30 cm H₂O may produce a decrease in capillary mucosal blood flow resulting in ischemia.

Performance Steps

- (4) Hold the cuff valve in one hand and simultaneously twist and pull the syringe with your other hand to remove the syringe.
13. Reoxygenate the patient.
14. Wedge a bite block or J tube between the back teeth to prevent biting of the ET tube, which may cause partial or complete obstruction of the tube (Figure 6).

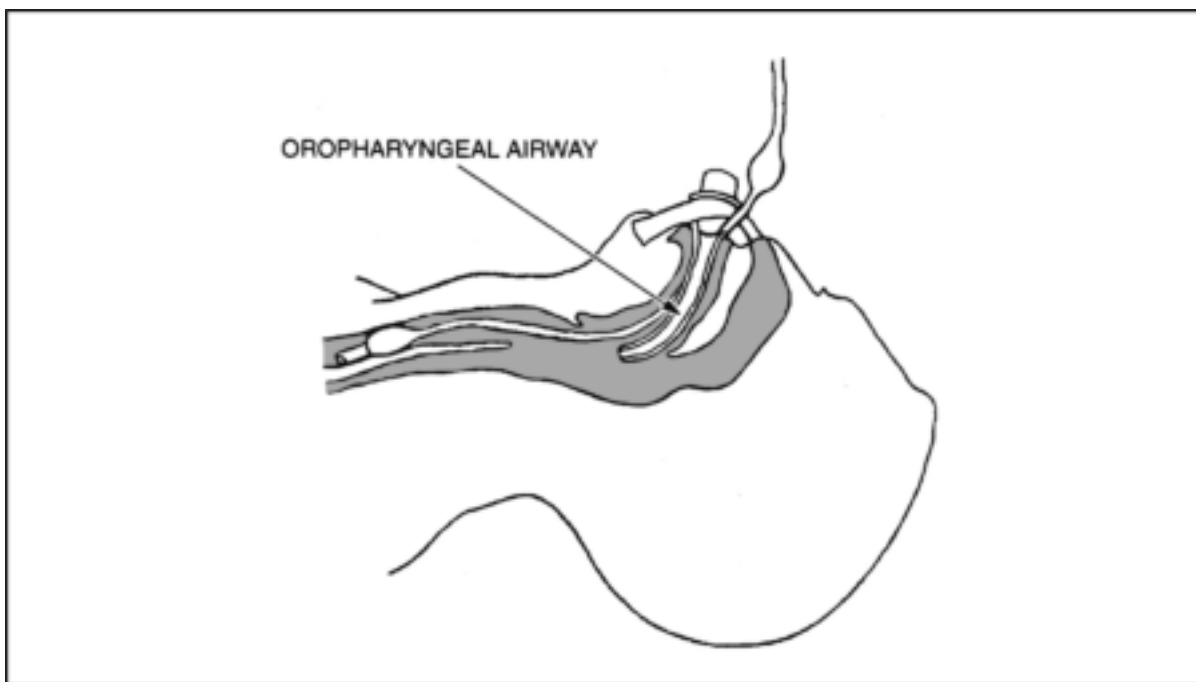


Figure 6. Maintaining the Airway

15. Secure the ET tube.
 - a. Wrap the middle of a long piece of tape around the ET tube.
 - b. Attach each end of the tape to the patient's face.
- NOTE: Benzoin may be applied to the skin to prevent the tape from coming off.
16. Ventilate the casualty once every 5 seconds.
 17. Monitor the casualty to ensure correct tube placement is maintained by auscultating the lungs and epigastric area.
- NOTE: The tip of the tube should be 2 to 3 centimeters above the carina. Proper tube placement is confirmed by taking an X ray of the patient's chest.
18. Record the procedure.

Performance Measures

1. Put on sterile gloves.
2. Oxygenated the casualty.
3. Positioned the patient's head.
4. Opened the patient's mouth.
5. Inserted the laryngoscope blade.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Retracted the epiglottis, and inspect the vocal cords.	_____	_____
7. Inserted the ET tube into the trachea.	_____	_____
8. Removed the laryngoscope.	_____	_____
9. Removed the stylet from the ET tube.	_____	_____
10. Inflated the cuff.	_____	_____
11. Checked the placement of the ET tube.	_____	_____
12. Checked the cuff pressure.	_____	_____
13. Reoxygenated the patient.	_____	_____
14. Wedged a bite block or a J tube between the back teeth.	_____	_____
15. Secured the ET tube.	_____	_____
16. Ventilated the patient once every 5 seconds.	_____	_____
17. Monitored the patient.	_____	_____
18. Recorded the procedure.	_____	_____
19. Completed all necessary steps in order.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	STP 8-91B15-SM-TG

Perform Exhale Carbon Dioxide Monitoring

081-830-4053

Conditions: Given an intubated patient and an end tidal carbon dioxide detector.

Standards: The soldier must determine that the endotracheal (ET) tube has been placed in the trachea by looking for color change in the end tidal carbon dioxide detector.

Performance Steps

NOTE: The patient has been intubated.

1. Understand the operation of end tidal carbon dioxide detectors.
 - a. Carbon dioxide detectors contain a chemical indicator in the upper part that is sensitive to carbon dioxide gas.
 - b. When the detector is attached to an ET tube, the color of the indicator changes with elevated carbon dioxide concentrations.
2. Place the end tidal carbon dioxide detector.
 - a. The detector is a flow through device.
 - b. The tapered end is designed to fit into the adapter of an endotracheal tube. The device is simply slid over the tube connector.
 - c. The other end of the device is identical to the ET tube connector so that all standard oxygen delivery equipment can attach to it.
 - d. It may be left in place without interfering with the flow of oxygen.
3. Assess proper endotracheal tube placement with the carbon dioxide detector.
 - a. In patients who are tracheally intubated, you will see a color change in the device.
 - b. In patients who are esophageally intubated, you will not see a color change in the device.

NOTE: With very low cardiac output during cardiopulmonary resuscitation, there may be no color change in the carbon dioxide detector, even though the ET tube is in the trachea.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must use an end tidal carbon dioxide detector.

Performance Measures

GO **NO GO**

1. Explained how end tidal carbon dioxide detectors operate.	_____	_____
2. Correctly attached the end tidal carbon dioxide detector to the ET tube.	_____	_____
3. Assessed proper ET tube placement with the carbon dioxide detector.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Pulse Oximetry Monitoring
081-830-4061

Conditions: Given a commercial pulse oximeter.

Standards: The soldier must recognize appropriate oxygenation levels, recognize conditions that may produce false readings, and monitor the patient's oxygenation level.

Performance Steps

1. Understand the principles that make pulse oximetry possible.
 - a. Pulse oximeters measure the level of oxygen in the blood by measuring the transmission of red and near infrared light through arterial beds.
 - b. Hemoglobin absorbs red and infrared light waves differently when it is bound with oxygen (oxyhemoglobin) and when it is not (reduced hemoglobin).
 - c. Oxyhemoglobin absorbs more infrared than red light, and reduced hemoglobin absorbs more red than infrared light.
 - d. Pulse oximetry reveals arterial saturation by measuring this difference.
 2. Select a site for placement of the probe.
 - a. The pulse oximeter probe is usually in the form of a clip, one side of which emits wavelengths of light into the arterial bed. The other side detects presence of red or infrared light.
 - b. Normally, the probe is placed on the finger or toe of an uninjured limb in an adult, or on the ear of an infant or small child.
 3. Recognize appropriate and inappropriate readings for pulse oximetry.
 - a. Normal SaO₂ (oxygen saturation of hemoglobin) is 93 percent or greater.
 - b. Levels below 93 percent indicate insufficient oxygenation of the blood.
- NOTE: These patients need oxygenation, assisted ventilations, or both.
4. Recognize conditions that may produce false pulse oximetry readings.
 - a. Dyshemoglobinemia: hemoglobin saturated with compounds other than oxygen, such as carbon monoxide or methemoglobinemia.
 - b. Excessive ambient light on the oximeters probe.
 - c. Patient movement that dislodges the probe.
 - d. Hypotension.
 - e. Hypothermia.
 - f. Patient use of vasoconstrictive drugs.
 - g. Patient use of nail polish.
 - h. Jaundice.
 5. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must use pulse oximetry.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the principles that make pulse oximetry possible.	—	—
2. Selected a site for placement of the probe.	—	—
3. Recognized appropriate and inappropriate readings for pulse oximetry.	—	—
4. Recognized conditions that may produce false pulse oximetry readings.	—	—
5. Recorded all findings in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform a Patient Care Handwash
081-831-0007

Conditions: You are about to administer patient care or have just had hand contact with a patient or contaminated material. Necessary materials and equipment: running water or two empty basins, a canteen, a water source, soap, towels (cloth or paper), and a towel receptacle or trash can.

Standards: Perform a patient care handwash without recontaminating your hands.

Performance Steps

1. Remove wristwatch and jewelry, if applicable.
NOTE: Rings should not be worn. If rings are worn, they should be of simple design with few crevices for harboring bacteria. Fingernails should be clean, short, and free of nail polish.
2. Roll shirtsleeves to above the elbows, if applicable.
3. Prepare to perform the handwash.
 - a. If using running water, turn on the warm water.
 - b. If running water is not available, set up the basins and open the canteen.
4. Wet your hands, wrists, and forearms.
 - a. If using running water, hold your hands, wrists, and forearms under the running water.
 - b. If running water is not available, fill one basin with enough water to cover your hands and refill the canteen.
5. Cover your hands, wrists, and forearms with soap.
NOTE: For routine patient care, use regular hand soap. For an invasive procedure such as a catheterization or an injection, use antimicrobial soap.
6. Wash your hands, wrists, and forearms.
 - a. Use a circular scrubbing motion, going from the fingertips toward the elbows.
 - b. Give particular attention to creases and folds in the skin.
 - c. Wash ring(s) if present.
7. Rinse your hands, wrists, and forearms.
 - a. If using running water.
 - (1) Hold your hands higher than the elbows under the running water until all soap is removed.
 - (2) Do not touch any part of the sink or faucet.
 - b. If not using running water.
 - (1) Use a clean towel to grasp the canteen with one hand.
 - (2) Rinse the other hand, wrist, and forearm, letting the water run into the empty basin. Hold your hands higher than the elbows.
 - (3) Repeat the procedure for the other arm.
 - (4) Do not touch any dirty surfaces while rinsing your hands.
8. Dry your hands, wrists, and forearms.
 - a. Use a towel to dry one arm from the fingertips to the elbow without retracing the path with the towel.
 - b. Dispose of the towel properly without dropping your hand below waist level.
 - c. Repeat the process for the other arm using another towel.
9. Use a towel to turn off the running water, if applicable.
10. Reinspect your fingernails and clean them and rewash your hands, if necessary.

Performance Measures

1. Removed wristwatch and jewelry, when applicable.

GO **NO GO**

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Rolled shirt sleeves to above the elbows, when applicable.	_____	_____
3. Prepared to perform the handwash.	_____	_____
4. Wet hands, wrists, and forearms.	_____	_____
5. Covered hands, wrists, and forearms with soap.	_____	_____
6. Washed hands, wrists, and forearms.	_____	_____
7. Rinsed hands, wrists, and forearms.	_____	_____
8. Dried hands, wrists, and forearms.	_____	_____
9. Used a towel to turn off the running water, if applicable.	_____	_____
10. Reinspected and cleaned fingernails and rewashed hands, when necessary.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG

Put On Sterile Gloves

081-831-0008

Conditions: Necessary materials and equipment: handwashing facilities, sterile gloves, and a flat, clean, dry surface.

Standards: Put on and remove sterile gloves without contaminating yourself or the gloves.

Performance Steps

1. Select and inspect the package.
 - a. Select the proper size of glove.
 - b. Inspect the package for possible contamination.
 - (1) Water spots.
 - (2) Moisture.
 - (3) Tears.
 - (4) Any other evidence that the package is not sterile.
2. Perform a patient care handwash.
3. Open the sterile package.
 - a. Place the package on a flat, clean, dry surface in the area where the gloves are to be worn.
 - b. Peel the outer wrapper open to completely expose the inner package.
4. Position the inner package.
 - a. Remove the inner package touching only the folded side of the wrapper.
 - b. Position the package so that the cuff end is nearest you.
5. Unfold the inner package.
 - a. Grasp the lower corner of the package.
 - b. Open the package to a fully flat position without touching the gloves.
6. Expose both gloves.
 - a. Grasp the lower corners or designated areas on the folder.
 - b. Pull gently to the side without touching the gloves.
7. Put on the first glove.
 - a. Grasp the cuff at the folded edge and remove it from the wrapper.
 - b. Step away from the table or tray.
 - c. Keeping your hands above the waist, insert the fingers of the other hand into the glove.
 - d. Pull the glove on touching only the exposed inner surface of the glove.

NOTE: If there is difficulty in getting your fingers fully fitted into the glove fingers, make the adjustment after both gloves are on.

8. Put on the second glove.
 - a. Insert the fingertips of the gloved hand under the edge of the folded over cuff.

NOTE: You may keep the gloved thumb up and away from the cuff area or may insert it under the edge of the folded over cuff with the fingertips.

- b. Keeping your hands above the waist, insert the fingers of the ungloved hand into the glove.
 - c. Pull the glove on.
 - d. Do not contaminate either glove.

9. Adjust the gloves to fit properly.
 - a. Grasp and pick up the glove surfaces on the individual fingers to adjust them.
 - b. Pick up the palm surfaces and work your fingers and hands into the gloves.
 - c. Interlock the gloved fingers and work the gloved hands until the gloves are firmly on the fingers.

NOTE: If either glove tears while putting them on or adjusting the gloves, remove both gloves and repeat the procedure.

Performance Steps

10. Remove the gloves.
 - a. Grasp one glove at the heel of the hand with the other gloved hand.
 - b. Peel off the glove, retaining it in the palm of the gloved hand.
 - c. Reach under the cuff of the remaining glove with one or two fingers of the ungloved hand.
 - d. Peel off the glove over the glove being held in the palm.
 - e. Do not contaminate yourself.

CAUTION: Do not "snap" the gloves while removing them.

11. Discard the gloves IAW local SOP.
12. Perform a patient care handwash.

Evaluation Preparation: Setup: If performance of this task must be simulated for training and evaluation, the same gloves may be used repeatedly as long as they are properly rewrapped after each use. You may give the soldier a torn or moist glove package to test step 1.

NOTE: If the soldier does not know his or her glove size, have several different sizes available to try on to determine the correct size.

Brief soldier: Tell the soldier to put on and remove the sterile gloves.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Selected and inspected the package.	_____	_____
2. Performed a patient care handwash.	_____	_____
3. Opened the sterile package.	_____	_____
4. Positioned the inner package.	_____	_____
5. Unfolded the inner package.	_____	_____
6. Exposed both gloves.	_____	_____
7. Put on the first glove.	_____	_____
8. Put on the second glove.	_____	_____
9. Adjusted the gloves to fit properly.	_____	_____
10. Removed the gloves.	_____	_____
11. Discarded the gloves IAW local SOP.	_____	_____
12. Performed a patient care handwash.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required

Related
STP 8-91B15-SM-TG

Initiate a Field Medical Card**081-831-0033**

Conditions: You have treated a casualty and must record the treatment given. Necessary materials and equipment: DD Form 1380, Field Medical Card, and a pen or pencil.

Standards: Complete, as a minimum, blocks 1, 3, 4, 7, 9, and 11. Complete blocks 2, 5, 6, 8, 12, 13, 14, 15, 16, and 17 as appropriate. Complete other blocks as time permits.

Performance Steps

1. Remove the protective sheet from the carbon copy.
2. Complete the minimum required blocks.
 - a. Block 1. Enter the casualty's name, rank, and complete social security number (SSN). If the casualty is a foreign military person (including prisoners of war), enter his or her military service number. Enter the casualty's military occupational specialty (MOS) or area of concentration for specialty code. Enter the casualty's religion and sex.
 - b. Block 3. Use the figures in the block to show the location of the injury or injuries. Check the appropriate boxes to describe the casualty's injury or injuries.

NOTE: Use only authorized abbreviations. Except for those listed below, however, abbreviations may not be used for diagnostic terminology.

Abr W--Abraded wound.

Cont W--Contused wound.

FC--Fracture (compound) open.

FCC--Fracture (compound) open comminuted.

FS--Fracture (simple) closed.

LW--Lacerated wound.

MW--Multiple wounds.

Pen W--Penetrating wound.

Perf W--Perforating wound.

SL--Slight.

SV--Severe.

NOTE: When more space is needed, attach another DD Form 1380 to the original. Label the second card in the upper right corner "DD Form 1380 #2." It will show the casualty's name, grade, and SSN.

- c. Block 4. Check the appropriate box.
 - d. Block 7. Check the yes or no box. Write in the dose administered and the date and time that it was administered.
 - e. Block 9. Write in the information requested. If you need additional space, use Block 14.
 - f. Block 11. Initial the far right side of the block.
3. Complete the other blocks as time permits. Most blocks are self-explanatory. The following specifics are noted:
 - a. Block 2. Enter the casualty's unit of assignment and the country of whose armed forces he or she is a member. Check the armed service of the casualty, that is, A/T = Army, AF/A = Air Force, N/M = Navy, and MC/M Marine.
 - b. Block 5. Write in the casualty's pulse rate and the time that the pulse was measured.
 - c. Block 6. Check the yes or no box. If a tourniquet is applied, you should write in the time and date it was applied.
 - d. Block 8. Write in the time, date, and type of IV solution given. If you need additional space, use Block 9.
 - e. Block 10. Check the appropriate box. Write in the date and time of disposition.
 - f. Block 12. Write in the time and date of the casualty's arrival. Record the casualty's blood pressure, pulse, and respirations in the space provided.

Performance Steps

- g. Block 13. Document the appropriate comments by the date and time of observation.
- h. Block 14. Document the provider's orders by date and time. Record the dose of tetanus administered and the time it was administered. Record the type and dose of antibiotic administered and the time it was administered.
- i. Block 15. The signature of the provider or medical officer is written in this block.
- j. Block 16. Check the appropriate box and enter the date and time.
- k. Block 17. This block will be completed by the United Ministry Team. Check the appropriate box of the service provided. The signature of the chaplain providing the service is written in this block.

Evaluation Preparation: Setup: For training and evaluation have another soldier act as a casualty and have him or her respond to the soldier's questions on personal data.

Brief soldier: Tell the soldier to complete the field medical card by asking appropriate questions of the casualty. Tell the soldier being tested any necessary information such as the nature of the wound and the treatment given. To test step 2, you may either have the soldier complete the minimum required blocks, or you may require the completion of all blocks. After step 2 ask the soldier what must be done with each copy of the field medical card.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Removed the protective sheet from the carbon copy.	_____	_____
2. As a minimum, completed blocks 1, 3, 4, 7, 9, and 11.	_____	_____
3. Made proper distribution of the field medical card copies.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
DD FORM 1380

Related
STP 8-91B15-SM-TG

Prepare An Injection For Administration

081-833-0088

Conditions: You have performed a patient care handwash. Necessary materials and equipment are: needles and syringes, medication, alcohol sponges, dry sterile gauze, and physician's orders.

Standards: Select, inspect, and assemble the appropriate needle and syringe. Draw the correct medication. Follow aseptic technique throughout the procedure.

Performance Steps

1. Select an appropriate needle.
 - a. Select a needle with the proper length based upon the following factors:
 - (1) The type of injection to be given (subcutaneous, intramuscular, or intradermal).
 - (2) The size of the patient (thin, obese).
 - (3) The injection site (1 inch for deltoid, 1 1/2 inches for gluteus maximus).
 - b. Select a needle with the proper gauge based upon the thickness of the medication to be injected.

NOTE: The gauge of the needle is indicated by the numbers 14 through 27. The higher the number, the smaller the diameter (bore) of the needle. A small bore needle is indicated for thin medications. A large bore needle is indicated for thick medications.

2. Select an appropriate syringe.
 - a. Check the drug manufacturer's specifications to determine whether a glass or plastic syringe should be used for the medication.

NOTE: Some medications deteriorate in a plastic syringe. Drug manufacturer's specifications provide guidance.

- b. Ensure that the total capacity of the syringe, usually measured in cubic centimeters (cc), is appropriate for the amount of medication to be administered.
 - c. Check the intervals of the calibration marks on the syringe.
3. Inspect the needle and syringe packaging for defects such as open packages, holes, and water spotting. Discard the equipment if any defect is found.
4. Unpack the syringe.
 - a. If the syringe is in a flexible wrapper, peel the sides of the wrapper apart to expose the rear end of the syringe barrel.
 - b. Grasp the syringe by the barrel with the free hand.

CAUTION: The needle adapter and the shaft of the plunger are sterile. Contamination could cause infection in the patient. The outside of the syringe barrel does not have to be kept sterile.

- c. Pull the syringe from the packaging.
 - d. If the syringe is packaged in a hard plastic tube container, press down and twist the cap until a distinct "pop" is heard. If the "pop" is not heard, the seal has been previously broken and the equipment must be discarded.
5. Inspect the syringe.
 - a. Grasp the flared end of the syringe, and pull the plunger back and forth to test for smooth, easy movement.
 - b. Visually check the rubber stopper (inside the syringe) to ensure that it is attached securely to the top end of the plunger, forming a seal.
 - c. If the plunger is stuck or does not move smoothly, discard the syringe.
 - d. Push the plunger fully into the barrel until ready to fill the syringe with medication.

6. Unpack the needle.

CAUTION: All parts of the needle are sterile. Be careful not to touch the hub. This would contaminate the needle and possibly pass an infection to the patient. Only the outside of the needle cover may be touched.

Performance Steps

- a. If the needle is packaged in a flexible wrapper, peel the sides of the wrapper apart to expose the needle hub.
- b. If the needle is packaged in a hard plastic tube, twist the cap of the tube until a "pop" is heard. Remove the cap to expose the needle hub. If a "pop" is not heard, the seal has been previously broken, and the equipment must be discarded.

7. Join the needle and the syringe.

- a. Insert the needle adapter of the syringe into the hub of the needle.
- b. Tighten the needle by turning 1/4 of a turn to ensure that it is securely attached.

8. Inspect the needle.

- a. Hold the needle and syringe upright, and remove the protective cover from the needle by pulling it straight off.

NOTE: A twisting motion may pull the needle off the hub.

- b. Visually inspect the needle for burrs, barbs, damage, and contamination. If the needle has any defects or damage, replace it with another sterile needle.
- c. Place the protective cover back on the needle.

9. Place the assembled needle and syringe on the work surface.

- a. Leave the protective cover on the needle.
- b. Leave the plunger pushed fully into the barrel.
- c. Keep the assembled needle and syringe continually within range of vision.

NOTE: When you assemble a needle and syringe, you are responsible for maintaining sterility and security of the equipment.

10. Verify the drug label, and check the container for defects.

- a. Compare the medication with the doctor's orders. The medication label must be verified three times.
 - (1) When obtained from the place of storage.
 - (2) When withdrawing the medication.
 - (3) When returning the container to storage.
- b. Examine the container.
 - (1) Examine the rubber stopper for defects, such as small cores or plugs torn from the stopper.
 - (2) Hold the vial to the light to check for foreign particles and changes in color and consistency. If the solution is in a dark vial, withdraw some solution to perform the checks.
 - (3) Check the date a multidose vial was opened, and check the expiration date of the medication.
 - (4) Determine whether the medication was stored properly, such as under refrigeration.

NOTE: If there is any evidence of contamination, discard the container and obtain another.

11. Prepare and draw the medication.

- a. Draw medication from a stoppered vial which contains a prepared solution.
 - (1) Remove the protective cap.
 - (2) Clean the stopper and neck of the vial with an alcohol sponge.
 - (3) Pick up the assembled needle and syringe and remove the protective needle cover.
 - (4) Slowly draw the plunger to the prescribed cc mark of medication.
 - (5) Pick up the vial and insert the needle into the rubber stopper, exerting slight downward and forward pressure. Ensure that the needle tip passes completely through the cap.

NOTE: To avoid contamination, the hub of the needle should not touch the rubber cap.

- (6) Push the plunger fully into the barrel to inject the air.
- (7) With the vial inverted (and keeping the needle tip in the solution), pull the plunger back to the desired cc mark, withdrawing the medication.
- (8) Withdraw the needle from the container.
- (9) Verify the correct dosage against the doctor's orders by raising the syringe to eye level and ensuring that the forward edge of the plunger is exactly on the prescribed cc mark.

Performance Steps

- b. Draw medication from a stoppered vial which contains a powdered medication which must be prepared.
 - (1) Remove the protective caps from the vial containing the powdered medication and the vial containing the sterile diluent.
 - (2) Clean the stoppers of both vials with alcohol sponges.
 - (3) Withdraw the required diluent, using the same procedure as for a stoppered vial. (See steps 11a(3) through 11a(8).)
 - (4) Hold the vial with the powdered medication horizontally, insert the needle through the stopper, and inject the diluent.

NOTE: If the vial with powdered medication contains air, the diluent may be difficult to inject. Air may have to be withdrawn to allow the diluent to be injected.

- (5) Withdraw the needle.
 - (6) Gently invert the vial several times until all the powder is dissolved. Visually inspect the solution to ensure that it is well-mixed.
 - (7) Change the needle (or needle and syringe), and insert it into the vial of reconstituted solution.
 - (8) Withdraw the prescribed amount of medication. (See step 11a(7).)
 - (9) Withdraw the needle from the container.
 - (10) Verify the correct dosage. (See step 11a(9).)
- c. Draw medication from an ampule.
 - (1) Lightly tap the upright ampule to force any trapped medication from the ampule neck and top.
 - (2) Clean the neck of the ampule with an alcohol sponge and wrap it with the same sponge.
 - (3) Grasp the ampule with both hands, and snap the neck by bending it away from the breakline, directing it away from yourself and others.
 - (4) Inspect the ampule for minute glass particles. If any are found, discard the ampule.
 - (5) Remove the protective cover from the assembled needle and syringe.
 - (6) Insert the needle, and withdraw the medication by holding the ampule vertically or by placing the ampule upright on a flat surface.
 - (7) Withdraw the prescribed medication, being careful not to touch the outside edge or bottom of the ampule with the needle.
 - (8) Withdraw the needle, and verify the correct dosage. (See step 11a(9).)

12. Check the syringe for air bubbles.

- a. Hold the syringe with the needle pointing up.
- b. Pull back on the plunger slightly to clear all the medication from the needle shaft.
- c. Tap the barrel lightly to force bubbles to the top of the barrel.
- d. Pull the plunger back slightly, and push it forward until the solution is in the needle hub, clearing it of bubbles.

13. Reverify the correct dosage. (See step 11a(9).)

14. Cover the needle with the protective needle cover.

Evaluation Preparation: Setup: If the performance of this task must be simulated for training and evaluation, colored solutions may be used to simulate medications. Have several sizes of needles and syringes available. Tell the soldier what type of medication is being simulated and what the route of administration would be. Have him or her select the appropriate needle and syringe. To test step 2, tell the soldier of any manufacturer's specifications. Testing may be varied by using various medications to be administered by different routes. Needles and syringes may be reused.

Brief soldier: Tell the soldier to assemble the proper needle and syringe and draw the medication.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

STP 31-18D34-SM-TG

**References
Required**

Related
STP 8-91B15-SM-TG

Perform a Needle Cricothyroidotomy

081-833-3006

Conditions: You are in a field environment. A casualty has a total upper airway obstruction. The casualty's airway cannot be opened using manual methods or an endotracheal (ET) tube. Necessary materials and equipment: blanket, poncho, two large bore needles (10 to 14 gauge), povidone-iodine, 5 to 10 cc syringe, cannula-over-needle device (optional), gloves, and tape.

Standards: Establish an emergency airway without causing unnecessary injury to the casualty. Complete steps 3 through 8 in order.

Performance Steps

1. Hyperextend the casualty's neck.

WARNING: Do not hyperextend the casualty's neck if a cervical injury is suspected.

- a. Place the casualty in a supine position.
- b. Place a blanket or poncho rolled up under the casualty's neck or between the shoulder blades so the airway is straight.

2. Put on gloves, if available.

3. Locate the cricothyroid membrane.

- a. Place a finger of the nondominant hand on the thyroid cartilage (Adam's apple) and slide the finger down to the cricoid cartilage.
- b. Palpate for the "V" notch of the thyroid cartilage.
- c. Slide the index finger down into the depression between the thyroid and cricoid cartilages.
- d. Prep the casualty's neck with povidone-iodine. Clean a 3 to 4 inch area using a circular motion, starting from the center and working outward.

4. Stabilize the larynx.

- a. Place the thumb and index finger of the nondominant hand on each side of the larynx.
- b. Apply enough pressure to keep the larynx in place.

WARNING: Holding the larynx too long or too tightly could cause the larynx to spasm or swell.

5. Insert a large bore needle (10 to 14 gauge) into the cricothyroid membrane.

- a. Hold the needle with the point directed 45 degrees caudally.
- b. Insert the needle through the cricothyroid membrane until no resistance is met.

CAUTIONS: 1. This procedure is more risky on a casualty with a large thick neck or one who has a tendency to bleed readily. 2. If resistance is met after having passed through the cricothyroid membrane, the needle has punctured the other side of the tracheal cartilage.

- c. Once the needle has penetrated the cricothyroid membrane, direct the needle inside the larynx downward and posteriorly to avoid penetration of the esophagus.

NOTE: This procedure may be varied by using a cannula-over-needle device. The catheter is advanced into the larynx.

6. Listen and feel for free airflow through the needle.

7. Insert a second needle, if necessary, and recheck for airflow. (If the airway formed by the first needle is not sufficient, a second needle may be inserted next to the first one following the procedure in step 5.)

NOTE: If air does not flow through the cricothyroidotomy needles, a surgical cricothyroidotomy must be performed. (See task 081-833-3005.) No more than two needles will be inserted.

8. Stabilize the needle(s).

- a. Wrap a 6 to 8 inch strip of tape around the needles one time where they exit the skin.
- b. Press the ends of the tape to the skin so they do not come off and so the needles are held in place.

Performance Steps

NOTE: Adequate ventilation of the casualty cannot be maintained simply by establishing an airway through the use of a needle cricothyroidotomy. The plunger of a syringe may be removed and mouth to barrel ventilation may be used. If equipment is available, the casualty can be ventilated using an ambu bag or oxygen. Approximately 12 respirations per minute should be administered.

9. Keep the casualty's head immobilized.

NOTE: If an airway needs to be artificially maintained for a prolonged period of time, and endotracheal intubation is not possible, perform a surgical cricothyroidotomy or tracheostomy.

Evaluation Preparation: Setup: For training and evaluation, use a mannequin or have another soldier act as the casualty. Under no circumstances will the needle be inserted in another soldier. Have the soldier demonstrate and explain what he or she would do.

Brief soldier: Tell the soldier to perform a needle cricothyroidotomy.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Hyperextend the casualty's neck.	_____	_____
2. Put on gloves, if available.	_____	_____
3. Locate the cricothyroid membrane.	_____	_____
4. Stabilize the larynx.	_____	_____
5. Insert a large bore needle into the cricothyroid membrane.	_____	_____
6. Listen and feel for free airflow through the needle.	_____	_____
7. Insert a second needle, if necessary and recheck for air flow. (If the airway formed by the first needle is not sufficient, a second needle may be inserted next to the first one following the procedure in step 5.)	_____	_____
8. Stabilize the needle(s).	_____	_____
9. Complete steps 3 through 8 in order.	_____	_____
10. Keep the casualty's head immobilized.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91C25-SM-TG

Apply Pneumatic Antishock Garment

081-833-3011

Conditions: A soldier has signs or symptoms of shock. Life-saving measures have been completed, but the casualty has not responded to treatment for shock. Another soldier is available to assist. Necessary materials and equipment are: a pneumatic antishock garment, stethoscope, sphygmomanometer, and watch.

Standards: Apply the pneumatic antishock garment without causing further injury to the casualty. Complete all steps in order. Complete steps 1 through 8 within 90 seconds, and complete the entire process within 10 minutes.

Performance Steps

WARNINGS:

1. Do not use the pneumatic antishock garment for psychogenic, anaphylactic, or septic shock. Do not apply the pneumatic antishock garment if the casualty's injury will be further aggravated. For example, if the casualty has a protruding, impaled object (such as a stick or knife) in the leg or abdomen, or an open fracture of a lower extremity.
2. If the pneumatic antishock garment is applied incorrectly, death could result.
3. If the casualty has an injury to which you must have access, do not apply the pneumatic antishock garment to the injury.
4. If the femur of either leg is fractured, a traction splint should be applied before the pneumatic antishock garment is applied.
5. The pneumatic antishock garment should not be used without direction of a physician if:
 - a. Trauma involves significant head injury.
 - b. Bleeding into the chest or chest wound is present.
 - c. The casualty is in heart failure with pulmonary edema.
 - d. Trauma is above the level of the pneumatic antishock garment application.
 - e. Pregnancy exists or is suspected.
 - f. Aortic aneurysm is suspected.

1. Open the pneumatic antishock garment kit, and remove the trousers and accessories.

NOTE: There are several different models of pneumatic antishock garments. The models may have one, two, or three chambers. Follow the manufacturer's instructions on the pneumatic antishock garment container.

2. Unfold the pneumatic antishock garment and unfasten the Velcro closures.

NOTE: If the terrain is rough and a backboard is available, the use of a backboard under the pneumatic antishock garment will help in positioning the trousers. The backboard may remain in place.

3. Lay the trousers flat (Figure 1).

Performance Steps

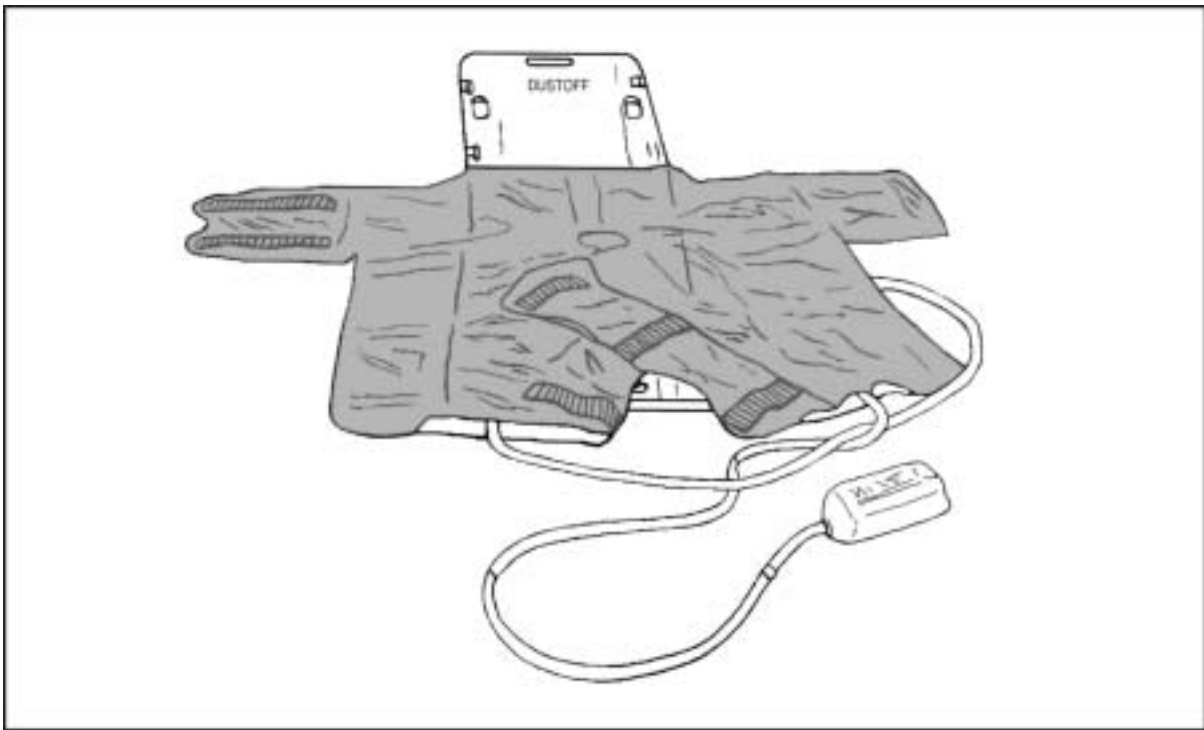


Figure 1. Positioning of Trousers

- a. Unfold the trousers so the left leg of the pneumatic antishock garment overlaps the right leg.
- b. Ensure that the outside Velcro fasteners face the ground and that the valves are on the outside adjacent to the ground.
- c. If there is sufficient space below the casualty's feet, lay the trousers out with the leg sections in the same direction as the casualty's legs.
- d. If there is insufficient space below the casualty's feet, lay the trousers beside the casualty with the leg sections in the same direction as the casualty's legs. Position the top of the trousers just below the casualty's lowest rib.

CAUTION To prevent squeezing the chest of an extremely short casualty, slide the trousers past the lowest rib and do not use the abdominal section.

NOTE: If there are sharp objects in the casualty's pants, remove them before applying the pneumatic antishock garment.

4. Place the casualty on the trousers in the supine position (Figure 2).

Performance Steps



Figure 2. Position of Casualty on Trousers

NOTE: Restrictive or bulky clothing could prevent pneumatic antishock garment application from stabilizing the casualty. Cut away any clothing that will interfere with the trousers.

WARNING: If a back injury is suspected, logroll the casualty onto the pneumatic antishock garment.

- a. Lift the casualty's legs high enough to slide the trousers underneath.
- b. Slide the trousers under the casualty's legs and up to the buttocks area.
- c. Lift the casualty's buttocks high enough to slide the trousers under the buttocks.
- d. Slide the pneumatic antishock garment up toward the casualty's waist. Position the garment so the top of the trousers is just below the casualty's lowest rib.

WARNING: Do not lift the casualty any higher than is absolutely necessary. If the casualty has a pelvic injury or a traction splint, serious injury or extreme discomfort can result when the pneumatic antishock garment is applied to the casualty. With this type of injury, the medic should position the casualty and direct the assistant to slide the trousers into position.

5. Wrap the casualty's legs.

NOTE: Either of the casualty's legs may be wrapped first; however, normally the left leg is wrapped first.

- a. Wrap the pneumatic antishock garment around the casualty's leg.
- b. Smooth the leg of the pneumatic antishock garment around the casualty's leg.
- c. Align the Velcro strips.
- d. Press the Velcro strips firmly together to secure the seam of the trouser leg (Figure 3).

Performance Steps



Figure 3. Securing the Trouser Leg Seam

- e. Repeat steps 5a through 5d for the other leg.
- 6. Apply the abdominal section of the pneumatic antishock garment (Figure 4).



Figure 4. Wrapping the Abdominal Section

- a. Wrap the abdominal section of the pneumatic antishock garment.
- b. Align the Velcro strips.
- c. Press the Velcro strips firmly together to secure the pneumatic antishock garment.

Performance Steps

7. Attach the foot pump hoses.
 - a. Connect each short tube on the pump to a leg tube on the trousers using a twisting motion (Figure 5).

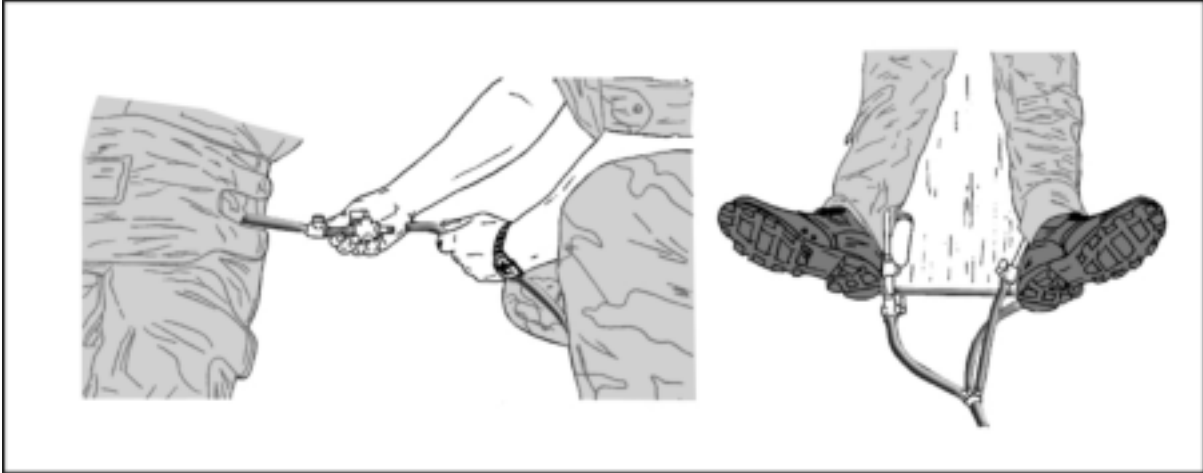


Figure 5. Connecting the Pump to the Trousers

- b. Connect the long tube on the foot pump to the abdominal section using a twisting motion.
8. Inflate the leg sections of the trousers.

CAUTION Do not inflate the pneumatic antishock garment if the casualty's systolic blood pressure is higher than 90 millimeters of mercury (mm Hg).

 - a. Open the stopcock valve on each leg section by turning the valve knob to the "OPEN" position (Figure 6).

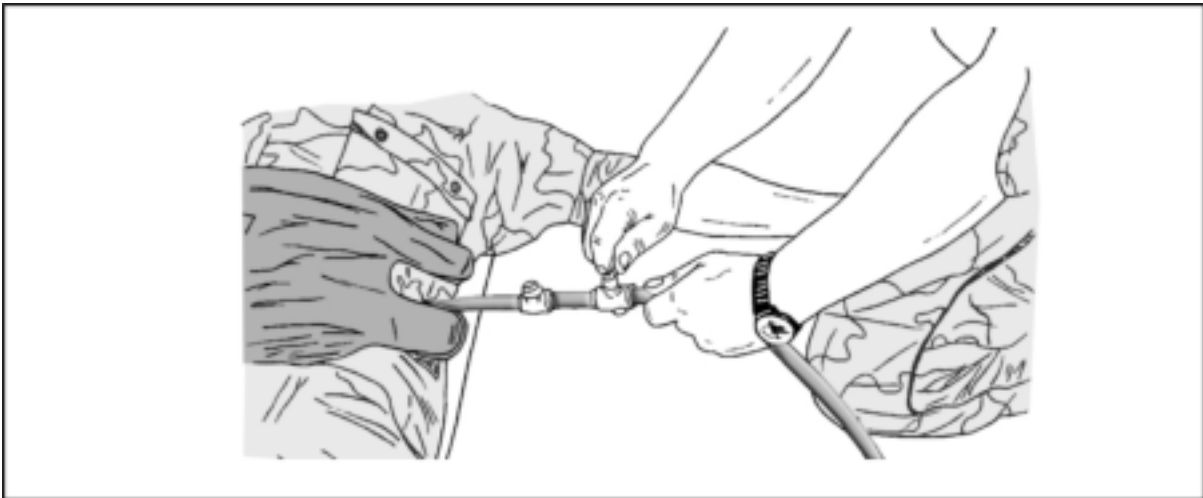


Figure 6. Opening the Stopcock Valve

- NOTE: Ensure that the stopcock valve to the abdominal section is closed.
- b. Check the casualty's vital signs and foot (pedal) pulses while inflating the leg sections.
 - c. Continue inflation until the casualty's vital signs are stable, the air release valves open, or until the Velcro starts to crackle or stretch apart.
 - d. Close the stopcock valve to the leg section(s).
 9. Inflate the abdominal section, if necessary.

Performance Steps

NOTE: If inflation of the leg sections alone was not adequate to stabilize the casualty, the abdominal section should be inflated.

- a. Open the stopcock valve to the abdominal section.
- b. Inflate the abdominal section following the same procedure used for the leg sections.
- c. Recheck the vital signs.
- d. Close the stopcock valve to the abdominal section (Figure 7).

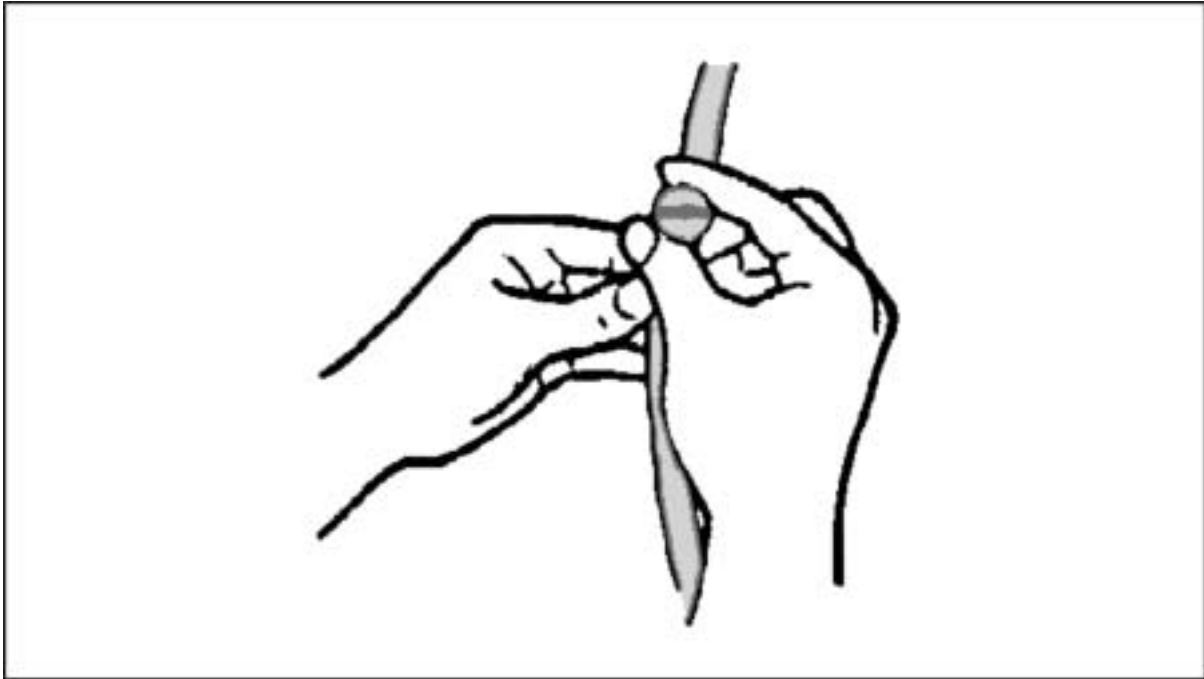


Figure 7. Closing the Stopcock Valve

10. Initiate an intravenous (IV) infusion with Ringer's lactate, if not already done.
11. Monitor the casualty's blood pressure to ensure it remains stable.
12. Monitor the pneumatic antishock garment pressure.
 - a. If the pneumatic antishock garment looks and feels soft, reinflate it until the Velcro strips start to stretch apart.
 - b. Stop inflating the pneumatic antishock garment if a loud, constant sound is heard coming from the air release valve.

NOTE: A loud, constant sound coming from the air release valve indicates the pneumatic antishock garment is overinflated.

CAUTION:

1. Do not remove the pneumatic antishock garment until ordered to do so by a physician.
2. If the casualty must be evacuated by air, it should be done at a low altitude and at low pneumatic antishock garment pressure.

Evaluation Preparation: Setup: For training and evaluation, a mannequin will be used. Under no circumstances will another soldier act as a simulated casualty. Select a scenario that will allow you to evaluate the soldier.

Brief Soldier: Tell the soldier to apply the pneumatic antishock garment. Ask the soldier to describe and explain his actions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Open the pneumatic antishock garment kit, and remove the trousers and accessories.	_____	_____
2. Open the folded trousers, and unfasten the Velcro closures.	_____	_____
3. Lay the trousers flat.	_____	_____
4. Place the casualty in the supine position on the trousers.	_____	_____
5. Wrap the casualty's legs.	_____	_____
6. Apply the abdominal section of the pneumatic antishock garment.	_____	_____
7. Attach the foot pump hoses.	_____	_____
8. Inflate the leg sections.	_____	_____
9. Inflate the abdominal section, if necessary.	_____	_____
10. Monitor the casualty's blood pressure.	_____	_____
11. Initiate an IV infusion, if not already done.	_____	_____
12. Monitor the pneumatic antishock garment pressure.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	STP 8-91B15-SM-TG

Perform X Rays

081-833-4001

Conditions: Given field or portable X ray equipment, field X ray developing equipment, X ray film and cassettes, protective lead shielding, the manufacturer's instructions for the X ray equipment, and the developing equipment.

Standards: Set up the X ray and developing equipment, take an X ray, and develop a readable X ray.

Performance Steps

1. Set up the X ray machine as per the manufacturer's instructions.
2. Set the kilovoltage peak (kVp) and milliamperage seconds (mAs) dials on the machine.

NOTES:

1. There may be only kVp and time switches on some machines.
2. During the production of an X ray, kVp is the highest voltage attained.
 - a. Determine whether the contrast is to be increased or decreased.
 - b. Calculate to increase: $kVp2 = kVp1 \times 0.85$ $mAs2 = mAs1 \times 2.00$
 - c. Calculate to decrease: $kVp2 = kVp1 \times 1.15$ $mAs2 = mAs1 \times 0.50$

NOTE: Under austere conditions, it is extremely important to develop a standing operating procedure (SOP) for the settings for your particular machine. This may require a process of trial and error initially to determine the best settings for each type of X ray. However, the process will save scarce resources of X ray film, developing chemicals, and in the long run, time.

- d. Set the focal-film distance (FFD). (FFD is the distance that the X ray source is from the film. FFD affects the density of the film adversely. If the FFD is doubled, the intensity of the X ray beam is decreased by the square of the distance.)

NOTE: Most X rays taken with a portable unit will be from a distance of 40 inches.

3. Position the patient with the injured side to the cassette.
 - a. Use shields for the patient and yourself.
 - b. Ensure joints are half a film view above and below the injury site.
4. Ensure the film is properly installed in the cassette.

5. Take the X ray.

NOTE: Most machines have a ready light that goes on when the filament is warmed or, in the case of a machine with a rotating anode, when the anode is at the proper speed.

6. Develop the X ray.

NOTE: Refer to manufacturer's instructions for developing and fixing chemicals for step h.

- a. Select the correct size of film processing hanger.
- b. Open the film cassette.
- c. Remove the film.
- d. Attach the film to the film processing hanger.
- e. Ensure that the film is held taut and does not bulge.
- f. Reload the cassette with unexposed film.
- g. Close the cassette.
- h. Determine the required developing and fixing times.
- i. Set the timer.
- j. Immerse the film in the developer.

NOTE: If several films are being developed at the same time, they should be immersed as one unit. The film hangers should be kept about 3/4 inch apart.

- k. Activate the timer.
- l. Agitate the film periodically.

NOTE: The film is agitated several times by raising the film hanger about 2 inches and then lowering it.

- m. Move the film to the rinse tank when the timer rings.

Performance Steps**NOTES:**

1. If the replenishment method is being used, do not allow the film to drip into the developer solution. 2. If the exhaustion method is being used, allow the film to drip into the developer solution.

- n. Rinse the film.

NOTE: If several films are being rinsed at the same time, keep the film hangers about 3/4 inch apart.

- o. Remove the film from the rinse tank, and allow the film to drip into the rinse tank.

- p. Immerse the film in the fixer, and set the timer.

NOTE: If several films are being fixed at the same time, keep the film hangers about 3/4 inch apart.

- q. Activate the timer.

- r. Agitate the film periodically.

NOTE: The film is agitated several times by raising the film hanger about 2 inches and then lowering.

- s. Remove the film from the fixer tank when the timer rings.

- t. Wash the film.

- u. Place the processed film in the film dryer.

- v. Replenish or remix the chemicals, as required.

7. Evaluate the developed X ray.

- a. Check for artifacts within the area of consideration.

- b. Check for adequate contrast to demonstrate the requested anatomy.

- c. Check for adequate density to demonstrate the requested anatomy.

- d. Check for demonstration of all of the requested anatomy on the radiograph.

- e. Check for the correct letter marker.

- f. Check for motion.

- g. Check for the correct patient identification.

- h. Check for correct positioning.

- i. Check for correct alignment.

- j. Check for correct collimation.

NOTE: Radiographs that are not of diagnostic quality are repeated with the deficiencies corrected.

8. Record the evaluation of the developed X ray in the X ray log. Include the following:

- a. Person who took the X ray.

- b. Person who developed the X ray (if different from above).

- c. kVp used.

- d. mAs used.

- e. FFD used.

- f. Type of cassette used.

- g. Body part x-rayed.

- h. Time in developer.

- i. Time in fixer.

- j. General impression of the X ray (that is, too dense, too light, and so on).

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must perform X rays.

Performance Measures**GO NO GO**

1. Set up the X ray machine as per the manufacturer's instructions.

_____	_____

2. Set the kVp and mAs dials on the machine.

_____	_____

3. Positioned the patient with the injured side to the cassette.

_____	_____

4. Ensured the film was properly installed in the cassette.

_____	_____

5. Took the X ray.

_____	_____

6. Developed the X ray.

_____	_____

Performance Measures

GO **NO GO**

7. Evaluated the developed X ray.

8. Recorded the evaluation of the developed X ray in the X ray log.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

BONTRAGERS POCKET ATLAS

Related

Perform a Complete Physical Examination

081-833-4002

Conditions: Given a patient who requires a physical examination (exam) and all necessary medical equipment to include: stethoscope, pen light, otoscope/ophthalmoscope, blood pressure cuff, tongue depressor, thermometer, reflex hammer, and exam gloves.

Standards: Perform a complete physical exam (PE) that includes an accurate patient history, a complete review of systems (ROS), and a PE. Order all required laboratory (lab) tests plus any additional lab tests as indicated by the history, ROS, and PE. Record all findings and results on the appropriate forms in accordance with (IAW) Army Regulation (AR) 40-66, Medical Record Administration and Health Care Documentation.

Performance Steps

1. Obtain and record a complete patient history.

NOTE: Do not use medical terminology and jargon when asking the patient questions. Use layman's terms.

- a. Record pertinent information about the patient--name, age, race, sex, and occupation.
- b. Record source of information--patient or other.
- c. Ask patient about chief complaint or reason for exam.
- d. Ask patient about history of present illness (HPI).
- e. Ask patient about past medical history (PMH).
- f. Ask patient about current health status, to include information on allergies, current medications, changes in diet, tobacco, alcohol, coffee, tea, recreational and prescription drugs, sleep patterns, exercise, and environmental hazards.
 - (1) Screening tests: purified protein derivative (PPD), papanicolaou (pap) smears, blood pressure (BP), and so on.
 - (2) Immunization history.
- g. Ask patient about additional information: birthplace, date of birth, education, occupation and hazards or military history, marital status and children, availability of family and friends, financial circumstances, religion, hobbies or special interests, and description of his or her average day average day (before in hospital--wake-up, amount of sleep, number and types of meals, and type of work).
- h. Ask patient about family medical history: age and health, or age and cause of death, of parents, children, siblings, spouse, and other family members, if pertinent, and family history of diseases.
- i. Ask patient about psychosocial history.

2. Describe and record a general description of the patient's appearance.

3. Conduct and record a ROS.

- a. Ask patient about:
 - (1) Overall state of health such as fatigue, unexplained weight changes, exercise tolerance, fevers, night sweats, frequent infections, and ability to carry out activities of daily living.
 - (2) Integumentary problems such as eruptions, rashes, pruritus, pigmentation, unusual hair growth or loss, and disorders or deformities of the nails.
 - (3) Problems related to their head such as headaches, surgery, and history of trauma.
 - (4) Problems related to their eyes such as history of trauma, visual problems, pain, lid edema, scotomata, excessive tearing, tests for glaucoma, use of glasses, date of last exam, change in vision, double vision, and spots.
 - (5) Problems related to their ears such as hearing loss or changes, tinnitus, discharge, history (Hx) of ruptured tympanic membrane (TM), vertigo, and earaches.
 - (6) Problems related to their nose and sinuses such as frequent colds, rhinorrhea, itching, abnormalities or loss of sense of smell, obstruction, epistaxis, and sinusitis.

Performance Steps

- (7) Problems related to their mouth, teeth, and gums such as dental surgery, dental problems, fit of dentures, sore tongue, bleeding gums, and last oral exam.
 - (8) Problems related to their throat and neck such as frequent sore throat, hoarseness, tonsillitis, neck stiffness or pain, lumps in neck, thyroid problems.
 - (9) Problems related to their breasts such as surgery, tenderness, discharge, bleeding, lumps, self-exam, and changes with menses.
 - (10) Problems related to their chest and lungs such as wheezing, cough (productive?), hemoptysis, sputum production (color, amount, and consistency), short of breath (SOB), dyspnea, orthopnea, last chest X ray (CXR), asthma, tuberculosis (TB), and diseases.
 - (11) Problems related to their cardiovascular system such as chest pain, palpitations, heart murmur, peripheral edema, hypertension, claudication, varicose veins, thrombophlebitis, syncope, tachycardia, dyspnea on exertion, paroxysmal nocturnal dyspnea, and date of last electrocardiogram (ECG).
 - (12) Problems related to their gastrointestinal (GI) system such as difficulty swallowing, changes in appetite or diet, hematemesis, antacids use, heartburn, food intolerance, nausea and vomiting (N&V), jaundice, hepatitis, gallbladder problems, abdominal pain, indigestion, laxatives, blood or mucous in stools, black and tarry stools, diarrhea, constipation, excessive gas, bowel habits, and hemorrhoids.
 - (13) Problems related to their genitourinary (GU) system such as dysuria, frequency, urgency, hesitancy, incontinence, nocturia, decreased force of stream, bleeding, stones, venereal disease, and discharge.
- b. Record all pertinent positive and negative responses from the patient.
4. Measure and record the patient's vital signs:
 - a. Height, weight, and temperature.
 - b. Pulse: rate, rhythm, and quality.
 - c. Respirations: rate, rhythm, and quality.
 - d. Orthostatic blood pressure: Measure and record the blood pressure after the patient has been lying still for 1 minute, after sitting for 1 minute, and standing for 1 minute.
 5. Examine the skin for cyanosis, unusual pigmentation, pallor/jaundice, lesions (describe distribution and character), petechiae, ecchymoses, temperature, texture, turgor.
 6. Examine the head, eyes, ears, nose, and throat (HEENT).
 - a. Inspect the head for symmetry, size, masses, deformities, and signs of injury/bruising.
 - (1) Scalp: inflammation, tenderness, hair color, texture, consistency, and distribution.
 - (2) Face: symmetry, discoloration, and unusual hair distribution.
 - b. Examine the eyes.
 - (1) Examine the eyelids and eyelashes for scars, symmetry, even distribution, drooping, swelling, and excessive tearing.
 - (2) Check vision for acuity, color acuity, fields of view, and cardinal directions.
 - (3) Check for position and alignment, bilateral symmetry, and extra ocular movement (EOM).
 - (4) Examine the conjunctivas and scleras for edema, inflammation, jaundice, and redness.
 - (5) Check the corneas, irises, and lenses for clearness.
 - (6) Ensure that the pupils are equal, round, reactive to light and accommodation (PERRLA).
 - (7) Perform a fundoscopic exam, and check the fundi, disc margins, color, disc-cup ratio, artery-to-nerve (AN) ratio, AN nicking, vessels branching, retina, macula hemorrhages, exudates, and ocular tensions.
 - c. Examine the ears, pinna, and canals.
 - (1) Check for mastoid tenderness.
 - (2) Perform an otoscopic exam of the TMs for erythema, damage, mobility, and fluid levels.
 - (3) Check gross hearing.
 - (4) Conduct the Weber and Rinne test.
 - d. Examine the nose and sinuses:
 - (1) Inspect for rhinorrhea.
 - (2) Inspect for inflammation, edema, or pallor of the mucous membranes.

Performance Steps

- (3) Inspect for hypertrophy, atrophy, septum deviation/perforation, polyps, masses, ulcers, and obstructions.
 - (4) Percuss the frontal sinuses lightly. This will elicit pain if the sinuses are filled with fluid.
- e. Examine the mouth and throat:
 - (1) Check the lips for cyanosis, pallor, lesions, ulceration, and fissures.
 - (2) Check the tongue for size, color, coat, papillae atrophy, ulceration, and neoplasm.
 - (3) Check the gums for bleeding, recession, pus ulceration, and a lead line.
 - (4) Check the teeth, and determine the number present, number missing, and their condition.
 - (5) Check the palate and buccal cavity for ulcerations, inflammation, and pigmentation.
 - (6) Check the throat and tonsils for inflammation and exudates/lesions.
7. Examine the neck.
 - a. Examine for mobility, stiffness, tenderness, masses, or jugular venous distension (JVD).
 - b. Check the carotid artery for pulsation and thrills/bruits.
 - c. Check the tracheal position.
 - d. Examine the thyroid for symmetry, consistency, goiter, nodules, or tenderness.
 - e. Palpate the submaxillary glands for enlargement and tenderness.
8. Examine the chest, respiratory system, and heart.
 - a. Examine the chest and lungs by using IAPP (inspect, auscultate, palpate, and percuss).
 - (1) Inspect the chest for rate and rhythm of respiration, symmetry of respirations, shape of the chest, deformities, mobility, and scars.
 - (2) Auscultate the lungs for normal equal bilateral breath sounds.
 - (a) Note location of sounds: vesicular, bronchial, or bronchovesicular.
 - (b) Note type of adventitious sounds: crackles, rhonchi, wheezes, or friction rubs.
 - (c) Auscultate for vocal fremitus.
 - (3) Palpate the chest for tactile fremitus, equal expansion, tenderness, masses, and axillary lymphadenopathy.
 - (4) Percuss the chest for normoresonance and level of descent of diaphragm with deep inspiration bilaterally.
 - b. Examine the heart by IAPP.
 - (1) Inspect for precordial bulges or pulsations.
 - (2) Palpate for lifts, heaves, and the apical pulse point of maximal impulse (PMI)
 - (3) Auscultate the heart in the following locations: aortic area (2d intercostal space [ICS] right sternal border [RSB]), pulmonic area (2d ICS left sternal border [LSB]), Erb's point (3d ICS LSB), tricuspid area (lower LSB), and mitral area (5th ICS left mid-clavicular line [L. MCL]).
 - (a) Use both bell and diaphragm.
 - (b) Determine the rate and rhythm.
 - (c) Identify the 1st sound and 2d sound.
 - (d) Listen for paradoxical splitting, constant splitting intensity, aortic component, intensity, pulmonic component, 3d sound, 4th sound, ejection sounds, opening snap, opening clicks, murmur, and friction rubs. (See also task 081-833-4040, Detect Abnormal Cardiac Sounds.)
 - c. Perform a 3-lead ECG.
 - d. Perform a breast examine within the patient in both the supine and sitting position.
 - (1) Inspect breasts for size, contour, symmetry, discharge, deformity, and pigmentation.
 - (2) Palpate the breasts for tenderness and masses.
9. Examine the abdomen by using IAPP.
 - a. Inspect the abdomen for shape, size, distension, dilated veins, herniation, or scars.
 - b. Auscultate for bowel sounds and four quadriceps, peristalsis, and bruits over the aorta, renal, femoral and iliac vessels.
 - c. Palpate for tenderness, rigidity, guarding, rebound tenderness, fluid wave, masses, and pulsations.
 - (1) Palpate lightly first, then deeply. Palpate any tender or painful area last.

Performance Steps

- (2) Feel for the shape and size of the liver, spleen, kidneys, and urinary bladder.
 - d. Percuss the abdomen to determine the liver size, shifting dullness, and presence of tympany.
 10. Examine the genitalia.
 - a. Examine the male genitalia.
 - (1) Examine the penis for development, prepuce, sores, growths, discharge from the urethra, and rashes.
 - (2) Examine the scrotum and testes for inguinal hernia, epididymis, masses, tenderness, hydroceles, and varicoceles.
 - b. Examine the female genitalia in accordance with (IAW) 081-833-4310, Perform a Pelvic Exam.
 11. Examine the anus and rectum.
 - a. Inspect for hemorrhoids, inflammation, and pilonidal cysts.
 - b. Perform a digital rectal exam.
 - (1) Check for sphincter tone tenderness, masses, and consistency and appearance of stool.
 - (2) Digitally palpate the prostate to feel for symmetry, consistency, tenderness, nodules, and masses.
 - (3) Perform a macroscopic exam of the feces and test for occult blood IAW 081-821-1042.
 12. Examine the extremities.
 - a. Examine the nails for cyanosis, clubbing, color, deformity, or brittleness.
 - b. Examine the skin for color changes, temperature differences, atrophy, and symmetrical/even distribution of hair growth.
 - c. Check the veins for varicosities, tenderness, and edema.
 - d. Check the arterial pulses.
 - (1) Bilateral symmetry of the radial, ulnar, femoral, popliteal, dorsalis pedis, and posterior tibial pulses.
 - (2) Strength, rate, and rhythm.
 13. Examine the lymph nodes.
 - a. Examine the anterior cervical, posterior cervical, preauricular, postauricular, occipital, supraclavicular, axillary, epitrochlear, inguinal, and femoral lymph nodes.
 - b. Check for enlargement, tenderness, hardness, mobility, and confluence.
 14. Examine the musculoskeletal system.
 - a. In general from the start of the exam, observe the patient's stance, gait, and alignment.
 - b. Check for spasms, edema, tenderness, crepitus, redness and increased temperature, muscle tremors, spasticity, flaccidity, atrophy, or fasciculation.
 - c. Check bilateral symmetry of range of motion.
 - d. Check bilateral symmetry in muscle strength (graded on a scale from 0 to 5).
 15. Examine the neurological system.
- NOTE: For information on a complete neurological examination, see task 081-833-4150, Assess Nervous System Disorders.
- a. Determine the patient's mental status.
 - (1) General appearance and behavior (quiet, talkative, agitated, euphoric, cooperative, resentful, and so on).
 - (2) Mood and affect.
 - (3) Sensorium (AVPU [alert and oriented, responds to vocal stimuli, responds to painful stimuli, and unresponsiveness to all stimuli]).
 - (4) Memory--short- and long-term.
 - (5) Level of intelligence.
 - (6) Thought process.
 - b. Perform a check of the 12 cranial nerves.
 - c. Check for motor function and bilateral symmetry.
 - d. Check sensory function: light/heavy touch, sharp/dull, 2 point discrimination, vibrations (knees, tibias, and elbows).

Performance Steps

- e. Check reflexes, deep tendon reflexes (DTRs) (scale 0 to 4+) and superficial.
 - f. Conduct cerebellar tests such as heel-toe walking, standing equilibrium, finger to finger to nose, heel to shin, rapid alternating movements, and Romber test.
16. Perform diagnostic laboratory work.
 - a. Complete blood count (CBC) with differential.
 - b. Urinalysis.
 - c. Fecal examination.
 - d. Any other lab tests indicated by findings during the exam.
 17. Record the exam and all lab results on appropriate forms, and maintain the records IAW Army regulations.

Evaluation Preparation: This task is best evaluated by performance of the steps on a simulated patient. Give the soldier a scenario in which he must perform a complete physical examination.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Obtained and recorded a patient history.	_____	_____
a. Did not use medical terminology and jargon when asking the patient questions.		
b. Obtained patient's pertinent information.		
c. Asked patient about chief complaint or reason for exam.		
d. Asked patient about history of present illness.		
e. Asked patient about past medical history.		
f. Asked patient about current health status.		
g. Asked patient for additional information.		
h. Asked patient about family medical history.		
i. Asked patient about psychosocial history.		
2. Described and recorded a general description of the patient's appearance.	_____	_____
3. Conducted and recorded an ROS.	_____	_____
4. Measured and recorded the patient's vital signs.	_____	_____
5. Examined the skin	_____	_____
6. Examined the HEENT.	_____	_____
a. Inspected and palpated the head.		
b. Examined the eyes and performed a fundiscopic exam.		
c. Examined the ears and performed an otoscopic exam of the TMs.		
d. Examined the nose and sinuses.		
e. Examined the mouth and throat.		
7. Examined the neck.	_____	_____
8. Inspected, auscultated, palpated, and percussed the chest, respiratory system, and heart and performed a 3-lead ECG.	_____	_____
9. Inspected, auscultated, palpated, and percussed the abdomen.	_____	_____
10. Examined the genitalia.	_____	_____
11. Examined the anus and rectum.	_____	_____
12. Examined the extremities.	_____	_____
13. Examined the lymph nodes.	_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
14. Examined the musculoskeletal system.	_____	_____
15. Examined the neurological system.	_____	_____
16. Performed diagnostic lab work.	_____	_____
a. Conducted a CBC with differential IAW tasks 081-821-1036, Perform a WBC Count on Whole Blood; 081-821-0039, Perform a WBC Differential Count; and 081-821-1040, Perform a Microhematocrit Determination.		
b. Conducted a urinalysis IAW 081-833-4670, Perform a Urinalysis.		
c. Conducted a fecal examination IAW tasks 081-821-1042, Perform a Macroscopic Examination of Feces and Test for Occult Blood; 081-821-1065, Perform a Microscopic Examination of Pinworm Preparations; and 081-821-1066, Perform Concentration Techniques for Ova and Parasites (Con-Trate Method).		
d. Conducted any other lab tests which were indicated by findings during the exam.		
17. Recorded the exam and all lab results on appropriate forms and maintained the records IAW Army regulations.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

BATES PE, 8TH ED. 2002

Related

AR 40-66

Manage Anaphylaxis

081-833-4006

Conditions: Given a patient demonstrating signs and symptoms of anaphylaxis, stethoscope, sphygmomanometer, penlight, epinephrine, diphenhydramine for injection, hypodermic needles, syringes, laryngoscope with blades, and endotracheal tubes.

Standards: Recognize the signs and symptoms of anaphylaxis, and provide emergency care and supportive measures so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Check the casualty for signs and symptoms of anaphylactic shock.

NOTE: Anaphylactic reactions occur within minutes or even seconds after contact with the substance to which the casualty is allergic. Reactions occur in the skin, respiratory system, and circulatory system.

- a. Skin.
 - (1) Flushed or ashen.
 - (2) Burning or itching.
 - (3) Edema (swelling), especially in the face, tongue, or airway.
 - (4) Urticaria (hives) spreading over the body.
 - (5) Marked swelling of the lips and cyanosis about the lips.
- b. Respiratory.
 - (1) Tightness or pain in the chest.
 - (2) Sneezing and coughing.
 - (3) Wheezing and difficulty in breathing (dyspnea).
 - (4) Sputum (may be blood tinged).
 - (5) Laryngospasms.
 - (6) Edema and swelling of the larynx and cords.
 - (7) Respiratory failure.
- c. Circulatory.
 - (1) Weak, rapid pulse.
 - (2) Falling blood pressure.
 - (3) Hypotension.
 - (4) Dizziness or fainting.
 - (5) Coma.

NOTE: The tasks referenced in steps 2 and 3 are in STP 31-18D34-SM-TG.

2. Manage anaphylaxis.

- a. Maintain an open airway (task 081-833-4167, Maintain a Patient's Airway). This may require intubation (task 081-830-3016, Intubate a Patient) if edema of the upper airway is unresponsive to epinephrine. If the upper airway is excessively edematous, a cricothyroidotomy may be necessary (task 081-833-4528, Perform a Cricothyroidotomy).
- b. Administer epinephrine (task 081-833-4013, Administer Medications).
 - (1) Administer 0.5 milliliters (ml) of epinephrine, 1:1000 solution, subcutaneously (SQ) or intramuscularly (IM). If the patient is in circulatory collapse, epinephrine should be administered intravenously (IV) or via endotracheal (ET) tube if in place.

NOTE: Annotate the time of injection on the field medical card (FMC).

- (2) Additional epinephrine may be required as anaphylaxis progresses. Additional incremental doses may be administered every 5 to 15 minutes.

- c. Administer oxygen.

NOTE: If the anaphylaxis is caused by an insect bite or a sting on an extremity, apply a constricting band 4 to 5 inches above the site.

- d. Initiate an IV lifeline (task 081-833-0033, Initiate an Intravenous Infusion).
- e. Administer diphenhydramine 50 milligrams (mg) by mouth (PO) or IM. With severe angioedema but without evidence of cardiovascular involvement, the required dose is 50 to 100 mg IV.

Performance Steps

- f. Administer hydrocortisone sodium succinate 100 mg IV push or methylprednisolone 40 mg IV with severe reactions. Repeat dosage in 8 hours, if needed.
 3. Provide supportive measures for the treatment of shock (task 081-833-4073, Manage Shock), respiratory failure, circulatory collapse, or cardiac arrest (task 081-833-4047, Manage Cardiac Arrest).
 - a. Infuse additional IV fluid if blood pressure continues to drop.
 - b. Position the patient in the Trendelenberg position if it does not interfere with respirations.
 - c. Perform basic and advanced cardiac life support measures, as needed.
- NOTE: Anyone who has had a reaction to an insect sting or other substance should be provided with an insect sting kit and instructed in its use.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated casualty and a scenario in which he must manage anaphylaxis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Checked the casualty for signs and symptoms of anaphylactic shock.	—	—
2. Managed anaphylaxis.	—	—
3. Provided supportive measures for the treatment of shock, respiratory failure, circulatory collapse, or cardiac arrest.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

STP 31-18-SM-TG

Related

MERCK MANUAL 17TH ED

Manage Insect Bites or Stings

081-833-4007

Conditions: Given a patient with signs and symptoms of an insect bite or sting, constricting bands, antiseptic swabs, intravenous (IV) administration equipment, methocarbamol, 10 percent calcium gluconate, dexamethasone, dapson, epinephrine, diphenhydramine for injection, laryngoscope with blades, endotracheal (ET) tubes, and antivenom as appropriate.

Standards: Examine the casualty for signs and symptoms of insect bites or stings, and treat the insect bite or sting so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Remove the casualty's clothing, shoes, or jewelry to expose the sting or bite area.

NOTE: Remove rings, watches, and other constricting items that are in the area of the bite or sting to prevent circulatory impairment in the event swelling of an extremity occurs.

2. Ask the casualty to identify, if possible, what bit or stung him or her.

3. Check the casualty for the signs and symptoms of insect bites and stings.

- a. Black widow spider.

NOTE: There are five species of widow spiders. Most are a glossy black with a red or orange hourglass shape on the underside of the abdomen. The brown widow may be either gray or light brown with a red or orange hourglass marking. The red widow has brilliant red spots or a yellow marking on its back.

- (1) An immediate pinprick sensation from the bite.
- (2) A dull, numbing pain at the bite site.
- (3) Two red puncture marks.
- (4) Severely painful muscular or abdominal spasms.
 - (a) Begin in 10 to 40 minutes.
 - (b) Peak in 1 to 3 hours.
 - (c) Persist for 12 to 48 hours.
- (5) Rigid, boardlike abdomen.
- (6) Tightness in the chest and painful breathing.
- (7) Dizziness.
- (8) Nausea.
- (9) Vomiting.
- (10) Sweating.
- (11) Skin rash.

- b. Brown recluse spider.

NOTE: The brown recluse spider is medium sized, yellowish to medium dark brown, and covered with fine, short hairs. It has a distinct groove between its chest and abdominal body parts and a violin-shaped mark on its back.

- (1) Mild to severe pain within hours.
- (2) Area around bite becomes red, swollen, and tender.
- (3) Area around bite develops a pale, mottled, cyanotic center.
- (4) A small blister may form.
- (5) A large scab of dead skin, fat, and debris forms (over several days).

- c. Scorpion.

NOTE: There are two general types of scorpions. The Arizona (black) scorpion is the only deadly type in the United States.

- (1) Harmless species.
 - (a) Severe pain and burning sensation at the sting site.
 - (b) Local swelling and discoloration.
 - (c) The symptoms last for 24 to 72 hours.
- (2) Deadly species.
 - (a) "Pins and needles" sensation at the sting site.

Performance Steps

- (b) No swelling at the sting site.
- (c) Excessive salivation.
- (d) Severe muscle contractions.
- (e) Hypertension.
- (f) Convulsions.
- (g) Circulatory collapse.
- (h) Cardiac failure.

d. Bee, wasp, hornet, and yellow jacket.

NOTE: A wasp or yellow jacket (slender body with elongated abdomen) retains its stinger and can sting repeatedly. A honey bee (rounded abdomen) usually leaves its stinger in the casualty.

- (1) Mild reaction.
 - (a) Pain at the sting site.
 - (b) Wheal, redness, and swelling.
 - (c) Itching.
 - (d) Anxiety.
- (2) Severe reaction.
 - (a) Generalized itching and burning.
 - (b) Urticaria (hives).
 - (c) Chest tightness and cough.
 - (d) Swelling around the lips and tongue.
 - (e) Bronchospasm and wheezing.
 - (f) Dyspnea.
 - (g) Abdominal cramps.
 - (h) Anxiety.
 - (i) Respiratory failure.
 - (j) Anaphylactic shock.

e. Fire ant.

NOTE: Fire ants inject a very irritating toxin into the skin. They bite repeatedly and in a very short period of time.

- (1) Burning sensation.
- (2) Wheal within minutes.
- (3) Clear, fluid-filled bubble or blister within minutes.
- (4) Cloudy, fluid-filled bubble within 2 to 4 hours.
- (5) Bubble on red base within 8 to 10 hours.
- (6) Ulceration (with scarring after healing).
- (7) Anaphylactic shock.

f. Tick.

NOTE: Hard ticks can transmit Rocky Mountain spotted fever, Lyme disease, and other diseases and may even cause anemia if the infestation is severe enough.

- (1) Itching and redness at the site.
- (2) Headache.
- (3) Moderate to high fever, which may last 2 to 3 weeks.
- (4) Pain in the joints or legs.
- (5) Swollen lymph nodes in the bitten area.
- (6) Paralysis and other central nervous system (CNS) disorders are possible after several days.

NOTE: Generally, a tick must remain attached to the body for 4 to 6 hours to transmit infections. Early detection and proper removal may prevent transmission.

g. Unknown, nonspecific insects.

- (1) Pain and swelling at the site.
- (2) Breathing difficulty.
- (3) Shock.

NOTE: The environmental risk of insect bites or stings exists worldwide. It is the responsibility of the Special Forces medic to advise his command of the specific threat in the area of operation and possible solutions to its management (for example, antivenom or other treatments if practical and possible).

Performance Steps

4. Treat the bite or sting.

CAUTION: Any insect bite or sting could cause an anaphylactic reaction in susceptible individuals. (See task 081-833-4006, Manage Anaphylaxis.)

a. Black widow spider.

- (1) Keep the casualty quiet and calm.
- (2) Apply a constricting band above the bite if on an extremity.
 - (a) Tighten the bands enough to stop superficial venous circulation but not enough to interfere with the distal pulse.

NOTE: An example of a proper constricting band would be a Penrose drain that is only tight enough to slightly indent the skin.

- (b) If swelling causes indentation of the band, apply another band above the first and remove the first.
- (3) Cleanse the bite site with antiseptic.
- (4) Apply ice or an ice pack to the site.
- (5) If systemic signs or symptoms occur following a black widow bite, antivenom (Lycovac) may be given.
 - (a) Give 0.1 milliliter (ml) intradermal (ID) to test for sensitivity. If no local reaction occurs within 15 minutes, begin administration of the antivenom.
 - (b) Lycovac is given by slow IV injection in 50 ml of 0.9 percent normal saline (NS).
 - (c) Stop the injection if signs of adverse reaction occur.
- (6) Narcotics are indicated for the control of pain.
- (7) For control of muscle spasms, 10 ml of 10 percent calcium gluconate every 4 hours (q4h) or other muscle relaxers such as methocarbamol can be used.
- (8) There is no clear indication for corticosteroids.

b. Brown recluse spider.

- (1) Keep the casualty quiet and calm.
- (2) Cleanse the bite site with antiseptic.
- (3) Antivenom is locally available for the necrotizing bites of some South American varieties.
- (4) Give dexamethasone, 40 milligrams (mg) every 6 hours (q6h) for the first 48 hours.
- (5) Give dapsone 50 milligrams (mg) every day (qd) by mouth (PO) for (x) 6 weeks.
- (6) Thorough cleaning and wound maintenance of the ulcerated area throughout the healing process.
- (7) Referral for hyperbaric oxygen therapy may speed the healing process and reduce tissue loss due to necrosis.
- (8) Referral for skin grafting may be necessary once the healing phase has begun.

c. Scorpion.

- (1) Keep the casualty quiet and calm.
- (2) Apply a constricting band as above.
- (3) Apply ice packs, if available.
- (4) Avoid benzodiazapines and opiates as they may potentiate the CNS effects.
- (5) Heavy salivation and neurotoxic effects may lead to airway compromise even without anaphylaxis. Respiratory paralysis is also possible. Closely monitor the patient's airway and proper intervention.
- (6) Use antivenom, if locally available. It is only necessary in the management of certain deadly species.

d. Bee, wasp, hornet, and yellow jacket.

- (1) Scrape the stinger from the site, if still in place.

CAUTION: Do not squeeze the stinger or try to pull it out. More venom will be injected into the casualty.

- (2) Cleanse the site with soap and water.
- (3) Apply ice, an ice pack, or 10 percent ammonia solution to the site.

e. Fire ant.

- (1) Cleanse the bite site with antiseptic.
- (2) Apply ice, an ice pack, or a cold compress to the site.
- (3) Take measures to avoid secondary infection.

Performance Steps

NOTE: There is no effective treatment to alter pustule formation and progress.

f. Tick.

(1) Remove all parts of the tick. Leave nothing embedded in the skin.

NOTE: Debride the area if the tick's head remains in the skin.

(a) Using tweezers, grasp the tick as close to the skin as possible. Using steady pressure, pull the tick straight out.

(b) If tweezers are not available, use an absorbent material (gauze or toweling) to protect your skin. Grasp the tick as close to the skin as possible and pull straight out using steady pressure.

(2) If the tick breaks, thoroughly clean your hands with antiseptic.

(3) Cleanse the bite site using antiseptic.

(4) Prophylactic treatment with antibiotics against tick borne diseases is controversial.

Preferably, preserve the tick body for testing and monitor the affected soldier for signs and symptoms of tick borne disease.

NOTE: This task is not all-inclusive. Specific treatment for dangerous insect invenomations should be researched before deployment to the operational area.

5. Record all treatment in the patient's medical record.

6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated casualty and a scenario in which he must treat a casualty for insect bites or stings.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Removed the casualty's clothing, shoes, or jewelry to expose the sting or bite area.	—	—
2. Asked the casualty to identify, if possible, what bit or stung him or her.	—	—
3. Checked the casualty for the signs and symptoms of insect bites and stings.	—	—
4. Treated the bite or sting.	—	—
5. Recorded all treatment in the patient's medical record.	—	—
6. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED

Administer Medications

081-833-4013

Conditions: Given a patient that requires medication and the necessary materials and equipment for administering the medication via the prescribed route. Materials required for injection are: medication; antiseptic pads; adhesive strips; prepared syringes with medication; sterile cotton; emergency drug tray or cart; equipment disposal system; Department of the Army (DA) Form 3862, Controlled Substances Stock Record; and patient's clinical record. Materials required for optic or otic are: medication, sterile cotton, sterile gauze, sterile normal saline, dressing materials, and the patient's clinical record. Materials required for topical are: medication; disposable medicine cups; tray; medicated pads or patches; application papers; tape; DA Form 3949, Controlled Substances Record; and the patient's clinical record. Materials required for vaginal or rectal are: medications, disposable medicine cups, tray, applicators, nonsterile gloves, water-soluble jelly, DA Form 3949, and the patient's records. Materials required for oral: disposable medicine cups, measuring device (teaspoon or syringe), tray, medications, DA Form 3949, and the patient's clinical record.

Standards: Administer a medication in accordance with (IAW) the five rights (drug, dose, route, patient, and time) without violating sterile technique or causing injury to the patient.

CAUTION: If the soldier violates aseptic technique or starts to do something that could injure the patient, stop the evaluation immediately.

Performance Steps

1. Perform the following safety checks:
 - a. Before administering any medication, operator checks the five rights: right medication, right dose, right route, right patient, and right time.
 - b. Wash your hands.
 - c. Verify the type, strength, and expiration date of the medication three times before administering.

NOTE: If unfamiliar with a medication, look it up to determine contraindications, precautions, drug interactions, and side effects.

- (1) First time--compare the orders, reference, or medicine card against the medicine container when removing the bottle from the storage shelf.
- (2) Second time--when preparing or pouring the medicine.
- (3) Third time--when returning the bottle or container to the shelf.
- d. Handle only one medication at a time.
- e. If giving any medication via intravenous (IV) or injection, operator ensures that an anaphylactic kit is available. Include a constricting band and a syringe containing a 1:1,000 solution of epinephrine. Have a tracheostomy set available, since the majority of fatalities reported involve asphyxiation due to laryngeal edema.

2. Calculate the amount of medication required.

3. Obtain the correct medication in the proper dosage.

NOTE: Perform pharmaceutical calculations as necessary to determine the amount of medication required to equal the required dose.

- a. Sign for controlled drugs on DA Form 3949, as appropriate.
- b. When preparing medication for more than one patient, mark each container with the patient's identification.
- c. Place all the prepared medications on a tray or the medication cart.

4. Prepare the patient.

- a. Ask the patient if he or she has any allergies or has experienced a drug reaction.
- b. Explain the procedure.
- c. Explain the possible adverse reactions and side effects of the medication.

Performance Steps

- d. Provide privacy, if necessary.

5. Administer oral medications.

- a. Prepare the prescribed dose of medication.

- (1) Tablets or capsules. Transfer the medication to the medicine cup.

- (2) Liquids.

- (a) Open the bottle, and place the lid upside down on a flat surface.

- (b) Pour the medicine with the label up.

- (c) Measure the amount of medicine with a teaspoon, tablespoon, syringe, or calibrated measuring cup, and pour the prescribed amount of liquid into a disposable cup.

NOTE: When you pour liquid into a cylinder, it forms a meniscus. In determining the volume of liquid, take a reading at the bottom of the meniscus, with the level of the liquid at eye level.

- (3) Powders.

- (a) Pour the correct dose of powdered or granulated medication into the medicine cup.

- (b) Pour the required amount of water or juice into a paper cup.

NOTE: Reconstitute the medication at the patient's bedside.

- b. Give the right medication to the right patient at the prescribed time.

- (1) Tablets, capsules, or liquids. Observe the patient swallow the tablets, capsules, or liquids.

- (2) Sublingual medications. Instruct the patient to allow sublingual medications to dissolve under the tongue.

- (3) Powdered medication. Reconstitute powdered or granulated medications in the prepared juice or water, and observe the patient drink the preparation.

- c. Inspect the patient's mouth to ensure the patient has swallowed the medication, if necessary.

6. Administer an injection.

- a. Prepare the prescribed dose of medication.

- (1) Verify that the appropriate needle, syringe, and medication are being used.

- (2) Prepare the injection in accordance with (IAW) task 081-833-0088, Prepare an Injection for Administration.

NOTE: Use a strict aseptic technique whenever foreign bodies (the needle and medications) are introduced into body tissues.

- b. Provide privacy if the injection is to be given in the buttocks or thigh.

- c. Select the injection site.

- (1) Intramuscular.

- (a) Upper arm deltoid muscle--the outer one-third of the arm between the lower edge of the shoulder bone and the armpit. The safe area is about the width of three fingers below the shoulder bone (Figure 1). Place the patient in a standing or sitting position with the arm at his side, muscles relaxed, and the shoulder completely exposed.

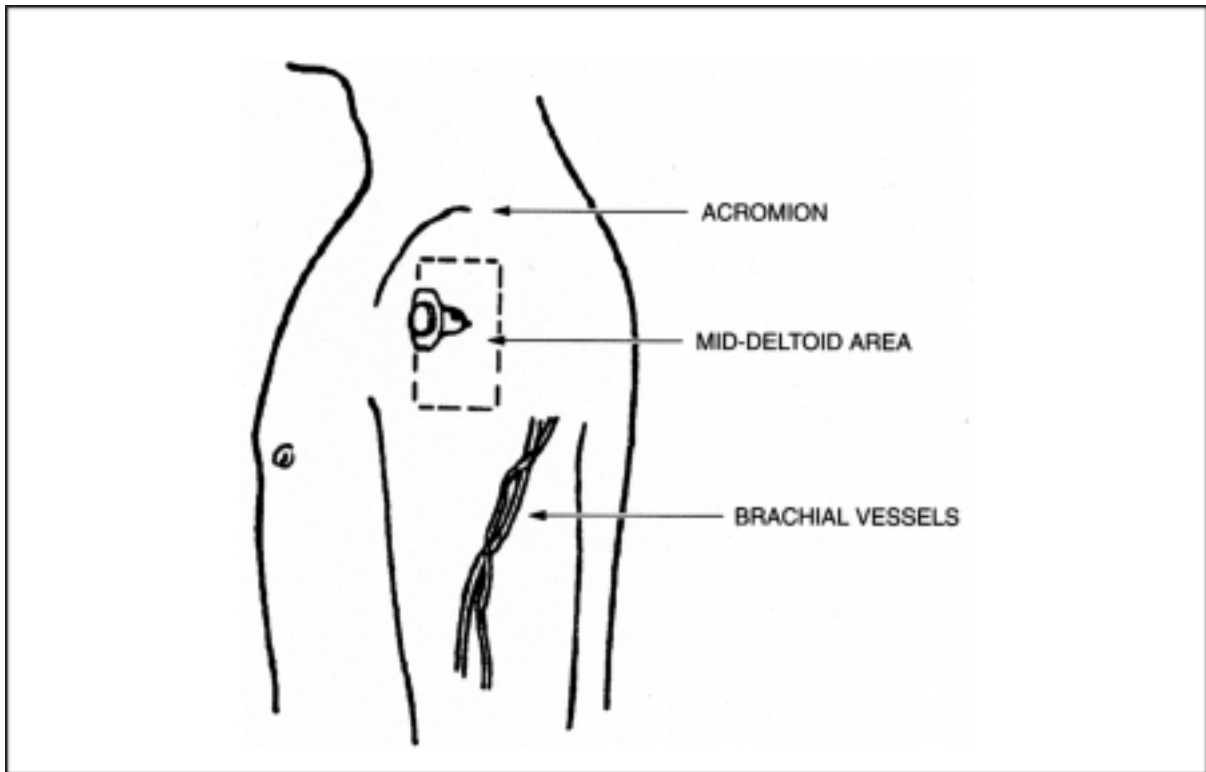
Performance Steps

Figure 1. Intramuscular Injection Site of the Upper Arm

- (b) Buttock--The proper location for an injection is in the upper, outer quadrant of either buttock (Figure 2). The patient should be in the prone position or standing and leaning forward, supported by a chair or table, with the weight shifted to the leg that will not be injected. If the patient is lying in a prone position, place the toes together with the heels apart. This will relax the muscles of the buttocks. The area is completely exposed.

Performance Steps

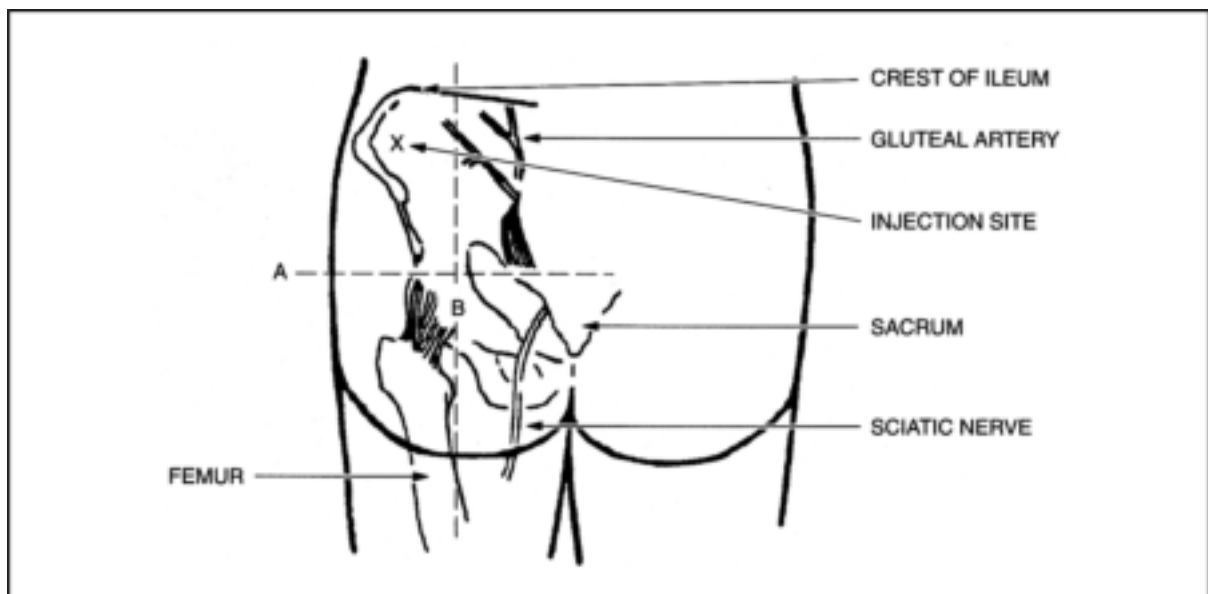


Figure 2. Intramuscular Injection Site of the Buttocks

NOTE: To identify the injection site, draw an imaginary horizontal line across the buttocks from hipbone to hipbone. Then divide each buttock in half with an imaginary vertical line. Figure 2 shows the imaginary lines.

WARNING: Do not give the injection in an area outside the upper-outer quadrant. The needle may do irreparable damage to the sciatic nerve or pierce the gluteal artery and cause significant bleeding.

- (c) Outer thigh--the area between a hand's width above the knee and a hand's width below the groin (Figure 3). Patient should be lying face up or seated with the area completely exposed.

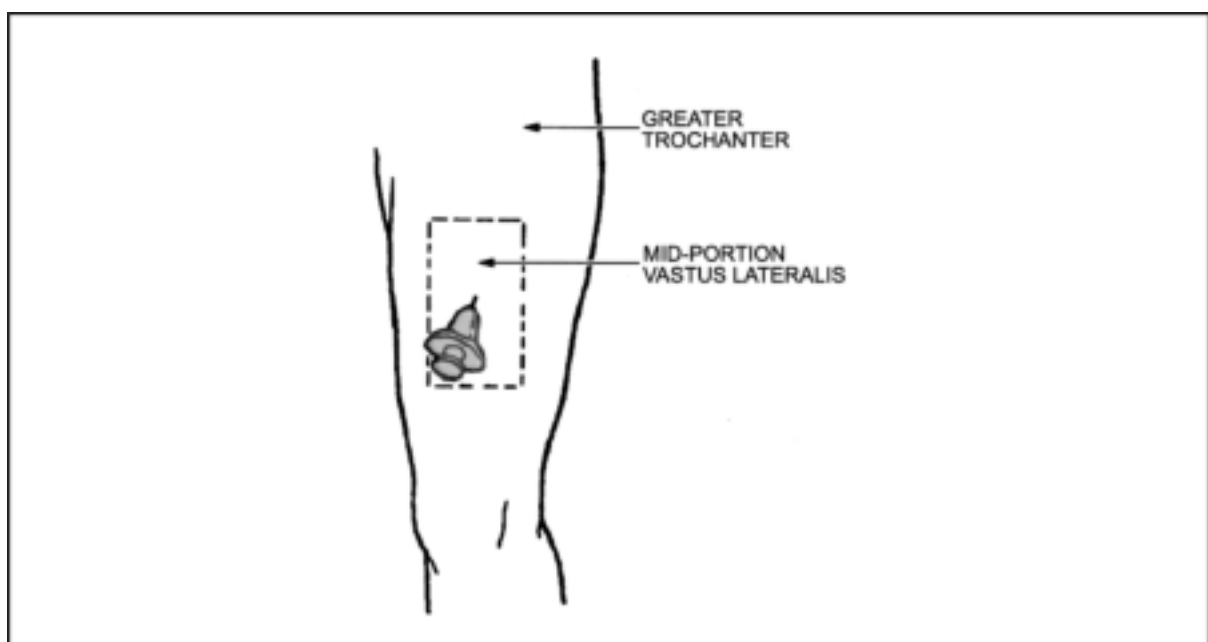


Figure 3. Intramuscular Injection of the Outer Thigh

Performance Steps

(2) Subcutaneous.

- (a) Outer aspect of upper arm--the injection site is one hand's width down from the top of the shoulder and a third of the way around the arm's outer aspect (Figure 4). Place the patient in a seated or standing position with the upper arm completely exposed.

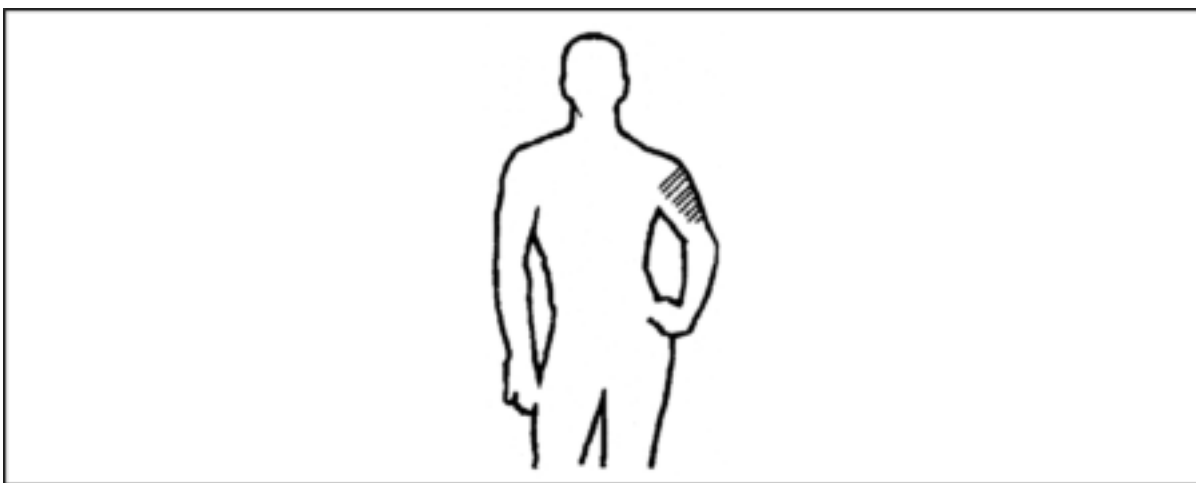


Figure 4. Subcutaneous Injection Site of the Upper Arm

- (b) Outer aspect of upper leg--the injection site is one hand's width down from the groin on the lateral outer area of the upper leg (Figure 5). Place the patient in a seated or standing position with the upper leg completely exposed.



Figure 5. Subcutaneous Injection Site of the Outer Thigh

- (c) Abdomen (Figure 6).

Performance Steps

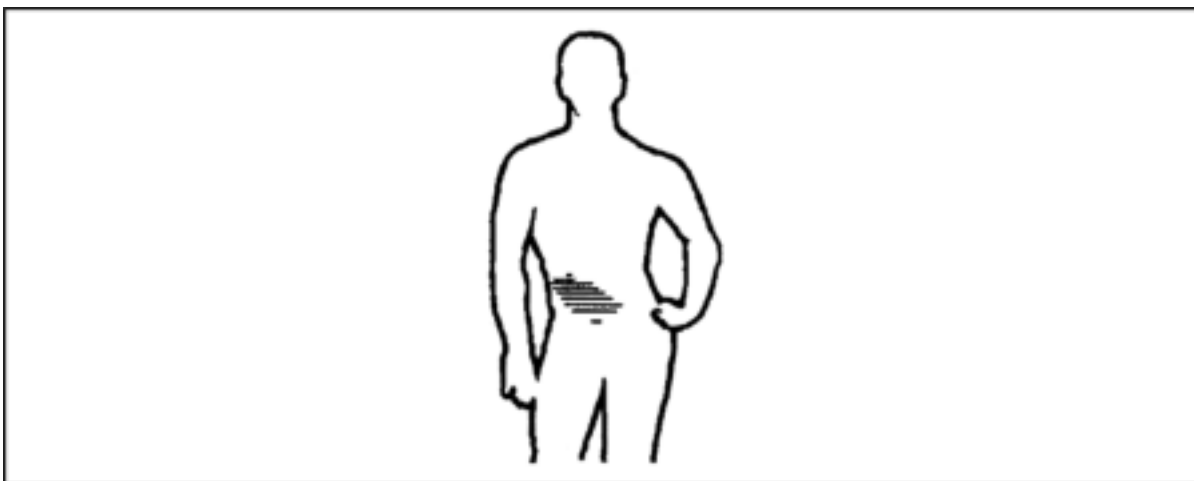


Figure 6. Subcutaneous Injection Site of the Abdomen

NOTE: Some medications, such as insulin and heparin, are administered into the subcutaneous tissue of the abdomen.

(3) Intradermal. The injection site is usually the inner forearm.

(a) Inner forearm (Figure 7). Position the patient's arm in a relaxed position with the elbow flexed and the palm up.

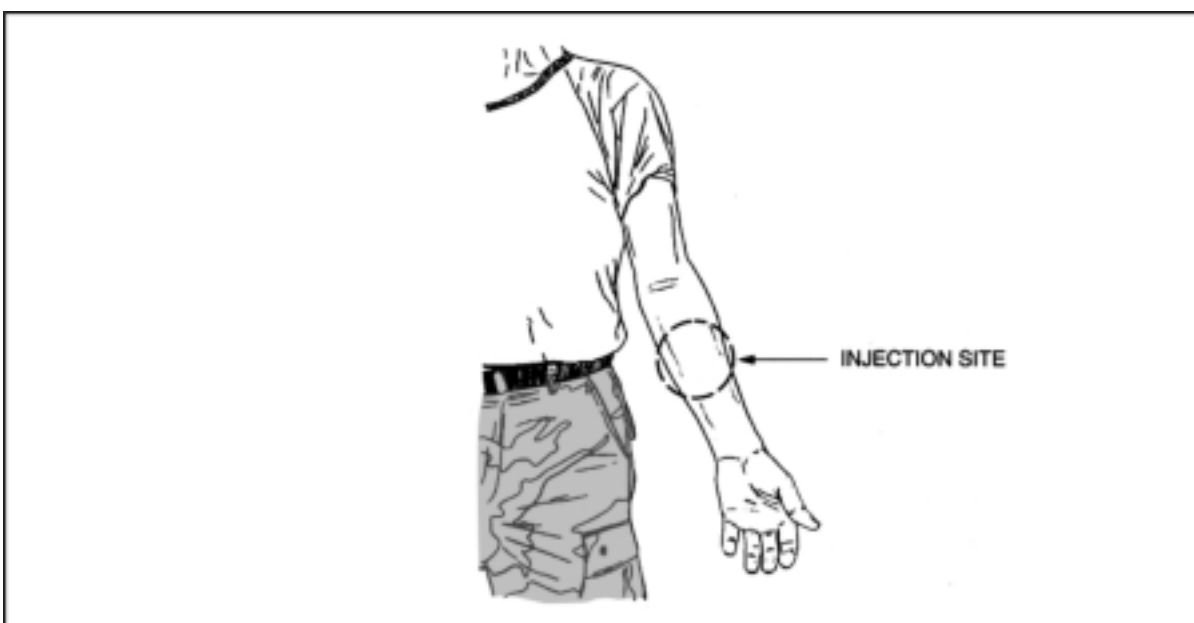


Figure 7. Intradermal Injection Site of the Upper Forearm

(b) Back of the upper arm (Figure 8).

Performance Steps

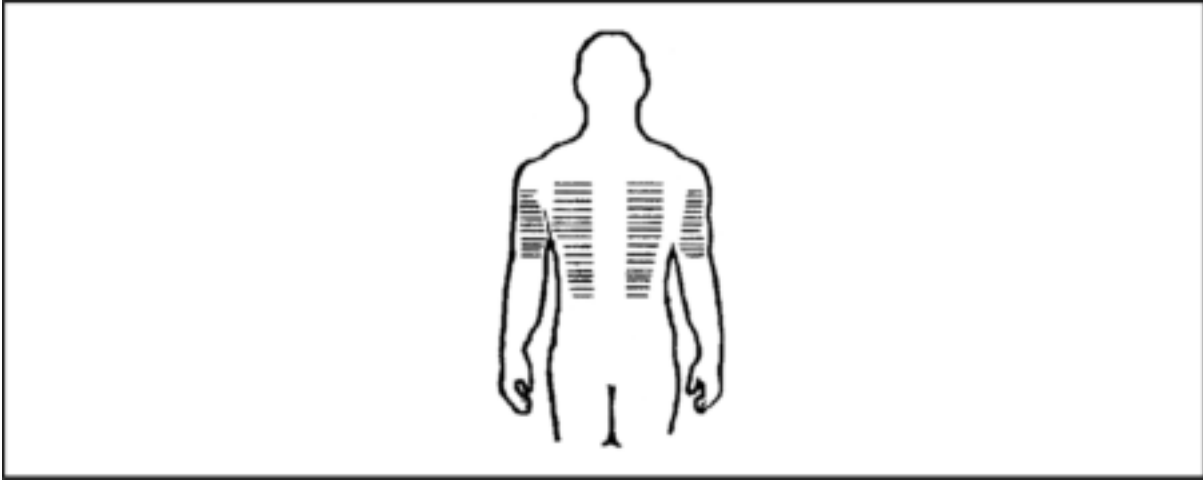


Figure 8. Intradermal Injection Sites From the Back View

- (c) Back below the shoulder blades (Figure 8). Patient is seated, leaning forward, and supported on a stable object or lying face down.
 - d. Clean the injection site.
 - (1) Intramuscular and subcutaneous.
 - (a) Open the antiseptic pad package.
 - (b) Begin at the injection site and with a spiral motion, clean outward 3 inches.
 - (2) Intradermal.
 - (a) Use ethyl alcohol or acetone germicide and a sterile sponge.
 - (b) Begin at the injection site and with a spiral motion, clean outward 3 inches.
 - e. Remove the needle cover.
 - (1) Pull the needle cover straight off.
 - (2) Do not bend or touch the needle.
 - (3) Lay the needle cover on a clean, flat surface.
 - f. Prepare the skin for the injection.
 - (1) Intramuscular and subcutaneous--firm up the tissue at the injection site by pinching the skin gently between the thumb and index finger of the nondominant hand. Do not touch the injection site.
 - (2) Intradermal--using the nondominant thumb, apply downward pressure directly below and outside the prepared injection site.
- CAUTION: Do not retract or move the skin laterally.
- g. Insert the needle.
 - (1) Intramuscular--With the dominant hand, position the needle, bevel up, at a 90-degree angle to the skin surface and plunge the needle firmly and quickly into the muscle to the depth of the needle (Figure 9).

Performance Steps

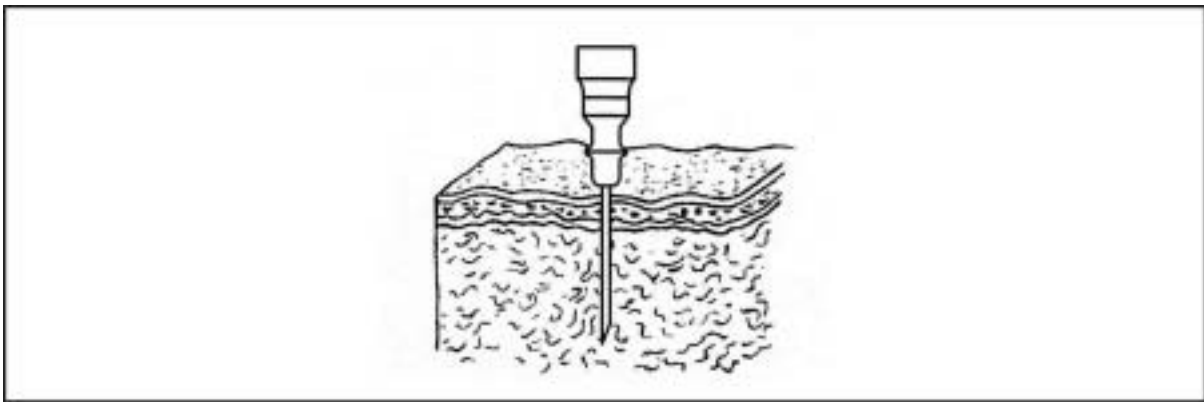


Figure 9. Angle of Intramuscular Injection

- (2) Subcutaneous--With the dominant hand, position the needle, bevel up, at a 45-degree angle to the skin surface and plunge the needle firmly and quickly into the fatty tissue below the skin to the depth of the needle (Figure 10).

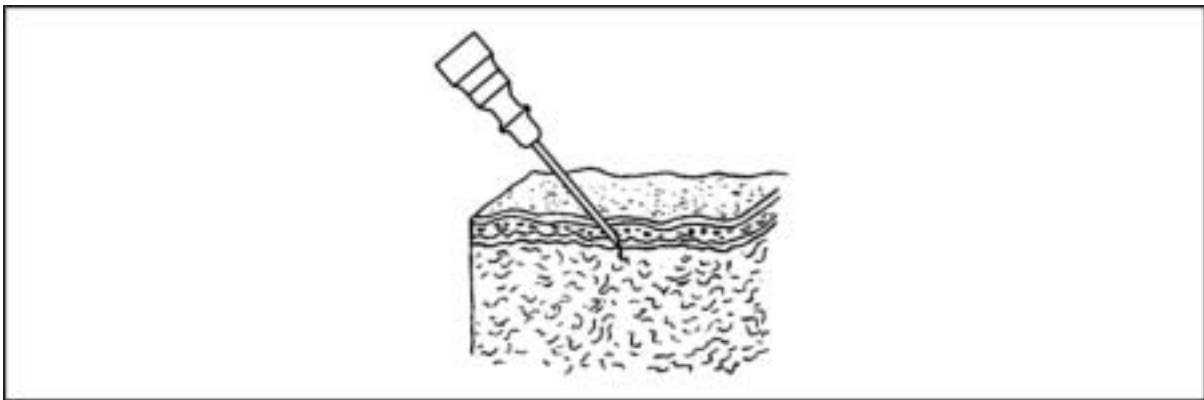


Figure 10. Angle of Subcutaneous Injection

- (3) Intradermal--With the dominant hand, position the needle, bevel up, at a 15- to 20-degree angle and insert it just under the skin until the bevel is covered (Figure 11).

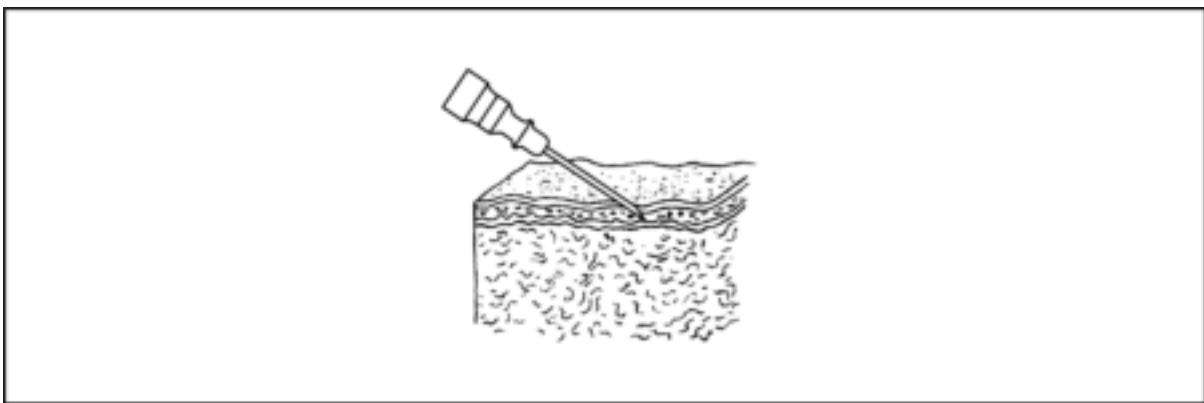


Figure 11. Angle of Intramuscular Injection

- h. Release the hold on the skin.
(1) Intramuscular and subcutaneous.

Performance Steps

- (a) Aspirate the syringe. If blood appears in the syringe, withdraw the needle, replace the needle, syringe, and medication and begin the procedure again at another injection site.

WARNING: Failure to aspirate could cause the medication to be injected into the blood stream.

- (b) If no blood appears in the syringe, inject the medication. Push the plunger into the syringe barrel with a slow, continuous movement as far as the plunger will go.
- (c) Place an antiseptic pad over the injection site, withdraw the needle at the same angle as inserted, and gently massage the injection site with the antiseptic pad.

- (2) Intradermal.

NOTE: Do not aspirate.

- (a) Push the plunger slowly forward until the medication is injected and a wheal appears at the site of injection.
- (b) If no wheal appears, begin the procedure again. Use a new needle, syringe, and medication and select a different injection site.
- (c) Quickly withdraw the needle at the same angle at which it was inserted.
- (d) Without applying pressure, cover the injection site with dry sterile gauze.
- j. Check the site for bleeding. If bleeding occurs, put an adhesive bandage strip over the injection site.
- k. Perform postinjection patient care.
 - (1) Have the patient remain in the area for 15 minutes.
 - (2) Monitor for signs and/or symptoms of allergic reactions or other unusual reactions.
- l. Dispose of the expended needle and syringe IAW local standing operating procedure (SOP).

7. Administer otic medication.

- a. Position the patient.
 - (1) Place the patient in the supine or sitting position.
 - (2) Ensure the involved ear is turned upward.
 - (3) Pull the auricle of the affected ear up and back.
- b. Instill the medication.
 - (1) Direct the tip of the dropper toward the vestibule of the ear.
 - (2) Instill the required number of drops.
 - (3) Ensure the medication runs down the side of the ear canal.
 - (4) Do not touch the ear canal with the tip of the dropper.
 - (5) Use sterile cotton to keep the medication from escaping.

NOTE: If the ear canal is badly swollen or edematous, gently insert a small strip of gauze into the vestibule of the ear to serve as a wick.

8. Administer topical medications.

- a. Prepare the required dose of medication.
 - (1) Obtain single-dose packets of topical medication.
 - (2) Obtain the required number of medicated patches or pads.
 - (3) Apply the prescribed size ribbon of ointment to an application paper.
 - (4) Obtain the jar or tube of medication identified for that individual patient's use.
 - (5) Aseptically transfer the required amount of topical medication from the bulk storage container to a sterile, disposable container.
- b. Prepare the skin.
 - (1) Provide privacy or screen the patient, as necessary.
 - (2) Expose the prescribed area of the patient's skin.
 - (3) Clean the skin.
- c. Apply the medication to the prescribed area IAW package insert.

NOTE: Wear gloves when appropriate.

- (1) Secure patches, pads, and application papers with tape.
- (2) Cover topical applications with sterile dressings, if required.

9. Administer rectal or vaginal medications.

- a. Prepare the required dose of medication.

Performance Steps

- (1) Place the suppository medication in the medication cup.
- (2) Draw the correct dose of cream or foam medication into the applicator device.
- (3) Prepare the prescribed amount of medicated solution for a vaginal irrigation (douche) or an enema.
- (4) Obtain the prescribed single use, disposable douche or enema.

NOTE: Leave medication wrapped or covered until ready to administer.

- b. Provide for privacy.
- c. Position the patient, as appropriate.
 - (1) Supine, with the legs spread and bent at the knees, for vaginal administration.
 - (2) Lateral, with the upper leg bent at the knee to facilitate spread of the buttocks, for rectal administration.
- d. Put on exam gloves.
- e. Insert the medication.
 - (1) Suppositories.
 - (a) Lubricate the suppository with water-soluble jelly.
 - (b) Insert the suppository into the appropriate orifice, and advance it with the index finger.

NOTE: Rectal suppositories must be advanced past the sphincter muscles (about 2 inches).

- (2) Cream or foam applications.
 - (a) Lubricate the tip of the applicator device with water-soluble jelly.
 - (b) Insert the applicator into the appropriate orifice.
 - (c) Push the applicator plunger to instill the medication.
 - (d) Withdraw the applicator.
- (3) Vaginal irrigation (douche).

NOTE: Place a catch basin or bedpan under the patient to collect return solution.

- (a) Lubricate the douche tip with water-soluble jelly.
- (b) Gently insert the douche tip into the vagina.
- (c) Release the clamp on the tubing, and allow solution to flow slowly. (If using a disposable douche, gently squeeze the container to dispense the solution.)
- (d) Rotate the douche tip to direct fluid over all parts of the vagina.
- (e) Administer all the solution, and gently withdraw the douche tip.
- (f) Remove the bedpan or catch basin, and place a sanitary pad over the vulva.
- (4) Enema.

NOTE: Provide a bedpan if the patient is unable to ambulate to the latrine to expel the solution.

- (a) Lubricate the rectal tip with water-soluble jelly.
- (b) Insert the rectal tip into the rectum about 3 to 4 inches.
- (c) Release the clamp on the tubing, and allow the solution to flow slowly. (If using a disposable enema, squeeze the container to dispense the solution.)
- (d) Slow the flow of solution if the patient complains of cramping.
- (e) Administer all the solution, and withdraw the enema tip.
- (f) Tell the patient how long the solution must be retained.

10. Record the administration of all medications on the appropriate medical forms.

NOTE: Administration of all scheduled and nonscheduled (as necessary [PRN]) medication must be documented.

- a. Initial the entry.
- b. Annotate the nursing notes when administering controlled drugs, nonscheduled (PRN) medications, and other medications as required by local policy.
 - (1) Name of the medication.
 - (2) Time the medication was administered.
 - (3) Reason it was not administered.
 - (3) Reason for the medication.
 - (4) Follow-up action taken.
 - (4) Effect of the medication.
 - (5) Adverse reaction.

Performance Steps

11. Record the omission of a medication on the appropriate medical forms whenever a scheduled medication is not administered.
 - a. Annotate the medication sheet (DA Form 4678, Therapeutic Documentation Care Plan [Medication]) by placing a circle in the initial block.
 - b. Annotate the nursing notes.
 - (1) Name of the medication.
 - (2) Time it should have been administered.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must administer medications.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Performed the required safety checks.	_____	_____
2. Calculated the amount of medication required.	_____	_____
3. Obtained the correct medication in the proper dosage.	_____	_____
4. Prepared the patient.	_____	_____
5. Administered oral medications.	_____	_____
6. Administered an injection.	_____	_____
7. Administered an otic medication.	_____	_____
8. Administered topical medications.	_____	_____
9. Administered rectal or vaginal medications.	_____	_____
10. Recorded the administration of all medications on the appropriate medical forms.	_____	_____
11. Recorded the omission of a medication on the appropriate medical forms whenever a scheduled medication was not administered.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

DA FORM 3862
DA FORM 3949
STP 8-91B15-SM-TG

Determine Death

081-833-4014

Conditions: Given a patient who appears to be dead, stethoscope, sphygmomanometer, penlight, reflex hammer, and thermometer.

Standards: Examine the patient, and correctly determine if the body no longer supports life.

Performance Steps

1. Recognize traumatic conditions that are not supportive of life.
 - a. Decapitation.
 - b. Expression of brain matter through the open skull or cranial orifice.
 - c. Open chest trauma in which the heart and great vessels have obviously been destroyed.
2. Examine the patient for clinical signs of death.
 - a. The absence of any of the following is an indicator of death.

WARNING: No single factor should cause a determination of death to be made.

 - (1) Palpate for pulse at chest, neck, or groin.
 - (2) Auscultate the heartbeat for at least 60 seconds.
 - (3) Auscultate for blood pressure.
 - (4) Auscultate for breath sounds.
 - (5) Check for pupillary reflex.
 - (6) Inspect the retina vessels.
 - (7) Check the muscle tone.
 - (a) Recently dead will be flaccid.
 - (b) After several hours, rigor mortis will cause stiffness of all joints.
 - (8) Check the deep tendon reflexes.
 - (9) Check the rectal temperature. Rectal temperature below 95 degrees Fahrenheit is not conducive to life.

WARNING: A victim of cold water drowning with all the signs of death still should receive vigorous efforts at resuscitation and warming before death can be determined.

 - (10) Visually inspect skin color.
 - (a) Recently dead will be pale or cyanotic.
 - (b) After several hours, dependent lividity (purple to black discoloration) will develop on the lower surface of the body.
 - (11) Check for capillary refill.
 - b. The syndrome of absence of pulse, blood pressure, and ventilation; cold, clammy skin without capillary refill; and no spontaneous movement or signs of life must all be present for a patient to be considered nonresuscitable.
 - c. Cessation of palpable pulse and blood pressure, as evidence of heart stoppage, and cessation of breathing are present in all dead patients but in and of themselves signal neither a nonresuscitable patient nor certain death.
3. Record the results of the assessment and the estimated time of death on the appropriate forms. See task 081-833-4015, Attend Death.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must determine death.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized traumatic conditions that are not supportive of life.	—	—
2. Examined the patient for clinical signs of death.	—	—

Performance Measures**GO****NO GO**

3. Made the determination of death on the basis of the presence or absence of all the clinical signs of death.	_____	_____
4. Recorded the results of the assessment and the estimated time of death on the appropriate forms.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Dispense a Medication

081-833-4016

Conditions: Given pencil, paper, medication containers, medication labels, medication package inserts, and medications.

Standards: Perform mathematical calculations to correctly determine drug dosage, convert weights from English standard to metric, write a prescription, dispense the medication in the proper container, and label the drug.

Performance Steps

1. Perform mathematical calculations to correctly determine drug dosage.

2. State the problem in IF-THEN form.

EXAMPLE: IF there were 2 milligrams (mg) of the drug in 1 cubic centimeter (cc) of the solution, THEN there would be 10 mg of the drug in X cc of the solution.

3. Convert the problem to a simple equation with each portion stated as a fraction.

EXAMPLE: $2 \text{ mg}/1\text{cc} \times 10 \text{ mg}/X \text{ cc}$

4. Cross multiply.

EXAMPLE: $2X = 10$

5. Solve for X.

EXAMPLE: What multiplied by 2 equals 10? The answer is 5, so $X = 5$. This means the answer to the original problem is 10 mg of the drug would be in 5 cc of the solution.

6. Remember weight conversions when converting from English standard to metric.

- a. 2.2 pounds = 1 kilogram
- b. 1 grain = 65 mg
- c. 1 pint = 473 milliliters (ml)
- d. 1 fluid ounce = 30 ml
- e. 1 tablespoon = 15 ml
- f. 1 teaspoon = 5 ml

7. Write a prescription.

- a. Line one: Patient's name, address, and age.
- b. Line two: Today's date. (Most states require the prescription to be filled within 6 months.)
- c. Line three: Prescription drug name (usually the generic unless you specify "no substitution"), strength (usually in mg), and type or form (tablets, capsules, suspension, and so on).
- d. Line four: Dispense (the amount of drug [either the number of capsules or the time period covered such as a 1-month supply]).
- e. Line five: Sig (Latin for "mark"). This is the patient instructions. Use approved abbreviations. Example: 1tablet (tab) by mouth (PO) three times a day (t.i.d.) for (x) seven days (7d).
- f. Line six: Refills. (Indicate the number of times the prescription can be refilled.)

WARNING: Never use a trailing 0 after a decimal point when writing numbers. (This can lead to a tenfold overdose.) Never leave a decimal point "naked." (Again, if the decimal point is not seen, it can lead to overdose. For example: 0.5 mg NOT .5 mg. Never abbreviate a drug name.

8. Dispense the medication in the proper container.

NOTE: Refer to the product information sheet for information regarding drug dispensing and storage recommendations. Some drugs require refrigeration after opening, protection from light, and so on. All drugs require childproof caps if they are going to be stored in an environment where children may have access to them.

9. Label the drug with:

- a. Patient's name.

Performance Steps

- b. Drug name.
- c. Drug route.
- d. Dosing regimen.
- e. Number of refills, if any.
- f. Expiration date.

10. Record in the pharmacy log book all medications dispensed.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must dispense a medication.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Performed mathematical calculations to correctly determine drug dosage.	_____	_____
2. Stated the problem in IF/THEN form.	_____	_____
3. Converted the problem to a simple equation with each portion stated as a fraction.	_____	_____
4. Cross multiplied.	_____	_____
5. Solved for X.	_____	_____
6. Remembered weight conversions when converting from English standard to metric.	_____	_____
7. Correctly wrote a prescription.	_____	_____
8. Dispensed the medication in the proper container.	_____	_____
9. Properly labeled the drug.	_____	_____
10. Recorded in the pharmacy logbook all medications dispensed.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Emergency Measures for Poisonous Ingestion

081-833-4022

Conditions: Given syrup of ipacec, a nasogastric tube, polyethylene glycol electrolyte lavage solution, activated charcoal, naloxone, mucamist, flumazenil, and deferoxamine mesylate.

Standards: Perform emergency measures for poisonous ingestion so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Define poison.
 - a. Poison is any substance taken into the body by ingestion, inhalation, injection, or absorption that interferes with normal physiological functions.
 - b. Virtually any substance can be poisonous if consumed in sufficient quantity.
 - c. The term "poison" more often refers to an excessive dosage of a substance rather than to a specific group of substances.
2. Recognize the types of poisoning.
 - a. Intentional poisoning (most adult poisonings fall into this category).
 - (1) Attempted suicide (secondary to depression).
 - (a) Cries for help.
 - (b) Approach patient in a cool and calm manner.
 - (2) Child abuse.
 - (3) Homicide.
 - (4) Intentional drug abuse.
 - b. Accidental poisoning (most child poisonings fall into this category).
 - (1) Over 85 percent of poisonings reported to poisoning centers in the United States are accidental.
 - (2) Children under 6 years old account for about 60 percent of reported poisonings in the United States. Most are the result of accidental ingestion.
 - (3) Many accidental poisonings are drug-induced; infants and elderly patients are the most susceptible.
 - c. Occupational and environmental exposures.
 - (1) Occupational exposure is exposure to hazardous materials from manufacturing and/or industry.
 - (a) Heavy metals (lead [Pb], arsenic [As], mercury [Hg], and thallium [Tl]).
 - (b) Pesticides (organophosphates, fluoride salts, and so on).
 - (c) Polychlorinated biphenyls (PCBs).
 - (2) Environmental exposures.
 - (a) Carbon monoxide (CO).
 - (b) Agent orange (AO) and phenoxy herbicides.
 - (c) Lead.
 - (d) Chemical warfare agents (similar in action to organophosphate pesticides).
3. Recognize the signs and symptoms of acute poisoning.
 - a. In children, physical evidence may be more suggestive of poisoning than symptoms.
 - (1) Tablet or plant fragments. If vomiting has occurred, it should be searched as well.
 - (2) Smell of cleaning products or chemicals.
 - (3) Nonfood stains.
 - (4) Opened bottles or containers.
 - b. Interview of family, friends, or medical personnel transporting the patient may reveal that an overdose has occurred.
 - c. Lack of immediate symptoms should not rule out a significant ingestion with acetaminophen, iron, tetracyclines (TCAs), and calcium channel blockers.

Performance Steps

- d. Symptoms may be delayed for up to 8 hours following some poisonings or longer if sustained-release preparations have been ingested.
 - e. Some common toxic syndromes signs and symptoms are:
 - (1) Anticholinergic agent ingestion.
 - (a) Dry mucous membranes.
 - (b) Flushed skin.
 - (c) Dilated pupils.
 - (d) Hyperthermia.
 - (e) Urinary retention.
 - (f) Decreased bowel sounds.
 - (g) Tachycardia.
 - (h) Lethargy.
 - (i) Seizures and hallucinations may occur in severe cases.
 - (2) Opiate (narcotic) ingestion.
 - (a) Miosis.
 - (b) Respiratory depression.
 - (c) Coma.
 - (3) Cholinergic agent ingestion.
 - (a) Salivation.
 - (b) Lacrimation.
 - (c) Urinary and fecal incontinence.
 - (d) Vomiting.
 - (e) Diaphoresis.
 - (f) In severe cases, central nervous system (CNS) depression, pulmonary edema, weakness, bradycardia or tachycardia, muscle fasciculations, and seizures.
 - (4) Sympathomimetic agents or drugs of abuse.
 - (a) Tachycardia (reflex bradycardia).
 - (b) Hypertension (may precede hypotension).
 - (c) Hyperpyrexia.
 - (d) Hyperreflexia.
 - (e) Delusions.
 - (f) Paranoia.
 - (g) Seizures and profound hyperpyrexia may follow larger overdoses.
4. Recognize significant clinical findings for poisoning.
- a. Skin should be evaluated for:
 - (1) Needle marks.
 - (2) Lesions or rashes, which may indicate dermal contact with a toxin.
 - b. Presence of odors may aid in making the diagnosis; however, their absence is not reliable in excluding any intoxications.
 - (1) Garlic: arsenic and organophosphates.
 - (2) Bitter almonds: cyanide.
 - (3) Rotten eggs: hydrogen sulfide.
 - c. Important components of the neurological exam include:
 - (1) Mental status: progressive obtundation is a sign of significant opiate poisoning.
 - (2) Observation for evidence of seizure activity. Seizures are caused by a variety of poisons.
 - (3) Pupillary size:
 - (a) Common causes of mydriasis are anticholinergics, meperidine, mushrooms, sympathomimetics, and glutethimide.
 - (b) Common causes of miosis are cholinergics, clonidine, mushrooms, insecticides, nicotine, narcotics, phenothiazines, and phencyclidine.
 - (4) Focal neurologic signs should prompt consideration of nontoxicologic medical conditions.
- NOTE: Drugs are occasionally transported in the rectum, vagina, or gastrointestinal (GI) tract. An unsuspected cardiac or respiratory arrest in a patient suspected of transporting drugs should prompt an examination of these areas along with abdominal radiography.

Performance Steps

5. Manage acute poisoning.

CAUTION: If in the United States, contact poison control for information regarding the specific treatment for the poison involved.

a. Gastric decontamination:

(1) Syrup of ipecac (SI) is most efficacious if given within 30 to 45 minutes following the ingestion.

(a) Dose: Infants (6 to 12 months), 10 ml; children (1 to 12 years), 15 ml; and adults, 30 ml. These doses are repeated in 20 to 30 minutes if emesis has not occurred. Doses may be given with any liquid. Milk and carbonated beverages do not interfere with the effectiveness of ipecac.

(b) SI is contraindicated following ingestion of: caustics, hydrocarbons, drugs known to cause abrupt loss of consciousness and seizures, foreign bodies, and nontoxic ingestion.

CAUTION: SI is contraindicated in unconscious patients or situations which might lead to unconsciousness. Use extreme care after intentional ingestion if the substances ingested, the amount ingested, and the time of ingestion cannot be ascertained.

(2) Perform a gastric lavage.

NOTE: Gastric lavage is performed before administration of activated charcoal.

(a) Use a 34 to 40 French orogastric tube for adults and 24 to 28 French orogastric tube for children.

(b) Lavage the stomach with 150 to 200 ml of warm water and normal saline until a total fluid volume of 5 to 10 liters (L) has been used for adults. For children, use 50 to 100 ml of normal saline.

(3) Use activated charcoal (AC) to adsorb a wide variety of toxins to prevent their absorption from the GI tract.

NOTE: AC does not absorb heavy metals (iron and lithium), alcohols, highly ionized compounds, caustics, and cyanide.

(a) Dose: For children, 1 to 2 grams (g) per kilogram (kg); adults, 50 to 100 g.

(b) May be given with a cathartic such as sorbitol or magnesium citrate. Other cathartics interfere with the adsorptive capacity of AC and should not be used.

(c) Multiple-dose activated charcoal (MDAC) regimens may enhance the excretion of theophylline, phenobarbital, phenytoin, and carbamazepine. Give 50 g every 4 hours for adults. A cathartic should be given no more frequently than every third dose. If the larger doses are not tolerated, give 10 g every hour.

NOTE: The clinical efficacy of MDAC following ingestion of TCAs, salicylates, and digoxin is questionable.

(4) Whole bowel irrigation (WBI).

(a) WBI uses a polyethylene glycol electrolyte lavage solution (PEG-ELS) to hasten removal of ingested substances.

(b) Possible indications for WBI include: patients who present late following an ingestion, ingestion of sustained-release pharmaceuticals, and toxins not adsorbed by AC and foreign bodies.

(c) WBI most commonly used for iron, lithium, and sustained-release calcium channel blockers.

(d) Dose: For adults, 2 L per hour for 5 hours; children, 500 ml per hour.

(e) End point of therapy: Documentation of passage by radiographs (iron tablets or cocaine packets). Clear rectal effluent if patient has clinically improved.

NOTE: Clear rectal effluent is not an end point for removal of foreign bodies or cocaine packets.

6. Administer specific antidotes for poison ingestions.

a. For opiate overdose, give Narcan (Naloxone): 0.4 mg IV every 5 minutes.

b. For acetaminophen overdose, give Mucamist 140 milligram per kilogram (mg/kg) PO then 70 mg/kg q4h (every 4 hours) for a total of 17 doses.

c. For toxic iron ingestion give Desferal (deferoxamine mesylate) 80 mg/kg intramuscular (IM).

Performance Steps

- d. For benzodiazepine overdose, give flumazenil 0.2 mg IV over 30 seconds. An additional dose of 0.3 mg may be given in 30 seconds followed by 0.5 mg at 1-minute intervals or until the patient becomes responsive (maximum of 3 mg).
- 7. Manage complications symptomatically with appropriate supportive care.
- 8. Record all treatment in the patient's medical record.
- 9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must perform emergency measures for poisonous ingestion.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined poison.	_____	_____
2. Recognized the types of poisoning.	_____	_____
3. Recognized the signs and symptoms of acute poisoning.	_____	_____
4. Recognized significant clinical findings for poisoning.	_____	_____
5. Managed acute poisoning.	_____	_____
6. Administered specific antidotes for poison ingestions.	_____	_____
7. Managed complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
EMT-P, BRADY 3RD ED. 1997
MERCK MANUAL 17TH ED

Manage Snakebite

081-833-4039

Conditions: Given soap and water, Tetanus toxoid, venom extractor pump, constricting band, dopamine, diphenhydramine, epinephrine, intravenous (IV) administration set, IV fluids, broad spectrum antibiotics, and antivenom (AV) for the specific type of snake involved.

Standards: Treat a casualty for snakebite so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Expose the injury site.
2. Determine the type of snakebite (Figure 1).

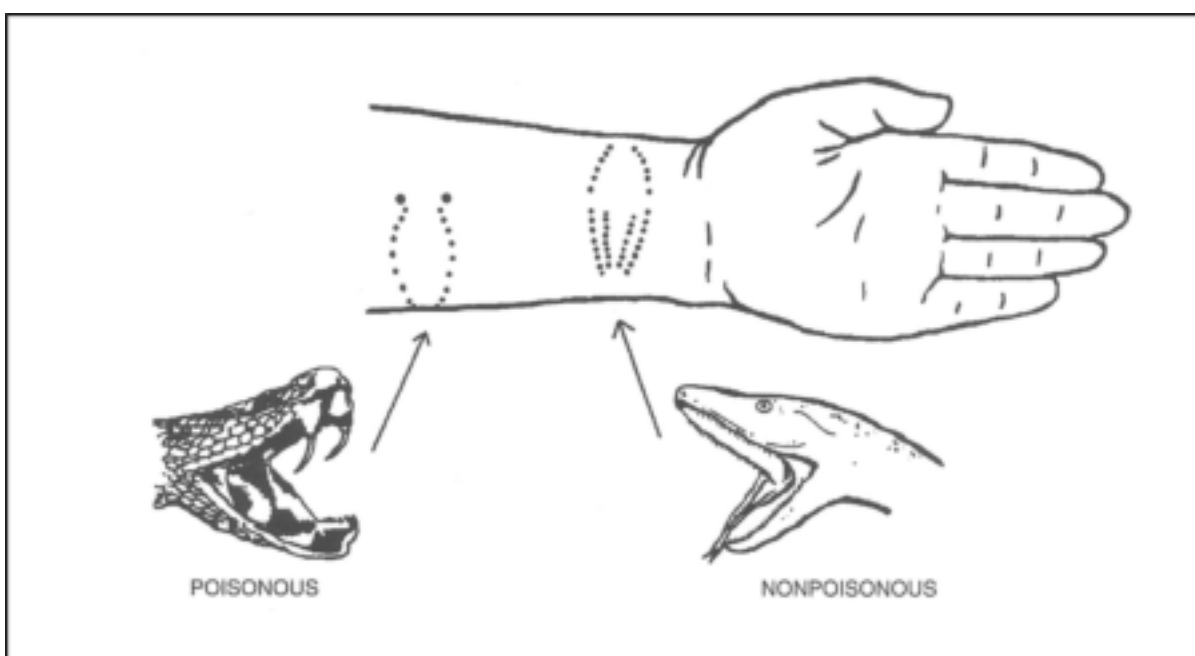


Figure 1. Types of Snakebite

CAUTION: If the bite cannot be positively identified as nonpoisonous, the bite should be treated as a poisonous bite.

- a. Nonpoisonous.
 - (1) Four to six rows of teeth.
 - (2) No fangs.
- b. Poisonous.
 - (1) Two rows of teeth.
 - (2) Bruising of the area from the pressure of the bite.
 - (3) Two fangs which create puncture wounds.

NOTES:

1. Coral snakes are neurotoxic and leave only one or more tiny scratch marks in the area of the bite.
2. Identify the snake if it is still in the area. Do not risk another bite in the effort to find and identify the snake. If the snake has been killed, bring it with the patient for identification. The Medic CD-ROM has an excellent section of color pictures that may prove useful in the identification of the snake. (2 hr Medic CD-ROM is available from the United States Army Special Operations Command [USASOC] Surgeon's Office.)

Performance Steps

3. Check the casualty for signs and symptoms of a poisonous bite.

NOTE: The casualty may exhibit any or all of the symptoms. Symptoms may develop in 1 to 8 hours.

- a. Pain and progressive swelling at the bite site. A painless pit viper bite (except for the bite of the Mojave rattler) is an indication of a "dry" bite (without envenomation).

NOTE: Almost 50 percent of all snakebites are dry bites in which no venom is injected.

- b. Drowsiness.
- c. General skin discoloration.
- d. Blurred vision.
- e. Difficulty hearing.
- f. Patient complains of a "metallic taste" in their mouth. This is almost always a sign of heavy envenomation.
- g. Fever, chills, or sweating.
- h. Nausea and vomiting.
- i. Shock.
- j. Difficulty breathing.
- k. Paralysis.
- l. Convulsions.
- m. Coma.

CAUTION: AV is indicated in patients who, within 30 to 60 minutes following the bite, show progressive swelling involving the injured area, complain of paresthesia of the mouth, scalp, fingertips, or toes or who have any signs or symptoms of poisoning.

4. Initiate treatment.

CAUTION: Do not give the casualty any sedatives, alcohol, food, or tobacco. Do not cut the bite. Do not suck on the bite with your mouth. Do not use electric shock devices in an attempt to neutralize the venom; they do not work. Do not ice the bite; it does not help.

- a. Nonpoisonous bite.
 - (1) Clean and disinfect the wound.
 - (a) Use soap and water or antiseptic solution.
 - (b) Apply iodine (betadine) if the casualty is not allergic to it.
 - (2) Give tetanus toxoid if the casualty does not have a current tetanus vaccination or does not know.
- b. Poisonous bites.
 - (1) Immobilize the casualty.
 - (a) Have the casualty lie down, if possible.
 - (b) Tell the casualty not to move.
 - (c) Keep the casualty calm and reassured.
 - (2) Use the commercially available venom extractor pump, if available. This device has been proven to remove up to 30 percent of the injected venom if properly used within 1 to 2 minutes of the bite.
 - (3) Apply constricting band(s).
 - (a) Place one band above and one band below the site.

NOTE: Use a single band above the wrist or ankle if the site is on a hand or foot.

- (b) Place the bands one to two finger widths from the site.
- (c) Tighten the bands enough to stop superficial venous circulation, but not enough to interfere with the distal pulse.

NOTE: Use constricting bands to slow the spread of the venom by restricting lymphatic and venous flow. Do not restrict arterial blood flow. Verify this by palpating for a distal pulse. An example of a properly applied constricting band would be a penrose drain that slightly indents the skin.

- (d) If swelling causes further indentation, apply another band above the first and remove the first.

Performance Steps

NOTE: The "Australian wrap" has been proven effective in slowing the progression of elapid poisoning. Because elapids have relatively short fangs, deep evenomation does not occur. Splint and wrap the affected limb with an Ace bandage. Start 4 to 6 inches above the bite and work down to the level of the bite.

- (e) Immobilize the affected limb with a splint at the level of the heart.
- (4) Clean the wound with soap and water or antiseptic solution.
- (5) Perform supportive care.

NOTE: In the absence of AV, heroic supportive measures may save life.

- (a) Oral suctioning to remove uncontrollable secretions and prevent aspiration.
- (b) Intubation and mechanical ventilation if respiratory paralysis develops.

NOTE: All effects of neurotoxic envenomation are reversible. Patients have recovered after being manually ventilated for up to 30 days.

- (c) Use volume replacement to combat shock. If hypotension persists, an infusion of dopamine, 2 micrograms per kilogram per minute (ug/kg/min) should be started and titrated to patient blood pressure and urine output.
- (d) Prevent the spread of local necrosis by surgical debridement of devitalized tissue and administration of broad spectrum antibiotics.

NOTE: Fasciotomy is rarely indicated. Much of the swelling associated with envenomation occurs outside the fascial compartments.

5. Administer AV.

CAUTION: AV is an extremely dangerous drug. Anaphylactic reactions are highly likely. Antivenom reactions are not reliably predicted with conjunctival or skin sensitivity tests.

- a. Premedicate the patient with antihistamines. Give Benadryl 50 milligrams (mg) intramuscularly (IM) and cimetidine 75 mg IV.
- b. Prepare an injection of epinephrine, and have it available at the bedside.
- c. Be prepared to deal with a combative patient. Patients given AV often become combative due to pain.
- d. Give the AV in the designated initial dose for the specific drug given. In the United States, a general recommendation is to administer the AV in groups of five vials.
- e. Titrate the dose of AV to the patient's level of pain. Give repeat doses at 30-minute intervals.

NOTE: If the patient has a reaction to the AV, it may be necessary to give a small dose of AV followed by a subcutaneous dose of epinephrine followed by more AV once the signs of anaphylaxis have subsided. It may be necessary to continue this process for hours.

- f. Never leave a patient receiving AV unattended. They must be constantly monitored until several hours after the AV has been discontinued.
- g. Manage pyrogenic reactions to AV with antipyretics (acetaminophine [APAP]).
- h. Diuretics may be required for renal insufficiency. Hemoglobinuria and myoglobinuria are common complications of hemotoxic venoms as a result of hemolysis and myolysis. Mannitol 12.5 grams (g) in 1 liter of normal saline (NS) and 1 milliequivalent per kilogram (mEq/kg) sodium bicarbonate until urine is clear (hemoglobinuria or myoglobinuria).
- i. Recognize the signs and symptoms of serum sickness. Patients who have received greater than seven vials of AV develop serum sickness. Patients will present with:
 - (1) Urticaria (most frequent).
 - (2) Arthralgias.
 - (3) Mild fever lasting 1 to 2 days.
 - (4) Lymphadenopathy near site or generalized.
 - (5) Occasionally, abdominal pain and diarrhea.
 - (6) Peripheral neuritis (may be irreversible).
- j. Manage serum sickness.
 - (1) Give prednisone 40 to 100 mg/day in equally divided doses. Corticosteroid therapy should continue until all signs and symptoms have subsided for 24 hours and then gradually tapered over 72 hours.
 - (2) Antihistamines may also be beneficial.

Performance Steps

NOTE: A new type of AV is being fielded now. It is much less likely to cause allergic reaction and serum sickness. It should be available to the military by 2000. The Medic CD-ROM has a complete list of worldwide available AV sources.

6. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated casualty and a scenario in which he must treat a casualty for snakebite.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Exposed the injury site.	_____	_____
2. Determined the type of snakebite.	_____	_____
3. Checked the casualty for signs and symptoms of a poisonous bite.	_____	_____
4. Initiated treatment.	_____	_____
5. Administered antivenom.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED
WILDERNESS MED, 4TH ED.

Perform 3-Lead Electrocardiography for Emergency Cardiac Care

081-833-4041

Conditions: Given a patient who presents with a cardiac problem, a cardiac monitor/defibrillator, electrocardiogram (ECG) paper, electrodes, alcohol preparation (prep) pads, surgical lubricant, drapes, and tape.

Standards: Center the recording on the graph paper and ensure it has a sharp, distinct baseline and is free from artifact. Obtain an ECG, accurately interpret the rhythm strip by using the 5-step procedure, determine the type of dysrhythmia recorded, and document the results.

Performance Steps

NOTE: A three-lead ECG is used to monitor the heart solely for dysrhythmias. The following information can be obtained from using Lead II:

1. Life-threatening dysrhythmias.
2. How fast the heart is beating (electrically).
3. How regular the heartbeat is (electrically).
4. How long it is taking to conduct an impulse through the parts of the heart.

The following information cannot be obtained from using Lead II:

1. The presence or location of an infarct.
2. Axis deviation or chamber enlargement.
3. Right-to-left differences in the conduction impulse formation.
4. The quality or presence of pumping action.

1. Prepare the equipment.
 - a. Read the manufacturer's instructions for proper use of the equipment on hand.
 - b. Plug the monitor/defibrillator into a wall outlet that is grounded.
 - c. Turn the power switch on, and allow the machine to perform its self-checks and warm up for 5 minutes.
 - d. Check the graph paper supply in the machine.
 - e. Ensure that the machine is set on the standard settings.
 - (1) Paper speed is set at 25 millimeters per second (mm/sec).
 - (2) Amplitude is set at 10 millimeters per millivolt (mm/mv).
 - f. Ensure that all other equipment is on hand.
 - (1) ECG paste (conductive gel).
 - (2) Adequate number of clean electrodes.
 - (3) Alcohol prep pads.
 - (4) Drapes and towels.
 2. Prepare the area.
 - a. Free from electrical interference.
 - b. Comfortable and private for the patient.
 - c. Convenient for the person obtaining the ECG.
 - d. Free from distractions (noise and traffic).
 3. Prepare the patient.
 - a. Explain the procedure to the patient, and answer any questions.
- NOTE: Many patients will be apprehensive about being connected to an electrical instrument. Reassure the patient that there is no danger and nothing unusual will be felt.
- b. Ask (or assist) the patient to remove all clothing from the waist up. Provide a chest drape for female patients.
 - c. Ask (or assist) the patient to lie supine on the bed or examination table.

Performance Steps

NOTE: Patients with respiratory problems may be unable to tolerate the supine position. If necessary, elevate the head of the bed up to 45 degrees.

CAUTION: When necessary, ensure the patient's intravenous (IV) tubing and/or urinary catheter tubing is handled with care and positioned properly to avoid discomfort to the patient.

- d. Ensure the patient's body is not in contact with the bed frame or any metal objects and that all limbs are firmly supported.
- e. Ask the patient to relax and breathe normally throughout the procedure.

4. Apply the chest electrodes.

- a. Clean the sites for electrode placement by rubbing with an alcohol preparation pad to remove dead skin, oils, and traces of soap or dirt.
- b. Apply a small amount of ECG paste to the sites.
- c. Attach the electrodes, being careful to place them over the intercostal spaces and not directly over the ribs. Lead II (bipolar) is the most commonly used lead.
 - (1) Attach the negative electrode (white) to the right arm, right shoulder, or upper right anterior chest wall.

NOTE: Place the electrodes on "meaty" places NOT directly over bone; bone is not a good conductor of electricity.

- (2) Attach the positive electrode (red) to the left leg, left thigh, or lower left anterior chest wall at the intersection of the fourth intercostal space and the midclavicular line.

NOTE: The latter is least preferred, because it may interfere with the defibrillator paddles if a dysrhythmia should occur.

- (3) Attach the electrically neutral electrode (black) to the left arm or right anterior chest.
- d. Ensure these three leads form a triangle around the heart (referred to as Einthoven's Triangle) (Figure 1).
- e. Obtain a readable ECG strip.

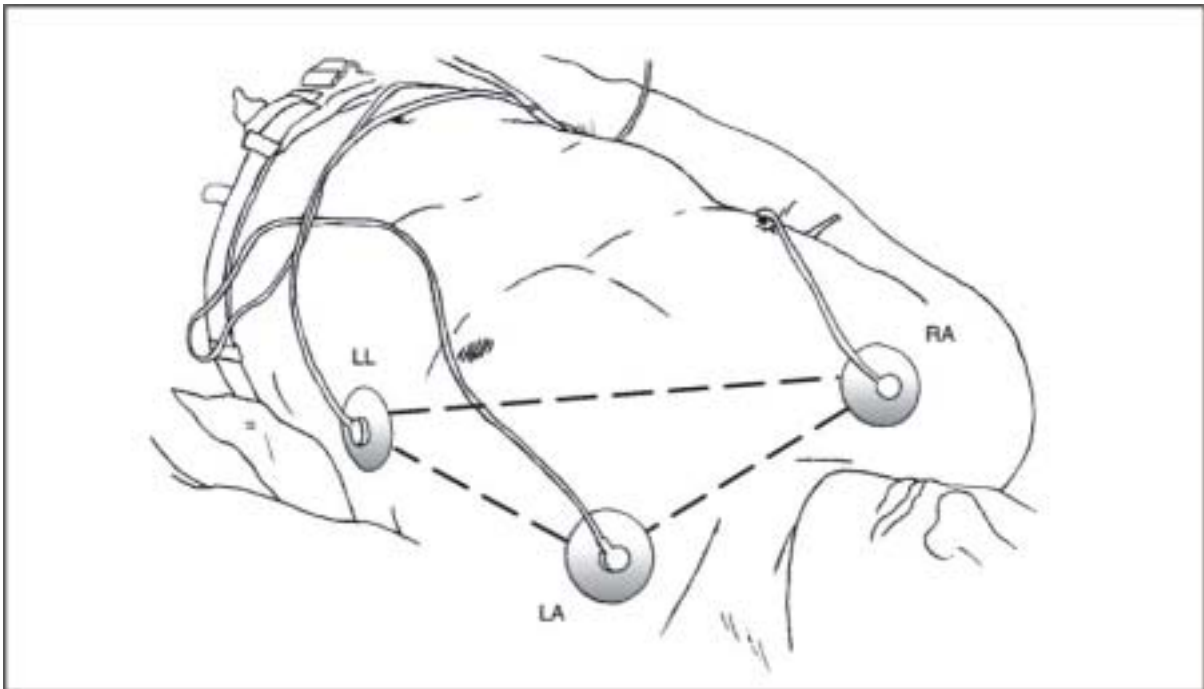


Figure 1. Placement of Lead-II Electrodes

- (1) Interpret the current flow for Lead II.
 - (a) When an electrical current flows toward the positive electrode, a positive (upward) deflection is recorded on the ECG.

Performance Steps

- (b) When an electrical current flows away from the positive electrode, a negative (downward) deflection is recorded on the ECG.
- (c) The absence of any electrical impulse results in the recording of an isoelectric line (flat line).

5. Interpret the rhythm strip by using the five-step procedure.

- a. Step 1: Analyze the rate by using one of the three following methods:

NOTE: Usually refers to ventricular rate. If the atrial and ventricular rates are different, you must calculate both.

(1) Six-second method.

- (a) Count the number of R-waves within a 6-second interval by noting two 3-second marks at the top of the ECG paper.
- (b) Multiply the number of R-waves within the 6-second strip by 10, which will give the heart rate per minute.

NOTE: This method is used to determine the rate of the irregular rhythm.

(2) Heart rate calculator ruler.

- (a) Commercially available heart rate calculator rulers allow you to determine the heart rate rapidly.
- (b) Use according to product directions.

(3) Triplicate method (Figure 2).

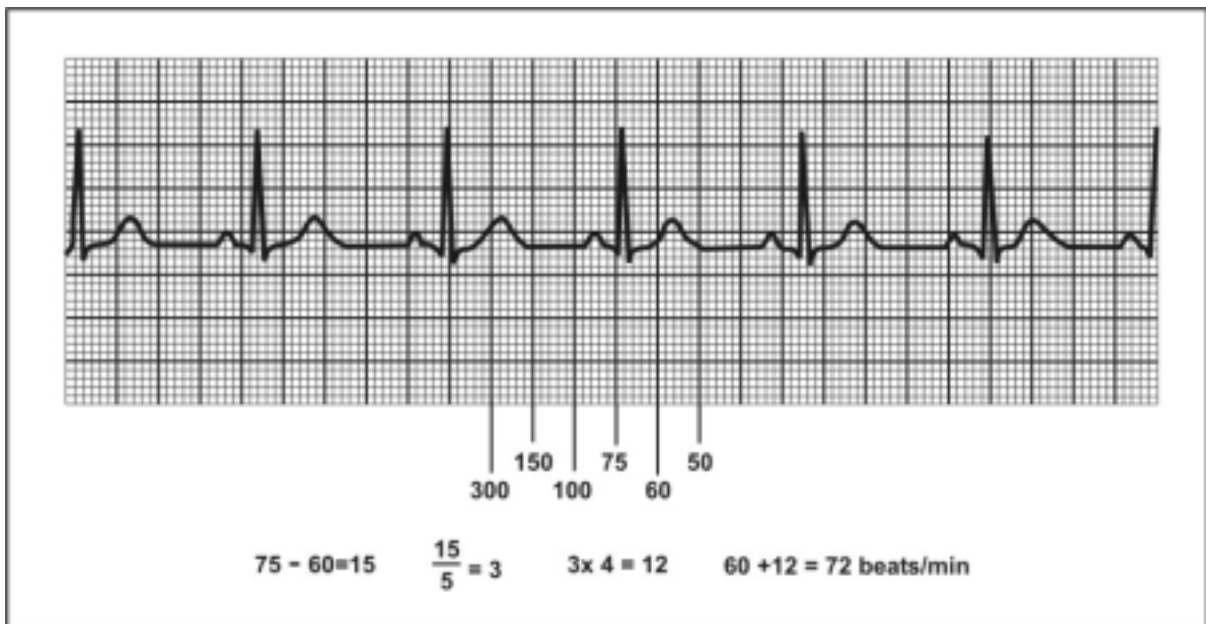


Figure 2. Triplicate Method of Rate Determination

- (a) Locate an R-wave that falls on a dark line or bordering a large box on the graph paper.
- (b) Assign numbers corresponding to the heart rate to successive dark lines, starting with the first dark line on which the R-wave fell.
- (c) The order is 300, 150, 100, 75, 60, 50, and so forth. The assigned numbers are a result of dividing 300 by 1, 2, 3, 4, 5, 6, and so forth. One can easily memorize and recall the successive value that each dark line represents.
- (d) If the next R-wave does not fall on a dark line, subtract the number value assigned to the dark line immediately following the R-wave from the number value assigned to the dark line immediately preceding the R-wave.
- (e) Divide the result by 5 to find the number value of each light line. This will give the heart rate per minute.

Performance Steps

(4) Categories of rate.

- (a) Normal rate is considered 60 to 100 beats per minute.
- (b) Tachycardia is a heart rate greater than 100 beats per minute.
- (c) Bradycardia is a heart rate less than 60 beats per minute.

b. Step 2: Analyze or determine the rhythm type. (Types of rhythms include regular, irregularly irregular, and regularly irregular.)

(1) Regular rhythm is when the P-wave and QRS complexes occur at regular intervals.

NOTE: Variations of 0.04 second are considered regular.

- (2) Irregularly irregular rhythm has no predictable pattern. The QRS complexes occur randomly without order and with no fixed relationship to the rapidly depolarizing atrium.
- (3) Regularly irregular rhythm has a distinct pattern that recurs at periodic intervals. This recurrence may be caused by extra beats that are coupled with every first or second normal beat, or it can occur due to parasympathetic response (respirations).

NOTE: An expedient way to determine if the rhythm is regular or irregular is to fold the ECG paper in half and hold it up to the light. If the R-waves fall on top of each other, the rhythm is regular. If not, they are irregular.

c. Step 3: Analyze the P-wave.

(1) The P-wave reflects atrial depolarization, normally the atria depolarizes away from the sinoatrial (SA) node and toward the ventricles.

NOTE: In Lead II, this movement is seen as a positive, rounded P-wave.

(2) Analysis of the P-wave should include the following questions:

- (a) Are the P-waves present?
- (b) Are the P-waves regular?
- (c) Is there a P-wave for each QRS complex?
- (d) Are the P-waves upright (positive) or inverted (negative)?
- (e) Do all the P-waves look alike?

NOTE: If during your P-wave analysis you answer NO to any of these questions, then it is abnormal.

d. Step 4: Analyze the P-R interval. The P-R interval represents the time necessary for atrial depolarization and conduction of the impulse to the atrioventricular (AV) node.

(1) The normal P-R interval is 0.12 to 0.20 second (3 to 5 small boxes on the ECG paper).

(2) The P-R interval should also be consistent across the strip.

e. Step 5: Analyze the QRS complex.

(1) The QRS complex represents ventricular depolarization.

(2) Analysis of the QRS complex should include the following questions:

- (a) Do all the QRS complexes look alike?
- (b) Is there a P-wave before each QRS complex?
- (c) What is the QRS duration time?

NOTE: Normal QRS duration time is 0.04 second (1 to 3 small boxes). Anything longer than 0.12 second or shorter than 0.04 second would be abnormal.

6. Consider the possible causes of the dysrhythmia and how it forms.

a. Dysrhythmia is any deviation from the heart's normal electrical rhythm.

b. Causes of dysrhythmia include the following:

(1) Myocardial ischemia, necrosis, or infarction.

NOTE: The causes listed in (1) are the leading causes of dysrhythmia.

(2) Autonomic nervous system imbalance.

(3) Distention of the chambers of the heart.

(4) Blood gas abnormalities.

(5) Electrolyte imbalances.

(6) Trauma to the myocardium.

(7) Drug toxicity and drug effects.

(8) Electrocution.

(9) Hypothermia.

(10) Central nervous system (CNS) damage.

(11) Idiopathic event.

Performance Steps

c. Mechanism of impulse formation are divided into conduction pathways and abnormal impulse formations. Abnormal impulse formations include ectopic foci and reentry.

(1) Conduction pathways include antegrade and retrograde conduction.

(a) Antegrade conduction is the depolarization impulse normally conducted through the conduction system and the myocardium.

(b) Retrograde conduction is the depolarization impulse conducted backwards.

(2) Ectopic foci are enhanced automatically.

NOTE: Heart cells other than the pacemaker cells automatically depolarize, resulting in a contraction.

(a) Depolarizations that occur from cells other than the normal pacemakers are referred to as ectopic beats.

(b) Ectopic beats can be intermittent or sustained.

(c) Premature ventricular contractions are examples of ectopic beats.

(3) Reentry.

(a) Occurs when two branches of a conduction pathway are altered by ischemia or other disease process.

(b) Conduction is slowed in one branch, while the other has an unidirectional block.

(c) After the depolarization wave is conducted through the slowed branch, it enters the branch with the unidirectional block and is conducted retrograde back to the origin of the block.

NOTES:

1. By this time, the tissue is no longer refractory, and stimulation again occurs.

2. Paroxysmal supraventricular tachycardia (PSVTs) and atrial fibrillation can be a result of reentry.

(d) The phenomena of reentry may be responsible for isolated premature beats, or tachyarrhythmias.

7. Determine dysrhythmia originating in the SA node.

a. Changes in autonomic tone (either increased sympathetic tone or increased parasympathetic tone) or disease of the SA itself most often causes dysrhythmia to originate in the SA node.

b. Characteristics of normal sinus rhythm (Figure 3).

Performance Steps

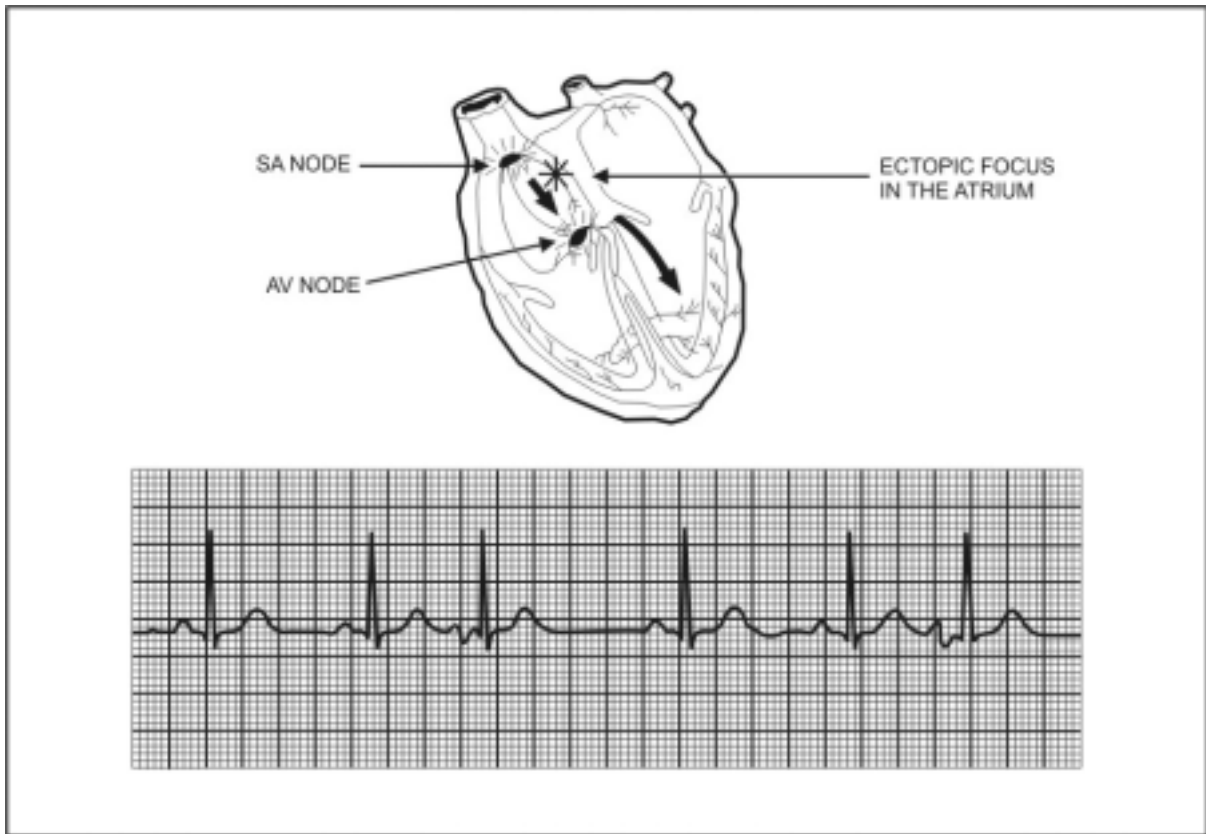


Figure 3. Normal Sinus Rhythm

- (1) The SA node is the pacemaker site.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate is 60 to 100 beats per minute.
 - (b) The P-wave is normal preceding every QRS complex.
 - (c) The P-R interval is between 0.12 to 0.2 second and is constant.
 - (d) The QRS complexes are preceded by a P-wave.
- c. Characteristics common to all dysrhythmia that originate in the SA node.
 - (1) Upright P-waves in Lead II.
 - (2) Similar appearance in all P-waves.
 - (3) Normal P-R interval.
 - (4) Normal QRS complex duration.
- d. Sinus bradycardia results from the slowing of the SA node and may be caused by increased parasympathetic (vagal) tone, intrinsic disease of the SA node, or drug effects (Figure 4).

Performance Steps

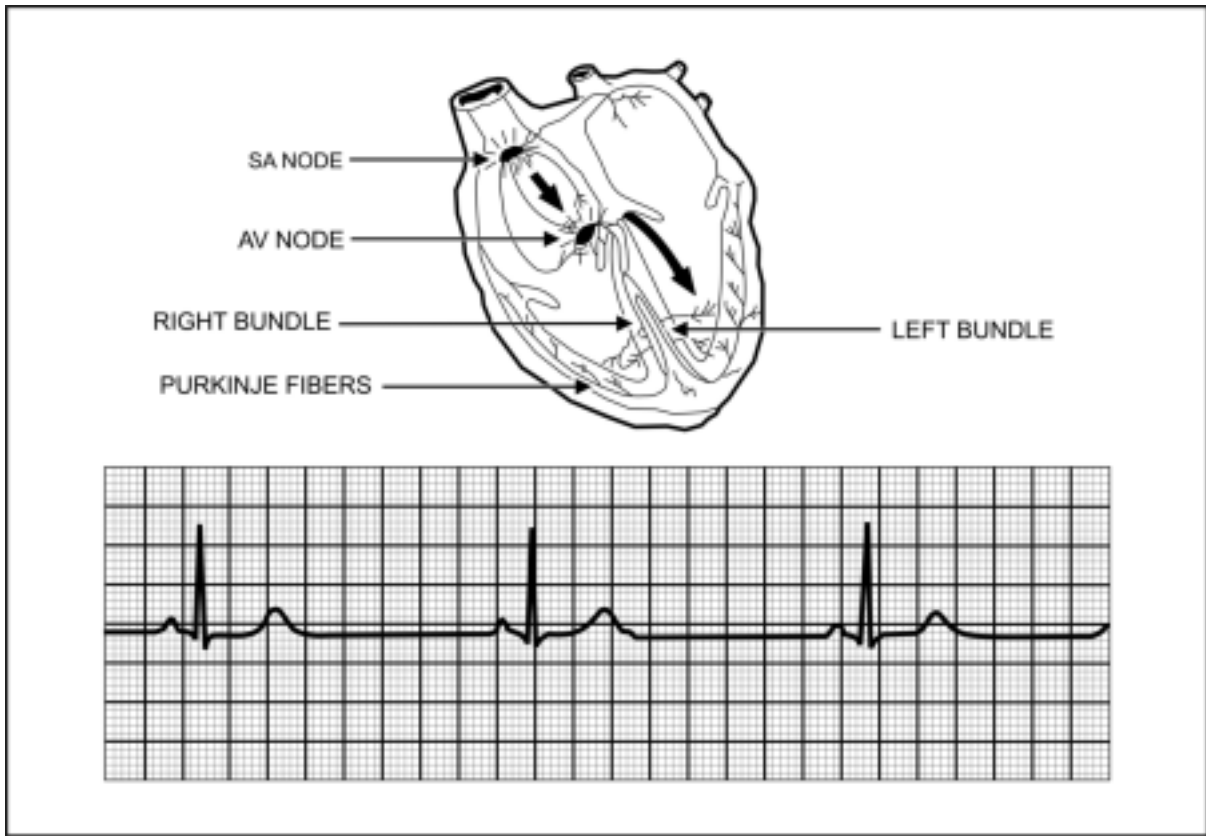


Figure 4. Sinus Bradycardia

NOTE: Types of drugs that affect the SA node include digitalis, propranolol, and quinidine.

- (1) SA node is the pacemaker site.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate is less than 60 beats per minute.
 - (b) The rhythm is regular.
 - (c) The P-wave is upright and normal in morphology, and a QRS complex follows each P-wave.
 - (d) The P-R interval is normal in duration between 0.12 to 0.2 second and is constant.
 - (e) The QRS complexes are normal in duration and morphology and are preceded by a P-wave.
- (3) Clinical significance of sinus bradycardia.
 - (a) Decreased heart rate can result in decreased cardiac output, hypotension, angina, and CNS symptoms.
 - (b) Atrial or ventricular ectopic rhythms may occur, especially true for rates less than 50 beats per minute.

NOTE: Sinus bradycardia may be a normal finding in healthy, well-conditioned persons.

- e. Sinus tachycardia results from an increase in the rate of the SA node and may be caused by exercise, fever, anxiety, pump failure, anemia, hypovolemia, or increased sympathetic rate (Figure 5).

Performance Steps

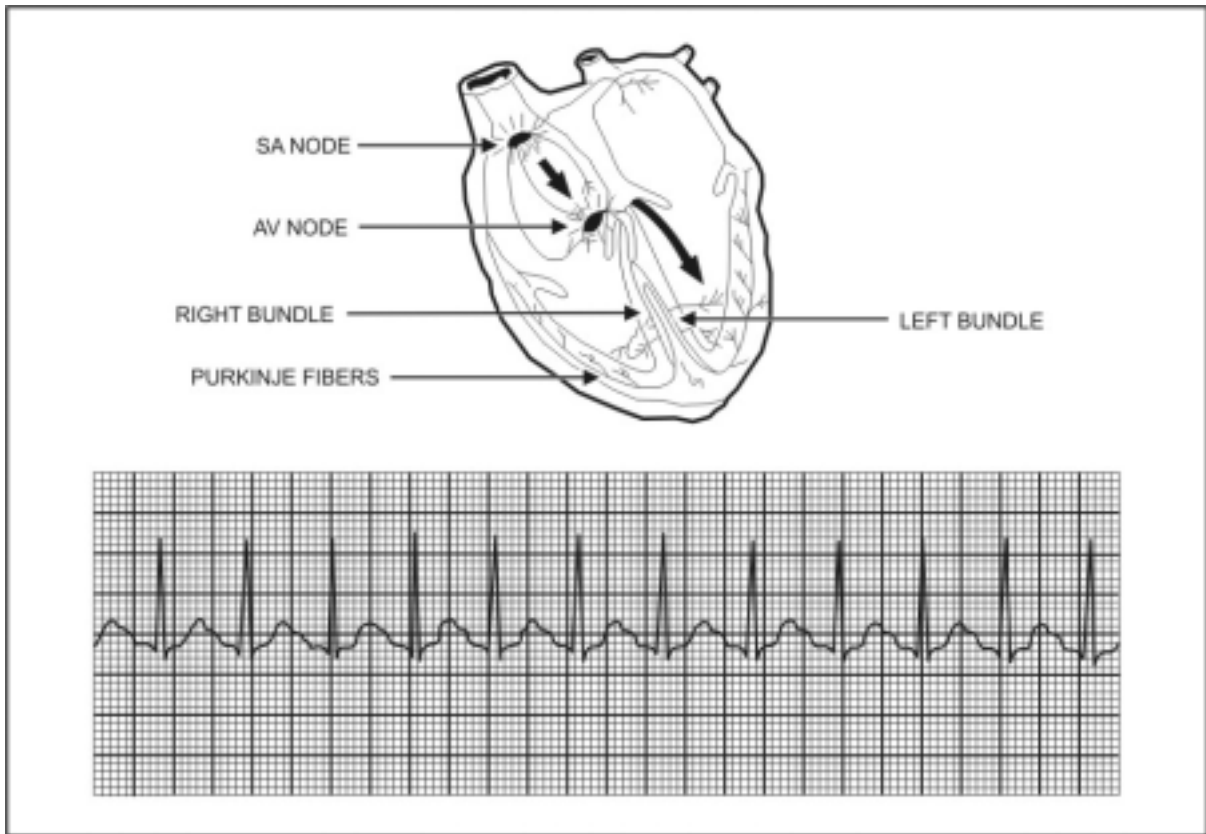


Figure 5. Sinus Tachycardia

- (1) SA node is the pacemaker site.
- (2) Rules of interpretation (Lead II monitoring).

(a) The rate is 100 to 150 beats per minute.

NOTE: The SA node cannot fire any faster than 150 beats per minute.

(b) The rhythm is regular.

(c) The P-wave is upright and normal in morphology, and a QRS complex follows each P-wave.

(d) The P-R interval is normal in duration between 0.12 to 0.2 second and is constant.

(e) The QRS complexes are normal in duration and morphology and are preceded by a P-wave.

- (3) Clinical significance of sinus tachycardia.

(a) Sinus tachycardia is often a benign process.

(b) In rates greater than 140 beats per minute, the cardiac output may fall because ventricular filling time is inadequate.

(c) A very rapid heart rate increases myocardial oxygen demand which in turn may precipitate ischemia or infarct in diseased hearts.

(d) Prolonged sinus tachycardia accompanying acute myocardial infarction (MI) is often an ominous finding, suggestive of cardiogenic shock.

8. Determine dysrhythmia originating in the atria.

a. Atrial dysrhythmia originate outside the SA node in the tissue of the atria or in internodal pathways. Causes include ischemia (most common cause), hypoxia, or atrial dilation.

b. Characteristics common to all dysrhythmia that originate in the atria.

- (1) P-waves differ in appearance from sinus P-waves.

Performance Steps

- (2) The P-R interval may be normal, shortened, or prolonged (depending on the location of the pacemaker site).
- (3) Normal QRS complex duration.
- c. Premature atrial contraction (PAC) (Figure 6) results from a single electrical impulse originating in the atria outside the SA node. This impulse causes a premature depolarization of the heart before the next expected sinus beat. Because it results in depolarization of the atrial syncytium, this impulse also depolarizes the SA node, interrupting the normal cadence.

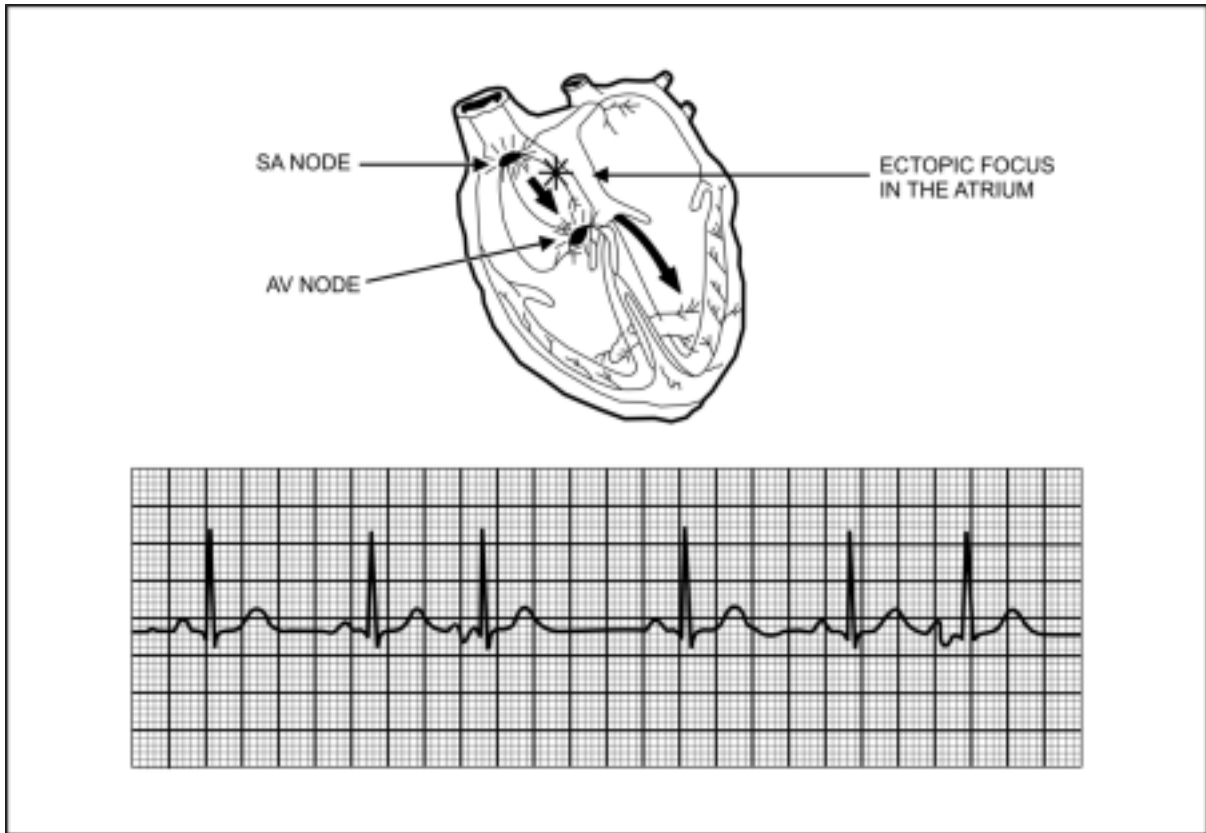


Figure 6. Premature Atrial Contractions

NOTE: Using caffeine, tobacco, alcohol, or sympathomimetic drugs can cause PAC. Other factors that can cause PAC include ischemic heart disease, hypoxia, and digitalis toxicity.

- (1) Two pacemaker sites can be used.
 - (a) SA node is responsible for the underlying sinus rhythm.
 - (b) Ectopic foci in the atrium are responsible only for the premature atrial contraction.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate depends on the underlying rhythm.

NOTE: The underlying rhythm is the sinus rhythm. The rate can be normal, tachycardic, or bradycardic.

- (b) The rhythm is irregular due to the PAC.
- (c) The P-wave of the PAC differs from the P-wave of the underlying rhythm in shape and size, and may differ in deflection.

NOTE: The P-wave of the PAC occurs earlier than the next expected P-wave and may be hidden in the preceding T-wave.

- (d) The P-R interval is usually normal in duration between 0.12 to 0.2 second and is constant. However it may vary with the location of the ectopic foci. If the ectopic focus is near the SA node, the P-R interval will be 0.12 second or greater. If the ectopic focus is near the AV node, the P-R interval will be 0.12 second or less.

Performance Steps

- (e) The QRS complexes are usually normal in duration, however the duration may be greater than 0.12 second if the PAC is abnormally conducted through partially refractory ventricles. Or the QRS complex may be absent if the PAC is conducted while the ventricles are in the refractory period.

(3) Premature atrial contractions are of minimal clinical significance.

NOTE: Frequent PAC may indicate organic heart disease and may be the forerunner of other atrial dysrhythmia.

- d. Supraventricular tachycardia (Figure 7) occurs when rapid atrial depolarization overrides the SA node. It often occurs in paroxysm with sudden onset. It may be caused by increased automaticity of a single atrial focus or by reentry phenomenon at the AV node. Supraventricular tachycardia may occur at any age unassociated with underlying heart disease. It may be precipitated by stress, overexertion, smoking, or ingestion of caffeine. It is frequently associated with underlying atherosclerotic cardiovascular disease and rheumatic heart disease. It also can occur with accessory pathway conduction, such as Wolff-Parkinson-White syndrome.

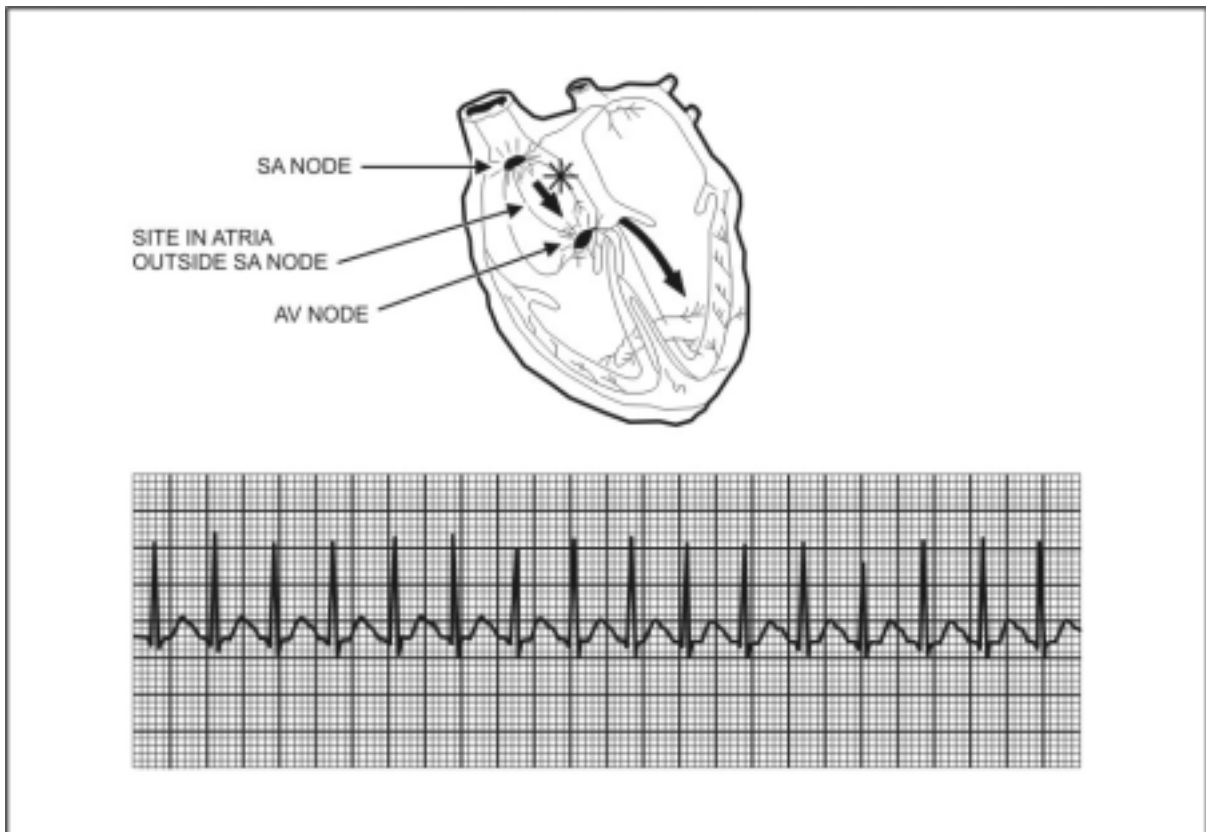


Figure 7. Supraventricular Tachycardia

NOTE: Paroxysmal atrial tachycardia is often more appropriately called PSVT. PSVT is also synonymous with atrial or supraventricular tachycardia. Paroxysmal just refers to sudden onset; however, supraventricular tachycardia does not have to appear suddenly. Because of the rapid rate of PSVT, it can be indistinguishable from AV junctional tachycardia. PSVT is rare in patients with MI.

- (1) The pacemaker site is in the atria outside the SA node because the SA node is incapable of rates over 150 beats per minute.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate is 150 to 250 beats per minute.
 - (b) The rhythm is "characteristically regular," except at onset and termination.

Performance Steps

- (c) The atrial P-waves differ slightly in morphology from sinus P-waves. The P-wave is often buried in the preceding T-wave due to the rapid rate. Turning up the speed of the graph paper or oscilloscope to 50 mm/sec spreads out the complex and can help identify the P-waves.
- (d) The P-R interval is usually normal, but it can vary with the location of the ectopic pacemaker. Ectopic pacemakers near the SA node will have a P-R interval close to 0.12 second. Ectopic pacemakers near the AV node will have a P-R interval 0.12 second or less.
- (e) The QRS complexes are normal 0.04 to 0.12 second.

NOTE: If the atrial rate becomes too rapid, usually greater than 180 beats per minute, the AV node can no longer keep up, so some QRS complexes will be dropped.

- (3) Clinical significance of supraventricular tachycardia.
 - (a) Young patients with good cardiac reserve may tolerate PSVT well for short periods of time.
 - (b) Rapid rates can cause a marked reduction in cardiac output because of inadequate ventricular filling time.
 - (c) Since the diastolic phase of the cardiac cycle is reduced, coronary artery perfusion can be compromised.
 - (d) PSVT can precipitate angina, hypotension, or congestive heart failure.
- e. Atrial flutter (Figure 8) results from a rapid atrial reentry circuit from one foci and an AV node which, physiologically, cannot conduct all impulses through the ventricles. It may occur in normal hearts and is usually associated with atherosclerosis and atrial dilation (which occurs with congestive heart failure). The AV junction may allow impulses in a 1:1 (rare), 2:1, 3:1, or 4:1 ratio, resulting in a discrepancy between atrial and ventricular rates.

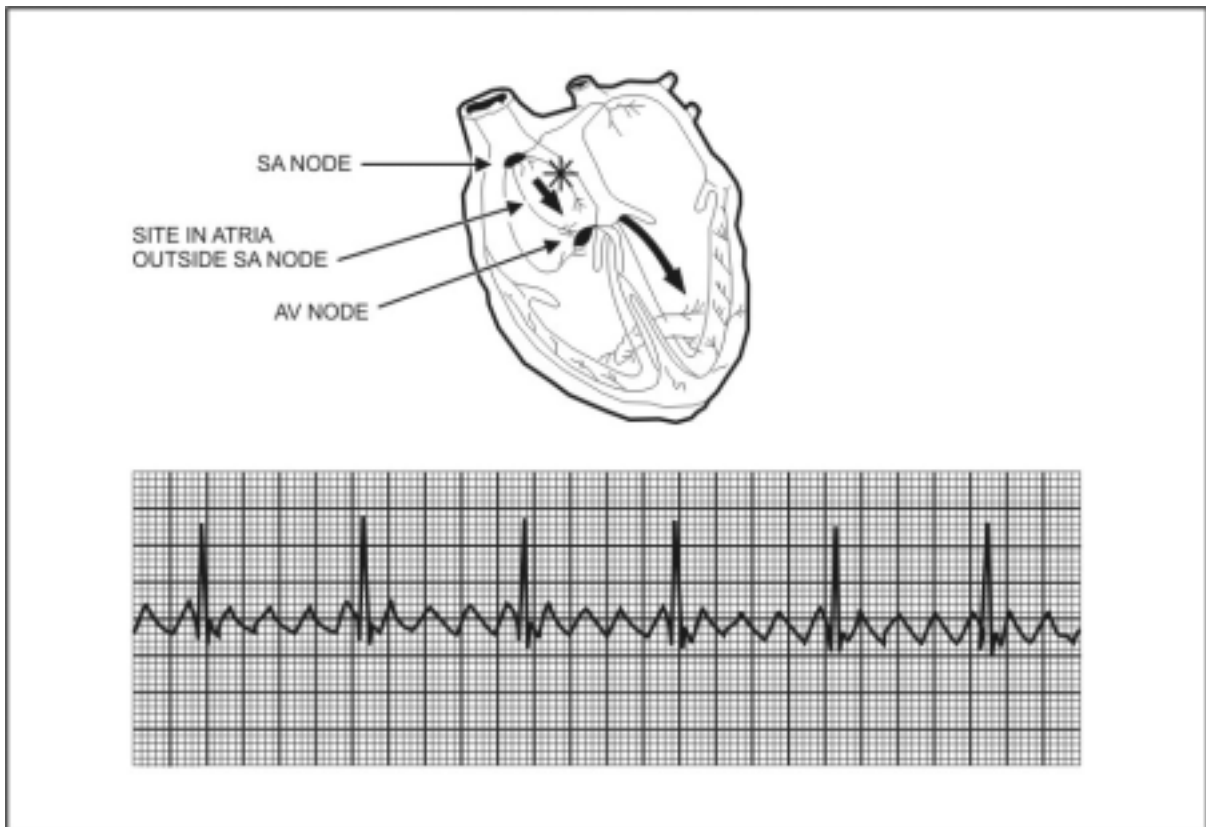


Figure 8. Atrial Flutter

- (1) The pacemaker site is the ectopic foci in the atria outside the SA node.

Performance Steps

(2) Rules of interpretation (Lead II monitoring).

- (a) The atrial rate is 250 to 350 beats per minute and the ventricular rate varies with the ratio of AV conduction.
- (b) The atrial rhythm is regular, where as the ventricular rhythm may be irregular if the block is intermittent.
- (c) The P-waves resemble a sawtooth or picket fence picture. These are called flutter (F) waves. This pattern is often difficult to identify in a 2:1 ratio.

NOTE: If the patient is stable, vagal maneuvers may help identify rhythm by slowing ventricular rate.

- (d) The P-R interval, by definition, does not exist since P-waves have been replaced by F-waves. However, the F-R interval is usually constant.
- (e) The QRS complexes are normal, 0.04 to 0.12 seconds in length.
- (3) Clinical significance of atrial flutter.

- (a) Atrial flutter with normal ventricular rates are generally well tolerated. However with rapid ventricular rates, cardiac output may be compromised and result in symptoms.
- (b) Atrial flutter often occurs in conjunction with atrial fibrillation and is referred to as "atrial fib-flutter."

- f. Atrial fibrillation (Figure 9) results from multiple areas of reentry within the atria or from multiple ectopic foci bombarding an AV node. Atrial fibrillation may be chronic and is often associated with rheumatic heart disease, atherosclerotic heart disease, and atrial dilation, which occurs with congestive heart failure.

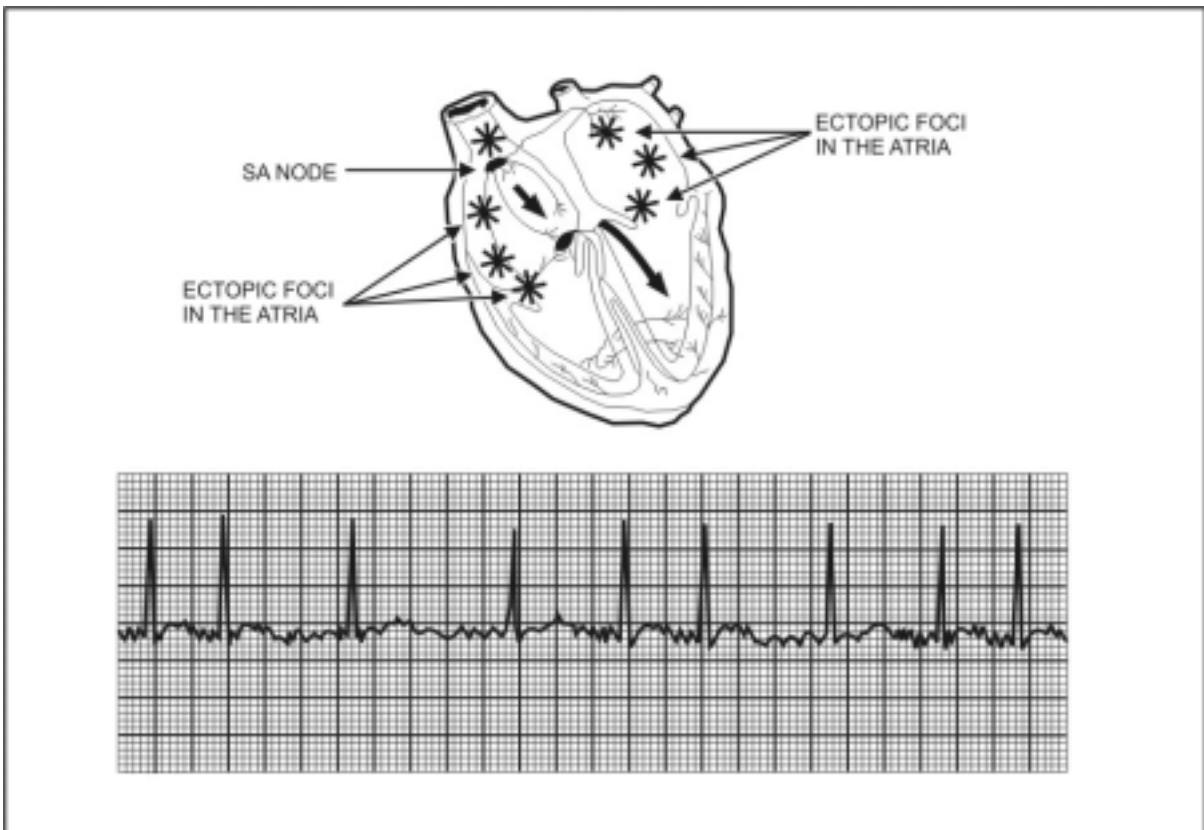


Figure 9. Atrial Fibrillation

NOTE: AV conduction is random and highly variable. The AV node physiologically cannot handle all of the incoming impulses. The strongest impulses are usually the ones that conduct through the AV node.

- (1) Pacemaker sites are numerous ectopic foci in the atria.
- (2) Rules of interpretation (Lead II monitoring).

Performance Steps

- (a) The atrial rate is 350 to 750 beats per minute (usually cannot be counted), and the ventricular rate varies greatly depending on conduction through the AV node.
- (b) The rhythm is always irregular.
- (c) There are NO discernible P-waves present.
- (d) There is NO P-R interval.
- (e) The QRS complexes are normal, 0.04 to 0.12 second in length.
- (3) Clinical significance of atrial fibrillation.
 - (a) The atria fails to contract and the so-called "atrial kick" is lost.

NOTE: Cardiac output is reduced by 20 to 25 percent.

- (b) There is usually a pulse deficit (a difference between the apical and peripheral pulse rate).
- (c) If the ventricular response is normal, as often occurs in patients on digitalis, the rhythm is usually tolerated. If the ventricular rate is less than 60, cardiac output can fall. If the ventricular response is rapid, coupled by the loss of the atrial kick, cardiovascular decompensation may occur, resulting in hypotension, angina, MI, congestive heart failure, or shock.

NOTE: Digitalis toxicity should be suspected in a patient with atrial fibrillation with a ventricular rate of less than 60.

- 9. Determine dysrhythmia originating in the AV junction.
 - a. Junctional dysrhythmia originates within the AV node and AV junction. The most common causes of junctional dysrhythmia are ischemia and hypoxia.

NOTE: The location of the pacemaker site will dictate the morphology of the P-wave.

- b. Characteristics common to all dysrhythmia that originate in the AV junction.
 - (1) Inverted P-wave in Lead II as a result of retrograde depolarization of the atria.
 - (a) The relationship of the P-wave to QRS depolarization is dependent on the relative timing of atrial and ventricular depolarization. The P-wave can occur before the QRS complex if the atria depolarizes first. The P-wave can occur during the QRS complex if the atria and ventricle depolarize simultaneously. However, the P-wave will be masked. The P-wave can occur after the QRS complex if the ventricles depolarize first.
 - (b) Some atrial complexes that originate near the AV node can also result in a negative P-wave.
 - (2) P-R interval of less than 0.12 second.
 - (3) Normal QRS complex duration.
 - c. Premature junctional contraction (PJC) results from a single electrical impulse originating in the AV node that occurs before the next expected sinus beat.

NOTE: PJC can be caused by using caffeine, tobacco, or alcohol; sympathomimetic drugs; ischemic heart disease; hypoxia; and digitalis toxicity.

- (1) Pacemaker sites include the SA node, which is responsible for the underlying sinus rhythm, and an ectopic foci in the AV junction, which is responsible for the PJC.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate depends on the underlying rhythm.
 - (b) The rhythm is irregular because the junctional contraction is coming prematurely.
 - (c) The p-waves are inverted and may appear before, during, or after the QRS complex.
 - (d) The P-R interval will be less than 0.12 second if the P-wave falls before the QRS complex.
 - (e) The QRS complexes are normally 0.04 to 0.12 second; however, they can be greater than 0.12 if the PJC is abnormally conducted through partially refractory ventricles.
- (3) Clinical significance of premature junctional contractions.
 - (a) Isolated PJCs are of minimal significance.
 - (b) Frequent PJCs indicate organic heart disease and may be a precursor to other junctional dysrhythmia.

Performance Steps

- d. Junctional rhythm (junctional escape rhythm) is a dysrhythmia that results when the rate of the primary pacemaker, usually the SA node, becomes less than that of the AV node. Thus, the AV node becomes the pacemaker. The AV node usually discharges at its intrinsic rate of 40 to 60 beats per minute.

NOTE: The AV node is a safety mechanism that prevents cardiac standstill.

- (1) The AV junction is the pacemaker site.
 - (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate is 40 to 60 beats per minute.
 - (b) The rhythm is regular.
 - (c) The P-wave is inverted and may appear before, after, or during the QRS complex. The QRS complex could be absent.
 - (d) P-R interval will vary dependent on when P-wave occurs. If the P-wave occurs before the QRS complex, the P-R interval will be less than 0.12 second. If the P-wave occurs during the QRS complex (or is absent), then there is no P-R interval. If the P-wave occurs after the QRS complex, technically it is an R-P interval.
 - (e) QRS complexes are normally 0.04 to 0.12 seconds; however, they may be greater than 0.12 second.
 - (3) Clinical significance of junctional rhythms.
 - (a) The slow heart rate can decrease cardiac output, possibly precipitating angina or other problems.
 - (b) If the rate is fairly rapid, the rhythm can be well tolerated.
10. Determine dysrhythmia originating in the ventricles.
- a. Dysrhythmia that originates in the ventricles may be caused by ischemia, hypoxia, or medications. The location of the pacemaker site will dictate the morphology of the QRS complex.
 - b. Characteristics common to all dysrhythmia originating in the ventricles.
 - (1) QRS complexes of 0.12 second or greater.
 - (2) Absence of P-waves.
 - c. Premature ventricular contraction (PVCs) (Figure 10) is a single ectopic impulse arising from an irritable focus in either ventricle, which occurs earlier than the next expected beat. It may result from increased automaticity in the ectopic cell or a reentry mechanism. The altered sequence of ventricular depolarization results in a wide and bizarre QRS complex. The altered sequence of ventricular depolarization can cause the T-wave to occur in the opposite direction to the QRS complex. If more than one PVC occurs, each one can be classified as unifocal or multifocal. PVCs can be caused by myocardial ischemia, hypoxia, acid-base disturbance, electrolyte imbalance, increased sympathetic tone, idiopathic causes, or by a normal variant.

Performance Steps

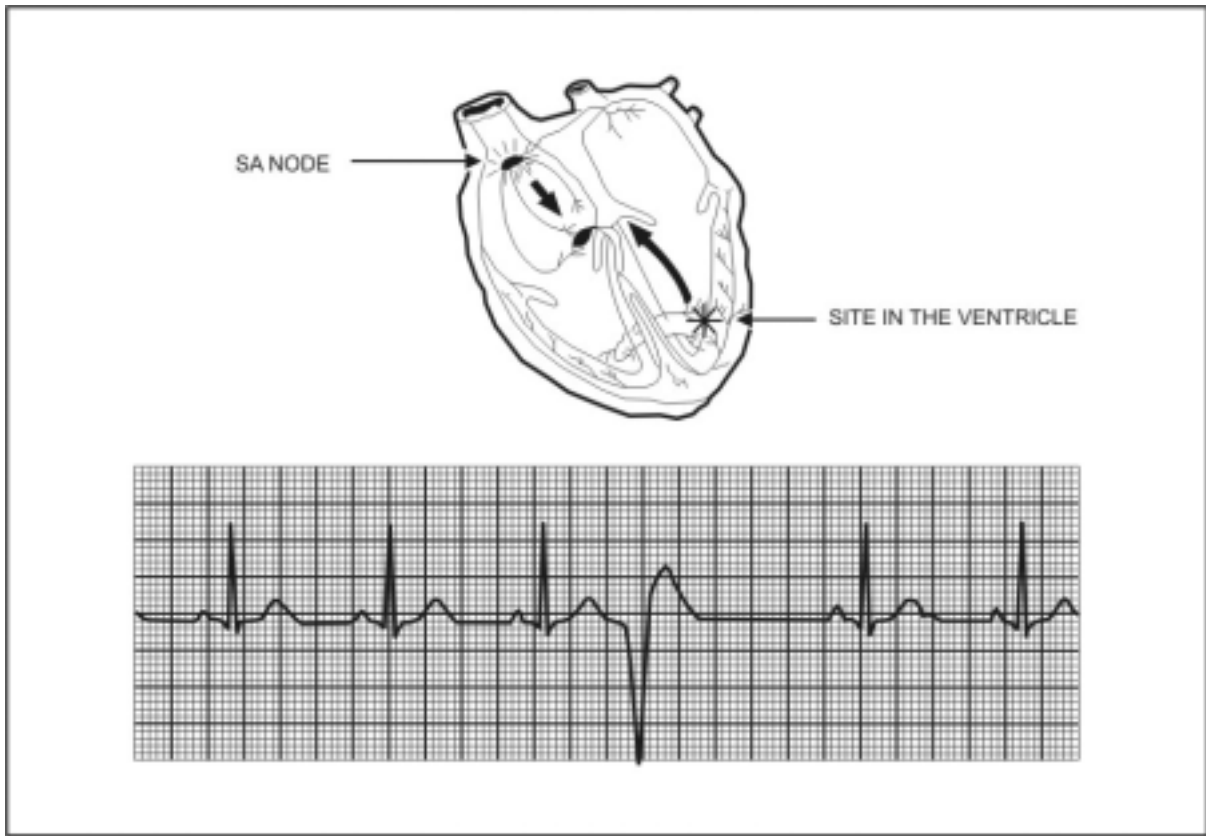


Figure 10. Premature Ventricular Contractions

NOTES:

1. A PVC does not usually depolarize the SA node and interrupt its rhythm. Occasionally a PVC falls between two sinus beats without interrupting the rhythm. This type of PVC is called an "interpolated beat."
2. The morphology of the PVC depends on the location of the ectopic pacemaker. Two PVCs of different morphologies imply two pacemaker sites (multifocal), and PVCs with the same morphology are considered unifocal.
3. PVCs often occur in patterns of group beating:
 - a. Bigeminy: every other beat is a PVC.
 - b. Trigeminy: every third beat is a PVC.
 - c. Quadrigeminy: every fourth beat is a PVC.
 - d. Repetitive PVCs: two PVCs together without a normal complex in between.
 - (1) Couplets: groups of two.
 - (2) Triplets: groups of three (referred to as a run of ventricular tachycardia).
 - e. PVCs can trigger lethal dysrhythmia such as ventricular fibrillation if they fall within the relative refractory period (R on T phenomena).
 - (1) Pacemaker site would be the SA node for the underlying rhythm and ventricles for the PVC.
 - (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate depends on the underlying rhythm and the rate of PVCs.
 - (b) The rhythm will be irregular since the ventricle contracts prematurely. If the PVC follows a pattern, the rhythm will be irregularly regular.
 - (c) The P-waves will be normal in the underlying sinus rhythm. The PVC has no P-wave preceding them.
 - (d) QRS complex is greater than 0.12 second and has a bizarre morphology.

Performance Steps

- (3) Clinical significance of premature ventricular contractions.
 - (a) In patients without heart disease, PVCs may be of no significance (skipped beats).
 - (b) In patients with myocardial ischemia, PVCs may indicate ventricular irritability and may trigger lethal ventricular dysrhythmia.
 - (c) PVCs are often classified as malignant or benign.
- d. Ventricular tachycardia (Figure 11) consists of three or more ventricular complexes in succession at a rate of 100 beats per minute or more. This rhythm overrides the normal pacemaker of the heart, and the atria and ventricles are synchronous. Ventricular tachycardia may be caused by myocardial ischemia, hypoxia, acid-base disturbances, electrolyte imbalance, incorrect sympathetic tone, or idiopathic causes.

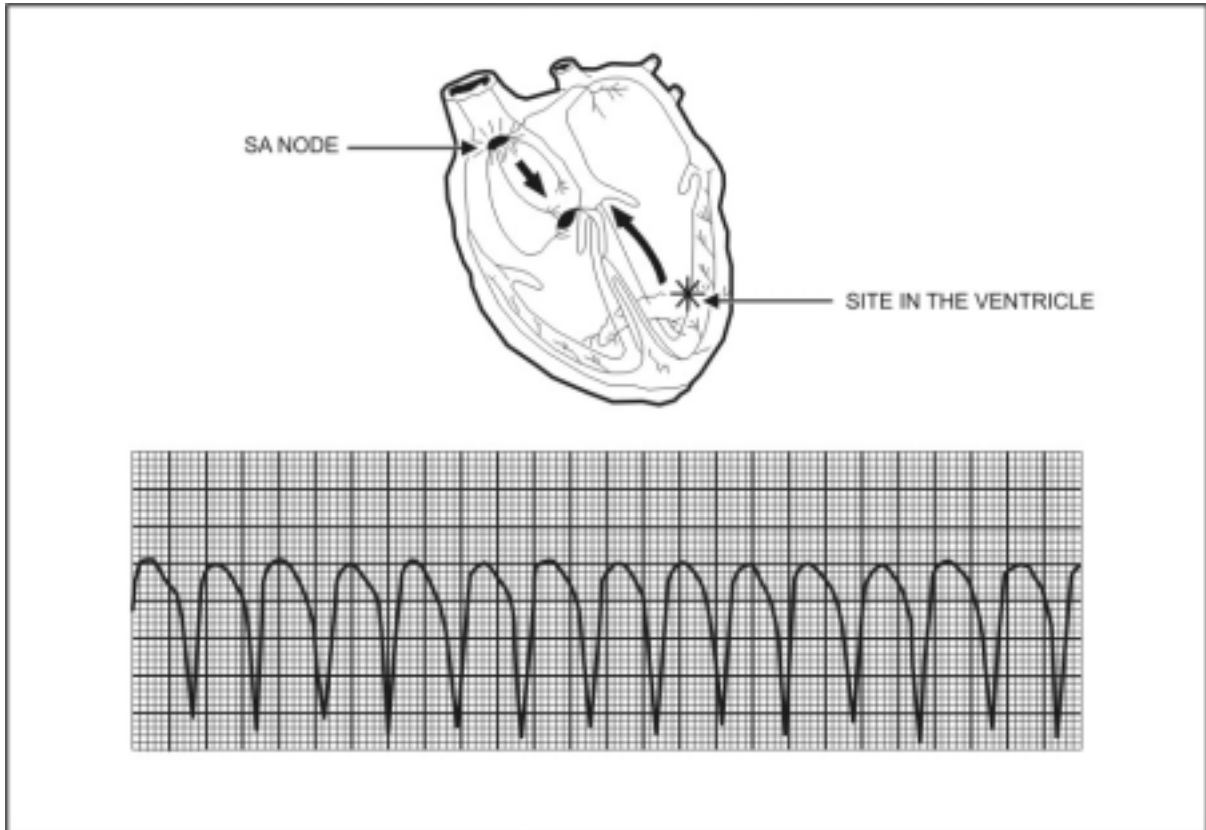


Figure 11. Ventricular Tachycardia

- (1) If sustained ventricular tachycardia is present and the SA node is the pacemaker for the underlying rhythm, the ventricles are the pacemaker.
 - (2) Rules of interpretation (Lead II monitoring).
 - (a) The rate is 100 to 250 beats per minute.
 - (b) The rhythm is regular if sustained ventricular tachycardia is present and irregular if intermittent ventricular tachycardia is present.
 - (c) The P-wave, if present, is not associated with the QRS complexes.
- NOTE: In rates below 150, P-waves can usually be seen.
- (d) P-R interval does not exist.
 - (e) QRS complexes are greater than 0.12 second.
 - (3) Clinical significance of ventricular tachycardia.
 - (a) Ventricular tachycardia usually results in poor stroke volume. This action, coupled with the rapid ventricular rate, may severely compromise cardiac output and coronary artery perfusion.

Performance Steps

- (b) Ventricular tachycardia may be either perfusing or nonperfusing (with a pulse or pulseless).
- (c) Ventricular tachycardia may eventually deteriorate into ventricular fibrillation.
- e. Ventricular fibrillation (Figure 12) is a chaotic ventricular rhythm usually resulting from the presence of many reentry circuits within the ventricles. There is no ventricular depolarization or contraction. Most cases result from advanced coronary artery disease.

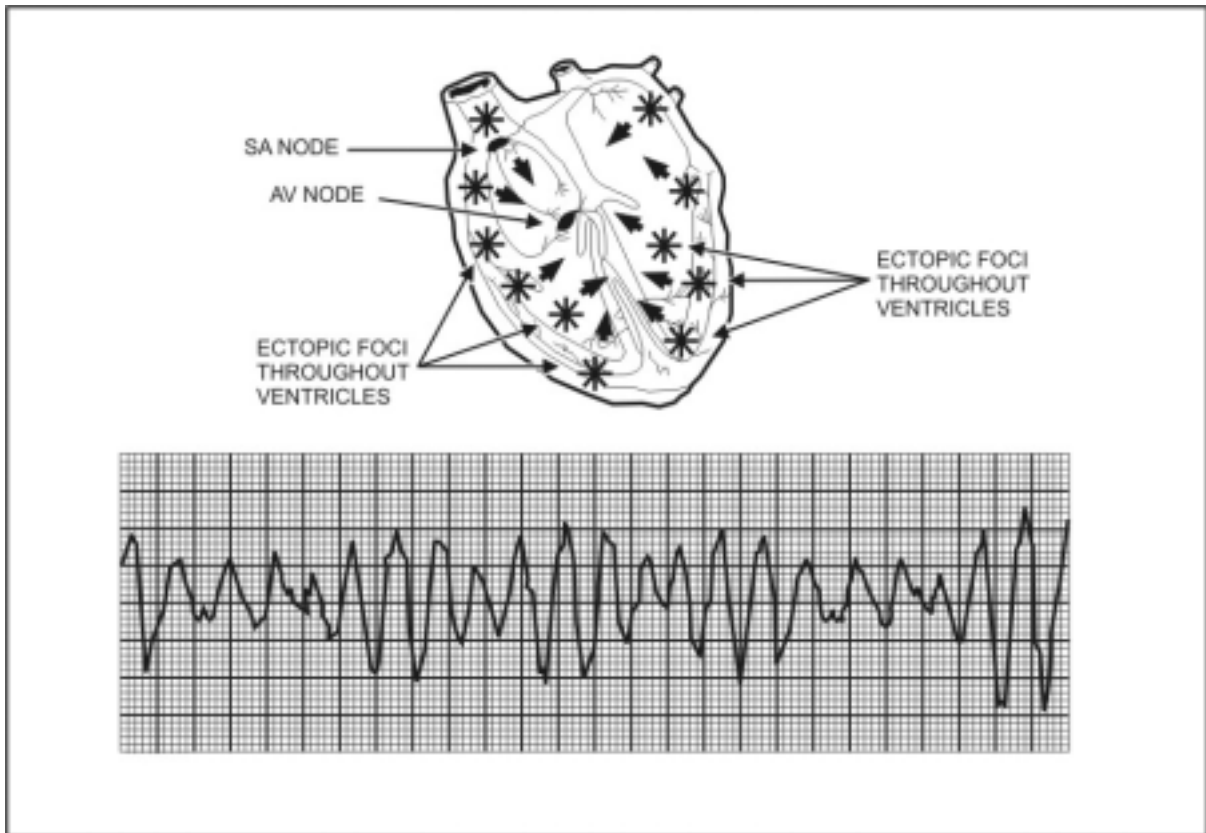


Figure 12. Ventricular Fibrillation

- (1) The pacemaker sites are numerous ectopic foci throughout the ventricles.
- (2) Rules of interpretation (Lead II monitoring).
 - (a) No organized rate.
 - (b) No organized rhythm.
 - (c) No organized P-waves.
 - (d) P-R interval absent.
 - (e) QRS complexes absent.
- (3) Clinical significance of ventricular fibrillation.
 - (a) Ventricular fibrillation is a lethal dysrhythmia.
 - (b) There is no cardiac output or organized electrical pattern (results in cardiac arrest).
- f. Ventricular escape complexes and rhythms (idioventricular rhythm) result when impulses from higher pacemakers fail to reach the ventricles or when the rate of discharge of higher pacemakers becomes less than that of the ventricles (discharge is normally 20 to 40 beats per minute). These complexes and rhythms are caused by the slowing of supraventricular pacemaker sites or high-degree AV block. They are frequently the first organized rhythms seen following defibrillation.

NOTE: Ventricular escape rhythms serve as safety mechanisms to prevent cardiac standstill.

- (1) The pacemaker sites are the ventricles.
- (2) Rules of interpretation (Lead II monitoring).

Performance Steps

- (a) The rate is 20 to 40 beats per minute.
 - (b) The ventricular escape rhythms are usually regular unless the pacemaker site is low in the ventricular conductive system, which makes regularity unreliable and the rhythm irregular in a single ventricle escape complex.
 - (c) The P-wave is not present in sustained ventricular escape beats. If the ventricular escape complexes are intermittent, normal P-wave exists in the underlying sinus rhythm.
 - (d) The P-R interval is absent or sustained in ventricular escape rhythms and are usually normal for the underlying rhythm (when intermittent ventricular escape complexes are present).
 - (e) The QRS complexes are greater than 0.12 second and bizarre in morphology in sustained ventricular escape rhythms. When intermittent ventricular escape complexes are present, QRS complexes are usually normal for the underlying rhythm.
- (3) Clinical significance of ventricular escape complexes and rhythms.
- (a) The slow heart rate can significantly decrease cardiac output, possibly to life-threatening levels.
 - (b) The ventricular escape rhythms are a safety mechanism and should not be depressed.
 - (c) Escape rhythms can be perfusing or nonperfusing (with a pulse or pulseless). Treatment is based on perfusion.
- g. Asystole (Figure 13) may be the primary event in cardiac arrest. It is usually associated with massive MI, ischemia, and necrosis. Asystole is often the end result of ventricular fibrillation, resulting from cases of heart block, in which no escape pacemaker takes over.

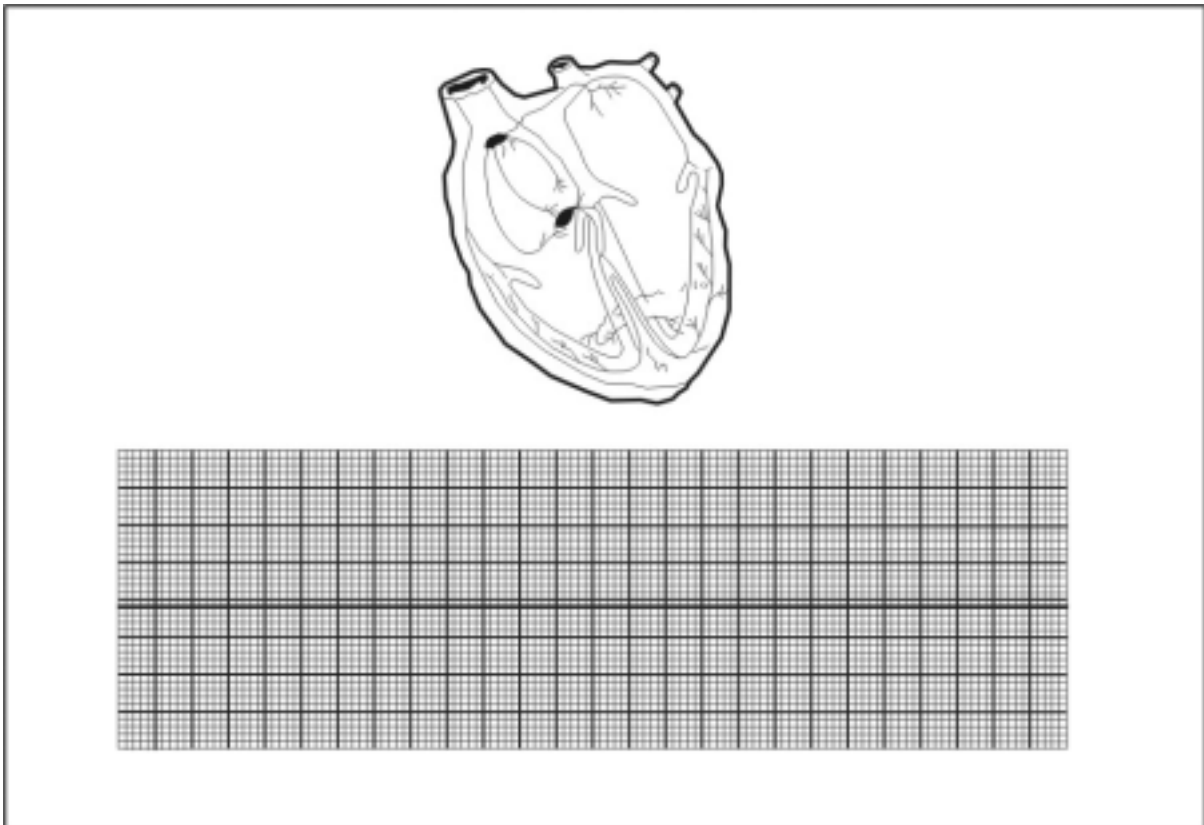


Figure 13. Asystole

- (1) There are no pacemaker sites.

Performance Steps

- (2) Rules of interpretation (Lead II monitoring).
 - (a) No rate.
 - (b) No rhythm.
 - (c) No P-waves.
 - (d) P-R interval absent.
 - (e) No QRS complexes.
- (3) Clinical significance of asystole.
 - (a) Results from cardiac arrest.
 - (b) The program for resuscitation is very poor.

11. Document the information obtained in steps 1 through 10 in accordance with the local standing operating procedure.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Prepared the equipment.	_____	_____
2. Prepared the area.	_____	_____
3. Prepared the patient.	_____	_____
4. Applied the electrodes.	_____	_____
5. Interpreted the rhythm strip by using the five-step procedure.	_____	_____
6. Considered the possible causes of the dysrhythmia.	_____	_____
7. Determined the location of the dysrhythmia.	_____	_____
8. Documented the information.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

ACLS 1997-1999
 BASIC ARRHYTHMIAS, 4TH ED
 EMT-P, BRADY 3RD ED. 1997

Perform Blood Transfusion

081-833-4069

Conditions: Given a casualty who requires an intravenous (IV) transfusion of whole blood and who has two large-bore IVs already established, thermometer, blood pressure cuff, stethoscope, gloves, tourniquet, alcohol and betadine preparation pads, IV catheter, tape, blood transfusion recipient set ("Y" type), 500-milliliter (ml) or 1,000-ml bag of 0.9 percent normal saline (NS), blood, IV stand, needle and syringe, and patient's record..

Standards: Administer the blood properly and safely without causing injury to the casualty.

Performance Steps

NOTE: It has already been determined that the casualty requires a blood transfusion in accordance with (IAW) task 081-833-4678, Assess Blood Replacement Requirements.

1. Order type-specific or type O blood or blood component based on the type and crossmatch.
2. Verify and inspect the blood pack received from the laboratory.

NOTE: Infusion of a blood pack should be initiated within 30 minutes of being issued.

- a. Note the time the blood pack was received, and record the time on the blood pack.

NOTE: Two people, if possible, should verify and match the information from the type and crossmatch with the label on the blood.

- b. Check the label for blood components, blood type, and expiration date.
- c. Inspect the blood for abnormalities such as gas bubbles or black- or gray-colored sediment (indicative of bacterial growth).

NOTE: Return the blood pack to the blood bank if it is the wrong type, expired, or any abnormality is present or suspected.

3. Establish baseline data.
 - a. Reconfirm data from the patient's history regarding allergies or previous reactions to blood or blood products.
 - b. Measure and evaluate the vital signs.
 - c. Record the vital signs on the nursing notes.
4. Reduce the chances of reactions by applying prophylactic measures.
 - a. At the bedside, meticulously identify and label with indelible marker the casualty's blood samples intended for compatibility testing.
 - b. Ensure that blood has been screened for hepatitis, acquired immunodeficiency syndrome (AIDS), malaria, and syphilis.
 - c. Carefully identify casualty and donor blood at the time of transfusion.
 - (1) Identify casualty by identification (ID) tags, ID bracelet, or other means.
 - (2) Identify the donor blood and have a second person check the blood and the casualty, if possible.
 - d. Handle blood products with care to prevent hemolysis or destruction of red blood cells (RBCs) by overwarming stored blood.
 - (1) Warming devices applied to the blood container itself (for example, microwave warmers) are contraindicated for the following reasons:
 - (a) A high incidence of hemolysis occurs.
 - (b) Any interruption in transfusion may encourage bacterial growth in unused warmed blood.
 - (c) The blood bank will not know if unused blood has been warmed and rechilled.
 - (2) Use an IV set that includes a heat exchange device, if available, to warm blood gently (but not greater than 37 degrees Centigrade (C) [98.6 degrees Fahrenheit (F)]) during delivery.
 - e. Prevents contact with inappropriate IV solutions such as injections of distilled water or nonisotonic solutions.

Performance Steps

- f. In a patient with a history of allergies or an allergic transfusion reaction, give an antihistamine prophylactically just before or at the beginning of the transfusion (for example, diphenhydramine 50 milligrams [mg] orally or intramuscularly [IM]). Antihistamine must never be mixed with the blood.
- g. In cases where pulmonary overload is possible, whole blood is contraindicated. A rise in venous pressure can be avoided by infusing RBCs at a slow-to-moderate rate. The patient should be observed for signs of increased venous pressure or pulmonary congestion. If possible, direct observation of venous pressure during the infusion is a useful precaution.

NOTE: Prolonged transfusions pose a hazard of bacterial growth because blood quickly reaches room temperature.

- h. Administer the first 10 to 30 ml over 15 minutes, while observing the patient for reactions.
- i. Use transfusion sets, which include a filter to trap the clots and fibrin shreds present in stored blood units.
- j. For patients likely to receive large amounts of blood that have been stored more than 5 or 6 days, use microaggregate filters to remove particles as small as 20 to 40 micrometers (μm).

CAUTION: Manufacturers' instructions should be consulted.

NOTE: Microaggregates can be detected in the lungs after massive transfusions and have been implicated as a cause of the syndrome of posttraumatic pulmonary insufficiency, though direct evidence is lacking.

- k. Guard against air in tubing with any pressure infusion and when changing IV sets to prevent air embolism.

5. Prepare the blood and the blood recipient set.

NOTE: Use only tubing that is designed for the administration of blood products. It is equipped with a filter designed for the fine filtration required for blood products.

- a. Close all three clamps on the "Y" tubing.
- b. Aseptically insert one of the tubing spikes into the container of normal saline (NS). Invert and hang this container about 3 feet above the level of the patient.
- c. Open the clamp on the NS line, and prime the upper line and the blood filter.
- d. Open the clamp on the empty line on which you will eventually hang the blood. NS will flow up the empty line to prime that portion of the tubing.

NOTE: Use only 0.9 percent NS with blood. Other solutions are not compatible.

- e. Once the blood line is primed with saline, close the clamp on the blood line.
- f. Leave the clamp on the NS line open.
- g. Open the main roller clamp to prime the lower infusion tubing.
- h. Close the main roller clamp.
- i. Aseptically expose the blood port on the blood pack.
- j. Aseptically insert the remaining spike into the blood port, and hang the blood at the same level as the NS container.

NOTE: If "Y" type recipient tubing is not available, use regular infusion tubing for the NS and the available blood recipient tubing for the blood pack. Prime each set. Attach a sterile, large bore (16- or 18-gauge) needle to the end of the blood tubing, and "piggyback" the blood into the NS line below the level of the roller clamp. Hang the blood pack at least 6 inches higher than the NS.

6. Connect the bloodline.

- a. Patients receiving blood should have two patent IV sites in the event of complications or emergencies.
 - (1) Establish one or two new IV sites (task 081-833-0033, Initiate an Intravenous Infusion), as needed.
 - (2) Use a large gauge IV catheter (14, 16, or 18) to enhance the flow of blood and prevent hemolysis of the cells.
- b. If the patient already has two IV sites, aseptically switch the blood line with one of the existing IV lines or piggyback the blood line into an existing IV line.

Performance Steps

NOTE: Insert a large gauge IV catheter (14, 16, or 18) for administering blood to an adult patient. This will enhance the flow of blood and prevent hemolysis of the cells.

7. Begin the infusion of blood.

- a. Attach the primed infusion set to the catheter, tape it securely, and open the main roller clamp.

NOTE: If a preexisting catheter is being used, run in 50 cubic centimeters (cc) of NS to flush out any incompatible solution. If a new catheter was inserted, this step is not required.

- b. Close the roller clamp to the NS, and open the roller clamp to the blood.
c. Adjust the flow rate with the main roller clamp.

(1) Set the flow rate to deliver approximately 10 to 30 cc of blood over the first 15 minutes.

NOTE: When delivering blood by piggyback, begin the infusion by opening the roller clamp on the NS line and setting it at a to-keep-open (TKO) rate. Adjust the roller clamp on the blood line to deliver 10 to 30 cc of blood over the first 15 minutes.

(2) Monitor the vital signs every 5 minutes for the first 15 minutes, and observe the casualty for indications of an adverse reaction to the blood.

CAUTION: Anytime an adverse reaction is suspected, immediately stop the blood and infuse NS.

(3) If after the first 15 minutes no adverse reaction is suspected and the vital signs are stable, set the main roller clamp to deliver the prescribed flow rate.

NOTE: Use the correct formula to calculate flow rate.

8. Monitor and evaluate the patient throughout the procedure.

- a. Monitor vital signs every 15 minutes or IAW local standing operating procedure (SOP).
b. Compare the vital signs with previous and baseline vital signs.
c. Observe the casualty for changes that indicate an adverse reaction to the blood.
d. If a reaction is suspected, stop the blood, infuse NS, and identify and treat the reaction IAW task 081-833-4070, Manage Blood Transfusion Reactions.

CAUTION: When a transfusion reaction occurs or is suspected, the unused blood and recipient tubing must be sent to the laboratory along with a 10 ml specimen of the patient's venous blood and a posttransfusion urine specimen.

9. Discontinue the infusion of blood when the patient's vital signs have stabilized or the transfusion is finished.

- a. Close the clamp to the blood and open the clamp to the NS.
b. Flush the tubing and filter with approximately 50 cc of NS to deliver the residual blood.
c. After the residual blood has been delivered, run the NS at a TKO rate or hang another solution, as needed.
d. Take and record the vital signs at the completion of the transfusion and 1 hour after completion.

NOTE: As a rule, a unit of blood should be infused within 2 to 4 hours unless contraindicated by risk of circulatory overload.

10. Dispose of the used blood pack IAW local SOP.

- a. Return it to the laboratory blood bank.
b. Discard it in a container for contaminated waste.

11. Document the procedure and significant observations in the patient's record IAW local SOP.

Performance Measures

NOTE: It has already been determined that the casualty requires a blood transfusion IAW task 081-833-4678 Assess Blood Replacement Requirements.

1. Ordered type-specific or type O blood or blood component based on the type and crossmatch.
2. Verified and inspected the blood pack.
a. Noted the time the blood pack was received and recorded the time.
b. Checked the label for blood components, type, and expiration date.

GO **NO GO**

Performance Measures	<u>GO</u>	<u>NO GO</u>
c. Inspected the blood for abnormalities such as gas bubbles or black or gray colored sediment (indicative of bacterial growth).		
3. Established and recorded the patient's baseline data.	—	—
4. Reduced the chances of reactions by applying prophylactic measures.	—	—
5. Properly prepared the blood and transfusion recipient sets.	—	—
6. Ensured the patient has 2 patent IVs before connecting the blood.	—	—
7. Connected the bloodline correctly and without contamination.	—	—
8. Administered the first 10 to 30 ml of blood over 15 minutes.	—	—
a. Monitored vital signs every 5 minutes for first 15 minutes.		
b. Checked for signs and symptoms of adverse reactions.		
c. Stopped the transfusion at the first sign of reaction.		
d. Upped the flow rate after 15 minutes when no signs of reaction occurred.		
9. Monitored and evaluated the patient throughout the procedure.	—	—
a. Monitored vital signs every 15 minutes or IAW local SOP.		
b. Compared the vital signs with previous and baseline vital signs.		
c. Observed for changes that indicated an adverse reaction to the blood.		
d. When a reaction was suspected, stopped the blood, infused normal saline, and identified and treated the reaction.		
10. Discontinued the infusion of blood when the patient's vital signs had stabilized or the transfusion was finished.	—	—
11. Disposed of the used blood pack IAW local SOP.	—	—
12. Documented the procedure on the appropriate forms IAW local SOP.	—	—
13. Monitored patient after completion of transfusion.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
TM 8-227-12
TM 8-227-3

Manage Blood Transfusion Reactions

081-833-4070

Conditions: Given a patient who has received or is receiving a transfusion of whole blood or a blood component, a thermometer, blood pressure cuff, stethoscope, gloves, tourniquet, alcohol and betadine preparation pads, intravenous (IV) catheters, tape, blood transfusion recipient sets ("Y" type), 500-milliliter (ml) or 1,000-ml bag of 0.9 percent normal saline (NS), blood, IV stand, needles and syringes, Ringer's lactate, Benadryl, epinephrine 1:1,000 solution, oxygen and related equipment, mannitol, bicarbonate, Tylenol or Ibuprofen, and the patient's clinical record.

Standards: Correctly identify the cause of a blood transfusion reaction, and manage the reaction without causing further injury to the patient.

Performance Steps

NOTE: Patient has received or is receiving a transfusions in accordance with (IAW) 081-833-4069, Perform Blood Transfusion.

1. Monitor the patient during and after transfusion.
2. Compare baseline vital signs to current vital signs.
3. Monitor the site of the infusion for edema, warmth, and urticaria.
4. Examine the patient for systemic signs and symptoms of reaction.
5. Identify the type of reaction based on the signs and symptoms.
 - a. Hemolytic reactions result in the hemolysis of recipient or donor red blood cells (RBCs) (usually the latter) during or after administration of solutions, plasma, blood, or blood components.

NOTE: Hemolytic reaction is rare but is the most severe transfusion reaction. It usually starts within the first 10 minutes of the transfusion. The most severe reaction occurs when donor RBCs are hemolyzed by antibody (Ab) in the recipient's plasma.

- (1) Onset is usually acute, within 1 hour; it may occur during or immediately after a transfusion.
- (2) Patient complains of discomfort and anxiety or may have no symptoms.
- (3) Patient may experience breathing difficulty, precordial oppression, a bursting sensation in the head, facial flushing, and severe pain in the neck, the chest, and especially the lumbar area.
- (4) Patient may show signs of chills, fever, and evidence of shock--a rapid and feeble pulse, cold and clammy skin, dyspnea, drop in blood pressure (BP), nausea, and vomiting.
- (5) Patient may pass dark urine, have an elevated bilirubin count, and show signs of clinical jaundice. Free hemoglobin (Hb) may be found in the plasma and urine.

NOTE: Group O whole blood, the plasma of which contains anti-A and anti-B of the hemolytic or immunoglobulin gamma (IgG) form, may be dangerous when given in emergencies to a recipient with another blood group. The plasma, which contains most of the antibodies, should be removed first. Therefore, Group O RBCs should be used rather than whole blood.

- b. Febrile reactions.
 - (1) Signs and symptoms within 30 minutes.
 - (2) Reactions consisting of chills and fever with a rise of at least 1 degree centigrade (C).
 - (3) Sometimes headache and back pain.
 - (4) Stable vital signs.
 - (5) Rarely progressing to cyanosis and shock.
- c. Allergic reactions are most common with multiple transfusions and in people with a history of allergies.
 - (1) Signs and symptoms of mild reactions include rashes, urticaria, edema, occasional dizziness, fever, and headache during or immediately after the transfusion.

Performance Steps

- (2) Signs and symptoms of severe reactions include dyspnea, wheezing, tracheal edema, and incontinence may be present, indicating a generalized spasm of smooth muscle.

NOTE: Severe reactions occur less frequently.

- (3) Rarely, anaphylaxis may occur.
- d. Circulatory overload.
 - (1) Dyspnea.
 - (2) Sudden anxiety.
 - (3) Neck vein distention.
 - (4) Crackles at the base of the lungs (signs of pulmonary edema).
- e. Transmission of large amounts of air into a vein can cause foaming of blood in the heart with consequent inefficient pumping, leading to heart failure.

NOTE: Air embolism is largely a complication of pressure infusion of blood from rigid glass bottles, but it can also happen when an IV set is changed or a plastic blood bag is erroneously vented.

- f. Rapid transfusion of cold blood can cause arrhythmia or cardiac arrest.

6. Initiate the appropriate treatment for the transfusion reaction.

- a. Treatment for hemolytic reactions.
 - (1) Stop the transfusion immediately, and change the IV tubing.
 - (2) Leave the needle in place, and reconnect the new tubing to the needle.
 - (3) Send a sample of the patient's fresh blood and urine to the laboratory for analysis, if possible.
 - (4) Start Ringer's lactate or NS IV to correct hypotension.
 - (5) Monitor vital signs and urine output.
 - (6) Administer oxygen.
 - (7) Administer medications.
 - (a) To establish osmotic diuresis, start an infusion of mannitol 20 grams (g) IV (for example, 100 ml of 20 percent solution) at once and continue it at 10 to 15 milliliters per minute (ml/min) until 1,000 ml (200 g) have been given.
 - (b) If diuresis ensues, mannitol should be continued to a maximum of 100 grams per day (gm/day), or volume may be maintained with other IV fluids until hemoglobinemia and hemoglobinuria have cleared.
 - (c) Bicarb IV (one ampule per liter of fluid given).
 - (d) Benadryl 50 mg intramuscular (IM).
 - (8) Use blankets to relieve chills.

NOTE: Lasix may be substituted for mannitol to maintain urine output.

- b. Treatment for febrile reactions.
 - (1) Febrile transfusion reactions can usually be managed with antipyretics and gentle patient cooling.
 - (2) Change tubing, but keep the venous access open with normal saline.
 - (3) Check the patient's temperature every 30 minutes.
 - (4) Give Tylenol or Ibuprofen for fever.
 - (5) Document the episode, time, and IV fluid given.
 - (6) When symptoms recur with blood that is otherwise compatible, further transfusions should consist of RBCs that have been washed or specially filtered to remove white blood cells (WBCs).
- c. Treatment for allergic reactions.
 - (1) Stop the transfusion, and change the tubing.
 - (2) An antihistamine usually controls mild cases (for example, diphenhydramine 50 milligrams [mg] IM or IV).
 - (3) Administer fluids, Ringer's lactate or NS IV, to support BP.
 - (4) Give Tylenol or Ibuprofen for pain.
 - (5) For more severe reactions:
 - (a) Epinephrine 0.5 to 1 ml of 1:1,000 solution subcutaneously (SQ) (or, in extreme emergencies, 0.05 to 0.2 ml of 1:1,000 solution diluted to 1:10,000 and injected slowly by IV) should be given.

Performance Steps

- (b) Give Benadryl 50 mg IV immediately (stat) and then 50 mg by mouth (PO) every 4 hours (q4h).
 - (c) Start IV NS at a rate to support BP.
 - (d) A corticosteroid (for example, dexamethasone sodium phosphate, 4 to 20 mg IV) may occasionally be required.
 - d. Treatment for circulatory overload.
 - (1) The transfusion should be discontinued immediately.
 - (2) Place the patient in an upright position.
 - (3) Keep the IV line open with a slow infusion of normal saline.
 - (4) Use diuretics (Lasix) and morphine if necessary.
 - e. Treatment for air embolism.
 - (1) Stop the source of the air, and bleed or replace the line.
 - (2) Turn the patient on his left side with his head down to allow the air to escape a little at a time from the right atrium.
 - (3) Monitor the patient for pulmonary or cerebral embolisms.
 - f. Treatment for arrhythmia or arrest due to infusion of cold blood.
 - (1) Stop the infusion.
 - (2) Manage the arrhythmia or arrest.
 - (3) Warm the blood before resuming infusion.
7. Explain to the patient that there are possible late complications of blood transfusions. The patient should notify clinic personnel immediately if he develops signs or symptoms of late complications.
- a. Serum hepatitis.
 - b. Malaria.
 - (1) Can be transmitted by asymptomatic donors.
 - (2) Patients may develop high fever and headaches weeks after the transfusion.
 - c. Syphilis.
- NOTE: Storing blood for more than 96 hours at 4 degrees Celsius inactivates the spirochetes.
- d. Acquired immunodeficiency syndrome (AIDS) virus.
- NOTE: All donated blood should be tested for antibodies to the AIDS virus.
- e. Delayed hemolytic reactions can occur from 1 to 2 weeks after transfusion.
 - (1) Fever.
 - (2) Mild jaundice.
 - (3) Gradual fall in hemoglobin level.
 - (4) Positive Coombs test.
 - f. Bacterial infection.
 - (1) A few contaminating bacteria, particularly gram-negative, can grow in refrigerated blood and may cause severe reactions and sepsis if transfused.
 - (2) Procedures that allow blood to reach room temperature (prolonged transfusions or warming blood) may accelerate bacterial growth and are potentially hazardous.
8. Record all treatment given.
9. Recommend evaluation by a physician.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Observed the patient during and after transfusion.	—	—
2. Compared baseline vital signs to current vital signs.	—	—
3. Monitored the site of the infusion for edema, warmth, and urticaria.	—	—
4. Examined the patient for systemic signs and symptoms of reaction.	—	—
5. Identified the type of reaction based on the signs and symptoms.	—	—
a. Hemolytic reactions		

Performance Measures	<u>GO</u>	<u>NO GO</u>
b. Febrile reactions.		
c. Allergic reactions		
d. Circulatory overload.		
e. Other complications, such as air embolisms and arrhythmias or cardiac arrests due to infusion of cold blood.		
6. Initiated prompt, appropriate treatment for the reaction.	_____	_____
7. Advised the patient of the late complications of a blood transfusion.	_____	_____
8. Recorded all treatment given.	_____	_____
9. Recommended evaluation by a physician.	_____	_____
10. Caused no further harm to the patient.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
TM 8-227-12
TM 8-227-3

Initiate an Intraosseous Infusion
081-833-4071

Conditions: Given alcohol swabs, intraosseous needles, a prepped intravenous (IV) administration set, and IV solution.

Standards: Observe universal precautions, clean the administration site, insert an intraosseous needle, and administer fluids via the intraosseous route without breaking aseptic technique or causing subcutaneous infiltration of the IV solution.

Performance Steps

NOTE: Intraosseous infusion should only be used in unconscious or gravely ill children under 6 years of age when peripheral cannulation is unobtainable.

1. Apply gloves for personal and patient protection.
2. Clean the site as for an IV infusion (task 081-833-0033, Initiate an Intravenous Infusion).
NOTE: The site of choice for intraosseous infusion is the superior portion of the tibia, 1 to 2 finger breadths below the tibial tuberosity .
3. Select an intraosseous (bone marrow) needle or 16-gauge spinal needle.
4. Use a boring or screwing motion to advance the needle distally (away from the epiphysial plate) at a 45-degree angle until it penetrated into the marrow.
NOTE: There should be a decrease in the resistance to advancement.
5. Aspirate bone marrow into a saline-filled syringe. (It will not always be possible to aspirate marrow.)
6. Infuse 5 to 10 milliliters (ml) of normal saline (NS) by syringe to ensure correct placement and to clear clots.
7. Secure the needle with tape, if necessary.
8. Attach an IV infusion set as with normal IV infusion.
NOTE: Crystalloid solutions, blood, and most advanced cardia life support (ACLS) drugs can be administered by this route.
9. Recognize the contraindications to intraosseous infusion.
 - a. Fracture at or proximal to the infusion site.
 - b. Traumatized extremity.
 - c. Cellulitis at the infusion site.
 - d. Congenital bone disease.
10. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must initiate an intraosseous infusion. The actual insertion of the intraosseous needle should be simulated for training purposes.

Performance Measures	GO	NO GO
1. Recognized the contraindications to intraosseous infusion.	—	—
2. Donned gloves.	—	—
3. Cleaned the site.	—	—
4. Selected an intraosseous needle or 16-gauge spinal needle.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Used a boring or screwing motion to advance the needle distally at a 45-degree angle until it penetrated into the marrow.	_____	_____
6. Aspirated bone marrow into a saline-filled syringe.	_____	_____
7. Infused 5 to 10 ml of NS by syringe to ensure correct placement and to clear clots.	_____	_____
8. Secured the needle with tape, if necessary.	_____	_____
9. Attached an IV infusion tube.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
ACLS 1997-1999

Dispense Common Fluid and Electrolyte Solutions

081-833-4080

Conditions: Given a patient with a functional intravenous (IV) infusion, pen, and Standard Form (SF) 511 (Medical Record--Vital Signs Record) or a suitable substitute.

Standards: Choose the correct fluid solution, and determine the proper amount to give for the chosen solution.

Performance Steps

NOTES:

1. Figure 1 is a flow chart of fluid resuscitation in trauma.
2. Some of the red-cell substitutes covered in this task will not be available for several years.
 1. Select the most appropriate fluid or fluids on the basis of the patient's situation and condition.

Performance Steps

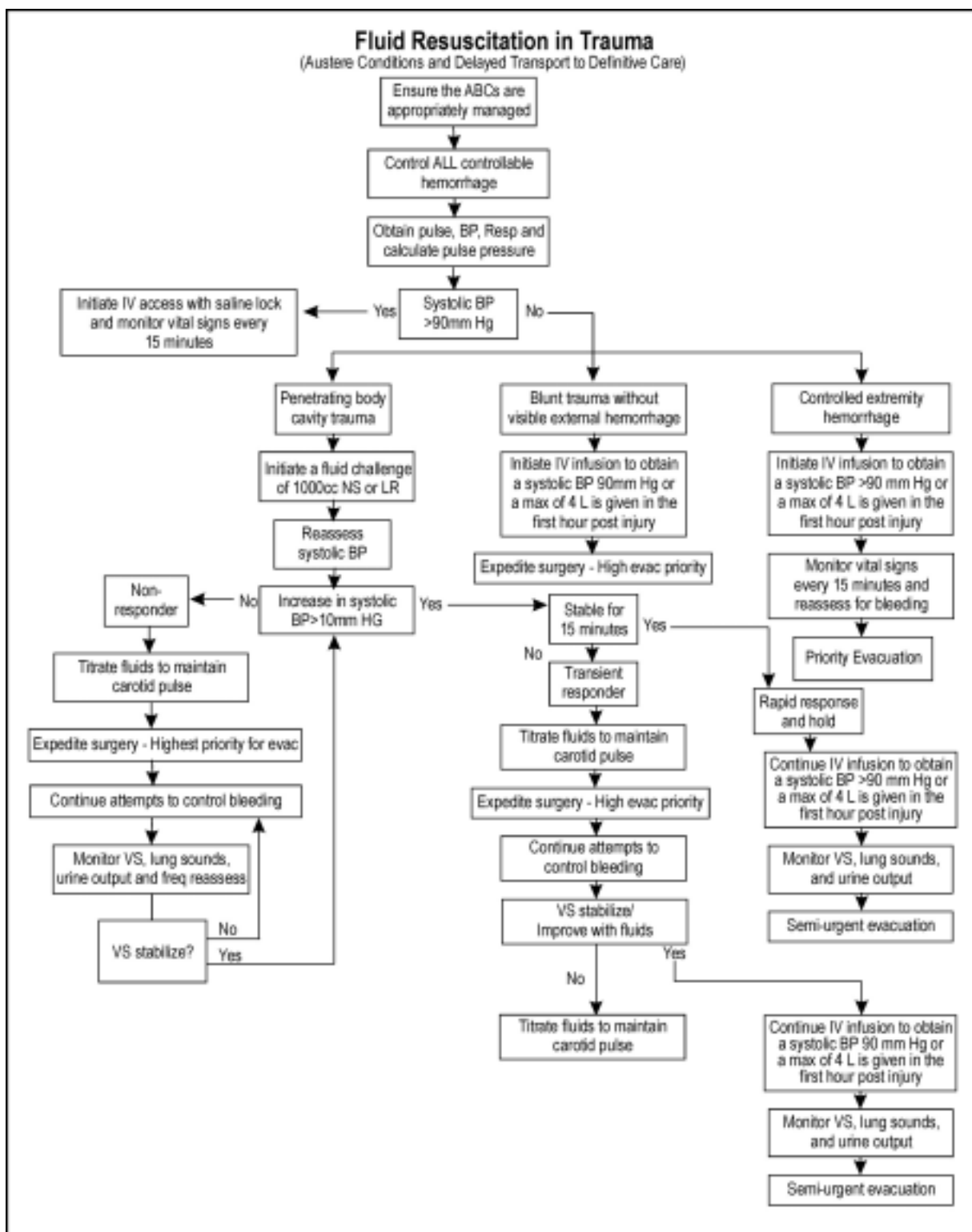


Figure 1. Fluid Resuscitation in Trauma Flow Chart

- a. Crystalloid fluids are IV fluids that are easily manufactured and serve to replace blood volume.

Performance Steps

- (1) Advantages of crystalloids: easy to transport, require no special storage, inexpensive, and few side effects.
- (2) Disadvantages of crystalloids: do not carry oxygen (O₂), and they lose up to 70 percent of their vascular volume 2 hours after administration.
- (3) Ringer's lactate is an isotonic crystalloid that most closely resembles the electrolyte composition of blood.
 - (a) It is the single fluid of choice for a patient in a field environment with hemorrhagic shock.
 - (b) It is the initial fluid of choice for fluid replacement in a burn patient.
 - (c) It is contraindicated in patients with crush injuries or hypothermia.
- (4) Normal saline (NS) at 0.9 percent is an isotonic crystalloid that contains just the electrolytes lost during disease processes (diarrhea and vomiting) or overexertion.
 - (a) It is the fluid of choice for hypovolemia that results from dehydration.

WARNING: Pediatrics and infants require special consideration to maintain electrolyte balance. Consult The Merck Manual before managing dehydration in these cases.

- (b) It is the fluid of choice for IV lifelines, medication lines, and administration of blood products.
- (c) It is the secondary fluid of choice for a trauma patient in a field environment.
- (d) Comes in different concentrations; for example, .045 sodium chloride.
- (5) Dextrose is a specialized crystalloid that is generally used for certain medical conditions.
 - (a) Used for hypoglycemia and to provide energy (dextrose) for patients requiring IV feedings.
 - (b) Does not provide volume replacement and unless it is a combined with NS, provides few or no electrolytes.
 - (c) Comes in varying concentrations.
- b. Colloids or plasma expanders are suspensions of large organic molecules that are used to expand intravascular volume of hypovolemic patients.
 - (1) Advantages of colloids:
 - (a) The administration of 500 cubic centimeters (cc) of colloid solution can result in an 800 cc increase in intravascular fluid.
 - (b) The fluid stays in the vascular system for longer, up to 8 hours.
 - (2) Disadvantages of colloids:
 - (a) Cost a lot more than crystalloids.
 - (b) Have a shorter shelf life (about 2 years) and requires a few extra handling and storage considerations.
 - (c) Do not contain the electrolytes of crystalloids.
 - (d) No O₂-carrying capability.
 - (e) Increased chance of side effects or adverse reactions.
 - (3) Hespan and Dextran are examples of plasma expanders.
 - (a) Max dose of Hespan is 1,500 milliliters (ml).
 - (b) Administered at a 1:1 replacement ratio.
- c. Hespan and normal saline (NS) can be administered together for the management of hypovolemic shock. They are considered the FLUIDS of choice if the situation permits.
 - (1) Use a 1:1 ratio.
 - (2) Administered by piggyback, alternating fluid or at two different infusion sites.
- d. In a clinical or hospital setting, whole blood and blood products are the treatments of choice for hypovolemia caused by trauma, provided the patient meets the criteria established in task 081-833-4678, Assess Blood Replacement Requirements.
 - (1) Blood products are very difficult to store, require type compatibility, and can transmit disease.
 - (2) Whole blood is used for rapid, massive blood loss and exchange transfusions. Whole blood may be necessary if specific blood components are unavailable.
 - (3) Packed red blood cells (RBCs) are also used for rapid, massive blood loss and exchange transfusions. Packed RBCs are the preferred choice due to less chance of complications. Packed red blood cells are the best volume expander.

Performance Steps

- (a) Transfused to replace hemoglobin (Hb) or O₂ carrying capacity, including blood lost at surgery or as a result of trauma.
- (b) When volume expansion is required, other fluids can be used concurrently or separately.
- (4) Fresh frozen plasma is an unconcentrated source of all clotting factors except platelets.
 - (a) Used to correct a bleeding tendency of unknown cause or one associated with liver failure.
 - (b) Can supplement RBCs when whole blood is unavailable for exchange transfusion.
 - (c) Except when prepared from autologous donations, not ordinarily used as a volume expander.
- (5) Washed RBCs (by continuous-flow washing) are free of almost all traces of plasma, most white blood cells (WBCs), and platelets. Washed RBCs are used for patients who have severe reactions to plasma (for example, severe allergies or immunoglobulin A [IgA] immunization) or for those who have rare WBC antibodies and repeated febrile transfusion reactions.
- (6) Human albumin is a sterile solution of serum albumin obtained from healthy blood donors. Restores blood volume only.
- e. Hb-based blood substitutes or red cell substitutes are derived from human or bovine blood, and they are customized for their intended use.

NOTE: These red cell substitutes are still undergoing clinical trials as of the writing of this manual and may not be available for some time.

- (1) Advantages of red cell substitutes are as follows:
 - (a) Can be transfused to a person of any blood type without any tests.
 - (b) Are composed of ultrapure compounds that are free of infectious agents and allergens, resulting in a nontoxic and disease-free product.
 - (c) Do not deteriorate with storage and do not need refrigeration.
 - (d) Are composed of readily and reliably available materials, ensuring adequate supplies for large-scale, economical manufacturing.
 - (2) Disadvantage of red cell substitutes are:
 - (a) Half-life of only 12 to 48 hours.
 - (b) Side effects include gastrointestinal irritability, hypertension, and death.
 - (c) Most have a pressor affect on the circulatory system.
 - (d) Most require supplemental O₂ at high pressure to make the O₂ molecule bond with the modified Hb.
 - (3) Oxyglobin is a sterile, IV-administered solution consisting of purified, chemically modified Hb in Ringer's lactate.
 - (a) Contains cross-linked Hb molecules (several tetramers bound together).
 - (b) Circulate in plasma and immediately transport O₂ to tissues upon infusion, even in the absence of red blood cells.
 - (4) Hemopure (glutaraldehyde polymerized bovine Hb) is a human version of oxyglobin.
 - (a) Ultrapurified, chemically modified Hb that begins transporting O₂ throughout the body immediately upon infusion.
 - (b) Advantages include: stable at room temperature, is a plasma-expanding fluid, carries O₂ under ambient conditions without supplemental O₂, does not require type and crossmatch, has an extended shelf life, and requires no refrigeration.
 - (c) Potential to be used in field conditions.
 - (5) PolyHeme is derived from human blood. One unit of PolyHeme contains 50 grams of modified Hb, approximately the same amount of Hb delivered by one unit of transfused blood.
 - (6) HemAssist (Diaspirin cross-linked Hb) is derived from outdated human blood.
 - (7) HemoLink is a Hb-based O₂ carrier (HBOC) derived from human RBCs.
2. Calculate the amount of fluid to be given on the basis of the patient's situation, weight, size, and condition.

Performance Steps

- a. Give a hypovolemic patient in a trauma situation replacement fluids in accordance with (IAW) the fluid resuscitation in trauma flowchart .
 - (1) Administer colloids, blood and blood products, and red cell substitutes are administered at a ratio of 1:1. One unit for each unit of blood lost.
 - (2) If the quantity of blood loss is unknown, then administer and titrate replacement fluids IAW Figure 1.
- b. Give a patient who is hypovolemic because of dehydration NS as follows:
 - (1) Initially, 1 to 2 liters for normal size adults and 20 milliliters per kilogram (ml/kg) for children and small adults.
 - (2) Titrate until vital signs (VS) return to normal and signs and symptoms of dehydration decrease.
- c. Burned patients will be given fluid initially IAW the following formulas:

NOTE: The decision as to which formula to use is based on the patient's condition, situation, and amount of medical support and supplies on hand.

- (1) The Brooke formula is the established, aggressive formula for determining the amount of fluid a burn patient requires.
 - (a) Milliliters of fluid to be given first 24 hours = (percent body burned) x (weight in kilograms) x 2 to 4 cubic centimeters (cc) of lactated Ringer's (LR) solution.
 - (b) Do not calculate first-degree burns.
 - (c) Give one-half of the total calculated 24-hour requirement in the first 8 hours. Give the remainder over the next 16 hours.

NOTE: Fluid requirement calculations for infusion rates are based on the time from injury, not for the time fluid resuscitation is initiated.

- (d) During the second 24-hour period, give dextrose 5 percent in water (D5W) at one-half of the volume of crystalloid (NS) administration.
 - (2) The Parkland formula is a conservative revision of the Brooke formula. Its use tries to prevent fluid overload and hyperkalemia in burn patients.
 - (a) Milliliters of fluid to be given first 24 hours = (percent body burned) x (weight in kilograms) x 2 cc of lactated Ringer's or NS.
 - (b) Administer the fluid in the same manner as the Brooke formula 2c(1)(b) through (d).
 - (3) Any resuscitation formula provides only an estimate of the fluid need. Base the fluid volume on the patient's response, vital signs, and urinary output.
 - d. Consult The Merck Manual before administering fluids to infants, pediatrics, and patient with medical conditions such as congestive heart failure (CHF), asthma, chronic respiratory distress, renal problems, or intracranial pressure (ICP).
3. Set up the required equipment to administer the infusion.
 4. Give the fluid and electrolyte solutions intravenously at the desired rate.
 5. Monitor the patient to ensure that the desired results are achieved and that there are no complications or side effects from the infusion.
 - a. If complications arise, either correct the problem or discontinue the infusion.
 - b. Treat the patient for side effects and complications.
 6. Record the procedure.
 - a. Record the time the fluids were given, the rate of flow, the type of fluids, and the electrolyte solution given.
 - b. Record the results, side effects, and/or complications of the infusion.

Evaluation Preparation: Setup: This task is best evaluated by verbalization of the steps. Give the soldier a scenario such as a field, clinic, or hospital environment and a list or amount of different IV fluids.

Brief Soldier: Tell the soldier to select the most appropriate fluid or fluids available to treat the patient on

the basis of the patient's condition and situation. Have the soldier explain how he is going to determine the quantity of fluid to be administered.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Selected the most appropriate fluid or fluids on the basis of the patient's situation and condition.	_____	_____
2. Correctly calculated the amount of fluid to be given on the basis of the patient's situation, weight, size, and condition.	_____	_____
3. Correctly set up the required equipment to administer the infusion.	_____	_____
4. Gave the fluid and electrolyte solutions intravenously at the desired rate.	_____	_____
5. Monitored the patient to ensure that the desired results were achieved and that there were no complications or side effects from the infusion.	_____	_____
a. When complications arose, either corrected the problem or discontinued the infusion.		
b. Treated the patient for side affects and complications.		
6. Recorded the procedure.	_____	_____
a. Recorded the time the fluids were given, the rate of flow, the type of fluids, and the electrolyte solution given.		
b. Recorded the results, side affects, and/or complications of the infusion.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SF 511

Related

ATLS 1997

Maintain a Patient's Airway

081-833-4167

Conditions: Given a casualty who is in respiratory distress, various sizes of oropharyngeal airways, gloves, gauze pads or tongue blades, bag-valve-mask (BVM) system, laryngoscope with blades, endotracheal tubes, and oxygen (if available).

Standards: Open the casualty's airway, and establish the least invasive but most effective patent airway for the casualty. Determine if the casualty is exchanging enough air to maintain oxygen saturation or requires assisted ventilations. Monitor the casualty, and perform corrective action immediately to correct any change in the casualty's airway status. Perform these procedures without causing further injury to the patient.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient. The protocols established in tasks 081-833-4149 and 081-833-4679, Perform Tactical Combat Casualty Care, establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of the airway and should be placed in the proper trauma sequence of (first sequence of airway through circulation [A1 through C1] and second sequence of airway through full set of vital signs [A2 through F]).

- a. If patient is conscious, go to step 2.
- b. If patient is unconscious, go to step 3.

2. Assess airway and respirations in a conscious casualty.

NOTE: Assessment of the airway and respirations are two different steps in the trauma sequence, but every time the airway is assessed, the respiratory effort can also be partially assessed. However, a clear airway with respiratory effort detected does not fully clear the respiratory system. After assessment of the airway, respiratory effort is assessed bilaterally to ensure that both lungs are working.

- a. Ask casualty simple questions to determine status of airway.
 - (1) If casualty can talk to you without difficulty, airway is clear.
 - (2) If the patient answers with difficulty (coughing, pain, hoarseness, or other difficulty), manage the airway by using the procedure for an unconscious casualty (step 3).
- b. Bilaterally auscultate the lungs to ensure that air is being exchanged equally bilaterally.
- c. If history or method of injury (MOI) does not point to respiratory and/or airway involvement and there are no signs of respiratory distress present, continue primary assessment.
 - (1) Monitor the patient's airway and respirations.
 - (2) Monitor for signs and symptoms of hypoxia.
- d. If signs of respiratory distress develop, perform the following steps:
 - (1) Initiate appropriate treatment immediately.

NOTE: Do not try to insert oropharyngeal airways or endotracheal (ET) tubes in conscious casualties unless they have a history or signs of inhalation burns or injuries. Suction must be available before you try.

- (2) Give supplemental oxygen, if available.
- (3) Use positive control measures, as needed.

NOTE: Failure to notice signs and symptoms of hypoxia or respiratory distress early may have catastrophic affect on the patient.

- e. If casualty becomes unconscious, manage casualty IAW step 3.

3. Assess airway and respirations in an unconscious casualty.

NOTE: If patient is in a position that makes assessing the airway impossible, reposition the patient as little as possible to assess the airway. Be aware of cervical-spine control and other possible injuries when moving patient. Remember life has precedent over limb.

- a. Look, listen, and feel for respiratory effort.
 - (1) Look for bilateral rise and fall of the chest.

Performance Steps

- (2) Listen for air escaping during exhalation.
- (3) Feel for breath exhaling from the casualty's mouth on the side of your face.
- b. If respiratory effort is detected, assess the respiratory effort for at least 6 seconds.
 - (1) Assess the quality of the respiratory effort as strong, moderate, or weak.
 - (2) Assess the rhythm of the respiratory effort as regular or irregular.
 - (3) Assess the rate of the respiratory effort. More than 20 respirations per minute or fewer than 10 respirations per minute are indicators for assisted ventilations.

NOTE: Multiply the number of respirations detected in a 6-second period by 10 to get the number of respirations per minute.

- c. If no respiratory effort is detected, check pulse.
 - (1) If the casualty is pulseless, the situation determines the next course of action.
 - (a) In a combat situation, an unresponsive, nonbreathing, pulseless casualty is a fatality. End of this task.
 - (b) In a noncombat situation, initiate cardiopulmonary resuscitation (CPR) IAW the protocols established in the American Heart Association Textbook for Basic Life Support for Health Care Providers.
 - (2) If the casualty has a pulse, an airway must be established immediately.
4. Open and inspect the airway of an unconscious casualty (Figure 1).

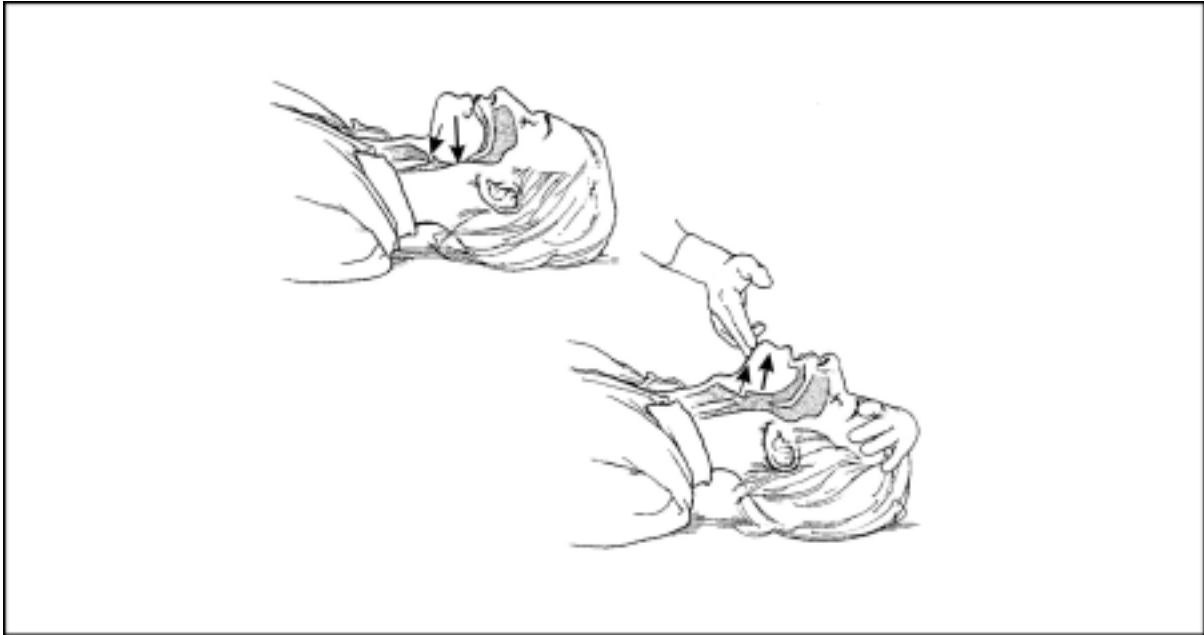


Figure 1. Head Tilt Chin Lift

- a. Inspect head, face, and throat for signs of trauma and inhalation injuries. Signs of inhalation injuries may also be reddened face or singed eyebrows and nasal hair.
- b. Open the airway by using the appropriate technique.
 - (1) If working on a trauma casualty, use the jaw-thrust technique (Figure 2).

Performance Steps

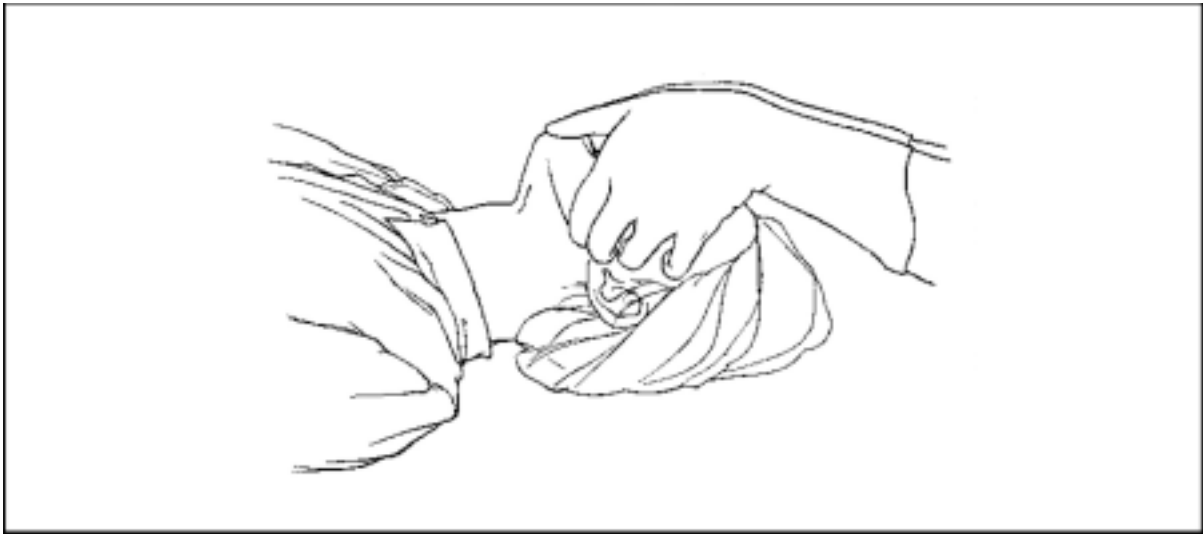


Figure 2. Jaw Thrust Maneuver

- (a) Kneel at the top of the casualty's head.
- (b) Grasp the angles of the casualty's lower jaw.
- (c) Resting your elbows on the surface on which the casualty is lying, lift with both hands, displacing the lower jaw forward.
- (2) If working on a nontrauma casualty, use the head-tilt/chin-lift method.
 - (a) Kneel at the level of the casualty's shoulders.
 - (b) To tilt the head back, place one hand on the casualty's forehead and apply firm, backward pressure with the palm of the hand.
 - (c) Place the fingertips of the other hand under the bony part of the casualty's lower jaw, bringing the chin forward.

CAUTIONS:

1. Do not use the thumb to lift the lower jaw.
2. Do not press deeply into the soft tissue under the chin with the fingers.
3. Do not completely close the casualty's mouth.
 - c. Inspect the oral cavity for foreign material, blood, vomitus, trauma, and signs of inhalation injuries. If the casualty has signs of trauma, foreign objects, and/or complications, continue with this step.
 - (1) If casualty is breathing with adequate respiratory effort/air exchange and has no signs of trauma, foreign objects, or complications of the upper airway, proceed to step 5.
 - (2) If airway is clear but no respiratory effort is detected, see step 6.
 - (3) If airway is not clear, regardless of respiratory effort, see step 7.
5. Insert an oropharyngeal airway (J-tube) if the casualty is breathing, has no history of apnea, and no trauma or complications of the upper airway.
 - a. The oropharyngeal airway should be about the same length as the distance from the corner of the casualty's mouth to the tip of his ear lobe.
 - b. Insert the airway in an inverted position until past the tongue, and then rotate the airway 180 degrees.

Warning: It is more traumatic (and contraindicated in children) to use this "corkscrew" technique. If a tongue depressor is available, it is preferable to use it to depress the tongue and insert the oral airway under direct vision.

- c. Check for respiratory effort after J-tube is inserted. Respiratory effort should be the same or improved after insertion of J-tube. If decreased, remove tube, reinspect airway, reinsert J-tube, and reassess.
- d. Have assistant assist ventilations and administer oxygen, if available.

Performance Steps

- e. Continue with the primary survey.
6. If the casualty has no respiratory effort and no apparent obstruction of the airway is seen, try to give two breaths by using the rescue breathing technique .
 - a. If the breaths go in, casualty must be intubated and ventilated. (See task 081-830-3016, Intubate a Patient.)
 - b. If the breaths do not go in, attempt to reopen the airway again and give two more breaths.
 - (1) If the breaths go in, casualty must be intubated and ventilated.
 - (2) If breaths still do not go in, insert laryngoscope and inspect the oropharynx for foreign body, blood, vomitus, swelling or other causes of obstruction.
 - (3) Using forceps, try to remove any foreign objects seen.
 - (a) If able to clear airway, attempt two breaths and assess for return of spontaneous respirations.

NOTE: If at any time spontaneous respirations return after clearing an airway, the casualty requires assisted ventilations with an oropharyngeal airway or ET tube. Casualties who were apnic for any length of time will have an elevated carbon dioxide (CO₂) level. Traumatized casualties who were apnic will have a hard time regaining their oxygen (O₂) saturation. While they may start off breathing adequately, their O₂ deficit will cause them to destabilize over time. Failure to assist ventilations in a formerly apnic casualty WILL cause harm and possible death.

- (b) If unable to clear airway, perform surgical cricothyroidotomy IAW 081-833-4528, Perform a Cricothyroidotomy.
- (c) If the situation makes it impossible to perform an immediate surgical cricothyroidotomy, perform a needle cricothyroidotomy IAW 081-833-3006, Perform a Needle Cricothyroidotomy.
- (4) If no cause of obstruction is seen but vocal cords are visualized, attempt to intubate casualty (task 081-833-3016, Intubate a Patient).
 - (a) Successful intubation, ventilate casualty.
 - (b) Unsuccessful intubation, perform surgical or needle cricothyroidotomy.
- (5) If no obstruction of airway is seen and vocal cords are not visualized, perform surgical cricothyroidotomy.
7. Clear the airway of a casualty who may or may not be breathing.
 - a. Clear any foreign material or vomitus seen in the mouth as quickly as possible by using the finger-sweep method or forceps.
 - b. If casualty is vomiting, turn casualty's head to the side or roll casualty on his side to prevent aspiration.

Caution: Be aware of C-spine and other injuries.

- c. Bleeding into the oral cavity may be stemmed with packed gauze, but only after a secure airway is in place.
- d. Once the obstruction is cleared, assess the respirations and determine the type of airway required based on the cause of the obstruction and the situation.

NOTE: Casualties who are vomiting or bleeding into their naso-oropharynx need a secured airway; that is, ET tube, to protect against aspiration. But in a combat situation, the medic may have to settle for a J-tube until time and circumstances permit him to intubate the casualty.

- (1) If the casualty is breathing on his own with little or no chance of aspiration, insert J-tube.
- (2) If the casualty is not breathing or has minimal respiratory effort, or there is a chance for aspiration, perform intubation(preferred method).
- e. Secure airway with an oropharyngeal airway or an ET tube.
- f. If blockage cannot be removed or injuries make obtaining a secure oral airway improbable, casualty must be given a cricothyroidotomy immediately.
- g. Assist ventilations with Ambu bag and oxygen, if available.
8. Monitor airway and respiratory effort every 5 minutes (q5min) minimum.
9. Continue with primary survey.

Performance Steps

- a. After C1 is complete, reassess casualty's level of consciousness (LOC), airway, and respiratory status to determine if additional management is required to further control and protect the airway.
 - b. Unconscious casualties require intubation to further control and protect airway.
 - (1) If casualty is in severe respiratory distress or arrest and cannot be intubated, he must receive a cricothyroidotomy.
 - (2) Inability to intubate a casualty who is not in respiratory distress or hypoxic is not a reason to perform surgical cricothyroidotomy.
10. Monitor and assess casualty on regular basis to determine if respiratory status is improving or worsening.
 11. Adjust treatment to compensate for improving or worsening status of the casualty.
 12. Evacuate casualty to nearest appropriate medical treatment facility.

Evaluation Preparation: Setup: Place a CPR mannequin capable of accepting an oropharyngeal airway or another soldier acting as the casualty on the ground. Brief the simulated casualty on the scenario and how to act. The evaluator can use any appropriate scenario that will test the soldier's ability to manage a casualty with or without an airway and who may or may not be breathing. Ensure that all equipment required to manage an airway is present.

Brief soldier: Brief the soldier on the situation, and tell them that they will only receive feedback on information that they verbalize or physically examine. Show them all the equipment that they have available.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient, and 081-833-4679, Perform Tactical Combat Casualty Care.	—	—
2. Assessed the airway and respirations of the casualty.	—	—
3. Opened and inspected the airway of an unconscious casualty. a. Used the jaw-thrust technique if working on a trauma casualty. b. Used the head-tilt/chin-lift method if working on a nontrauma casualty.	—	—
4. Looked, listened, and felt for respiratory effort of all casualties.	—	—
5. Assessed the rate, rhythm, and quality of the respirations.	—	—
6. Checked pulse at the same time as assessing the respirations. a. Took appropriate action when no pulse was detected. (1) In a noncombat situation, initiated CPR IAW the protocols established in the American Heart Association Textbook for Basic Life Support for Health Care Providers. (2) In a combat situation, took appropriate action for a pulseless, nonbreathing casualty. b. Immediately initiated appropriate treatment for a nonbreathing casualty with a pulse.	—	—
7. Inspected and cleared the oral cavity, as needed. a. When casualty had no respiratory effort and no apparent obstruction of the airway was seen, tried two breaths by using the rescue breathing technique. (1) If breaths went in, casualty requires intubation.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
(2) If the breaths did not go in, attempted to reopen the airway again and gave two more breaths.		
b. Tried to clear the airway.		
c. Tried rescue breathing after clearing the airway.		
8. Established an appropriate airway for the casualty by using the least invasive procedure.	—	—
a. A conscious casualty with adequate respiratory effort/air exchange, no history of apnea, and no trauma or complications of the upper airway required no invasive airway.		
b. Inserted an oropharyngeal airway for an unconscious casualty who was breathing with no history of apnea and who had no trauma or complications of the upper airway.		
c. Tried to intubate an unconscious casualty who was not breathing or required a secure airway.		
d. Performed surgical cricothyroidotomy only when unable to clear the airway or intubate the patient and a secured airway and assisted ventilations were required.		
e. Performed a needle cricothyroidotomy when the situation made it impossible to perform an immediate surgical cricothyroidotomy.		
9. Reassessed the airway and respiratory effort immediately after any treatment.	—	—
10. Monitored airway and respiratory effort q5min minimum to determine if respiratory status was improving or worsening.	—	—
11. Continued with primary survey.	—	—
12. Adjusted treatment to compensate for improving or worsening status of the casualty.	—	—
13. Assisted ventilations, if the situation permitted, if any of the following indicators were present:	—	—
a. More than 20 respirations per minute or fewer than 10 respirations per minute.		
b. The quality of the respiratory effort was weak.		
c. The rhythm of the respiratory effort was irregular.		
14. Detected LOC or decreasing LOC within 2 minutes and took appropriate action.	—	—
15. Evacuated casualty to nearest appropriate medical treatment facility.	—	—
16. Did no further harm to the casualty.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Apply Cold Therapy for the Management of Soft Tissue Injuries

081-833-4413

Conditions: Given a patient with a soft tissue injury, patient's record, chemical ice, ice, and/or cold water.

Standards: Apply or instruct the patient to correctly apply cold therapy so that maximum healing benefit is gained from the treatment without damaging the skin from excessive cold application.

Performance Steps

1. Understand the physiology of cold therapy for the management of soft tissue injuries.
 - a. Decreases blood flow as a result of vasoconstriction.
 - b. Decreases cell metabolism.
 - c. Decreases cellular oxygen consumption.
 - d. Increases fluid viscosity.
 - e. Decreases capillary permeability.
 - f. Decreases inflammation.
 - g. Decreases pain.
 - h. Reduces the level of muscle spasm by reducing muscle contraction velocity.
2. Recognize the appropriate use of cold therapy.
 - a. Use cold therapy during acute inflammation.
 - b. Use cold therapy before range-of-motion exercises.
 - c. Use cold therapy following physical activity.
3. Apply cold therapy.
 - a. Immerse the affected part in 50- to 60-degrees Fahrenheit water. Keep the affected part immersed for as long as the patient can tolerate or until the water temperature is raised to the point of ineffectiveness.
 - b. Apply ice packs to the affected area.
 - (1) Never apply ice packs directly to the skin. The skin should be covered with a cloth or thin bandage.
 - (2) Never leave an ice pack in place for more than 15 minutes without monitoring the underlying skin for signs of frostbite.
 - c. Apply ice massage.
 - (1) Freeze small paper cups filled with water in the freezer.
 - (2) When ready to use, tear off the top portion of the cup, but leave the bottom covered with paper to protect the fingers from the cold.
 - (3) Massage the affected area with the ice, ensuring that the ice is constantly kept moving.
4. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must apply cold therapy for the management of soft tissue injuries.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the physiology of cold therapy for the management of soft tissue injuries.	—	—
2. Recognized the appropriate use of cold therapy.	—	—
3. Properly applied the cold therapy without causing harm.	—	—
4. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Apply Heat Therapy for the Management of Soft Tissue Injuries

081-833-4415

Conditions: Given warm water, a heat lamp, and/or a heating pad.

Standards: Recognize the appropriate circumstances for application of heat therapy and properly apply the therapy so that maximum benefit is gained by the patient without further injuring the patient.

Performance Steps

1. Understand the physiology of heat therapy as it applies to the management of soft tissue injuries.
 - a. Heat therapy causes vasodilation.
 - b. Increases the rate of cell metabolism.
 - c. Increases delivery of leukocytes to the affected area.
 - d. Increases capillary permeability.
 - e. Increases venous and lymphatic drainage.
 - f. Causes edema formation.
 - g. Speeds the removal of metabolic wastes.
 - h. Increases the elasticity of ligaments, capsules, and muscles.
 - i. Provides some analgesia and sedation of nerves.
 - j. Decreases muscle tone and muscle spasm.
2. Recognize when to apply heat therapy.
 - a. Use heat for subacute or chronic inflammation.
 - b. Use heat to encourage tissue healing.
 - c. Use heat to assist in range of motion exercises.
 - d. Use heat to fight infection.
3. Apply heat therapy by one of the following methods:
 - a. Warm water immersion.
 - b. Moist heat packs.
 - c. Chemical heat packs.
 - d. Electrical heating pads.
 - e. Infrared heat lamps.

NOTE: Ensure no skin is left exposed to infrared heat lamps and that no articles of clothing come into contact with the lamp, as it may catch fire.

4. Understand when to use heat as part of a contrast bath.
 - a. Used with subacute and chronic inflammatory conditions.
 - b. Used within 24 hours postinjury for ankle sprains.
 - c. The exact physiology of the effect on the injury is not understood.
5. Use heat as a part of the application of a contrast bath.
 - a. Fill one large mop bucket with water that has been heated to 110 degrees Fahrenheit.
 - b. Fill one large mop bucket with water that has been cooled to 50 degrees Fahrenheit.
 - c. Immerse the affected part in the hot water for 5 minutes while performing range-of-motion exercises.
 - d. Follow this by immersing the affected part in cold water for 1 minute.
 - e. Repeat the cycle, decreasing the hot therapy by 1 minute each time until the hot and cold therapy are equal at 1 minute each.
 - f. At this point, the session is complete. Treatment should be performed tid, and especially after physical activity.
6. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must apply heat therapy.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the physiology of heat therapy as it applied to the management of soft tissue injuries.	_____	_____
2. Recognized when to apply heat therapy.	_____	_____
3. Applied heat therapy.	_____	_____
4. Understood when to use heat as part of a contrast bath.	_____	_____
5. Used heat as a part of the application of a contrast bath.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Construct a Field Suction Device

081-833-4490

Conditions: As a Special Forces medical sergeant in a clinic or field clinic environment and given a patient with a chest tube that requires suction; three bottles (one with a hangar); three sections of rubber tubing measuring 4 feet, 4 1/2 feet, and 5 1/2 feet; four glass tubes (three 3-inch and one full-length tubes); three clamps or Kelly hemostats; and two 2-hole stoppers.

Standards: Construct a working field suction device.

Performance Steps

1. Gather all required materials (Figure 1).

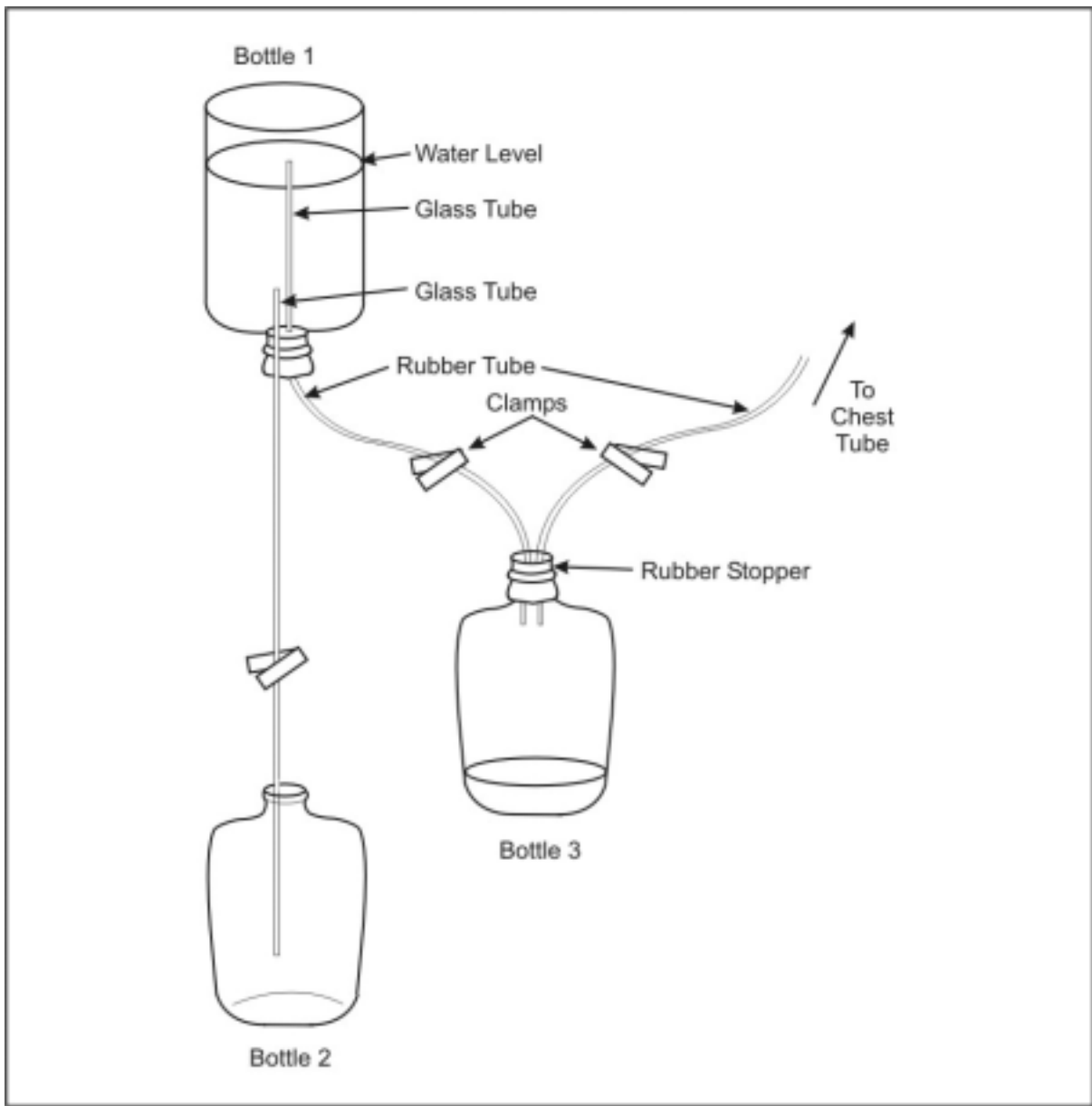


Figure 1. Field Suction Device

Performance Steps

- a. Three bottles (one with a hangar).
 - b. Two 2-hole stoppers or lids for two of the bottles that can be punctured and sealed.
 - c. Three sections of rubber tubing about 4 feet, 4 1/2 feet, and 5 1/2 feet long.
 - d. Four glass tubes, three of them about 3 inches and one about 9 inches long.
 - e. Three clamps or Kelly hemostat.
2. Inspect all equipment for serviceability and damage and to ensure that it forms airtight seals.
 3. Insert glass tubes into stoppers.
 - a. Two short glass tubes in one stopper.
 - b. One short glass tube and one long glass tube in one stopper.
 4. Label the bottles "#1," "#2," and "#3."
 - a. Fill bottle #1 about 3/4 full.
 - b. Insert the stopper with one long and one short glass tube into bottle #1. Ensure that the long glass tube will be above the water level when the bottle is inverted.
 - c. Insert the stopper with two short glass tubes into bottle #3.
 5. Connect one end of the 4 1/2-foot piece of rubber tubing to the short glass tube in bottle #1, and place the other end into bottle #2, the open drainage bottle.
 6. Connect one end of the 5 1/2-foot long piece of rubber tubing to the long glass tubing in bottle #1, and connect the other end to one of the glass tubes in bottle #3.
 7. Connect one end of the 4-foot piece of tubing to the other glass tube in bottle #3, and attach a clamp to the tubing.
 8. Attach the clamps.
 - a. Place one clamp between bottle #1 and bottle #2 on the 4 1/2-foot piece of tubing.
 - b. Place the other clamp on the 5 1/2-foot piece of tubing between bottle #1 and bottle #3.
 9. Invert bottle #1, and suspend it 4 feet above the other two bottles.
- NOTE: The water level in bottle #1 must not be above the long glass tube when inverted.
10. Place bottles #1 and #3 on the floor.
 11. Attach the free end of the tubing from bottle #3 to the end of the chest tube or Heimlich valve.
 12. Remove the clamps on the tubes.
 13. Ensure that the device is functioning properly.
 14. Control the suction by opening and closing the clamps or Kelly hemostats.
 - a. When the clamps or Kelly hemostats are clamped on the tubing, the device will not provide suction.
 - b. Open the clamps or hemostats to provide suction.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must construct a field suction device.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Gathered all required materials.	—	—
2. Inspected all equipment for serviceability and damage and to ensure that it forms airtight seals.	—	—
3. Inserted glass tubes into stoppers.	—	—
4. Labeled the bottles "#1," "#2," and "#3."	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Connected the 4 1/2-foot piece of rubber tubing bottle #1 and bottle #2 correctly.	—	—
6. Connected the 5 1/2-foot piece of rubber tubing to bottle #1 and bottle #3 correctly.	—	—
7. Connected the 4-foot piece of tubing to bottle #3 and attached a clamp.	—	—
8. Attached the clamps to the tubing from bottle #1.	—	—
9. Inverted bottle #1 and suspended it 4 feet above the other two bottles, ensuring the water level in bottle #1 was not above the long glass tube when inverted.	—	—
10. Placed bottles #1 and #3 on the floor.	—	—
11. Attached the free end of the tubing from bottle #3 to the end of the chest tube or Heimlich valve.	—	—
12. Removed the clamps.	—	—
13. Ensured that the device was functioning properly.	—	—
14. Controlled the suction by opening and closing the clamps.	—	—
15. Took necessary corrective action when the device malfunctioned.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Assess Wound Healing

081-833-4492

Conditions: As a Special Forces (SF) medic in any environment and given the SF tactical medical and laboratory sets and a patient with a wound that requires assessing.

Standards: Identify any predisposing factors or signs and symptoms of infection, and determine if the wound is healing properly or not. Correctly manage the wound and any complications, and record all findings and treatment given.

Performance Steps

1. Take a history about the wound and wound care received to date.
 - a. What caused the wound?
 - b. How long ago did it happen?
 - c. Has the wound received any medical care?
 - d. Did the patient follow medical instructions for caring for the wound?
 - e. Were any antibiotics given prophylactically?
2. Determine the patient's tetanus status.
 - a. Only casualties who have had the three-shot tetanus toxoid series and a booster within 10 years are considered immunized. Anything less than that is considered inadequately immunized.
 - b. Consider administration of tetanus immune globulin (TIG) on the basis of whether or not the wound is tetanus prone and the immunized status of the casualty.
3. Determine if the wound has any of the predisposing factors to wound infection.
 - a. Delay in surgical treatment beyond the first 6 hours.
 - b. Inadequate wound excision and/or debridement.
 - c. Inadequate hemostasis during initial operation, resulting in formation of hematoma.

NOTE: Devitalized tissue and extravasated blood are excellent culture mediums for bacteria, which can lead to infection.

- d. Retention of foreign bodies in wound.
 - e. Inadequate drainage.
 - f. Wound packed too tightly, tight circular dressings, or casts.
 - g. Primary closure of war wounds.
 - h. Failure to recognize and treat any perforated hollow viscera.
 - i. Secondary contamination with fomites, or exposure to personnel who are carriers of pyogenic bacteria.
 - j. Vascular injury resulting in regional tissue ischemia.
 - k. Location of wound; lower extremities are less vascular than the scalp.
 - l. Wound contaminated with bacteria that are resistant to antibiotics.
 - m. Presence of metabolic diseases.
4. Gently remove any bandages and dressings from the wound.
 - a. If the dressings are stuck to the wound, moisten with normal saline (NS) or sterile water.
 - b. Peel the bandages and dressings toward the wound, not away.
5. Examine the wound for local signs and symptoms of infection.
 - a. Examine the wound and dressing for any discharge.

NOTE: In a normally healing wound, the discharge is initially sanguineous, then serosanguineous, and finally serous before stopping after 48 to 72 hours. In an infected wound, the discharge can be thick or runny and yellow, brown, or green.

- (1) If present, examine the discharge for color, odor, and consistency.
 - (2) Use sterile swabs to obtain sample of the discharge for lab tests.
 - b. Look for erythema that is spreading away from wound.

Performance Steps

NOTE: Some erythema is normal; however, it should not extend more than 1 to 2 centimeters (cm) beyond the edges of the wound.

- c. Check for excessive swelling or edema.
- d. Compare uninjured extremity to injured extremity. Measure circumference, if necessary.
- e. Look for necrotic wound edges.
- f. Palpate the wound and surrounding area for increased local temperature and tenderness.

NOTE: Increase in pain for the first 24 to 48 hours is normal; then pain should start to decrease.

Continuous or dramatic increase in pain from wound indicates infection or other problem.

- g. Smell the wound for foul, putrid odors or sweet, sickly smells. These odors indicate infection.
- h. Check for lymphadenitis and lymphadenopathy.
 - (1) Regional lymphadenopathy indicates an area of infection distal to affected lymph nodes.
 - (2) Generalized lymphadenopathy indicates systemic infection.

Warning: The differential diagnosis for lymphadenopathy includes: Streptococcus (strep) infections, tuberculosis (TB), nonTB, tularemia, plague, cat-scratch, syphilis, lymphogranuloma venereum (LGV), chancroid, herpes, and so on. Consider the other alternatives.

- i. Look for lymphangitis.

NOTE: Lymphangitis is an acute inflammation of the subcutaneous lymph channels, usually caused by strep pyogenes.

- (1) Red, irregular, warm, tender streaks develop distally and run proximally to lymph nodes (may cause lymphadenitis).
- (2) Systemic signs of infection are common and may precede local findings. Leukocytosis is a common finding.

- j. Look for abscesses.

NOTE: Abscesses are a collection of pus, usually caused by bacterial infection, that appear in tissues, organs, and confined spaces. The signs and symptoms (S/S) vary depending on location, depth, size, and exact cause of the abscess.

6. Examine the patient for systemic signs and symptoms of infection.

- a. Fever.
- b. Tachycardia.
- c. Rigors and chills.

Warning: This is an indication of septicemia.

- d. Vomiting.
- e. Hypotension.
- f. Confusion.
- g. Prostration.
- h. Malaise.
- i. Myalgias.
- j. Sweating.

7. Perform laboratory tests to determine the presence or absence of infection.

- a. Perform a gram stain of the wound and any discharge.
 - (1) Interpret the results of the gram stain as positive or negative.
 - (2) Identify the organisms seen.
- b. Perform a complete blood count (CBC) with differential. Leukocytosis with a left shift indicative of infection. Leukocytosis with a left shift is indicative of infection.

8. Determine if the wound is healing properly or is infected.

9. Manage the wound.

- a. If the wound is healing properly:
 - (1) Clean wound and aseptically replace dressing.
 - (2) Advise patient about wound care and dressing changes.
 - (3) Inform patient about signs and symptoms of infection, and tell him to return to the clinic immediately if signs or symptoms of infection develop.

Performance Steps

- b. If the wound is infected, identify the causative organism on the basis of the signs and symptoms and the lab results.
 - (1) Initiate treatment immediately for the specific infection.
 - (2) Thoroughly clean and debride the wound.
 - (3) Drain abscesses.
 - (4) Admit patient for treatment, or instruct him to return every 24 hours for follow-up.
 - (5) Advise patient about wound care, dressing changes, and antibiotic therapy.

10. Record all treatment given.

11. Evacuate patient, if necessary.

Performance Measures**GO** **NO GO**

1. Took a history from the patient about the history of the wound and wound care.	_____	_____
2. Determined the patient's tetanus status.	_____	_____
3. Determined if the wound had any of the predisposing factors to wound infection.	_____	_____
4. Removed any bandages and dressings from the wound without disrupting the healing process or contaminating the wound.	_____	_____
5. Examined the wound for local signs and symptoms of infection.	_____	_____
6. Examined the patient for systemic signs and symptoms of infection.	_____	_____
7. Performed laboratory tests to determine the presence or absence of infection.	_____	_____
8. Determined if the wound was healing properly or was infected.	_____	_____
9. Correctly managed the wound.	_____	_____
a. For noninfected wounds:		
(1) Cleaned wound and aseptically replaced dressing.		
(2) Advised patient about wound care and dressing changes.		
(3) Informed patient about signs and symptoms of infection and told him to return to the clinic immediately if signs or symptoms of infection developed.		
b. For infected wounds:		
(1) Identified the probable cause of the infection.		
(2) Thoroughly cleaned and debrided the wound.		
(3) Drained any abscesses present.		
(4) Administered appropriate antibiotics.		
(5) Admitted patient for treatment or instructed him to return every 24 hours for follow-up.		
(6) Advised patient about wound care, dressing changes, and antibiotic therapy.		
10. Recorded all treatment given.	_____	_____
11. Evacuated patient, if necessary.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED
VT 1405

Assess Blood Replacement Requirements

081-833-4678

Conditions: You are in a medical facility with blood replacement capability and patients that may or may not require transfusions. Given thermometer, blood pressure cuff, stethoscope, intravenous (IV) stand, tourniquet, large bore IV catheters, tape, alcohol and betadine preparation pads, vacutainers, needle and syringe, gloves, crystalloids, and the patient's clinical record.

Standards: Correctly assess a trauma patient to determine whether or not he requires blood replacement and if he does, what those requirements are.

Performance Steps

1. Perform a survey of the casualty to ensure airway stabilization, adequate respirations, and hemorrhage control.
 - a. Establish two large-bore, 18-gauge or larger, IV lines.
 - (1) Draw blood.
 - (2) Request and/or perform laboratory (lab) tests, hematocrit and hemoglobin (H/H) with type and crossmatch.
 - b. Initiate fluids for resuscitation. Give Ringer's lactate as a first choice; normal saline (NS) as a second choice.

NOTE: The usual dose is 1 to 2 liters in an adult and 20 milliliters (ml) per kilogram (kg) in pediatric cases. Other diagnostic decisions are based on the observed response.

- c. Establish a set of baseline vitals.
 - d. Perform other resuscitative procedures as required.
 2. Monitor patient, and determine if patient requires blood transfusion.
 - a. Indications that patient does not require a blood transfusion.
 - (1) Patient has stable vital signs within normal limits; patient is in Class I or Class II shock.
 - (2) Patients who have lost less than 20 percent of their blood volume and are no longer hemorrhaging require no further fluid bolus or immediate blood administration.
 - (3) H/H within normal limits.

CAUTION: With rapid blood loss, H/H will lag behind actual blood volume.

- b. Indications for blood transfusion.
 - (1) Patient's vital signs are not stable; patient in Class III shock.
 - (2) Patients who have lost 20 to 40 percent of their blood volume and are still hemorrhaging will show marked deterioration. Continued fluid therapy and blood replacement are indicated.
 - (3) Patients with little or no response to the initial fluid therapy.
 - (4) H/H below normal.

NOTE: Isovolemic patients can have adequate oxygen (O₂) carrying capacity with hemoglobin (Hb) levels as low as 7 grams per deciliter (gm/dl).

3. Determine the type of blood to give to the patient.

NOTE: Response to blood administration should identify the patients who are still bleeding and require rapid surgical intervention.

- a. Select the appropriate blood type based on the type and crossmatch and the types of blood available.
 - b. Ideally, the patient should receive the same type of blood that they have.
 - c. In urgent situations, type O red blood cells (RBCs) (not whole blood) may be used for patients of other blood types and either A or B RBCs may be used for AB recipients (not both together).
 - d. Rh-negative (rhesus factor negative) patients should always receive Rh-negative blood except in life-threatening emergencies when Rh-negative blood may be unavailable.
 - e. Rh-positive patients may receive either Rh-positive or Rh-negative blood.
4. Select the appropriate blood component, if available.

Performance Steps

- a. Whole blood is used for rapid massive blood loss and exchange transfusions. Whole blood may be necessary if a component is unavailable.
 - b. Packed RBCs are also used for rapid massive blood loss and exchange transfusions. Packed RBCs are the preferred choice due to less chance of complications.
 - (1) Transfused to replace Hb or O₂ carrying capacity, including blood lost at surgery or as a result of trauma.
 - (2) Consider the patient's age, cause, degree of anemia, circulatory stability, and the condition of heart, lungs, and blood vessels.
 - (3) When volume expansion is required, other fluids can be used concurrently or separately.
 - c. Fresh frozen plasma is an unconcentrated source of all clotting factors except platelets.
 - (1) Used to correct a bleeding tendency of unknown cause or one associated with liver failure.
 - (2) Can supplement RBCs when whole blood is unavailable for exchange transfusion.
 - (3) Except when prepared from autologous donations, not ordinarily used as a volume expander.
 - d. Washed RBCs (by continuous-flow washing) are free of almost all traces of plasma, most white blood cells (WBCs), and platelets. Washed RBCs are used for patients who have severe reactions to plasma (for example, severe allergies or immunoglobulin A [IgA] immunization) or for those who have rare WBC antibodies and repeated febrile transfusion reactions.
5. Determine the amount of blood to administer.
 - a. Blood is usually replaced at a 1:1 ratio.
 - b. Stabilization of adequate vital signs is primary indicator of sufficient blood volume.
 6. Administer the whole blood in accordance with (IAW) 081-833-4069, Perform Blood Transfusion.
 7. Record the procedures and any adverse reactions.
 8. Evacuate the patients to a definitive care facility.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Performed a survey of the casualty and ensured airway stabilization, adequate respirations, and hemorrhage control. a. Initiated any treatment required to stabilize the casualty. b. Established two large bore IVs and initiated treatment for hypovolemic shock with crystalloids. c. Ordered and performed appropriate labs. d. Established baseline vitals. e. Performed resuscitative procedures as required.	—	—
2. Monitored patient and determined if patient required a blood transfusion. a. Identified indications that patient does not require a blood transfusion. b. Identified indications that patient does require a blood transfusion.	—	—
3. Selected the appropriate blood type based on the type and crossmatch and the types of blood available. a. Identified compatible donor-recipient combinations. b. Identified incompatible donor-recipient combinations. c. Explained how the Rh affects the transfusion.	—	—
4. Determined the most appropriate blood component to administer. a. Administered packed RBCs first, if available. b. Administered whole blood if components were not available. c. Used fresh frozen plasma and washed RBCs if indicated.	—	—
5. Determined the amount of blood to administer based on the following: a. The 1:1 ratio.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
b. Stabilization of adequate vital signs.		
6. Administered the whole blood IAW 081-833-4069, Perform Blood Transfusion.	_____	_____
7. Recorded the procedures and any adverse reactions.	_____	_____
8. Evacuated the patients to a definitive care facility.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

TM 8-227-12

TM 8-227-3

Prepare a Patient for Evacuation Using Special Equipment

081-833-4681

Conditions: Given a jungle penetrator, stokes litter, three A7-A cargo straps, two sling ropes, two snap links, a suspended tactical airborne body operations (STABO) suspension rope, or SKED, prepare a patient for transport by using special equipment.

Standards: Prepare the patient for transport ensuring that the patient's airway is secure, all hemorrhage is controlled, IV infusions are secure, all fractures and dislocations are splinted, patient care and condition are documented, and the patient is safely secured in the extraction device.

Performance Steps

1. Ensure the patient has a secure airway.
 2. Reinforce all bandages.
 3. Secure splinted arms to the body trunk.
 4. Secure legs together if one or both of the legs are fractured or dislocated and splinted.
- NOTE: If using the jungle penetrator, do not secure the casualty's legs together.
5. Reinforce IV sites by wrapping the catheter site and a 4- to 6-inch loop of tubing with an elastic bandage. Wrap the site and the tubing in a spiral fashion.
 6. Just before pickup, clamp off the IV infusion set and secure the IV bag around the casualty's neck with a cravat.
 7. Document the patient's injuries and condition, to include vital signs, and attach them to the patient.
 8. Prepare the casualty for transport by using the jungle penetrator.
 - a. Select a proper site for extraction.
 - (1) The capabilities and limitations of the mission aircraft are the primary factors in site selection.
 - (2) Consider site altitude and temperatures as they determine air density that affects the helicopter payload.
 - (3) Extremely dense overhead foliage prevents lowering the penetrator. Select a spot that provides some overhead clearing to allow safe lowering and retrieval.
 - b. Allow the penetrator to touch the ground to discharge static electricity. Do not touch the hoist cable or rescue seat until after ground contact; static electricity may cause severe electrical shock.
 - c. For one-man rescue, do the following:
 - (1) Assume a kneeling position for ease in holding and mounting the penetrator.
 - (2) Hold the penetrator upright in front of you.
 - (3) Pull the seat blade down until the retaining hook engages and locks the seat blade in the extended position.
 - (4) Mount and straddle the seat while facing the shank.
 - (5) Open the safety strap cover, and remove the safety strap.
 - (6) Position the safety strap around the body under the armpits, and pull it tight.
 - (7) Attach the snap fastener to the bar located at the top of the safety strap.
 - (8) When ready for retrieval, signal the helicopter by one of the following means:
 - (a) Give "thumbs-up" signal.
 - (b) Radio.
 - (c) Vigorously shake hoist cable from side to side.
 - (9) Hold on with both arms around the shank.
 - (10) Keep the crotch close to the penetrator and the head and shoulders close to the cable.

CAUTION: The hoist hook swivel will spin rapidly as tension is placed on the cable. Do not hold the swivel.

Performance Steps

- (11) Upon reaching a position level with the helicopter door, the crewman will turn you to face away from the door and pull you inside.

NOTE: Do not try to help the crewman nor to dismount the rescue seat until instructed to do so. The crewman will disconnect you from the penetrator when you are safely inside.

- (12) While in flight, do not cross your legs because of possible injury when you enter the aircraft.

- (13) Make certain the hoist cable does not become entangled with the safety strap(s) or with any part of the body.

d. For a two-man rescue, do the following.

- (1) Place least injured individual (number 1) on one seat, and secure the safety strap.
- (2) Place the most severely injured individual (number 2) on the two remaining seats with his legs over number 1's legs, and secure the safety strap.
- (3) Instruct the men to hold on to each other.
- (4) Signal the helicopter for retrieval as above.
- (5) Hoist operator will bring number 2 into aircraft first, followed by number 1.

NOTE: For rescue of wounded or injured personnel or rescue under emergency conditions, the rescuer always dons and tightens the safety strap. Personnel can be safely retrieved without being mounted on the seat. The same penetrator, equipped with a flotation collar, can be used for water rescue.

9. Prepare the patient for evacuation by using the stokes litter.

NOTE: Follow steps 1 through 7 above for all casualties regardless of the extraction equipment being used.

a. Place the casualty into the basket by using one of the following methods:

- (1) Three- or four-man lift.
- (2) Log roll.

b. Secure the casualty with the straps provided.

- (1) One strap below the knee.
- (2) One strap above the knee.
- (3) One strap at waist level.
- (4) One strap at chest level. Ensure that the chest strap is not so tight that it interferes with respiration.

WARNING: Never try to "ride up" by standing or hanging on to a stokes litter. This will cause the litter to become unbalanced and spin, making it impossible to retrieve into the aircraft and possibly endangering aircraft flight operations.

10. Prepare the patient for evacuation by using the horse collar.

NOTE: The horse collar rescue device is a padded strap that is lowered on the end of the hoist to extract one soldier at a time.

- a. Extend one arm through the loop.
- b. Slip the loop over your head and shoulders.
- c. Put your other arm through the loop.
- d. Place the collar behind your back.
- e. Connect the chest strap.
- f. Give the ready signal to the aircraft.

NOTE: The horse collar cannot be used to extract severely injured or unconscious patients.

11. Prepare the patient for extraction by using the Hansen rig.

NOTE: The Hansen Rig is constructed from an A7-A strap with a D-ring and snap link.

- a. Thread the strap through the D-ring.
- b. Hold the D-ring so that it is pointing in the opposite direction of the thick-lip floating bar of the friction adapter.
- c. Remove any twists in the strap, and thread the end through the friction adapter.

NOTE: The device is now ready to be donned.

- d. Place the D-ring and the friction adapter on the casualty's left shoulder with the running end strap to the casualty's front.
- e. Stand on the strap with the left foot, and pull the running end tight.

Performance Steps

- f. With your left hand, hold the hardware on top of the casualty's left shoulder. With your right hand, reach behind the casualty and pull the strap around to the front.
- g. With your left hand, grasp and hold both left and right straps.
- h. Reach between the casualty's legs and pull up the third section. This forms a diaper.
- i. Connect all three sections with a snap link, and retighten the strap.
- j. Hook up to the extraction rope (STABO suspension rope) by connecting the snap link at the end of the extraction rope to the D-ring on the A7-A strap.
- k. Give the ready signal to the aircraft.

NOTE: If time permits, the suspension rope hook can be passed through the D-ring and run down to the snap link holding the A7-A strap together.

12. Prepare the patient for extraction by using the Palmer rig.
 - a. Form a standard rappel seat.
 - b. Make the extraction rope by using a standard 120-rappel rope and connecting a snap link to the end or using a STABO suspension rope.
 - c. With either rope, tie a second rope (about 6 to 8 feet long) near the end to form a loop. Use a prusik knot to attach the loop so that it can be slid up or down.
 - d. When the extraction line is lowered, connect the snap link at the end of the rope through the single wrap around the waist and through the ropes that form the overhand knot at the waist.
 - e. Slide the prusik knot down to the patient's chest level.
 - f. Pass the loop over the patient's shoulder, and give the thumbs-up signal.
 - g. With a conscious patient, instruct him to adjust the prusik knot up or down as he is lifted so that he is in the seated position.

NOTE: The special patrol infiltration and extraction system (SPIES), fast rope infiltration and extraction system, FRIES and STABO rigs can all be used in their normal configuration for casualty extraction. For information on the use of the Fulton surface-to-air recovery (STAR) system, refer to FM 3-05.210 (currently published as TC 31-24, Special Forces Air Operations).

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must prepare a casualty for evacuation by using special equipment.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured the patient has a secure airway.	—	—
2. Reinforced all bandages.	—	—
3. Secured splinted arms to the body trunk.	—	—
4. Secured legs when one or both legs were fractured or dislocated and splinted.	—	—
5. Reinforced IV sites by wrapping the catheter site and a 4- to 6-inch loop of tubing with an elastic bandage. Wrapped the site and the tubing in a spiral fashion.	—	—
6. Just prior to pickup, clamped off the IV infusion set and secured the IV bag around the casualty's neck with a cravat.	—	—
7. Document the patient's injuries and condition to include vital signs and attached them to the patient.	—	—
8. Prepared the casualty for transport by using the forest penetrator.	—	—
9. Prepared the patient for evacuation by using the stokes litter.	—	—
10. Prepared the patient for evacuation by using the horse collar.	—	—
11. Prepared the patient for extraction by using the Hansen rig.	—	—
12. Prepared the patient for extraction by using the Palmer rig.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
TC 31-24

Perform Field Interpretation of X Rays

081-833-4687

Conditions: As a Special Forces medic in a clinical environment and given a properly developed X ray and a light source, perform a field interpretation of X rays.

Standards: Interpret the X ray so that all gross fractures and thoracic abnormalities are discovered.

Performance Steps

1. Check the films to ensure that the correct patient identification data is present. (For example, name, social security number, and date.)
2. Check the films to ensure they have the correct views and film quality.
3. Set the films in the view box in the anatomical position.
4. Stand back from the X ray, and assess the general density.
5. Assess the local changes by examining the X ray up close.
 - a. Examine the soft tissue for the following:
 - (1) Ossification or calcification.
 - (2) Fluid collection, abscesses, and masses.
 - (3) Transradiancy, which may indicate the presence of gas or fat.
 - b. Examine the periosteum and cortex for the following:
 - (1) Breaks in the cortex.
 - (2) Texture.
 - (3) Erosion.
 - (4) Thickening or thinning.
 - (5) New bone formation (callus).
 - c. Examine the medullary canal for the following:
 - (1) Texture.
 - (2) Destruction.
 - (3) Sclerosis.
 - d. Examine the joint capsule and joint for the following:
 - (1) Narrowing of the joint space and/or cartilage space.
 - (2) Erosion.
 - (3) Irregularity or roughening.
 - (4) Osteophytes.
 - e. Examine the epiphysis, epiphyseal plate, and metaphysis if present.
6. Describe any fracture noted by using the following terms:
 - a. Describe the site of the fracture as midshaft, proximal 1/3, and so on.
 - b. Name the bones involved: tibia, carpal navicular, and so on.
 - c. Identify the extent of the fracture--complete or incomplete.

NOTE: Complete is defined as separation of the bone into two fragments with a dark line between the fragments.

- d. Describe the configuration of the fracture:
 - (1) A transverse fracture is a break directly across the bone (Figure 1).

Performance Steps

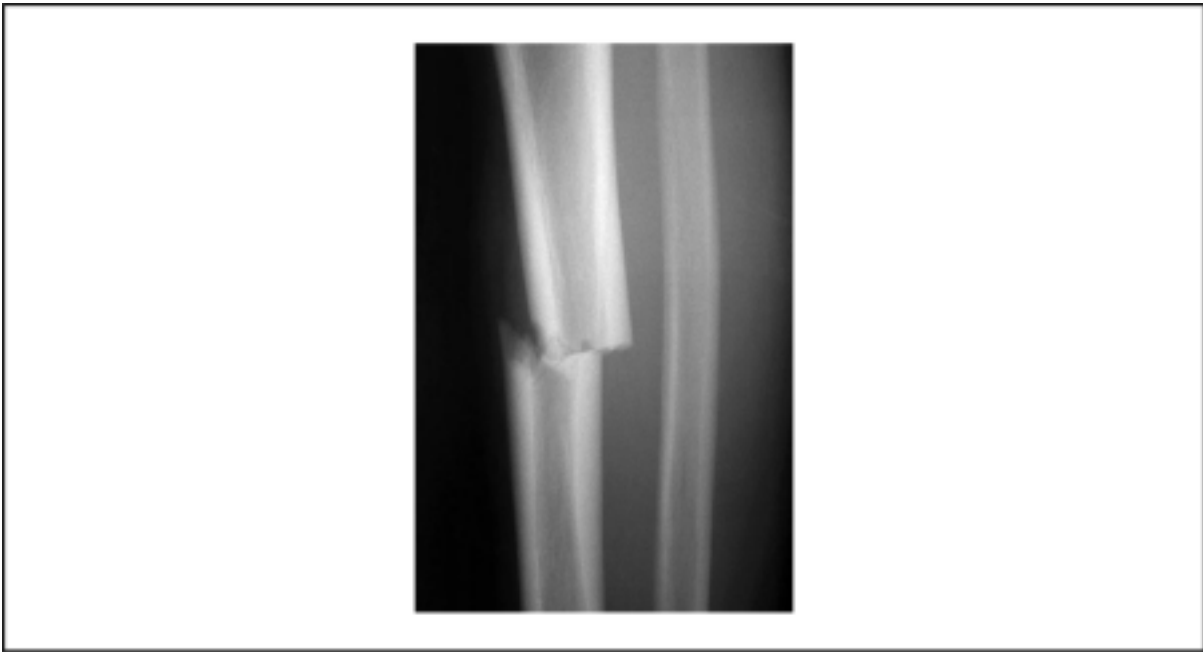


Figure 1. Transverse Fractures

(2) A spiral fracture spirals around the bone (Figure 2).



Figure 2. Spiral Fracture

NOTE: Usually caused by torsion force.

(3) A segmental fracture is a fracture with a free central fragment (Figure 3).

Performance Steps

Figure 3. Segmental Fracture

- (4) A comminuted fracture has one or more fragments separated from each other along the line of fracture. A distinct pattern appears at the fracture line; that is, T, V, or Y. Multiple patterns might also appear.

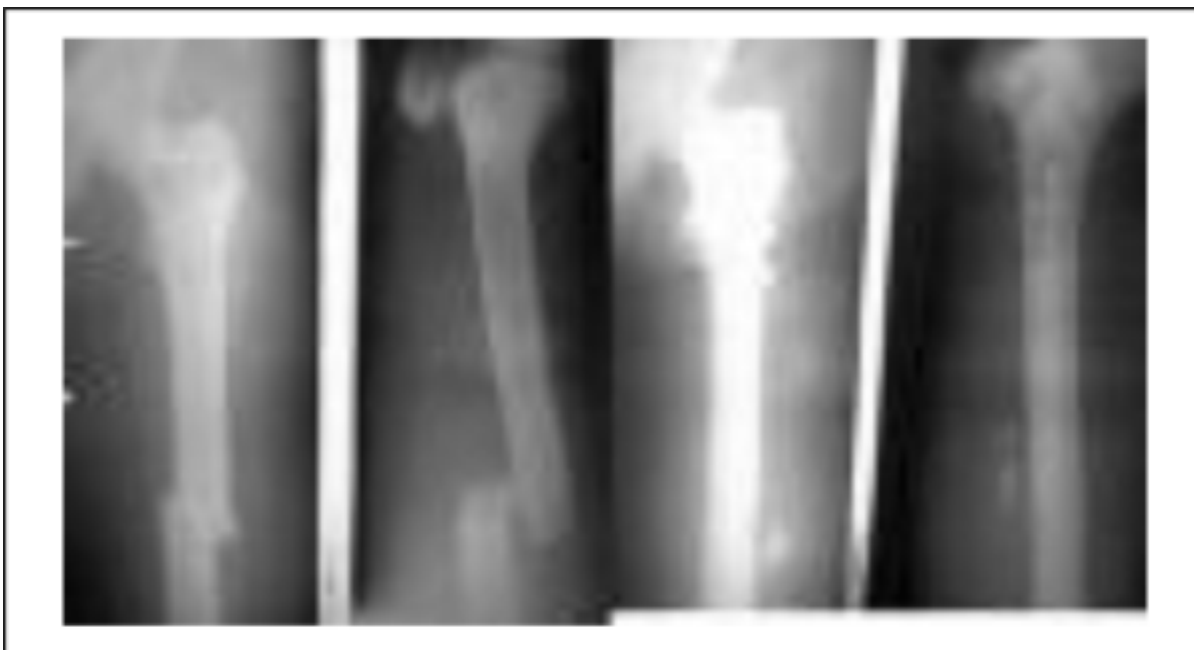


Figure 4. Comminuted Fractures

NOTE: Usually caused by direct force (Figure 4).

- (a) T pattern is common at the distal end of the femur.
- (b) V pattern is found in midshaft of long bones.

Performance Steps

- (c) Y pattern is found in distal end of humerus.
- (d) Multiple pattern is two or more fractures involving a single bone.
- (5) A chip (corner) fracture is a separation of a small fragment or chip from the corner of a phalanx or another long bone. Resembles an avulsion fracture and is common in fingers.
- (6) An impacted (incomplete) fracture has fragments that are driven into each other along the fracture line. A radiolucent line is seen on the X ray. To indicate a fracture, a dense line may be noted at the impaction site with a disruption of the trabecular pattern. Two common sites where the dense line appears are the neck of the humerus and the neck of the femur. (Figure 5).



Figure 5. Impacted Fracture

- (7) An occult fracture has clinical signs of a fracture, although a fracture cannot be demonstrated on initial X ray; for example, carpal navicular fracture.
- (8) Crush fractures are special types of comminuted fracture; for example, tuft fractures and distal fractures.
- (9) A pseudofracture has like defects that extend part way or completely through bone (frequently seen in osteomalacia).
 - (a) A similar type of transverse fracture is seen in Paget's disease, fibrous dysplasia, and osteogenesis imperfecta.
 - (b) Multiple pseudofracture is also known as "Milkman's Syndrome" but considered to be osteomalacia.
- (10) Pathologic fractures occur through diseased bone. Types of fractures that suggest diseased bone are as follows:
 - (a) A buckling fracture occurs when the fracture involves osteoporotic bone. Buckling fractures are frequent in osteogenesis imperfecta.
 - (b) A transverse fracture extends at right angle to the longitudinal axis of bone. The end of the fragments are smooth or slightly irregular.
- (11) Stress (march) fracture. A diagnosis of stress fracture must be considered when a transverse line or band of increased density extends partway or completely through the end of either a long bone or one in the small bones found on X ray.

Performance Steps

- (a) First sign is subperiosteal callus, which appears faint, hazy, and fusiform. Within a week, dense callus shadow (faint fracture line) appears extending transversely through the bone.
 - (b) The first finding in a stress injury near the end of a long bone or tarsal bone is sclerosis.
 - (c) The first finding in an inner upper margin of the tibia or os calcis may be only a linear zone of sclerosis.
 - e. Describe the displacement as nondisplaced, percent displaced, or completely displaced.
 - (1) Nondisplaced means that there is no shift of distal fragment.
 - (2) Displaced fractures involve the shifting of the bone ends so that they no longer align. Determine the percentage of the ends that are no longer aligned.
 - (3) In a completely displaced fracture, the bone ends no longer meet.
 - (a) If the bone fragments overlap, the fracture is described as shortened. Determine how much.
 - (b) If the distal fragment has rotated, describe the rotation of the fragment.
 - f. Identify if the fracture is open or closed.
 - (1) If the fracture communicates externally to air through a break in the skin, it is open.
 - (2) If there is no skin penetration, it is closed.
 - g. Identify if there is any complication such as bleeding.
7. Remember the "rule of twos" when working with X rays.
- a. Two views: A fracture or dislocation may not be seen on a single film, and at least two views (AP and lateral) must be taken.
 - b. Two occasions: Soon after injury a fracture (that is, the scaphoid) may be difficult to see. If doubt exists, further examinations must be carried out 10 to 14 days later, by which time bone absorption at the fracture site makes diagnosis more evident.
 - c. Two joints: In the forearm or leg, one bone may be fractured and angulated. However, angulation is impossible unless the other bone is broken or dislocated. The joints above and below the fracture must be included on the film.
 - d. Two limbs: In pediatric X rays, normal epiphysis and centers of ossification may confuse the diagnosis of a fracture. Films of the uninjured extremity are often helpful and comparison views should be ordered.
8. Identify normal findings on a chest X ray. (Figure 6).
- a. Evaluate the trachea for midline positioning. It should be centered over the spine with the greater densities of the spinous processes appearing as dots down the center of the trachea.
 - b. Evaluate the aortic knob for size. It should be about 3 centimeters (cm) in size. (About the size of a half-dollar.)
 - c. Evaluate the heart size. The heart should be 50 percent of the distance from chest wall to chest wall.
 - d. Evaluate the lung fields. The lung fields should be clear and have no signs of opacities or infiltrates.
 - e. Evaluate the diaphragmatic angles of the lungs. The angles should be sharp and well demarcated.

Performance Steps



Figure 6. Normal Chest X Ray

9. Identify abnormal findings on chest X rays.
 - a. Identify infiltrates. (See Figure 7.) Infiltrates may follow one of two patterns:
 - (1) Interstitial pattern may be "reticular" as a result of granulomatous infections, miliary TB, coccidioidomycosis, sarcoidosis or congestive heart failure (CHF), or "honeycombing," which represents end-stage fibrosis caused by sarcoid, rheumatoid arthritis (RA), or pneumoconiosis.
 - (2) Alveolar pattern will appear as diffuse with quick progression and regression. They are caused by pulmonary emboli, pneumonia, near drowning, bleeding, and CHF.

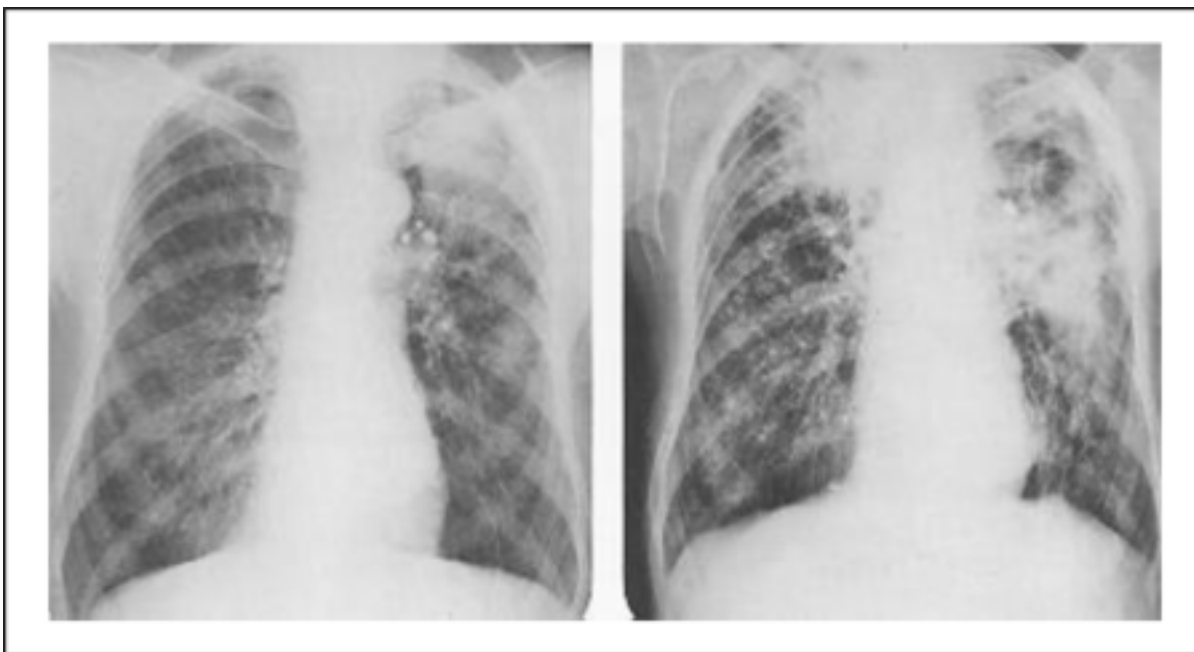
Performance Steps

Figure 7. X Ray Showing Infiltrates

- b. Identify a collapsed lung. (See Figure 8.)
- (1) There will usually be a faint line beyond which the tracings of the bronchioles and pulmonary vessels do not pass.
 - (2) Remember that a totally clear lung field (that is, with no white tracings at all) indicates a completely collapsed lung.



Figure 8. X Ray Showing Collapsed Lung

- c. Identify fluid collection. (See Figure 9.)

Performance Steps

- (1) Fluid in the chest cavity will settle to the lowest possible point. In an upright chest film, the fluid will obscure the diaphragmatic angles of the chest.
- (2) Diaphragmatic angles are blunted by 300 to 500 milliliters (ml) of fluid.



Figure 9. X Ray Showing Fluid Collection

- d. Identify mediastinal widening.
 - (1) Mediastinal width greater than 50 percent of the distance from chest wall to chest wall is considered widening. It will be necessary to measure this distance accurately to detect nominal amounts of widening.
 - (2) Mediastinal widening is most often caused by CHF or a build up of fluid in the pericardium. (See Figure 10.)

Performance Steps

Figure 10. X Ray Showing Mediastinal Widening

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier an X ray that he must interpret.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Checked the films to ensure that the correct patient identification data was on them.	—	—
2. Checked the films to ensure that they had the correct views and film quality.	—	—
3. Set the films in the view box in the anatomical position.	—	—
4. Stood back from the X ray and assessed the general density.	—	—
5. Examined the X ray closely to evaluate the following:	—	—
a. Soft tissue.		
b. Periosteum and cortex.		
c. Medullary canal.		
d. Joint capsule and joint.		
e. Epiphysis, epiphyseal plate, and metaphysis.		
6. Described the fracture by using correct medical terminology.	—	—
7. Applied the rule of twos when working with X rays.	—	—
a. AP and lateral views.		
b. Two occasions.		
c. Joints above and below.		
d. Comparison views of the uninjured limb.		
8. Ordered any missing or additional X rays required.	—	—
9. Identified normal findings on chest X rays.	—	—

Performance Measures

GO

NO GO

10. Identified abnormal findings on chest X rays.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Pain
081-833-4690

Conditions: Given a selection of pain medications and The Merck Manual.

Standards: Manage pain so the quality of life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the physiology of pain.
 - a. Pain is a sensation in which a person experiences discomfort, distress, or suffering as a result of irritation or stimulation of sensory nerves.
 - b. Nociceptors are free nerve endings located in almost all tissues of the body. These are the specialized receptors for pain.
 - c. Somatic pain is related to the skin, skeletal muscles, joints, tendons, and fascia.
 - d. Visceral pain is related to stimulation of receptors in the viscera.
 - e. Acute pain occurs rapidly, usually within 0.1 second after a stimulus is applied and is not felt in deeper tissues of the body. The impulses conduct along myelinated A fibers.
 - f. Chronic pain begins after a second or more and gradually increases in intensity. Chronic pain impulses conduct along smaller diameter, unmyelinated C fibers. It is usually defined as persisting longer than 3 months.
2. Recognize the physiologic effects of pain.
 - a. Superficial to moderate pain will cause an increase in pulse, blood pressure (BP), and respiration with dilated pupils (flight or fight response).
 - b. Deep, severe pain will cause a decrease in pulse and BP, nausea, vomiting, and diaphoresis.
 - c. Chronic pain will cause muscle weakness, fatigue, immobility, and depression.
3. Solicit a patient history.
4. Recognize significant subjective findings for pain.

NOTE: Remember OPQRST.

 - a. Onset: Acute or chronic.
 - b. Palliative or provocative: What makes the pain better or worse.
 - c. Quality:
 - (1) Sharp, dull, or stabbing.
 - (2) Burning, gripping, or boring.
 - (3) Constant, throbbing, or colicky.

NOTE: Do not lead the patient.

 - d. Radiation or region:
 - (1) Location of the pain. Have the patient point to it with one finger.
 - (2) Does it travel?
 - (3) Where and when do you have pain?
 - e. Severity: (scale of 1 to 10) Compare to worst pain.
 - f. Temporal relationship:
 - (1) Day versus night?
 - (2) Before or after meals?
5. Perform a physical examination (task 081-833-4002, Perform a Complete Physical Examination).
6. Recognize significant objective findings for pain.
 - a. Facial expressions (grimace).
 - b. Posturing (bent over or fetal).
 - c. Holding or protecting painful areas.
 - d. Muscle rigidity (guarding).
7. Manage pain.

Performance Steps

- a. Psychological factors:
 - (1) Be honest with the patient.
 - (2) Reassure the patient.
- b. Mechanical factors:
 - (1) Proper body positioning
 - (2) Proper support.
 - (3) Apply heat therapy (task 081-833-4415, Apply Heat Therapy for the Management of Soft Tissue Injuries) and/or cold therapy (task 081-833-4413, Apply Cold Therapy for the Management of Soft Tissue Injuries), as appropriate.
 - (4) Bedrest.
 - (5) Dimly lit, quiet environment.
- c. Pharmacological management:
 - (1) Local and regional infiltration blocks with lidocaine or equivalent may be useful in the management of acute pain--especially pain caused by a fractured extremity or ribs. (See task 081-833-4550, Administer Local Anesthesia.)
 - (2) Skin: Lidocaine or xylocaine (injection or topical).
 - (3) Eyes: Tetracaine ophthalmic drops. Do not give to patient. Limit use to 24 hours.
 - (4) Ears: Tetracaine otic.
 - (5) Deep, mild pain: acetylsalicylic acid (ASA) (aspirin), Tylenol, and Motrin.
 - (6) Deep, moderate pain: propoxyphene hydrochloride (HCL) (Darvon)
 - (7) Deep, severe pain: Meperidine (Demerol), Morphine sulfate, or Nalbuphine.
 - (8) Ulcer and indigestion: antacids (Maalox, Mylanta, and so on).
 - (9) Hemorrhoidal pain: Nupercaine or dibucaine topical ointment.
 - (10) Constipation cramps: Colace (soap).
 - (11) Diarrhea cramps: Pepto-Bismol, Kaolin-Pectin, and paregoric.
 - (12) Urinary pain: Pyridium.

NOTE: For indications, dosages, contraindications and warnings, refer to the Physicians Desk Reference.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pain.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the physiology of pain.	_____	_____
2. Recognized the physiologic effects of pain.	_____	_____
3. Solicited a patient history.	_____	_____
4. Recognized significant subjective findings for pain.	_____	_____
5. Performed a physical examination.	_____	_____
6. Recognized significant objective findings for pain.	_____	_____
7. Managed pain.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Remove the Pneumatic Antishock Garment

081-833-4691

Conditions: Given a casualty wearing the pneumatic antishock garment, at least two intravenous (IV) routes established for the administration of blood products, sphygmomanometer, stethoscope, watch, IV equipment, IV solutions, and blood products.

Standards: Sequentially deflate the pneumatic antishock garment while monitoring the casualty's response. Take immediate corrective action if the casualty begins to destabilize.

Performance Steps

1. Take and record the casualty's vital signs every 5 to 10 minutes until his vitals are stable.
WARNING: Shock will result if the pneumatic antishock garment is deflated before the casualty's vital signs are stable.

2. Deflate the abdominal section.
WARNING: The abdominal section will always be deflated before the leg sections so that the casualty's stable vital signs are maintained.

NOTE: Begin the procedure only when the casualty's blood pressure is at least 90 millimeters (mm) mercury (Hg) systolic.

- a. Deflate the abdominal section of the pneumatic antishock garment by slowly turning the stopcock valve until a small amount of air escapes.

NOTE: A hissing sound will be heard when air is escaping.

- b. Close the valve.
- c. Take the casualty's vital signs every 5 to 10 minutes.
 - (1) If the casualty's blood pressure is lower than 90 millimeters of mercury (mm Hg) systolic or the blood pressure has dropped precipitously (more than 5 mm Hg), infuse 100 to 200 milliliters of IV solution over a 10-minute period until the casualty's blood pressure stabilizes at or above 90 mm Hg systolic.
 - (2) If the casualty's vital signs do not become stable after IV infusion, reinflate the pneumatic antishock garment and wait until the casualty's vital signs have been stable for 5 to 10 minutes before beginning to deflate the pneumatic antishock garment again.
 - (3) Deflate in increments, monitoring vital signs, until the abdominal section is deflated.

3. Deflate one leg section.
 - a. Turn the stopcock valve slowly until a small amount of air escapes.
 - b. Close the valve.
 - c. Take the casualty's vital signs every 5 to 10 minutes as in steps 2c(1) through 2c(3).
 - d. Deflate in increments, monitoring vital signs, until the leg section is deflated.
4. Deflate the other leg section.
 - a. Turn the stopcock valve slowly until a small amount of air escapes.
 - b. Close the valve.
 - c. Take the casualty's vital signs every 5 to 10 minutes as in steps 2c(1) through 2c(3).
 - d. Deflate in increments, monitoring vital signs, until the leg section is deflated.
5. If the patient's vital signs remain stable after each section is deflated, unfasten the Velcro strips for each pneumatic antishock garment section.
6. Record all treatment in the patient's medical record.

Evaluation Preparation: Setup: For training and evaluation, a mannequin will be used. Under no circumstances will another soldier act as a simulated casualty to evaluate this task. Soldiers can practice applying pneumatic antishock garment on each other but will orally indicate inflation and deflation.

Brief soldier: Tell the soldier to deflate the pneumatic antishock garment.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Took and recorded the casualty's vital signs every 5 to 10 minutes.	—	—
2. Began the procedure only when the casualty's vitals signs were stable and the blood pressure was at least 90 mm Hg systolic.	—	—
3. Deflated the abdominal section first. a. Deflated section in increments. b. Monitored vital signs while deflating the section.	—	—
4. Deflated leg sections one at a time. a. Deflated section in increments. b. Monitored vital signs while deflating the section.	—	—
5. Took immediate corrective action as needed. a. Immediately stopped deflation when the casualty's vital signs became unstable, the blood pressure went below 90 mm Hg systolic, or the blood pressure dropped more than 5 mm Hg. b. Infused 100 to 200 milliliters of IV solution over a 10-minute period. c. Reinflated the pneumatic antishock garment when the casualty's vital signs did not stabilize after IV infusion. d. Waited until the casualty's vital signs were stable for 5 to 10 minutes before beginning to deflate the pneumatic antishock garment again.	—	—
6. Unfastened the Velcro strips for each pneumatic antishock garment section when the patient's vital signs remained stable after each section was deflated.	—	—
7. Performed all steps in sequence.	—	—
8. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG

Initiate an Intraosseous Sternal Infusion System

081-833-4692

Conditions: Given a casualty who requires immediate intravenous (IV) fluid to prevent or combat shock, a first access for shock and trauma (FAST) intraosseous infusion system, IV solution, IV injection set, alcohol and betadine antiseptic pads, and gloves. Attempts to initiate a peripheral IV have not succeeded or are prevented by the casualty's injuries and/or condition. The casualty has an airway, and hemorrhaging is stopped.

Standards: Establish intraosseous access without causing further injury or unnecessary discomfort to the patient. Do not violate aseptic technique.

Performance Steps

CAUTION: The FAST intraosseous infusion system is designed to be used only on the manubrium of adult patients.

1. Explain the procedure to patient.
 - a. Caution the patient against manipulating the equipment.
 - b. Ask about any known allergies to such things as betadine or medication.

2. Inspect the FAST intraosseous infusion system package for damage, holes, or tears.

Note: Strict aseptic technique should be used to prepare the insertion site and should be maintained during insertion. Sterile gloves should be used during placement of the system.

3. Locate the insertion site over the manubrium, below the suprasternal notch and midline (Figure 1).

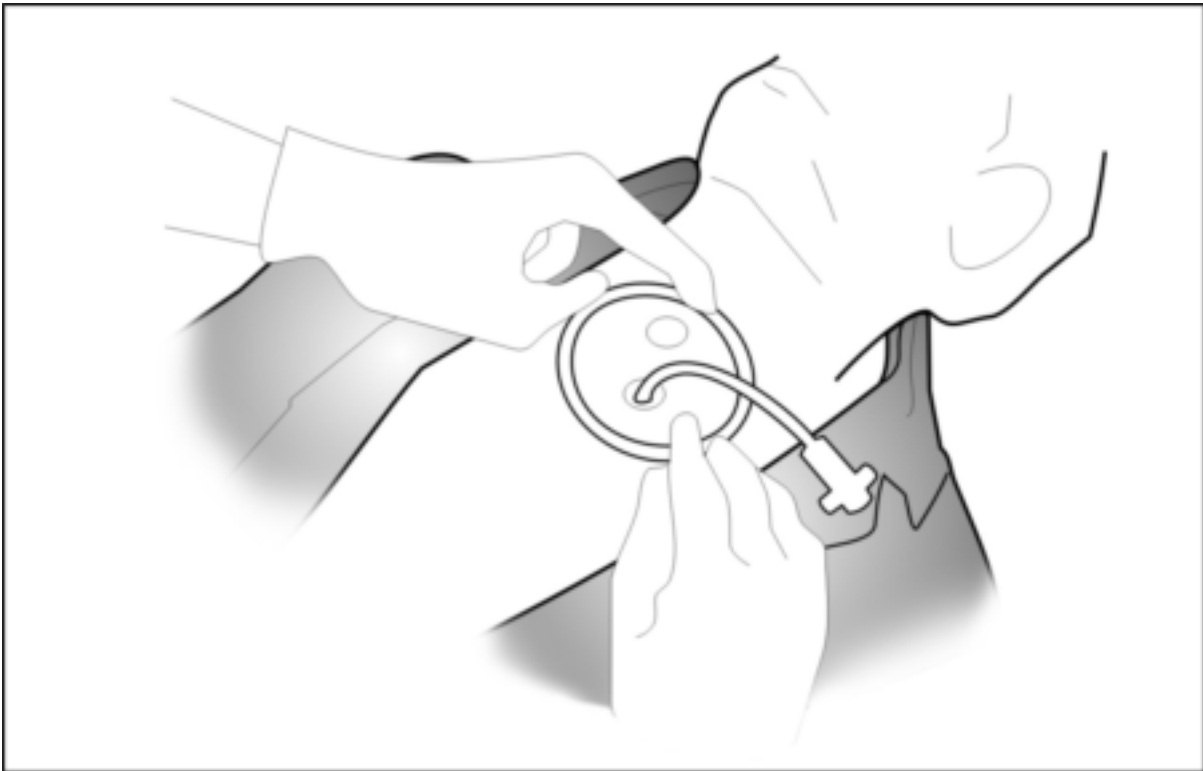


Figure 1. Placing the Patch at the Site

WARNING: Severe skin compromise such as trauma, infection, or burns over the infusion site may interfere with the use of the device.

Performance Steps

- a. Check for fracture of the sternum or vascular injury, which may compromise the integrity of the manubrium or its vascularization.
- b. Check for midline sternotomy scars as the device may not be effective in patients with a previous midline sternotomy.
4. Prepare the insertion site by using an aseptic technique.
 - a. Swab the site with iodine, and then wipe with alcohol in concentric circles.
 - b. Allow the site to dry for at least 15 seconds.
 - c. Administer a local anesthetic if the patient is awake or alert.
5. Prepare the IV solution.
 - a. Select the appropriate IV solution.
 - b. Inspect the IV solution and tubing for defects, expired date, and contamination.
 - (1) Do not use expired fluids.
 - (2) Discard containers which have cracks, scratches, leaks, sedimentation, condensation, or fluid which is not crystal clear and colorless.
 - (3) Inspect the spike, drip chamber, tubing, and needle adapter of the injection set. Discard them if there are cracks or holes or if any discoloration is present.
 - (4) Ensure that the tubing clamp releases and catches.
 - c. Clamp the tubing 6 to 8 inches below the drip chamber.
 - d. Remove the protective covers from the spike and from the outlet of the IV container.

CAUTION: Do not touch the spike or the outlet of the IV container.

- e. Insert the spike into the container.
 - (1) If using a bag, push the spike firmly into the container's outlet tube.
 - (2) If using a bottle, push the spike firmly through the container's diaphragm.

CAUTION: If no vacuum release sound is heard when puncturing bottled solution, discard the solution. Bagged solution makes no vacuum release sound.

- f. Hang the container at least 2 feet above the level of the patient's heart, if possible.

NOTE: An IV bag container may be placed under the patient's body if there is no way to hang it.

- g. Squeeze the drip chamber until it is half full of the IV fluid.
- h. Prime the tubing.

NOTE: Ensure that all air is expelled from the tubing.

- (1) Hold the tubing above the level of the bottom of the container.
- (2) Loosen the protective cover from the needle adapter to allow the air to escape.
- (3) Release the clamp on the tubing.
- (4) Gradually lower the tubing until the solution reaches the end of the needle adapter.
- (5) Clamp the tubing.
- (6) Retighten the needle adapter's protective cover.
- (7) Loop the tubing over the IV stand or holder.

6. Open the FAST package, and set it down without contaminating the contents.

7. Don sterile gloves.

8. Place the target or strain-relief patch over the casualty's manubrium.
 - a. Remove the top half of the backing from the target or strain-relief patch.
 - b. Place an index finger in the patient's suprasternal notch, perpendicular to the manubrium.
 - c. Align the notch in the patch with the sternal notch.
 - d. Align the target zone with the patient's midline.
 - e. Secure the top part of the patch to the body by pressing downward on the patch.
 - f. Remove the bottom half of the backing from the patch, and secure the rest of the patch to the skin by pressing firmly down on the patch.
 - g. Verify that the notch on the patch matches the patient's sternal notch, and the target zone is positioned over the patient's midline.

NOTE: If the error is greater than 1 centimeter (cm), discard the patch and prepare a new one.

9. Remove the sharps protector from the introducer.

Performance Steps

- a. Ensure that there is an infusion tube stub in the introducer.
 - b. Ensure that the bone probe cluster needles are straight and that there are no barbs, burrs, or contamination on the bevels.
10. Place the bone probe cluster in the target zone, with the long axis of the introducer perpendicular to the skin (Figure 2).

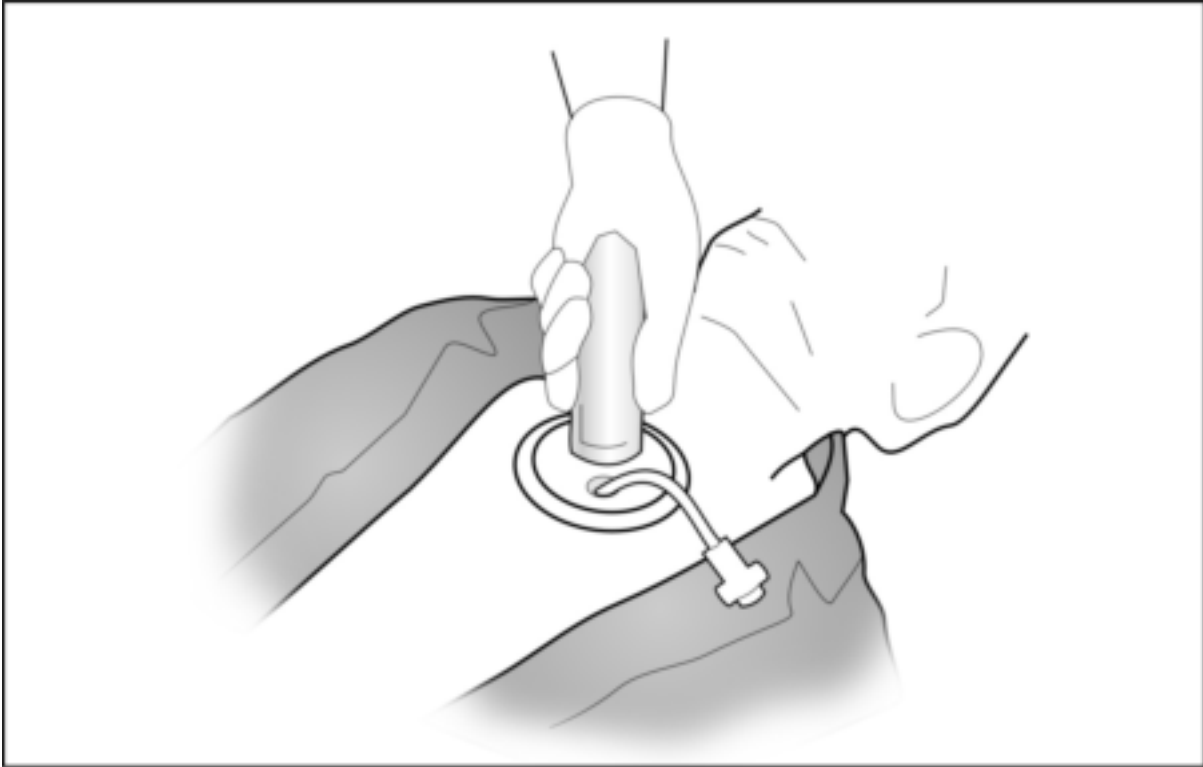


Figure 2. Inserting the Infusion Tube

- a. Ensure that the entire bone probe cluster is within the target zone.
- b. Align the arm with the introducer so that the pressure will be applied along the axis of the introducer (Figure 3).

Performance Steps

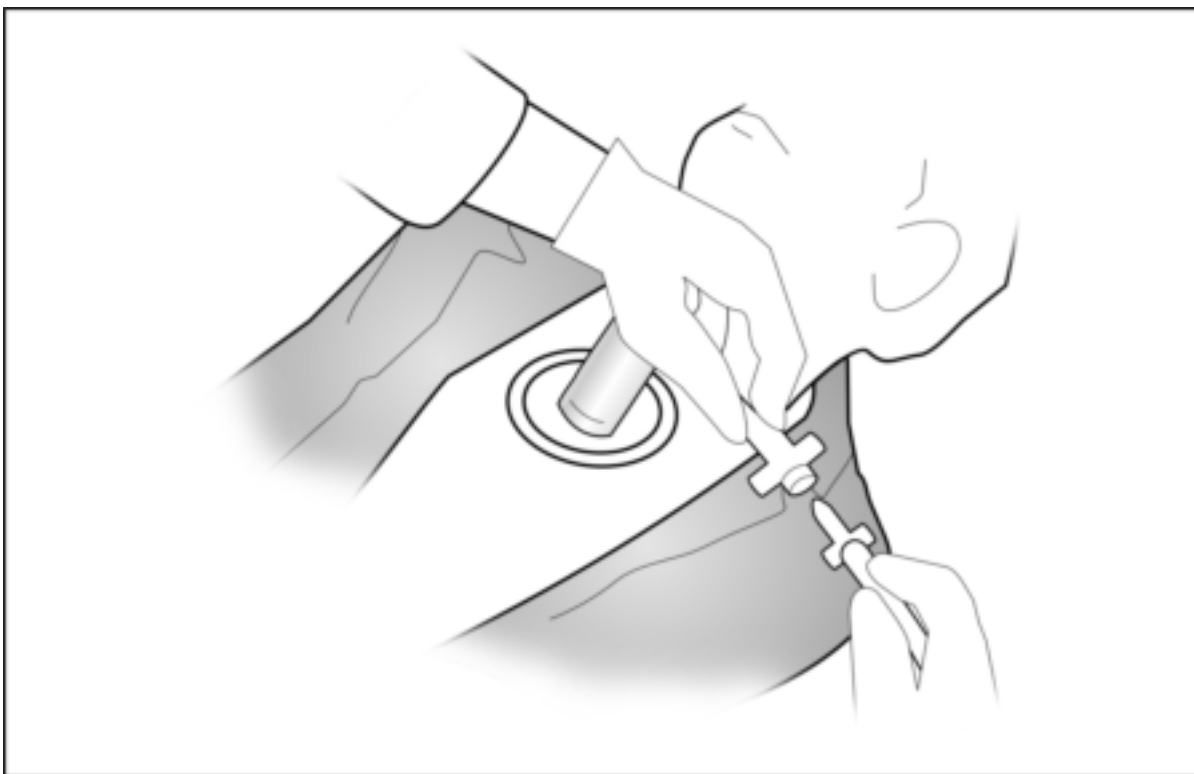


Figure 3. Connecting the Fluid Source

11. Press with increasing force until release of introducer occurs. The distinct release of the introducer should be heard and felt.

NOTE: Considerable force may be needed to release the introducer.

12. Remove the introducer and replace the sharps protector.
13. Attach the male connector on the patch to the infusion tube.
14. Connect a syringe to the female connector on the patch and withdrawing a small amount of bone marrow to verify that the infusion tube has been positioned in the right place.
15. Attach the female connector on the patch to the IV tubing.
 - a. Turn the fluid on.
 - b. Adjust the flow to the desired rate.
16. Place the protective dome over the patch, and press firmly down to engage the Velcro.
17. Attach the unopened remover package to the patient's arm or leg.

NOTE: This package must be transported with the patient. The remover will be needed later to remove the infusion tube from the patient's bone when intraosseous access is no longer required.

Evaluation Preparation: CAUTION: The FAST device is never used on another soldier during training. During training, a FAST sternal intraosseous insertion practice kit is used. This allows the soldier to practice inserting the FAST device into a simulated sternum.

Setup: For training and evaluation, have another soldier act as the casualty. For step 10, have the soldier use the practice device with the simulated sternum placed on the floor or the table.

Brief soldier: Brief the soldier that all attempts to initiate a peripheral IV have failed. Ensure that the soldier knows that the FAST device will not be inserted in the simulated casualty.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the procedure to patient.	—	—
2. Inspected the FAST intraosseous infusion system package for damage, holes, or tears.	—	—
3. Located the insertion site over the manubrium, below the suprasternal notch and midline.	—	—
a. Checked for fracture of the sternum or vascular injury.		
b. Checked for midline sternotomy scars.		
4. Prepared the insertion site.	—	—
a. Used aseptic technique.		
b. Administered a local anesthetic, as needed.		
5. Correctly prepared the IV solution.	—	—
6. Opened the FAST package, and set it down without contaminating the contents.	—	—
7. Donned sterile gloves.	—	—
8. Correctly and aseptically placed the target/strain-relief patch.	—	—
9. Removed the sharps protector from the introducer.	—	—
10. Ensured that there is an infusion tube stub in the introducer, the bone probe cluster needles are straight, and that there are no barbs, burrs, or contamination on the bevels.	—	—
11. Correctly placed the bone probe cluster in the target zone.	—	—
a. The long axis of the introducer is perpendicular to the skin.		
b. The entire bone probe cluster is within the target zone.		
12. Pressed with increasing force until release of introducer occurs.	—	—
13. Removed the introducer and replaced the sharps protector.	—	—
14. Attached the male connector on the patch to the infusion tube.	—	—
15. Verified that the infusion tube is in the correct place with a syringe.	—	—
16. Attached the female connector on the patch to the IV tubing.	—	—
a. Turned the fluid on.		
b. Adjusted the flow to the desired rate.		
17. Placed the protective dome over the patch and pressed firmly down to engage the Velcro.	—	—
18. Attached the unopened remover package to the patient's arm or leg.	—	—
19. Performed all steps in sequence.	—	—
20. Did not cause further harm to the casualty or violate aseptic technique.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Remove an Intraosseous Sternal Infusion Tube**081-833-4693**

Conditions: Given a patient with a first access for shock and trauma (FAST) intraosseous infusion tube in place and the FAST remover. Peripheral intravenous (IV) access has been gained or the sternal infusion tube is no longer needed. A patient care hand wash has already been performed.

Standards: Remove the infusion tube without causing further injury or unnecessary discomfort to the patient. Do not violate aseptic technique.

Performance Steps

CAUTION: Do not pull the infusion tube to remove it. The tip of the tube is embedded firmly in the bone, and the flexible tubing is likely to break, leaving the portal in the patient's bone. Always use the remover to remove the infusion tube.

1. Explain the procedure to the patient.
2. Turn off the IV fluid.
3. Remove the protector dome from the target/strain relief patch.
4. Disconnect the infusion tube from the male connector on the patch.
5. Open the remover package, and take out the remover without allowing the tip of the remover to become contaminated.

NOTE: If the remover has been lost and a replacement is unavailable, the tip of the infusion tube must be removed surgically.

6. Insert the remover into the infusion tube.
7. Advance the remover, and turn it clockwise until it stops turning. (At this point, the thread of the remover will have engaged the thread at the proximal end of the infusion tube.)
8. Pull straight out on the remover to remove the infusion tube.

NOTE: If the remover disengages from the infusion tube without removing it, return to step 6 and try again. If the threads cannot be engaged, repeat the procedure with a new remover. If this fails, remove the infusion tube surgically.

9. Discard the infusion tube and remover in a sharps container.
10. Remove the target/strain relief patch.
11. Apply pressure after removing the patch.
12. Dress the site aseptically.
13. Record the procedure in the patient's medical records.

Performance Measures

1. Explained the procedure to the patient.

GO **NO GO**

2. Turned off the IV fluid.

3. Removed the protector dome.

4. Disconnected the infusion tube from the male connector on the patch.

5. Aseptically removed the remover from the package.

6. Aseptically inserted the remover into the infusion tube.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
7. Advanced the remover and engaged the threads.	_____	_____
8. Pulled out the infusion tube.	_____	_____
9. Discarded the infusion tube and remover in a sharps container.	_____	_____
10. Removed the target/strain relief patch.	_____	_____
11. Applied pressure to stop any bleeding.	_____	_____
12. Dressed the site aseptically.	_____	_____
13. Recorded the procedure in the patient's medical records.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 4: Nursing

Irrigate Eyes

081-833-0054

Conditions: You have performed a patient care handwash. Necessary materials and equipment: draping materials, catch basin, light source, gauze or cotton balls, irrigating syringe or similar equipment, gloves, and irrigating solution (normal saline, water, or other prescribed solution).

Standards: Irrigate the eyes without contaminating or injuring the eyes.

Performance Steps

1. Identify the casualty and explain the procedure.
2. Verify the type, strength, and expiration date of the medication, as appropriate.
CAUTION: Do not irrigate an eye that has an impaled object.
3. Ask the casualty to remove contact lenses or glasses, if necessary.
4. Position the casualty.
 - a. If lying on the back, tilt the head slightly to the side that is to be irrigated.
 - b. If seated, tilt the head to the side that is to be irrigated, and slightly backward.
5. Position the equipment.
 - a. Drape the areas of the casualty that may be splashed by the solution.
 - b. Place a catch basin next to the face on the affected side.
 - c. Position the light so that it does not shine directly into the casualty's eyes.
6. Put on gloves.
WARNING: Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.
7. Clean the eyelids with gauze or cotton balls, and rinse debris from the outer eye.
8. Separate the eyelids using the thumb and forefinger, and hold the lids open.
CAUTION: Do not put pressure on the eyeball.
9. Irrigate the eye.
 - a. Hold the irrigating tip 1 to 1 1/2 inches away from the casualty's eye.
 - b. Direct the irrigating solution gently from the inner canthus to the outer canthus.
 - c. Use only enough pressure to maintain a steady flow of solution and to dislodge the secretions or foreign bodies.
 - d. Instruct the casualty to look up to expose the conjunctival sac and lower surface of the eye.
 - e. Instruct the casualty to look down to expose the upper surface of the eye.
10. Dry the area around the eye by gently patting with gauze sponges.
CAUTION: Do not touch the eye.
11. Remove the gloves, and perform a patient care handwash.
12. Record the treatment given on the appropriate form.
13. Did not injure or contaminate the eye.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must irrigate eyes.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identify the casualty and explained the procedure.	_____	_____
2. Verify the type, strength, and expiration date of the medication, as appropriate.	_____	_____
3. Ask the casualty to remove contact lenses or glasses, if necessary.	_____	_____
4. Position the casualty.	_____	_____
5. Position the equipment.	_____	_____
6. Put on gloves.	_____	_____
7. Clean the eyelids with gauze or cotton balls, and rinsed debris from the outer eye.	_____	_____
8. Separate the eyelids using the thumb and forefinger, and held the lids open.	_____	_____
9. Irrigate the eye.	_____	_____
10. Dry the area around the eye by gently patting with gauze sponges.	_____	_____
11. Remove the gloves, and performed a patient care handwash.	_____	_____
12. Record the treatment given on the appropriate form.	_____	_____
13. Do not injure or contaminate the eye.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG

Attend Death
081-833-4015

Conditions: Given a patient who is dying. All medical treatments and interventions have been exhausted, and the patient is being kept as comfortable as possible.

Standards: Recognize the five stages of the grieving process, apply the three general principles of caring for terminally ill patients, and appropriately handle the effects and remains of the deceased.

Performance Steps

1. Identify in order the five stages of the grieving process.
 - a. First stage: denial and isolation.
 - b. Second stage: anger and resentment.
 - c. Third stage: bargaining.
 - d. Fourth stage: depression.
 - e. Fifth stage: acceptance.
2. Apply the three general principles to guide nursing interventions in terminally ill patients.
 - a. Acknowledge the loss to the patient.
 - b. Facilitate the expressions of grief by the patient and the family.
 - c. Support the patient and family as they move through the stages of the grieving process.
3. Ensure that the patient is as comfortable and pain-free as possible.
4. Appropriately handle the effects and remains of the deceased.
 - a. In a clinical setting, do the following:
 - (1) After death has been determined (task 081-833-4014, Determine Death), ensure appropriate notification of chaplain, unit commander, and so on.
 - (2) Provide privacy for the body.
 - (3) Ensure that the body is in the supine position with arms at the sides and palms turned toward the thighs.
 - (4) Inventory all the patient's personal effects, and turn them over to the proper administrative authority for safekeeping.
 - (5) The patient's area should be neat and clean. Remove all unnecessary equipment.
 - (6) Clean the body, and apply dressings loosely over wounds.
 - (7) Tie off or clamp all drains and tubes.
 - (8) All indwelling tubes and lines should be left in place.
 - (9) Attach two Department of the Army (DA) Forms 3910 (Death Tag) to the body. Tie one death tag to the great right toe, and tie another tag to the left wrist.
 - (10) Wrap the body in a plastic shroud, or place it in a body bag depending on local standing operating procedure (SOP).
 - (11) Attach the third death tag to the outside of the shroud or body bag.
 - (12) Transport the body to the morgue.
 - b. In a tactical or field setting, do the following:

NOTE: The tactical situation may make the recovery of remains impossible. In this instance, conceal the body in a shallow grave until it can be recovered at a later date.

- (1) Wrap the body in a poncho, blanket, and so on whenever possible.
- (2) Include identification with the body. (North Atlantic Treaty Organization [NATO] doctrine is to bury personal effects with the body.)
- (3) Time and situation permitting, the grave should be deep enough to protect the body from marauding animals and looting (minimum depth of 3.5 feet is recommended).
- (4) If available, sprinkle chlorobenzalmalononitrile (CS) powder over the body to prevent animals from digging it up, especially if it is not buried over 3 feet deep.
- (5) Record the grid coordinates of the burial site (accurate to within 10 meters). Note any identifying landmarks.

Performance Steps

- (6) Conceal the grave by the best means possible.
- (7) If possible, do a detailed strip map from at least one identifiable terrain feature or landmark. Include the distance and azimuth to the grave.
- (8) Give all pertinent information to the team's communications man so he can prepare an under report.

NOTE: Turn host nation forces' casualties over to their command for burial. If unable to return the body to his own forces, any casualty from host-nation forces should be handled with respect to his culture and religion. At a minimum, treat the body the same as you would United States' casualties.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must attend death.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified the five stages of the grieving process in the correct order.	_____	_____
2. Explained the five stages of the grieving process.	_____	_____
3. Applied the three general principles to guide nursing interventions in terminally ill patients. a. Acknowledged the loss to the patient. b. Facilitated the expressions of grief by the patient and the family. c. Supported the patient and family as they moved through the stages of the grieving process.	_____	_____
4. Ensured that the patient was as comfortable and pain-free as possible.	_____	_____
5. Appropriately handled the effects and remains of the deceased in a clinical and field environment.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	DA FORM 3910

Monitor a Patient's Vital Signs

081-833-4017

Conditions: Given pencil and paper, a stethoscope, a sphygmomanometer, and an oral, a rectal, or a digital thermometer.

Standards: Determine the patient's temperature, pulse, respirations, and blood pressure (BP), and record the findings in the patient's medical record.

Performance Steps

1. Measure a patient's temperature.
 - a. Determine which site to use.
 - (1) Take an oral temperature if the patient is conscious, can follow directions, and can breathe normally through the nose.

CAUTION: Do not take an oral temperature when the patient--

1. Has had recent facial or oral surgery.
2. Is confused, disturbed, or heavily sedated.
3. Is being administered oxygen by mouth or nose.
4. Is likely to bite down on the thermometer.
5. Has smoked, chewed gum, or ingested anything hot or cold within the last 15 to 30 minutes.
 - (2) Take a rectal temperature if the oral site is ruled out by the patient's condition or when the patient is unconscious.

CAUTION: Do not take a rectal temperature on a patient with a cardiac condition, diarrhea, a rectal disorder such as hemorrhoids, or recent rectal surgery.

- (3) Take an axillary temperature if the patient's condition rules out using the other two methods.
 - (4) Otic digital thermometers may be used if available.
- b. Select the proper thermometer.
 - (1) An oral thermometer has a blue tip and may be labeled "Oral."
 - (2) A rectal thermometer has a red tip and may be labeled "Rectal."
 - (3) Axillary temperatures are taken with oral thermometers.
 - (4) An otic thermometer may be used if the ear is accessible.
- c. Explain the procedure, and position the patient.
 - (1) Take an oral temperature with the patient seated or lying face up.
 - (2) Take a rectal temperature with the patient lying on either side with the top knee flexed.
 - (3) Take an axillary temperature with the patient lying face up with the armpit exposed.
 - (4) An otic digital thermometer may be used in any position from which the ear can be accessed.
- d. Measure the temperature.
 - (1) Shake the thermometer down to below 94 degrees Fahrenheit.
 - (2) Place the thermometer at the proper site.
 - (a) If you are taking an oral temperature, place the thermometer in the heat pocket under the tongue. Tell the patient to close his or her lips and not to bite down.
 - (b) If you are taking a rectal temperature, insert the thermometer 1 to 2 inches into the patient's rectum.

CAUTION: Lubricate the tip before insertion. Hold the thermometer in place.

- (c) If you are taking an axillary temperature, pat the armpit dry and then place the bulb end in the center with the glass tip protruding to the front of the patient's body. Place the arm across his or her chest.
 - (d) If you are taking an otic digital temperature, cover the instrument tip with a disposable cover, and insert it into the ear canal in the same manner as an otoscope speculum. The thermometer will not properly function if the tympanic membrane is not "visible" to the scanner.
- e. Leave the thermometer in place for the required time.

Performance Steps

- (1) Oral: at least 3 minutes.
- (2) Rectal: at least 2 minutes.
- (3) Axillary: at least 10 minutes.
- (4) Otic digital: depends on the model. Some models will beep when finished, others simply require you to depress a button. When the button is depressed, the temperature is taken.
- f. Remove the thermometer, and wipe it down with a gauze square. With the otic thermometer, remove the disposable cover and discard it.
- g. Read the scale.
- h. Put the thermometer in the proper "used" canister. Return the otic digital thermometer to its receptacle.
- i. Record the temperature to the nearest 0.2 degrees Fahrenheit on the appropriate forms.

NOTES:

1. The normal temperature range is oral, 97.0 to 99.0 degrees Fahrenheit; rectal, 98.0 to 100.0 degrees Fahrenheit; and axillary, 96.0 to 98.0 degrees Fahrenheit.
2. Record an axillary temperature with an "A" on the patient's record. Record a rectal temperature with an "R" on the patient's record.

2. Measure a patient's pulse.

- a. Position the patient so that the pulse site is accessible.
- b. Palpate the pulse site.
 - (1) Place the tips of your index and middle fingers on the pulse site.

NOTE: You must use a stethoscope to monitor the apical site.

- (2) Press your fingers on the pulse site, using moderate pressure, to feel the pulse.
- c. Count for 1 full minute to determine the pulse rate.
 - (1) Normal adult rate: 60 to 100 beats per minute.
 - (2) Bradycardia: less than 60 beats per minute.
 - (3) Tachycardia: more than 100 beats per minute.
- d. Evaluate the pulse rhythm while counting.

NOTE: To detect irregularities, you must count for 1 full minute.

- (1) Regular.
 - (a) Usually easy to find.
 - (b) Has a regular rate and rhythm.
 - (c) Varies with the individual.
- (2) Irregular or intermittent: any change from a regular beating pattern.

NOTE: If a peripheral pulse is irregular or intermittent, you should take a second pulse at the carotid, femoral, or apical site.

- (3) Pulse strength.
 - (a) Strong: easy to find, has even beats with good force.
 - (b) Bounding: easy to find, exceptionally strong heartbeats that make the arteries difficult to compress.
 - (c) Weak or thready: difficult to find.
- e. Record the rate, rhythm, strength, and any significant deviations from normal on the appropriate forms.

3. Measure a patient's respirations.

NOTE: The patient should not be aware that respirations are being counted. If the patient is aware, he or she often becomes tense, and an accurate count becomes extremely difficult. The normal respiration rate for an adult is generally considered to be between 12 and 20 respirations per minute.

- a. Count the number of times the chest rises in 1 minute.
- b. Evaluate the depth of the respirations.
 - (1) Normal: deep, even movement of the chest.
 - (2) Shallow: minimal rise and fall of the chest and abdomen.
 - (3) Deep: the rib cage expands fully, and the diaphragm descends to create a maximum capacity.
- c. Evaluate the rhythm and pattern of the respirations.

Performance Steps

- (1) Healthy: exhalations are twice as long as inhalations.
- (2) Irregular.
- (3) Hypoventilation: slow and shallow respirations.
- (4) Hyperventilation: sustained, increased rate and depth of respiration.
- (5) Sigh: deep inhalation followed by a slow, audible exhalation.
- (6) Apnea: temporary absence of breathing.
- (7) Tachypnea: increased respiration rate, usually 24 or more breaths per minute.
- d. Evaluate the quality of the respirations.
 - (1) Normal: effortless, automatic, regular rate, even depth, noiseless, and free of discomfort.
 - (2) Dyspnea: difficult or labored breathing.
 - (3) Wheezing or whistling sound.
 - (4) Rattling or bubbling.
- e. Check for the physical characteristics of abnormal respirations.
 - (1) Appearance: the casualty may appear restless, anxious, pale, ashen, or cyanotic.
 - (2) Position: the casualty may alter his or her position by leaning forward or may be unable to lie flat.
 - (3) Cough.
 - (a) Acute: comes on suddenly.
 - (b) Chronic: has existed for a long time.
 - (c) Dry: coughs without sputum.
 - (d) Productive: coughs that expel sputum.
- f. Record the rate of respirations and any observations noted on the appropriate forms.

4. Measure the patient's blood pressure.

- a. Explain the procedure to the patient, if necessary.
 - (1) The length of time the procedure will take.
 - (2) The site to be used.
 - (3) The physical sensations the patient will feel.
- b. Check the equipment.
 - (1) Ensure that the cuff is deflated completely, and fully retighten the thumbscrew.
 - (2) Ensure the sphygmomanometer gauge reads zero.

NOTE: Steps b through h describe the procedure for taking the blood pressure at the brachial site. If the brachial site cannot be used, measure the BP by using a larger cuff applied to the thigh. The patient should be lying down (preferably on the stomach; otherwise, on the back with one knee flexed). Apply the cuff at midthigh, and place the stethoscope over the popliteal artery. The remainder of the procedure is the same as for the brachial artery site.

- c. Position the patient.
 - (1) Place the patient in a relaxed and comfortable sitting, standing, or lying position.

NOTE: A reading obtained from a standing position will be slightly higher.

- (2) Place the patient's arm palm up at approximately heart level. Support the arm so that it is relaxed.
- d. Place the cuff at the brachial artery site.
 - (1) Place the cuff so the lower edge is 1 to 2 inches above the elbow and the bladder portion is over the artery.
 - (2) Wrap the cuff just tightly enough to prevent slippage.
 - (3) If applicable, clip the gauge to the cuff in alignment with the palm.
- e. Position the stethoscope, if used.
 - (1) Palpate for the brachial pulse.
 - (2) Place the diaphragm of the stethoscope over the pulse site.
- f. Inflate the cuff until the gauge reads at least 140 millimeters of mercury (mm Hg) or 10 mm Hg higher than the usual range for that patient, if known.

NOTE: If a pulsation is heard when the gauge reaches 140 mm Hg, continue to inflate the cuff 10 mm Hg beyond the point at which the last pulsation was heard.

CAUTION: The cuff should not remain inflated for more than 2 minutes.

Performance Steps

g. Determine the BP.

NOTE: Systolic BP may be estimated by palpation at the various pulse points. A radial pulse ensures a minimum of approximately 80 mm Hg, a femoral pulse ensures a minimum of approximately 70 mm Hg, and a carotid pulse ensures a minimum of about 60 mm Hg.

- (1) If a stethoscope is used, complete the following steps:
 - (a) Rotate the thumbscrew slowly in a counterclockwise motion, allowing the cuff to deflate slowly.
 - (b) Watch the gauge, and remember the reading when the first distinct sound is heard (systolic pressure).
 - (c) Continue to watch the gauge, and remember the reading where the sound changes again and becomes muffled or unclear (diastolic pressure).
 - (d) Release the remaining air.
- (2) If a stethoscope is not used, complete the following steps:
 - (a) Palpate for the radial pulse.
 - (b) Rotate the thumbscrew slowly in a counterclockwise motion, allowing the cuff to deflate slowly.
 - (c) Watch the gauge and remember the point at which the pulse returns (systolic pressure).

NOTES:

1. The diastolic pressure cannot be determined by using this method.
2. If the procedure must be repeated, wait at least 1 minute before repeating steps e. through g.
 - h. Record the BP on the appropriate forms.
 - (1) Record the systolic reading over the diastolic reading, for example 120/80.
 - (2) Record the readings in even numbers.
 - i. Evaluate the BP reading by comparing it with one of the following:
 - (1) The patient's previous reading.
 - (2) An average of the patient's previous readings.
 - (3) The normal range: 100-140/60-90 for males and 90-130/50-60 for females.

5. Perform an orthostatic BP and pulse check.

NOTE: This is to be used as a guide for assessing, confirming, and/or estimating fluid loss when actual observation of the loss is not possible or visible.

- a. Indications for use (examples).
 - (1) Fluid deficit from diarrhea.
 - (2) Fluid deficit from vomiting.
 - (3) Occult blood loss; for example, chronic gastrointestinal (GI) or menstrual blood loss.
- b. Procedure.
 - (1) Have patient lie down (quietly for 3 minutes); then take BP and pulse.
 - (2) Have patient stand up; then take BP and pulse within 3 minutes.
- c. Interpretation.
 - (1) If standing systolic BP is 10 to 20 mm Hg lower than recumbent systolic BP and the pulse is 20 beats per minute (BPM) higher, then this indicates a fluid deficit of 1,000 to 1,500 cubic centimeters (cc).
 - (2) If the standing BP is more than 20 mm Hg lower than the recumbent BP, this indicates a fluid deficit greater than 1,500 cc.
 - (3) The change in pulse is the more sensitive of the two methods.
 - (4) If the patient becomes syncopal upon standing, this indicates a fluid deficit of 1,000 to 1,500 cc or greater.

6. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must monitor a patient's vital signs.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Measured and recorded the patient's temperature.	_____	_____
2. Measured and recorded the patient's pulse rate, rhythm, and strength.	_____	_____
3. Measured and recorded the patient's respiratory rate, depth, rhythm or pattern, and quality.	_____	_____
4. Measured the patient's BP.	_____	_____
5. Performed an orthostatic BP and pulse check.	_____	_____
6. Recorded all information on the appropriate forms.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
STP 8-91W15-SM-TG

Manage a Continuous Intravenous Infusion

081-833-4043

Conditions: Given a patient with an established intravenous (IV), dressings, antiseptic swabs, sterile gauze, IV tubing, IV solution, tape, antimicrobial ointment, and examination gloves.

Standards: Properly manage a patient with an IV infusion so that complications are prevented or minimized. Assess for complications of the IV therapy, and initiate appropriate interventions. Accurately document the IV therapy. Do not violate aseptic technique or cause further injury to the patient.

Performance Steps

1. Check the IV system regularly to ensure that it is flowing properly. The situation dictates how frequently the IV should be monitored, but it should be checked every time the patient or IV are moved.

NOTE: The sequence of checking the IV system is not critical but it should be checked in a systemic manner, either starting at the IV site and moving up to the bag or from the bag to the IV site.

- a. Check that the bag is still intact and not damaged (field environment).
- b. Check the amount of fluid remaining in the bag.
 - (1) Ensure that the proper amount of fluid has been infused.
 - (2) Ensure that there is sufficient fluid remaining in the bag to last until the next scheduled check.
- c. Ensure that the IV tubing is still connected to the bag.
- d. Look in the drip chamber, and ensure that the solution is still flowing or dripping. If the solution is being infused at a set drip rate, count the drops and ensure that it is still infusing at the proper rate.

NOTE: The drip rate will frequently have to be readjusted.

- e. Examine the tubing for damage, kinks, twists, or signs of blood backing up.
- f. Make sure the IV tubing is still connected to the catheter.
- g. Make sure the IV tubing and catheter are still secured to the patient.

2. Check for flow of the IV.

- a. Lower the bag below the level of the infusion site, and look for blood backing up in the IV tubing.
 - (1) A rapid, immediate backup of blood in the IV line indicates that the catheter is in the vein.
 - (2) A slow, intermittent backup may indicate that the catheter is not in the vein or that it may be blocked by a valve or the vein wall.
- b. Place pressure over the IV catheter tip, and look at the drip chamber.
 - (1) If the drip stops, then the catheter is probably in the vein.
 - (2) If the flow continues, the catheter is either not in the vein or the operator is not occluding the catheter tip.
- c. Take corrective actions if an indication of proper catheter placement is not observed.
 - (1) Reposition the extremity of the patient.
 - (2) Pull the catheter back while watching the drip chamber. If flow resumes, reinsert the catheter and recheck flow once catheter is fully inserted.
 - (3) If unable to restart flow, initiate another IV at a different site. Use either another suitable limb or a site proximal to the current IV site.

3. Assess the IV site and patient for complications to IV therapy.

- a. Infiltration.
 - (1) Accumulation of fluids in the tissue surrounding an IV needle site. It is caused by penetration of the vein wall by the needle or catheter or later dislodgement of the needle or catheter.
 - (2) Signs and symptoms of infiltration.
 - (a) Solution flows sluggishly or not at all.
 - (b) Discoloration or cool feeling around the infusion site.

Performance Steps

- (c) Swollen extremity.
 - (d) Fluid leaking from the infusion site.
 - (e) Patient complains of pain, tenderness, irritation, or burning at the infusion site.
 - b. Phlebitis.
 - (1) Inflammation of the wall of the vein.
 - (2) It is caused by injury to the vein during puncture, from later catheter movement, or from irritation to the vein caused by long-term therapy, incompatible additives, or use of a vein that is too small to handle the amount or type of solution.
 - (3) Signs and symptoms of phlebitis.
 - (a) Swelling, redness, and/or tenderness around the venipuncture site.
 - (b) Sluggish flow rate.
 - c. Infection of the site.
 - (1) Usually indicated by yellowish, foul-smelling discharge from the venipuncture site.
 - (2) Signs and symptoms will vary depending on the cause of the infection.
 - d. Air embolism is the obstruction of a blood vessel by air carried via the bloodstream (usually occurring in the lungs or heart). It is caused by conditions such as air bubbles in the IV tubing, a solution container that has run dry, or disconnected IV tubing.
 - (1) Abrupt drop in blood pressure.
 - (2) Chest pain.
 - (3) Weak, rapid pulse.
 - (4) Cyanosis.
 - (5) Loss of consciousness.
 - e. Circulatory overload.
 - (1) Increased circulatory system volume that is caused by excessive IV fluid infused too rapidly into the vein.
 - (2) Signs and symptoms of circulatory overload.
 - (a) Elevated blood pressure.
 - (b) Distended neck veins.
 - (c) Rapid breathing, shortness of breath, and tachycardia.
 - (d) Fluid intake is much greater than urine output.
- 4. Manage IV therapy complications, as required.
 - a. Infiltration.
 - (1) Stop the infusion.
 - (2) Place a compressive bandage over the site of infiltration until the subcutaneous fluid is reabsorbed.
 - (3) Restart the IV in another location.
 - b. Phlebitis.
 - (1) Stop the infusion.
 - (2) If other signs and symptoms of infection are not present, clean the catheter site and monitor for infection.
 - (3) Restart the IV in another location.
 - c. Infection.
 - (1) Start an IV in another location, preferably in another extremity.
 - (2) Stop the infected infusion.
 - (3) Culture the infected site by using the "roll" method to express any exudate from the catheter site.
 - (4) More than 15 colonies on the culture medium suggest infection.
 - (5) Manage IV line infection based on the treatment modality in the most current edition of Sanford's Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - (a) Drug of choice (DOC) is vancomycin 1.0 gram (g) IV every 12 hours (q12h) for (x) 10 days.
 - (b) With immunocompromise or burns, give the above dose of vancomycin PLUS cefotaxime 2.0 gm IV every 8 hours (q8h), both for 10 to 14 days.

Performance Steps

CAUTION: These are not benign drugs. Consultation with pharmacology is recommended, especially in complex situations where other concurrent problems exist.

- d. Air embolism.
 - (1) Ensure that no further air is going into the system.
 - (2) Place the patient in the left lateral recumbent position.
 - (3) Evaluate the patient for any neurologic deficit. (See 081-833-4150, Assess Nervous System Disorders.)
 - (4) Monitor the patient's vital signs, and treat complications symptomatically.

NOTE: It is unlikely that enough air would enter a patient's system through normal IV procedures to cause significant disability.

- e. Circulatory overload.
 - (1) Slow the infusion rate to keep the vein open (TKO).
 - (2) Place the patient in the semi-Fowler's position.
 - (3) Place the patient on oxygen (O₂), if available.
 - (4) Monitor the patient's vital signs until stable.

NOTE: Ensure that the patient's condition is related to the amount of fluid received, and not to underlying problems such as congestive heart failure (CHF), or renal failure.

- 5. Change the solution container every 24 hours when running a slow infusion in which the container may not be depleted in 24 hours.
 - a. Perform a patient care handwash.
 - b. Select or prepare the new solution.
 - c. Clamp the IV tubing shut.
 - d. Remove the used container from the IV hanger.
 - e. Remove the spike from the used container.
 - f. Insert the IV spike into a new IV container.

CAUTION: The old tubing is still connected to the catheter or needle. Use care to maintain sterility. To prevent backflow of blood, keep the spike and tubing elevated.

- g. Hang the new container.
- h. Adjust the infusion rate.
- i. Label the solution container, and prepare a timing label.
- j. Record the amount of solution received from the previous container on the appropriate form and the time, type, and amount of new solution.

- 6. Change the IV site dressing every 24 hours.

NOTE: The situation may require that the dressing be changed more frequently or less frequently.

- a. Perform a patient care handwash.
- b. Remove the tape and the old dressing without dislodging the catheter or needle.

NOTE: Tubing should remain taped in place to reduce the chance of accidental dislodgement of the catheter or needle.

- c. Clean the area around the infusion site with betadine or alcohol wipes. Use the alcohol pads after the betadine wipes.
- d. Examine the site for infiltration.
- e. Cover the infusion site with sterile gauze and secure with tape, or dress in accordance with (IAW) local standing operating procedure (SOP).
- f. Secure the dressing to the site without encircling the wrist or arm.
- g. Label the dressing.

- 7. Change the tubing every 48 hours.

NOTE: Time the tubing change to coincide with the time the solution container will be changed.

- a. Perform a patient care handwash.
- b. Spike the new tubing into a new solution container, and hang it from the IV pole.
- c. Prime the tubing, and clamp it.
- d. Clamp the old tubing shut.
- e. Connect the new tubing to the catheter by using the following sequence.

Performance Steps

WARNING: Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.

- (1) Loosen the tape on the old tubing without dislodging the catheter.
- (2) Place a sterile gauze pad under the catheter hub to provide a small sterile field.
- (3) Grasp the new tubing between the fingers of one hand.
- (4) Grasp the catheter hub with a sterile gauze pad between the thumb and index finger, and carefully disconnect the old tubing.
- (5) Press the fingers over the catheter tip to help prevent dislodgement and backflow of blood.
- (6) Remove the protective cap from the new tubing and quickly connect it to the catheter hub.

CAUTION: Do not remove the protective cap with your teeth.

- (7) Remove the pressure over the catheter tip.
- (8) Remove the gauze pad from under the catheter hub, and clean the site, if necessary.
- (9) Secure the tubing to the arm and reinforce the dressing, as necessary.
- (10) Adjust the infusion rate.

8. Discontinue the infusion.

- a. Perform a patient care handwash.
- b. Put on exam gloves.
- c. Clamp the IV tubing.
- d. Remove the tape and dressing without dislodging the catheter.
- e. Place a sterile gauze pad over the injection site.
- f. Smoothly pull out the catheter, following the course of the vein.

WARNING: Do not twist, raise, or lower the catheter.

- g. Apply pressure to the site with the gauze.
- h. Examine the catheter to ensure that it was removed intact.
- i. Apply an adhesive bandage to the site, if necessary.
- j. Dispose of the used equipment IAW local SOP.

9. Correctly label the IV and its components when the IV is initiated and each time any part of the IV equipment is changed.

a. Label the dressing.

- (1) Cut adhesive tape, and place it on a flat surface.

NOTE: Never write on the tape after it has been placed on the dressing.

- (2) Record the following information on the piece of tape:
 - (a) Gauge of the catheter or needle.
 - (b) Time and date the dressing was applied.
 - (c) Your initials.
- (3) Place the labeled tape over the dressing.

b. Label the solution container.

- (1) Cut adhesive tape, and place it on a flat surface.
- (2) Record the following information on the piece of tape.
 - (a) Patient's name.
 - (b) Patient's identification number and room or ward number, as appropriate.
 - (c) Infusion rate.
 - (d) Time and date the solution container was hung.
 - (e) Your initials.
- (3) Place the label on the solution container.
- (4) Prepare the timing label.
 - (a) Place a strip of adhesive tape vertically along the length of the solution container.
 - (b) Determine how long the solution container will last.
 - (c) Write on the tape the approximate times at which the solution level will reach the volume markings on the solution container.
 - (d) At the bottom of the label, write the approximate time the solution container will be empty.

Performance Steps

- c. Label the tubing.
 - (1) Place a strip of adhesive tape around the tubing, leaving a tab.
 - (2) Write on the tab the date and time the tubing was changed.

10. Record all procedures on the appropriate forms.

NOTE: Ensure that the fluids received have been recorded on the appropriate form(s).

- a. Record the following information on the appropriate forms (nursing notes or field medical card).
 - (1) Date and time the IV was initiated.
 - (2) Amount and type of solution.
 - (3) Infusion rate.
 - (4) Type and gauge of the needle or catheter.
 - (5) Insertion site.
 - (6) Patient's condition.
 - (7) Your name.
- b. Record the amount of infusion.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a patient with an IV infusion.

Performance Measures**GO** **NO GO**

1. Checked the IV system regularly to ensure that it was flowing properly.	_____	_____
a. Checked the system frequently, depending on the situation.		
b. Checked the IV in a logical sequence.		
c. Inspected the bag for damage and the amount of fluid remaining.		
d. Ensured the IV tube was still attached.		
e. Checked that the drip rate was still correct, and made any necessary adjustments.		
f. Examined the tubing for damage, kinks, twists, or signs of blood backing up.		
g. Made sure the IV tubing was still connected to the catheter.		
h. Made sure the IV tubing and catheter were still secured to the patient.		
2. Checked IV patency by lowering the bag or occluding the catheter.	_____	_____
3. Took corrective action if an indicator of proper catheter placement was not observed.	_____	_____
4. Assessed for signs and symptoms of IV therapy complications.	_____	_____
5. Managed IV therapy complications as required.	_____	_____
6. Changed the solution container after 24 hours.	_____	_____
7. Changed the IV site dressing every 24 hours.	_____	_____
8. Every 48 hours, changed the tubing with the solution container.	_____	_____
9. Rotated the IV site every 72 hours, and established a new IV site before discontinuing the old IV.	_____	_____
10. Discontinued the infusion.	_____	_____
11. Correctly labeled the IV and its components.	_____	_____
12. Recorded the procedure on the appropriate form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
STP 8-91B15-SM-TG
STP 8-91C25-SM-TG

Manage a Patient with a Nasogastric Tube
081-833-4097

Conditions: Given a patient with a nasogastric tube in place, exam gloves, sterile swabs, gauze or wipes, tape, lubricating lotion, and antibiotic ointment.

Standards: Manage a patient with a nasogastric tube so that the patient does not develop pressure sores, the tube does not become clogged, and the tube continues to function properly.

Performance Steps

1. Perform a patient care handwash.
2. Put on exam gloves.
WARNING: Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.
3. Examine the patient to determine if there are any problems caused by the nasogastric tube.
 - a. Inspect and palpate the abdomen for distention. This may indicate nonabsorption of a previous feeding.
 - b. Examine the nose where the nasogastric tube rests for signs of pressure sores.
4. Examine the suction device to rule out tube blockage.
 - a. Unblocked tube will show bubbling in the suction device.
 - b. Blocked tube may be cleared by flushing the tube with a syringe filled with 20 to 30 cubic centimeters (cc) of water.
 - c. If the tube cannot be unblocked, it must be removed and another tube placed.
5. Perform nasogastric tube care.
NOTE: Tube care and nasal hygiene should be performed after every gavage, or every 6 hours (q6h) at a minimum.
 - a. Remove the tape from the patient's nose.
 - b. Gently clean around the naris with a soft cloth.
 - c. Gently extract the tube 1 to 2 centimeters (cm) and reinsert it to ensure the tube is not adhering to the nasal passages or the esophagus.
 - d. Apply a small amount of lubricating skin lotion to the naris where it contacts the tube.
 - e. Reposition the tube so that it is exiting from the opposite side of the nares than before the procedure. This reduces the possibility of pressure sores.
 - f. Retape the tube to the patient.
 - g. If both sides of the naris are irritated, remove the tube and reinsert a new tube into the other naris, as needed.
NOTE: Ensure that the patient's other naris is patent before removal of the tube to avoid causing unnecessary discomfort to the patient.
 - (1) Apply a lubricating skin care lotion to the irritated areas.
 - (2) Apply antibiotic ointment if signs or symptoms of infection are present or suspected.
6. Record all procedures in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a patient with a nasogastric tube.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Performed a patient care handwash.	—	—
2. Donned exam gloves.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Examined the patient to determine if there were any problems caused by the nasogastric tube.	_____	_____
4. Examined the suction device to rule out tube blockage.	_____	_____
5. Correctly performed nasogastric tube care.	_____	_____
6. Took appropriate corrective action for problems found.	_____	_____
7. Recorded all procedures in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91B15-SM-TG

STP 8-91C25-SM-TG

Measure a Patient's Intake and Output

081-833-4099

Conditions: Given a calibrated measuring container, a scale calibrated in grams, a pen, Department of Defense (DD) Form 792 (Twenty-Four Hour Patient Intake and Output Worksheet) or a substitute record, and a patient whose intake and output requires measuring.

Standards: Accurately measure and record the patient's intake and output on the appropriate forms.

Performance Steps

1. Explain the procedure to the patient.
 - a. Inform the patient of the purpose of taking the measurements.
 - b. Inform the patient of the length of time during which the intake and output will be measured.
 - c. Inform the patient of any orders on fluid intake, such as forcing fluids or restricting the amount of intake.
2. Explain to the patient what types of items require intake and/or output measurement.
 - a. Intake measurement.
 - (1) Items that are naturally fluid at room temperature such as gelatin, ice cream, ice, and infant cereals.
 - (2) Fluids consumed with and between meals, such as water, coffee, tea, broth, juice, milk, milk shakes, and carbonated beverages.
 - (3) IV infusion fluids and blood.
 - (4) Oral liquid medications.
 - (5) Irrigating solutions that are not returned.
 - b. Output measurement.
 - (1) Urine.
 - (2) Liquid stool.
 - (3) Vomitus.
 - (4) Drainage from wounds and suction devices.
3. Tell the patient to use specified containers, such as a bedpan or urinal, to save all fluid output.
4. Measure the intake.
 - a. Calculate the oral fluid intake.

NOTE: Check the water pitcher at the beginning and end of each shift. Check the meal tray for the amount of liquids consumed before removing it from the room.

 - (1) Note the type and size of the oral fluid containers.
 - (2) Check the container to find the fluid capacity.
 - (3) Check the "equivalents table" on DD Form 792, if available.

NOTE: If an unmarked container is not listed on DD Form 792 or DD Form 792 is not available, fill the container with water and pour it into a graduated container to check its capacity.
 - b. Calculate the amount of IV solution or blood given.
 - c. Calculate the amount of any irrigating solutions that are not returned, if applicable.
 - (1) Subtract the amount of solution returned from the known amount used for the irrigating procedure.
 - (2) Record the difference as intake.
5. Record the fluid intake under the appropriate heading on DD Form 792 or the substitute record in cubic centimeters (cc) (Figure 1).

Performance Steps

[illegible]

Figure 1. Sample Form DD 792

Performance Steps

NOTE: To convert ounces to cc, multiply the number of fluid ounces by 30. Example: 12 fluid ounces multiplied by 30 equals 360 cc. One milliliter (ml) is equal to one cc.

6. Measure the output.

a. Put on gloves.

b. Record the level of output (urine, liquid stool, or emesis) in a graduated container.

NOTE: If it is not possible to weigh or measure liquid stool, estimate the amount. Estimate the amount of solid stool.

c. Estimate the amount of wound drainage, if present.

d. Estimate any output not in a container, such as on the floor, skin, or sheets.

e. Observe the characteristics of the output.

(1) Color, clarity, and odor of urine.

(2) Color, odor, and consistency of stool.

(3) Color, odor, and consistency of any drainage or suction material.

7. Remove gloves, and perform a patient care handwash.

8. Record in cc the amount and characteristics of output under the appropriate headings on DD Form 792 or the substitute record (Figure 2).

Figure 2. Sample Form DD 792

Performance Steps

NOTE: If no output was available to measure, enter this information in the REMARKS section of DD Form 792 or the substitute record.

9. Compute accumulated intake and output totals at the end of the 24-hour period, and record on the appropriate forms.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must monitor a patient's intake and output.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the procedure to the patient.	—	—
a. Explained the purpose of the procedure.		
b. Explained the length of time that measuring will be conducted.		
c. Explained any limits or requirements on fluid intake.		
2. Explained to the patient what types of items require intake and/or output measurement.	—	—
3. Told the patient to use specified containers to save all fluid output.	—	—
4. Measured the intake.	—	—
a. Calculated the oral fluid intake.		
b. Calculated the amount of IV solution or blood given.		
c. Calculated the amount of any irrigating solutions that are not returned, if applicable.		
5. Correctly recorded the fluid intake on the appropriate form.	—	—
6. Measured the output.	—	—
a. Donned gloves.		
b. Recorded the level of output in a graduated container.		
c. Estimated the amount of wound drainage or any output not in a container.		
d. Observed the characteristics of the output.		
7. Removed gloves and performed a patient care handwash.	—	—
8. Correctly recorded the amount and characteristics of output on the appropriate form.	—	—
9. Correctly computed accumulated intake and output totals at the end of the 24-hour period and recorded them on the appropriate forms.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
DD FORM 792

Related
STP 8-91B15-SM-TG

Perform Gavage

081-833-4101

Conditions: Given a patient who requires feeding through a nasogastric tube (NG), an NG tube with a clamp, potable water, a feeding syringe or a feeding bag, a record for recording intake and output, and premixed feeding solution or a blender and suitable food.

Standards: Feed the patient so that the specified quantity of food is delivered without extubating the patient or causing further harm.

Performance Steps

1. Examine the patient to determine if there were any contraindications or cautions that must be considered before administering the gavage.
 - a. Ask the patient about food allergies.
 - b. Inspect and palpate the abdomen for distention, which may indicate nonabsorption of a previous feeding.
 - c. Determine if flatulence or nausea have occurred as a result of previous feedings, which may indicate an intolerance to the prescribed feeding solution.

NOTE: If abdominal distention, nausea, flatulence, or allergies are identified, consider the possible effects of the current feeding. Document your findings in the patient's chart.

2. Assemble the necessary equipment.
 - a. If the patient does not have an NG tube in place, obtain an NG tube with a clamp, lubricating jelly, and a glass of water with a straw.
 - b. The prescribed amount of premixed feeding solution or a blender and suitable food.
 - c. A feeding syringe or a feeding bag.
 - d. Potable water.
 - e. The patient's record for recording intake and output.
3. Insert the NG tube if one is not already in place (task 081-833-4496, Perform Nasogastric Intubation).
4. Prepare the feeding solution.
 - a. When using the premixed feeding solution, do the following:
 - (1) Check the expiration date of the solution.
 - (2) Warm the solution to room temperature if it has been refrigerated.

NOTE: Warming the solution will prevent cramping and vasoconstriction.

- b. If the premixed solution is unavailable, blend, whip, or liquify food that is easily digestible.
 - (1) Use strained soups or broths.
 - (2) Consider the types of foods and portion sizes found in a meal, ready to eat (MRE) when determining the types of food and quantity.

5. Position the patient in the Fowler's position, if permissible.

NOTE: If the Fowler's position is contraindicated, the semi-Fowler's position or a slightly elevated side position are also acceptable.

6. Aspirate all stomach contents.
 - a. Measure the aspirate to evaluate absorption of the last feeding.

NOTE: If more than 150 milliliters (ml) of stomach contents are obtained, consider the possibility of a partial obstruction before proceeding with the feeding. If partial or complete obstruction is a possibility, do not administer gavage.

- b. Return the aspirate to the patient's stomach, unless contraindicated.

Performance Steps

NOTE: Reinstilling aspirated stomach contents reduces loss of electrolytes.

CAUTION: If unable to aspirate any stomach contents, the tube position must be verified by another method before proceeding with the feeding. Do not proceed with the feeding if unable to verify that the tube is correctly positioned in the stomach.

7. Administer the feeding by using either the syringe or feeding bag method.

a. Syringe method.

- (1) Remove the plunger from the feeding syringe.
- (2) Attach the syringe barrel to the NG tube.
- (3) Position the syringe 12 to 18 inches above the level of the patient's stomach.

NOTE: Raise or lower the syringe as necessary to slow instillation of the feeding.

- (4) Slowly pour the feeding solution into the syringe barrel. Continue to pour additional solution until the prescribed amount has been administered.

CAUTION: To prevent instilling air into the stomach, do not let the syringe barrel empty completely between pourings.

b. Feeding bag method.

- (1) Pour the prepared feeding solution into the feeding bag, open the clamp, and prime the tubing with the feeding solution.

NOTE: Priming the tubing with solution prevents instilling air into the stomach.

- (2) Suspend the feeding bag 12 to 18 inches above the level of the patient's stomach.
- (3) Connect the feeding bag to an NG tube by attaching the feeding bag tubing to the NG tube.

- (4) Adjust the flow rate control clamp to deliver the feeding solution at the prescribed rate.

NOTE: If precise control of feeding is required, the feeding may be administered and controlled by using an infusion pump (such as IVAC, IMED, or Abbott).

- (5) Observe the patient and the flow rate of the solution at frequent intervals during the feeding to prevent the solution from being administered too quickly.
- (6) When the feeding has been administered, clamp the tubing on the feeding bag and disconnect it from the NG tube.

8. Flush the NG tube of feeding solution residue by instilling 30 to 50 ml of water after the prescribed amount of feeding solution has been administered.

9. Clamp the tube to prevent reflux of the feeding solution.

10. Provide for the patient's comfort and safety.

- a. Perform oral and nasal hygiene after each feeding.
- b. Ensure that the nasogastric tube is secured, in accordance with (IAW) task 081-833-4097, without causing discomfort or injury to the patient.
- c. Assist the patient to remain in the Fowler's position for 30 to 60 minutes after the feeding.

NOTE: Maintaining an upright position after feeding prevents regurgitation and facilitates absorption of the feeding.

11. Remove used equipment from the patient's bedside, and dispose of it or clean it IAW local standing operating procedure (SOP).

12. Document the procedure and significant nursing observations on the DD Form 792 or appropriate substitute.

- a. Record the amount and time of the feeding on the Intake and Output Report Form.
- b. Initial the therapeutic documentation care plan.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must feed a patient via an NG tube.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Examined the patient to determine if there are any contraindications or cautions that must be considered before administering the gavage.	_____	_____
2. Assembled the necessary equipment.	_____	_____
3. Inserted the NG tube, when necessary.	_____	_____
4. Prepared the feeding solution.	_____	_____
5. Positioned the patient in the Fowler's position, if permissible.	_____	_____
6. Aspirated all stomach contents.	_____	_____
a. Considered the possibility of a partial obstruction if more than 150 ml of stomach contents are obtained.		
b. Unless contraindicated, returned the aspirate to the patient's stomach.		
7. Administered the feeding by using either the syringe or feeding bag method.	_____	_____
8. Flushed the tubing with 30 to 50 ml of water.	_____	_____
9. Clamped the tubing.	_____	_____
10. Provided for the patient's comfort and safety.	_____	_____
11. Disposed of or cleaned the equipment used.	_____	_____
12. Correctly documented the procedure.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91C25-SM-TG

Develop a Dietary Program

081-833-4131

Conditions: Given The Merck Manual.

Standards: Develop a dietary program that provides enough micronutrients and macronutrients and is culturally acceptable to the patient.

Performance Steps

1. Establish the essentials of a good nutritional program.
 - a. Nutrient is the part of food that nourishes the body. It consists of micronutrients and macronutrients.
 - b. Macronutrients are interchangeable sources of energy.
 - (1) Carbohydrates convert to glucose and monosaccharides.
 - (2) Fats convert to fatty acids and glycerol.
 - (3) Proteins convert to peptides and amino acids.
 - (4) Alcohol is used basically the same as carbohydrates.
 - c. Micronutrients include water, vitamins, minerals, and elements and are essential for the metabolic process.
 - (1) Vitamins:
 - (a) Essential for health.
 - (b) Generally consumed in small amounts.
 - (c) Absorbed unchanged, they perform many catalytic functions.
 - (d) Water-soluble: group B and C.
 - (e) Fat-soluble: A, D, E, and K.
 - (f) Fat-soluble and B12 vitamins are stored in the body.
 - (2) Elements and minerals:
 - (a) Essential for health.
 - (b) Present in food.
 - (c) Varying concentrations.
2. Ensure enough intake of micronutrients.
 - a. Administer multivitamin supplements to ensure enough intake of micronutrients.
 - b. Consult the multivitamin label for information on the recommended daily allowance of each of the micronutrients.
3. Ensure enough intake of macronutrients.
 - a. Protein: 0.8 grams per kilograms per day (gm/kg/day), for normal growth, repair, and maintenance. Athletes need slightly more, about 1.0 to 1.5 gm/kg/day (80 grams per day for a 176-pound athlete). The average American intake is two to three times that.
 - b. Carbohydrates: Most carbohydrate intake should be in the form of complex carbohydrates. Daily intake should be 40 to 60 percent of total daily caloric intake. For a 2,000 calorie per day diet, this is 800 to 1,200 calories or 200 to 400 grams of carbohydrates (4 calories per gram) daily.
 - c. Fat: Most fat intake should be in the form of monounsaturated fat. Intake of saturated fat should be limited. Daily intake should be 15 to 30 percent of daily calories. For a 2,000 calorie per day diet, this is 300 to 600 calories or 33 to 67 grams of fat (9 calories per gram) daily.
4. Ensure enough water intake.
 - a. Insufficient water intake is the single greatest detriment to physical performance.
 - b. To maintain body function, 64 to 96 ounces of water are required daily at rest, at a temperature of 75 degrees Fahrenheit. The amounts are upped to 64 ounces per hour when working in high heat.

WARNING: High levels of water intake can cause loss of electrolytes exacerbating the fluid imbalance. Persons who require a high daily intake of water should be supplemented with oral rehydration salts or

Performance Steps
their equivalent.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must develop a dietary program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Established the essentials of a good nutritional program.	_____	_____
2. Ensured enough intake of micronutrients.	_____	_____
3. Ensured enough intake of macronutrients.	_____	_____
4. Ensured enough water intake.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Perform Pulmonary Nursing Care

081-833-4175

Conditions: Given suction apparatus, sterile suction tip, sterile water, incentive spirometer, oxygen, and oxygen delivery equipment.

Standards: Perform pulmonary nursing care so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Perform a physical examination of the chest.

- a. Inspect for the following:

- (1) Bilateral rise and fall.
 - (2) Use of accessory muscles.
 - (3) Cyanosis.

- b. Auscultate for the following:

NOTE: Listen to at least one cycle of inspiration and expiration in each area of the chest, both anteriorly and posteriorly.

- (1) The presence or absence of normal breath sounds in each lobe.

NOTE: Unless the patient has had all or part of a lung removed, some sound should be heard during auscultation. Absence of sound indicates an abnormal condition such as atelectasis, pleural fluid, pneumothorax, or lung consolidation.

- (2) Normal breath sounds may be:

- (a) A high-pitched, harsh tubular sound heard over the mainstem bronchus.
 - (b) A moderate pitched, muffled blowing sound heard over the large air passages.
 - (c) A low-pitched, soft rustling sound heard over the smaller air passages at the peripheral areas of the lungs.

- (3) Adventitious (abnormal) breath sounds may be:

- (a) Rales: crackling or bubbly noises heard during inspiration and not cleared by coughing. This is commonly a result of air movement into alveoli or small airways containing fluid.
 - (b) Rhonchi: loud, low-pitched, coarse sounds, like a snore, heard at any point during inspiration or expiration. This is commonly caused by accumulation of fluid or secretions in larger airways.

NOTE: Coughing may clear this if the sounds are caused by mucous accumulation in large airways.

- (c) Wheeze: musical noise sounding like a squeak, usually louder during expiration than inspiration. The sound is produced by high-velocity airflow through restricted passages.

- (d) Pleural friction rub: a dry, rubbing or grating sound usually caused by inflammation of pleural surfaces. This will be heard during both inspiration and expiration.

- (e) Stridor: high-pitched crowing, usually due to tracheal narrowing. Stridor may be the result of vocal cord edema, tracheal stenosis, epiglottitis, tumor, or foreign body.

- c. Palpate the chest if a new examination. If a continuing patient, palpation may be omitted.

- d. Percuss for:

- (1) Areas of hyperresonance and hyporesonance.
 - (2) Fluid line.

NOTE: Examination of the chest is an integral part of each procedure.

2. Review the patient's arterial blood gas analysis, if available.

Performance Steps

DEFINITIONS:

1. Acidosis: a potential of hydrogen (pH) less than 7.35.
2. Alkalosis: a pH greater than 7.45.
3. Respiratory acidosis: Partial pressure of carbon dioxide (PCO₂) greater than 45 millimeters (mm) mercury (Hg) due to hypoventilation (lungs retaining carbon dioxide [CO₂]).
4. Respiratory alkalosis: PCO₂ less than 35 mm Hg due to hyperventilation (lungs eliminating CO₂).
5. Metabolic acidosis: a decrease in base excess (B.E.) below normal range (kidneys eliminating bicarbonate ion [HCO₃]).
6. Metabolic alkalosis: an increase in B.E. above normal range (kidneys retaining HCO₃).
7. Hypoxemia: an arterial oxygen (O₂) tension (partial pressure of oxygen [PO₂]) below normal, for example, less than (<) 80 mm Hg at sea level; different at varying altitudes.

a. Determine the disease state of the pH.

- (1) If the pH is less than 7.35, it is considered acidosis.
- (2) If the pH is greater than 7.45, it is considered alkalosis.

NOTE: Even if the pH is in the normal range, determine if it is on the acidotic or alkalotic side of 7.40. For example, a pH of 7.36 is normal but is closer to the acidotic side of the pH scale.

b. Identify which component is the cause of the disease state.

(1) Respiratory.

- (a) If the PCO₂ has risen above 45 mm Hg and if the pH indicates the disease state is acidosis, it is considered a respiratory acidosis.
- (b) If the PCO₂ has fallen below 35 mm Hg and if the pH indicates the disease state is alkalosis, it is considered a respiratory alkalosis.

(2) Metabolic.

- (a) If the B.E. has risen above 2 milliequivalent per liter (mEq/L) and if the pH indicates the disease state is alkalosis, it is considered a metabolic alkalosis provided the PCO₂ is not also contributing to the problem.
- (b) If the B.E. has fallen below -2 mEq/L and if the pH indicates the disease state is acidosis, it is considered a metabolic acidosis provided the PCO₂ is not also contributing to the problem.

NOTE: Often the PCO₂ may be compensating for a metabolic problem by rising above 45 mm Hg in alkalosis and falling below 35 mm Hg for acidosis.

(3) Mixed. When the PCO₂ and B.E. are contributing to the diseased condition, the interpretation would be a mixed alkalosis or acidosis.

c. Determine the degree of compensation.

(1) Partially compensated.

- (a) Determine which component is causing the problem, PCO₂ or B.E.
- (b) Look at the other component to see if it is outside its normal range. If it is and if the pH is outside the normal range, then this condition is partially compensated.

(2) Fully compensated.

- (a) Determine if the pH is on the acidotic or alkalotic side of the normal range.
- (b) Determine which component is causing the problem, PCO₂ or B.E.
- (c) Look at the other component to see if it is outside its normal range. If it is and if the pH is in the normal range, then the condition is considered fully compensated.

(3) Uncompensated.

- (a) Determine which component is causing the problem, PCO₂ or B.E.
- (b) Look at the other component to see if it is outside its normal range. If it is not and if the pH is outside its normal range, then the condition is considered uncompensated.

d. Determine the degree of hypoxemia.

- (1) If the PO₂ is greater than 80 mm Hg, the condition is without hypoxemia.
- (2) If the PO₂ is between 60 and 80 mm Hg, the condition is mild hypoxemia.
- (3) If the PO₂ is between 40 and 59 mm Hg, the condition is moderate hypoxemia.
- (4) If the PO₂ is less than 40 mm Hg, the condition is severe hypoxemia.

NOTE: For example: pH 7.44, PCO₂ 24, PO₂ 65, HCO₃ 16, and B.E. -6. The complete interpretation would be a fully compensated respiratory alkalosis with mild hypoxemia.

Performance Steps

3. Perform oral and nasotracheal suctioning if necessary.

a. Position the patient in the semi-Fowler's (semisitting) position.

NOTE: In some cases, such as spinal injuries, the patient will have to remain in whatever position he or she is in at the time.

b. Check the pressure on the suction apparatus.

(1) If using mechanical suction, ensure that only low-power suction is used.

(2) If using hand- or foot-powered suction, it would be very difficult to provide a suction that is too high.

WARNING: If the suction pressure is too low, the secretions cannot be removed. If the pressure is too high, the mucous membranes may be forcefully pulled into the catheter opening.

c. Prepare the sterile materials (task 081-833-0007, Establish a Sterile Field).

(1) Open the sterile solution basin package on the bedside stand or table to create a sterile field.

(2) Pour sterile saline solution into the basin.

(3) Open the suction catheter package to expose the suction port of the catheter.

(4) Open the sterile glove package.

NOTE: Disposable suctioning kits contain the same items as a sterile, single-use kit prepared by central materiel supply (CMS).

WARNING: Some patients should not receive increased oxygen. If the patient has respiratory disease, check with the supervisor or physician.

d. Oxygenate the patient (tracheal suctioning only).

(1) If the patient is on oxygen therapy, increase the oxygen to 100 percent for 1 minute.

(2) If the patient is not on oxygen therapy, have him or her take a minimum of five deep breaths or administer them with a bag-valve-mask.

NOTE: After each suctioning attempt or suctioning period, reoxygenate the patient.

e. Put on sterile gloves.

f. Remove the catheter from the package by using the dominant hand, keeping the catheter coiled to prevent contamination.

NOTE: The dominant hand must remain sterile.

g. Grasp the suction connecting tubing with the other hand. Attach the tubing to the catheter.

NOTE: The hand attaching the tubing to the catheter does not have to remain sterile. The glove is for your protection.

h. Test the patency of the catheter.

(1) Turn the suction unit on with the nonsterile hand.

(2) Using the sterile hand, Insert the catheter tip into the sterile saline solution.

(3) Place the nonsterile thumb over the suction port to create suction. Observe the saline entering the drainage bottle.

NOTE: If no saline enters the bottle, check the suction unit and/or replace the catheter and retest for patency.

i. Suction the patient by the oral route.

NOTE: Instruct the patient to cough, if he or she is able. This helps to bring secretions up to the back of the throat.

(1) Insert the catheter into the patient's mouth, without suction applied.

NOTES:

1. Hold the catheter with the sterile hand. Manipulate the suction connecting tubing and suction port with the nonsterile hand.

2. If an oropharyngeal airway is in place, insert the catheter alongside the airway and then back into the pharynx.

(2) Place the thumb of your nonsterile hand over the suction control port on the catheter.

(3) Apply intermittent suction by moving your thumb up and down over the suction control port.

(4) Slowly and gently rotate the catheter between the thumb and index finger of your sterile hand as you withdraw the catheter.

Performance Steps

WARNING:

1. Advancing the catheter too far into the back of the patient's throat may stimulate the gag reflex. This could cause vomiting and the aspiration of stomach contents.
2. Do not continue suctioning for more than 10 to 15 seconds because it removes oxygen and secretions. Longer periods of continuous suctioning may cause oxygen deprivation.
 - (5) Rinse the catheter between suctionings by inserting the tip into the saline solution. Suction the solution through the catheter until the catheter is clear of secretions.
 - (6) Repeat steps 9a(1) through 9a(5) until all secretions have been removed or until the patient's breathing becomes easier. Noisy, rattling, or gurgling sounds should no longer be heard.
 - (7) Allow the patient to rest between each suctioning.

NOTE: If the patient is uncooperative, or oral entry is not possible due to injuries, nasopharyngeal suctioning may be required.

j. Nasopharyngeal route.

- (1) Measure the catheter from the tip of the earlobe to the nose (about 5 inches).
- (2) Lubricate the catheter by dipping the tip into the saline solution.
- (3) Insert the catheter into one nostril without suction applied. If an obstruction is met, try the other nostril. If both are obstructed, seek assistance.
- (4) Quickly and gently advance the catheter 3 to 5 inches.
- (5) Perform steps 9a(2) through 9a(7) to suction secretions.

k. Nasotracheal route.

NOTE: The nasotracheal route consists of the nose, pharynx, and trachea. This suctioning procedure is similar to nasopharyngeal suctioning, although deeper suctioning is accomplished.

- (1) Estimate the distance the catheter is to be inserted by measuring from the tip of the earlobe to the nose and then to the larynx.
- (2) Lubricate the catheter tip by dipping it into the saline solution.
- (3) If the patient is alert and cooperative, instruct the patient to flex the neck and stick out the tongue. This makes insertion easier and prevents swallowing.
- (4) Insert the catheter into one nostril. If an obstruction is met, try the other nostril. If both are obstructed, seek assistance.
- (5) Quickly and gently advance the catheter into the trachea.
- (6) Perform steps 9a(2) through 9a(7) to suction secretions.

CAUTION: If suctioning causes the patient to cough, remove the catheter until the coughing stops and then proceed.

l. Tracheostomy (or cricothyrotomy) route.

- (1) Insert the catheter into the tracheostomy tube.
 - (a) Lubricate the tip of the catheter with sterile saline.
 - (b) Insert the catheter, without suction, into the tracheostomy tube until slight resistance is felt.
- (2) Apply suction.
 - (a) Place the thumb of your nonsterile hand over the suction control port on the catheter.
 - (b) Apply intermittent suction by moving your thumb up and down over the suction control port.
 - (c) Slowly and gently rotate the catheter between the thumb and index finger of your sterile hand as you withdraw the catheter from the tracheostomy tube.

CAUTION: Suctioning removes oxygen and secretions. Suction for no longer than 10 to 15 seconds at a time. Oxygenate the patient prior to the start of the procedure, between suctionings, and at the end of the procedure.

- (3) Instruct your assistant to oxygenate the patient while you rinse the suction catheter by suctioning a small amount of sterile saline through the catheter.
- (4) Repeat the suctioning procedure until the airway is clear.

NOTE: During suctioning, turn the patient's head to the left to facilitate suctioning of the right tracheobronchial tree, and to the right to facilitate suctioning of the left tracheobronchial tree.

- (5) Oxygenate the patient between suctionings and after the last suctioning.
- (6) Rinse the catheter between suctionings and after the last suctioning.

Performance Steps

NOTE: If the secretions are tenacious, instill 3 to 5 centimeters (cc) of sterile normal saline into the tracheostomy tube. This will liquefy the secretions and facilitate their removal as you continue to suction.

- (7) Reconnect the patient to the original oxygen source or ventilator, if required.
- (8) Using the same setup and catheter, suction the patient's mouth and pharynx.
 - (a) Ask the patient to stick out his tongue to facilitate passage of the catheter into the pharynx.
 - (b) Advance the catheter deep enough to remove the secretions that have pooled on top of the tracheostomy cuff.

CAUTION: Once a catheter has been used for oropharyngeal suctioning, it is considered contaminated. Do not reinsert it into the patient's tracheostomy.

- m. Observe the patient for hypoxemia.

WARNING: Discontinue suctioning immediately if severe changes in color or pulse rate occur.

- n. Sterilely clean the tracheostomy site, and recover it with a sterile dressing.

4. Record the procedure.

- a. Respirations (rate and breath sounds before and after suctioning).
- b. Procedure (oral, nasopharyngeal, nasotracheal, or tracheostomy).
- c. Type and amount of secretions.
- d. Patient's toleration of the procedure.

5. Administer nebulization therapy, if necessary.

- a. Explain the procedure to the patient and answer any questions about the therapy.
- b. Attach the therapy device to the gas or power source.
- c. Add water, normal saline, or medication to the medicine cup or jar.
- d. Position the patient in the upright position for maximal diaphragm and chest expansion and distribution of the medication.

NOTE: If the patient is unable to sit upright, raise his or her head and chest as high as possible.

- e. Take the patient's vital signs before, during, and after the therapy.
- f. Auscultate the patient's lungs as above.
- g. Adjust the flow of gas so that a light cloud or mist appears.
- h. Administer the therapy to the patient.
 - (1) Hold the mask over the patient's face or
 - (2) Tell the patient to place the mouthpiece between his or her lips.
 - (3) Instruct the patient on the proper breathing technique.

- (a) Tell the patient to inspire slowly and deeply through his or her mouth.

NOTE: Inspiring through the mouth will improve distribution of ventilation and avoid having the aerosol being deposited in the nose.

- (b) Have the patient hold his or her breath for a few seconds to maximize diffusion and deposition of the aerosol due to gravity.

- (c) Tell the patient to exhale slowly.

CAUTION: If the patient's pulse rate increases or decreases more than 20 beats per minute, immediately stop the treatment and notify the physician.

- i. Disconnect the patient from the therapy device upon completion of the therapy.
- j. Shut off the gas or power source.
- k. Record the treatment given.
 - (1) Breath sounds before, during, and after therapy.
 - (2) Pulse rate before, during, and after therapy.
 - (3) Respiratory rate before, during, and after therapy.
 - (4) How the patient tolerated the treatment.
 - (5) Sputum production.

6. Use incentive spirometry.

- a. Explain the procedure to the patient, and answer any questions he or she may have about the procedure.

NOTE: The patient must be alert and oriented to properly perform the deep breathing maneuvers.

- b. Gather and assemble the required equipment and supplies at the patient's bedside.

Performance Steps

- c. Auscultate the patient's lungs.
- d. Position the patient in the upright sitting position in the bed or in a chair for maximal inspiratory effort.

NOTE: If the patient is unable to sit upright, raise his or her head and chest as high as possible.

- e. Practice the procedure with the patient.

(1) Estimate a goal, and preset the incentive spirometer device.

NOTE: The initial inspiratory goal should be twice the patient's measured tidal volume, but this may have to be increased or decreased to find an appropriate goal. An individual with normal lung expansion should be able to achieve an inspiratory capacity greater than 12 to 15 millimeters per kilogram (mm/kg) of body weight.

(2) Tell the patient to hold the mouthpiece securely between the lips.

NOTE: At this time, explain the importance of maintaining a sustained maximal inhalation. A sustained maximal inspiration for 5 to 15 seconds will ensure maximum inflation and alveolar recruitment.

(3) Instruct the patient to inhale as deeply as possible, thus attempting to reach or surpass the goal.

NOTE: The patient should be coached throughout the maneuver to inspire slowly (about 200 milliliters per second [ml/sec]).

(4) Instruct the patient to relax and exhale normally.

NOTE: Exhalation below the functional residual capacity (FRC) will increase the work of breathing and cause small airway collapse.

(5) Observe the patient repeating steps 7c and 7d several times until proficiency is shown.

- f. Instruct the patient in the use of proper coughing techniques.

(1) Provide the patient with tissues and a sputum cup.

(2) Cover the wound site of a surgical patient with a pillow or rolled blanket, and tell the patient to press the pillow or blanket against the wound site to decrease pain while coughing.

(3) Tell the patient to take a deep breath and cough.

(4) Encourage the patient to repeat steps 8b and 8c two more times.

- g. Instruct the patient on periodic use of the incentive spirometer device that will be left at bedside.

(1) Establish the minimum number of times the patient should practice each day.

NOTE: Instruct the patient to do the therapy every waking hour 6 to 10 times. After each sustained maximal inhalation, the patient should wait at least 30 to 60 seconds to prevent hyperventilation.

Evaluate the patient's goals and performance at least twice daily.

(2) Encourage the patient to increase the effort each day by advancing the goal with the volume indicator.

7. Perform postural drainage and percussion, if required.

- a. Explain the procedure to the patient, and answer any questions about the therapy.
- b. Auscultate the patient's lungs.
- c. Cover the affected area with a thin towel.

NOTE: If the area to be treated was not specified in the physician's order, consult with the physician or review the patient's X rays to determine the affected area.

- d. Place the patient in the proper position to drain the appropriate segment.

NOTE: Inform the patient that the postural drainage position is held for 15 minutes to 1 hour, depending on the patient's ability to stay in one position.

- e. Perform the therapy.

NOTE: Percussion therapy for each affected area will last 3 to 5 minutes. If pain or an adverse reaction is noted, stop the procedure. Avoid percussing over surgical wounds, breasts, floating ribs, and the spine.

- f. Vibrate the affected area.

(1) Position the hands over the affected area so that the fingers are spread. One thumb is crossed over the other, and the index fingers are touching at the tips.

(2) Direct the patient to take a slow, deep breath.

(3) Direct the patient to exhale slowly through pursed lips.

Performance Steps

(4) Vibrate the affected area with both hands until the end of the patient's exhalation.

NOTE: Vibration is accomplished by either tensing the muscles causing "tremors" at the hands or by pushing up and down rapidly.

CAUTION: Do not pinch the patient's skin.

(5) Repeat steps 8b through 8d two more times.

(6) Direct the patient to resume normal breathing.

g. After the patient has remained in the postural drainage position for the prescribed time, return the patient to a normal resting position and readjust the bed.

h. Direct the patient to practice diaphragmatic breathing.

(1) Tell the patient to place his hands on abdomen.

(2) Instruct the patient to inhale through his nose while moving the abdomen downward and outward.

(3) Tell the patient to exhale slowly through his or her mouth with his or her lips pursed.

(4) Repeat steps 10a through 10c at least two more times.

i. Direct the patient to initiate a cough at least three times. If sputum is produced, direct the patient to put it in a sputum cup.

NOTE: For a surgical patient, have him or her hold a pillow over the abdomen or surgical site (splinting). Have tissues or an emesis basin into which the patient can cough.

8. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform pulmonary nursing care.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Performed a physical examination of the chest.	—	—
2. Reviewed the patient's arterial blood gas analysis, if available.	—	—
3. Performed oral and nasotracheal suctioning when necessary.	—	—
4. With each type of suctioning, recorded the procedure.	—	—
5. Administered nebulization therapy when necessary.	—	—
6. Used incentive spirometry.	—	—
7. Performed postural drainage and percussion when required.	—	—
8. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

STP 8-91V14-SM-TG

Provide Contraceptive Counseling

081-833-4308

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given the SF medical book set.

Standards: Provide clear guidance on the types, proper use, advantages, and disadvantages of contraceptives that are available.

Performance Steps

1. Establish a setting conducive to contraceptive counseling.
 - a. The setting must be one that does not interfere with local customs.
 - (1) Before providing counseling, the approval of the local religious, tribal, or community leaders must be sought.
 - (2) If providing counseling to females, it is always a good idea to have a local female health care provider (midwife, nurse, or doctor) present initially.
 - b. The setting must make the person receiving the information feel at ease.
 - (1) In some cultures, contraception would never be spoken about in public, such as a lecture. In other cultures, a lecture may make the recipient feel more at ease and less easily embarrassed.
 - (2) It may be necessary to engage in extensive small talk on several occasions before actually broaching the subject of contraception.
 - (3) Use language that is clear and jargon-free. If both you and the patient are speaking a second language, consider using an interpreter to limit the possibility of misunderstandings.
 - (4) At all times, show respect for the patient and their way of life.
2. Discuss the possible advantages and disadvantages of contraception.
 - a. Advantages:
 - (1) Fewer mouths to feed.
 - (2) Reduced risk to the mother. (Childbirth is not without risks, especially where modern health care facilities are nonexistent.)
 - (3) Reduced disease risk with some methods.
 - b. Disadvantages:
 - (1) Fewer hands to help with work.
 - (2) Fewer children surviving to adulthood. In many areas, adult children who take care of their parents are the only form of "social security."
 - (3) Possible social stigma and religious consequences if contraception is practiced without social and religious acceptance.
3. Discuss the mechanism, advantages, and disadvantages of various types of contraceptives.

NOTE: All methods presume availability of the drugs or devices. If a particular drug or device is not readily available, it should not be discussed or considered.

 - a. Combined oral contraceptives (birth control pills).
 - (1) Alters the female physiology by suppressing the secretion of gonadotrophins at midcycle, which in turn suppresses ovulation.
 - (2) Estrogen and progestin combination pills are taken daily for 21 days, beginning on the fifth day of menses. Withdrawal bleed is anticipated within 3 to 5 days of last pill.
 - (3) Advantages:
 - (a) Convenient, effective contraception.
 - (b) Menstrual flow is lighter and resultant anemia decreased.
 - (4) Disadvantages:
 - (a) Risk of heart attack is higher.
 - (b) Increased rate of fatal and nonfatal venous thromboembolism.
 - (c) Increased risk in thrombotic and hemorrhagic stroke and subarachnoid hemorrhage.

Performance Steps

- (d) Increased risk of cancer.
- b. Progestin mini pill.
 - (1) The mini pill is believed to prevent conception by causing thickening of the cervical mucous to make it hostile to sperm.
 - (2) It may also cause inhibition of implantation of fertilized eggs.
 - (3) Used for women unable to tolerate estrogen.
 - (4) Advantages:
 - (a) Safe during lactation.
 - (b) Minimal doses of hormones.
 - (c) Works well on women over the age of 35.
 - (5) Disadvantages:
 - (a) Bleeding irregularities, such as prolonging menstrual flow and spotting.
 - (b) Ectopic pregnancies.
 - (c) Weight gain.
 - (d) Mild headache.
 - (e) Must be taken at the same time daily.
- c. Intrauterine devices (IUD).
 - (1) The IUD is often an excellent contraceptive method for parous women with one sexual partner.
 - (2) It is less desirable for young nulliparous women because of the greater threat of pelvic inflammatory disease in young women.
 - (3) Advantages:
 - (a) Progesterone-secreting IUDs decreases cramping.
 - (b) Menstrual flow is lighter.
 - (c) Low cost.
 - (d) Fertility usually restored immediately after removal.
 - (4) Disadvantages:
 - (a) Twice the normal risk of pelvic inflammatory disease.
 - (b) Spontaneous expulsion, complete or partial.
 - (c) A 50 percent chance of spontaneous abortion remains.
 - (d) Copper-bearing IUDs may cause tissue reaction and adhesions.
 - (e) Ring-shaped IUDs may strangulate a loop of bowel.
- d. Diaphragm and cervical cap.
 - (1) The diaphragm with contraceptive jelly is a safe and effective method.
 - (2) It has features that are acceptable to some women and not others, such as, it must be inserted prior to intercourse, it must remain in place for 6 hours, and some may be allergic to the latex or spermicide.
 - (3) The cervical cap with contraceptive jelly is similar to the diaphragm but fits snugly over the cervix only. It can be used by women who cannot be fitted for a diaphragm.
 - (4) Advantages:
 - (a) It has no systemic side effects.
 - (b) Protection against pelvic infection.
 - (c) Protection against cervical dysplasia as well as pregnancy.
 - (5) Disadvantages:
 - (a) Must be inserted near time of coitus.
 - (b) Should not be left in the vagina for over 12 to 18 hours.
 - (c) Because of slight risk of toxic shock syndrome not to be used during menstrual period.
 - (d) Repeated bladder infections with diaphragm.
- e. Contraceptive foams, sponges, creams, jellies, and suppositories.
 - (1) These products are available without prescription, easy to use, and fairly effective with reported failure rates of 2 to 29 percent.
 - (2) Have some virucidal and bactericidal activity.
 - (3) Advantages:
 - (a) Easy to use.

Performance Steps

- (b) Can be used for repeated acts of intercourse.
 - (c) Fairly effective.
- (4) Disadvantages:
 - (a) Slightly higher failure rate than diaphragm or condom.
 - (b) Should not be left in vagina longer than 12 to 18 hours.
 - (c) Slight risk of toxic shock syndrome.
- f. Condoms.
 - (1) Protection against becoming pregnant.
 - (2) Protection against disease.
 - (3) Advantages:
 - (a) Offers protection against socially transmitted diseases (STDs) and cervical dysplasia.
 - (b) When used in conjunction with a spermicide, the failure rate approaches that of an oral contraceptive.
 - (4) Disadvantages:
 - (a) Dulling of sensation.
 - (b) Sperm loss caused by tearing, slipping, or leakage.
- g. Implants (Norplant-Levonogestrel).
 - (1) Must be prescribed by a physician.
 - (2) Provides a near state of birth control for 5 years.
 - (3) Must be placed in a fan shape subdermally on the nondominant side.
 - (4) Advantages:
 - (a) Effective birth control while maintaining future fertility.
 - (b) Decreased ovarian cysts, ectopic pregnancies, pelvic inflammatory disease (PID), and cancer of the ovaries, cervix, and breast lasting up to 15 years.
 - (5) Disadvantages:
 - (a) Cardiovascular disease in women over 35 who smoke and have diabetes.
 - (b) Causes liver detoxification, thrombophlebitis, pelvic vein thrombosis, pulmonary embolism, cerebrovascular accident (CVA), myocardial infarction (MI), and hypertension.
 - (c) Serious side effects include gallbladder disease, retinal vein thrombosis, vascular headaches, and depression.
 - (d) Minor side effects include weight gain, fluid retention, nausea, breast fullness or tenderness, and menstrual irregularities.
- h. Natural family contraceptive practices.
 - (1) "Symptothermal" natural family planning. The basis for this approach is the patient observed an increase in clear elastic cervical mucus, brief abdominal midcycle discomfort, and a sustained rise of the basal body temperature about two weeks after onset of menstruation. Unprotected intercourse is avoided from shortly after the menstrual period, when fertile mucus is first identified until 48 hours after ovulation, as identified by a sustained rise in a woman's morning resting temperature (the temperature will increase by 0.4 to 0.8 degrees Fahrenheit on the day of ovulation and stay elevated until the next menstrual period), and disappearance of clear elastic mucus.
 - (a) The elevated temperature continues throughout the remainder of the cycle.
 - (b) The second day after the rise marks the end of the fertile period.
 - (2) Coitus interruptus: The basis for this approach is withdrawal of penis before ejaculation.
 - (3) Post coital douche: The basis for this approach is attempt to flush semen out of vagina using various fluids (water, vinegar, or commercial products).
 - (4) Prolongation of lactation: The basis for this approach is extended nursing may suppress ovulation.
 - (5) "Rhythm" method: The basis for this approach is avoidance of coitus during fertile period by predicting ovulation by calendar method and basal body temperature.
 - (6) Calendar method: The basis for this approach is after the length of menstrual cycle has been observed for at least 8 months, the following calculation is made:

NOTE: This method is only useful in women who have a regular menstrual cycle, when a reasonable estimate can be made of when the next menstrual cycle will begin.

Performance Steps

- (a) Subtract 14 days from the estimated beginning day of the next menstrual cycle. This will give you the approximate day of ovulation.
- (b) The most fertile time of the menstrual cycle is 5 days before and the day of ovulation. During this time, unprotected sex should be avoided.
- (7) Basal body temperature method: The basis for this approach is determining the safe time after ovulation has passed.
 - (a) Woman's temperature must be taken immediately upon awakening and before any activity.
 - (b) A slight drop in temperature often occurs 1 to 1 1/2 days before ovulation and a rise of about 0.4 to 0.7 degrees Fahrenheit occurs 1 to 2 days after ovulation.
- (8) Advantages and disadvantages:
 - (a) Coitus interruptus requires no medical device or substances, but does require significant control on the part of the male to withdraw before ejaculation. Semen may escape before ejaculation.
 - (b) Post coital douche will not flush out semen that might have entered the cervix. This is a poor method of contraception.
 - (c) Prolongation of lactation is a very unreliable method of control due to variable duration of suppression of ovulation.
 - (d) Rhythm method is accepted by the Catholic church. However, this method is dependent on accurately predicting ovulation and requires abstinence of about 7 to 9 days.
 - (e) None of these methods provide protection against disease.
- 4. Before placing any female on birth control pills, perform a complete physical examination, to include a pregnancy test.
- 5. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must provide contraceptive counseling.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Established a setting conducive to contraceptive counseling.	—	—
2. Discussed the possible advantages and disadvantages of contraception.	—	—
3. Discussed the mechanism, advantages, and disadvantages of various types of contraceptives.	—	—
4. Performed a complete physical examination to include a pregnancy test before placing any female on birth control pills.	—	—
5. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Administer Oxygen Therapy

081-833-4485

Conditions: Given oxygen tanks of various sizes, oxygen gauges, oxygen tubing, nasal prongs, oxygen mask, venturi mask, humidification equipment, and warning signs.

Standards: Assemble the oxygen tanks and gauges, determine the amount of oxygen available for delivery at the desired flow rate, attach the delivery device to the tank, place the delivery device on the patient, replace the tank at the appropriate time, and post the appropriate warning signs without creating a fire or explosion hazard or causing further harm to the patient.

Performance Steps

1. Obtain the necessary equipment.
 - a. Oxygen tank (cylinder) (Figure 1).

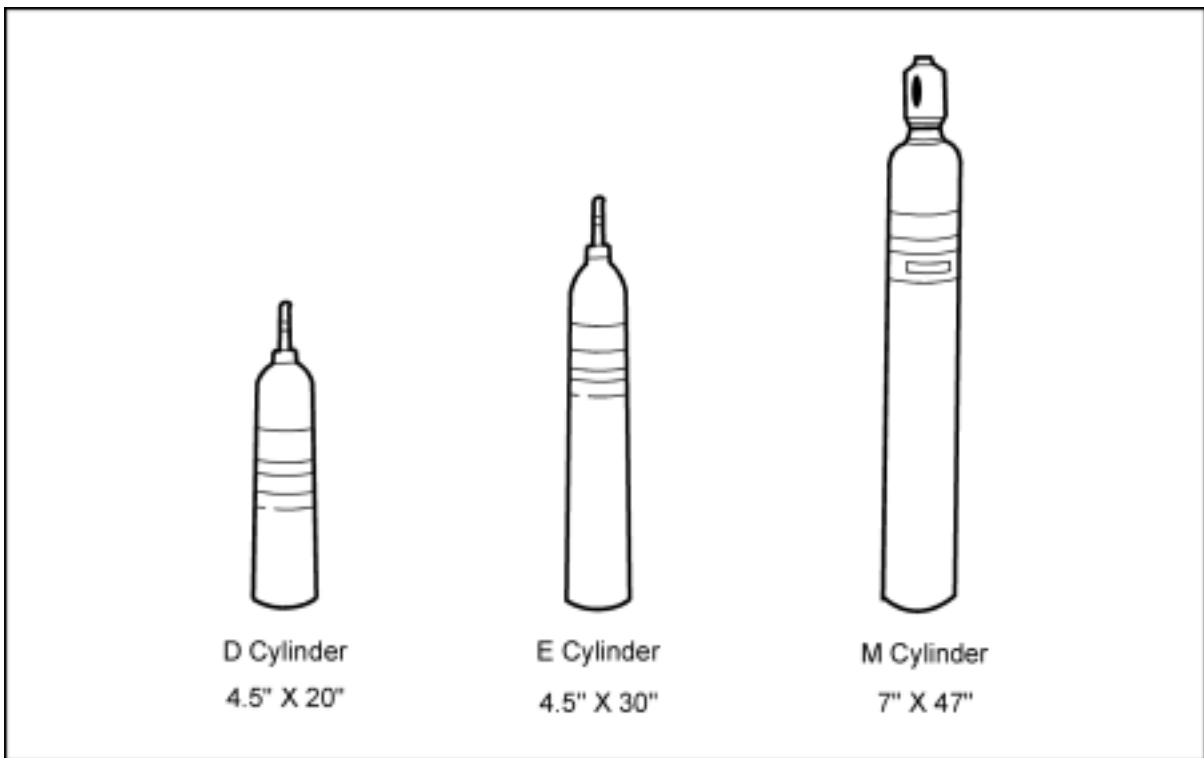


Figure 1. Oxygen Cylinders

- (1) Check the oxygen cylinder tag (Figure 2) to determine whether the tank is full, in use (partially full), or empty.
- (2) Ensure the tank selected contains oxygen and not some other gas.

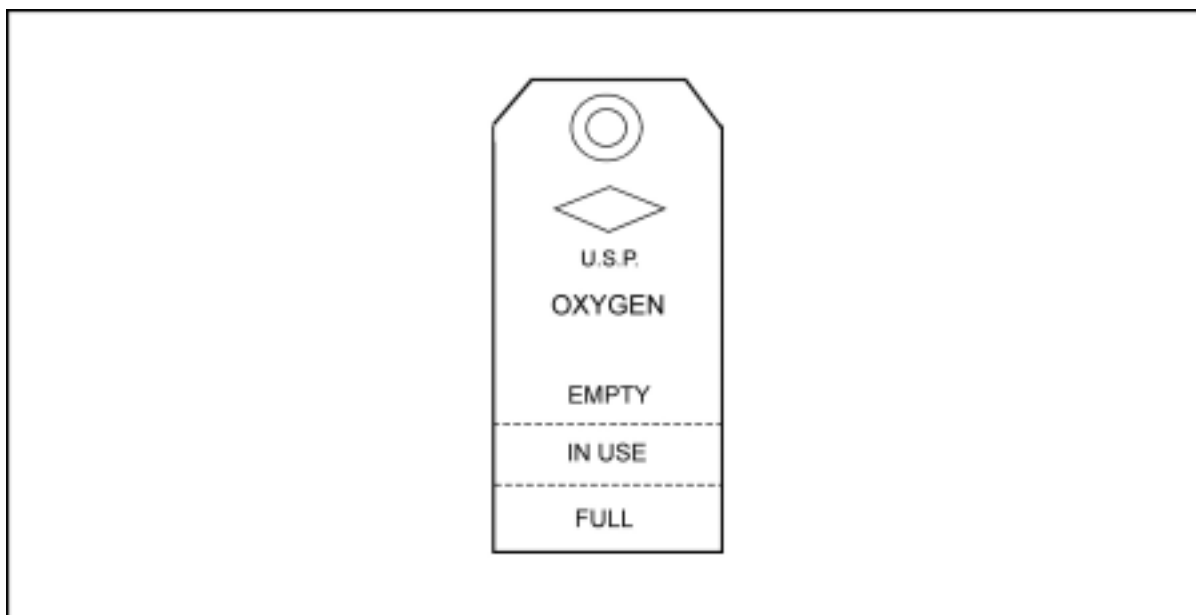
Performance Steps

Figure 2. Cylinder Tag

NOTE: United States oxygen tanks are color-coded (painted) green. The international code is white.
b. Cylinder regulator with flowmeter (Figure 3).

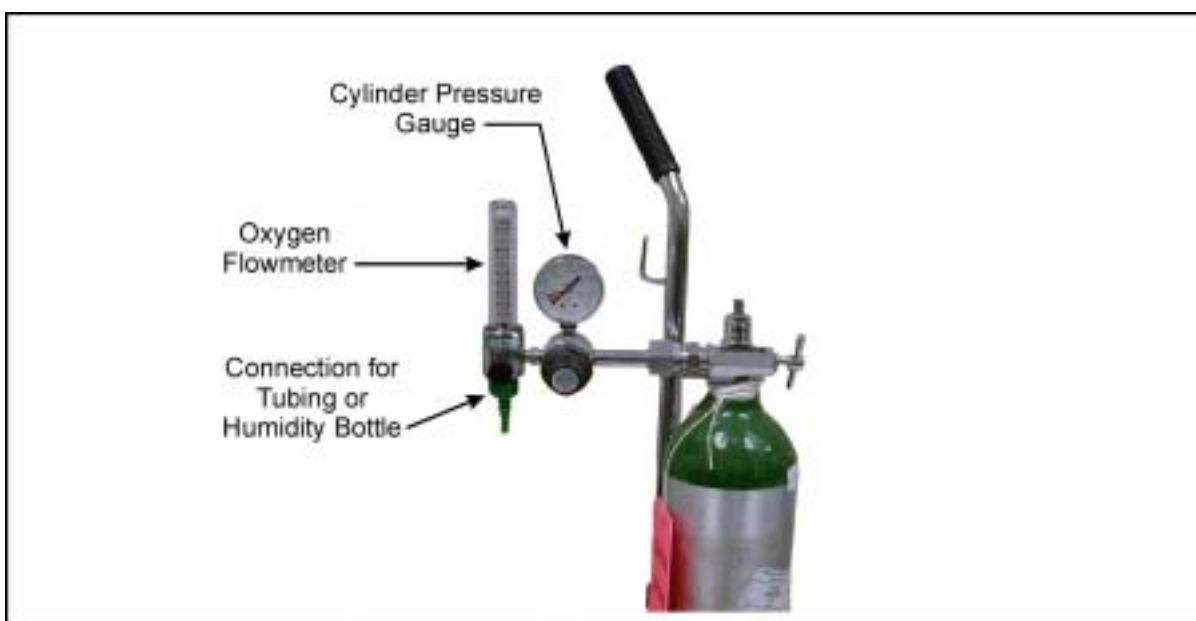


Figure 3. Cylinder Flowmeter

NOTE: When the cylinder regulator pressure gauge reads 200 pounds per square inch (psi), the oxygen tank is considered empty.

NOTE: The pressure-compensated flowmeter is affected by gravity; therefore keep it upright. The Bourdon gauge flowmeter is not affected by gravity and can be used in any position.

- c. Humidifier.
- d. Sterile water.

Performance Steps

- e. Nonsparking cylinder wrench.
- f. Oxygen tank transport carrier and/or stand.
- g. Oxygen delivery system ordered by the physician (nasal prongs or mask).
- h. Warning signs.
 - (1) NO SMOKING.
 - (2) OXYGEN IN USE.

CAUTION: Because of the extreme pressure in oxygen tanks, handle them with great care. Do not allow tanks to be banged together, dropped, or knocked over.

- 2. Secure the oxygen cylinder as follows:
 - a. Upright position or in accordance with (IAW) local standing operating procedure (SOP).
 - b. Secured with straps or in a stand.
 - c. Placed away from doors and areas of high traffic.

- 3. Remove the cylinder valve cap.

NOTE: The cylinder valve cap may be noisy or difficult to remove. However, the threads of the cylinder cap should never be oiled. Never apply petroleum products to any part of an oxygen delivery system.

- 4. Use either the handwheel or a nonsparking wrench to "crack" (slowly open and quickly close) the cylinder to flush out any debris.
- 5. Attach the regulator to the cylinder.
 - a. M-cylinder:
 - (1) Hold the gauge in an upright position.
 - (2) Insert the cylinder regulator inlet into the threaded outlet of the oxygen cylinder in an upright position.
 - (3) Hand-tighten the inlet nut (Figure 4), located on the cylinder regulator, and then completely tighten the inlet nut with a nonsparking wrench (Figure 5).



Figure 4. Inlet Nut

Performance Steps

Figure 5. Nonsparking Wrench

(4) Open the valve to test for leaks, and then close the valve.

NOTE: If there is a leak, check the regulator connection and, if necessary, obtain a new regulator and/or tank.

b. D- or E-cylinder:

(1) Locate the three holes on the oxygen cylinder stem (Figure 6), and ensure an O-ring is present.

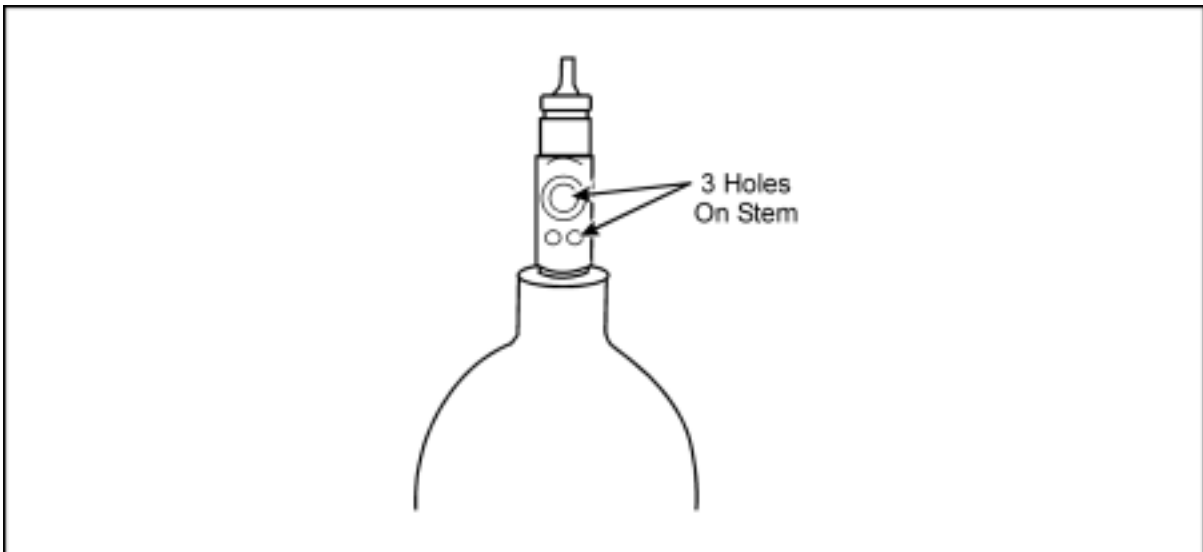


Figure 6. Three Holes on Oxygen Cylinder Stem

NOTE: If the O-ring is not present, an oxygen leak will occur.

(2) Examine the yoke attachment, and locate the three corresponding pegs on the yoke attachment (Figure 7).

Performance Steps

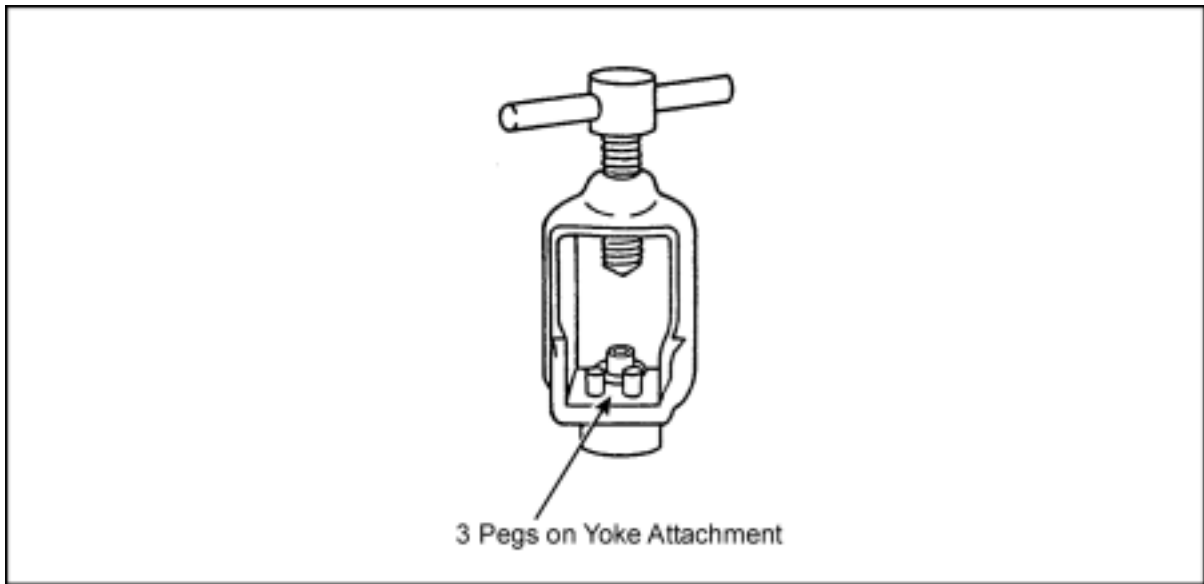


Figure 7. Three Pegs on Yoke Attachment

- (3) Slide the yoke attachment over the cylinder stem, ensuring that the pegs are seated in the proper holes.
- (4) Turn the vise-like screw on the side of the yoke attachment to secure it.
- (5) Open the valve to test for leaks, and then close it.

NOTES:

1. If there is a leak, check the regulator connection and, if necessary, obtain a new regulator and/or tank.
2. When in-wall oxygen is available, the flowmeter will be attached to the oxygen outlet as follows:
 - a. Turn the flow adjusting valve of the flowmeter to the OFF position.
 - b. Insert the flowmeter adapter into the opening outlet, and press until a firm connection is made.

6. Calculate the duration of flow of the oxygen cylinder.
 - a. Determine the remaining pressure in the tank by reading the regulator gauge.
 - b. Determine the safe residual level of the oxygen tank.

NOTE: The safe residual level is the level of oxygen at which the tank should be replaced. This level has been established to be 200 psi.

- c. Determine the available cylinder pressure by subtracting the safe residual level from the remaining pressure. Example: 2,000 psi remain in a tank. 2,000 psi remaining pressure minus 200 psi safe residual level = 1,800 psi available pressure.
- d. Determine the conversion factor for the oxygen cylinder in use.

NOTE: Each type of oxygen cylinder, depending on its size, employs a specific conversion factor.

- (1) D-size oxygen cylinder: 0.16.
- (2) E-size oxygen cylinder: 0.28.
- (3) G-size oxygen cylinder: 2.41.
- (4) H-size oxygen cylinder: 3.14.
- (5) M-size oxygen cylinder: 1.56.
- e. Determine the available liters by multiplying the conversion factor by the amount of available pressure. For example, A D-size cylinder is being used. A .16 conversion factor x 1,800 psi available pressure = 288 liters of oxygen available for use.
- f. Determine the flow rate based on the patient's condition.
- g. Determine the duration of the oxygen by dividing the available liters by the flow rate. For example, 288 available liters divided by the prescribed flow rate of 10 liters per minute (L/M) = 28.8 (29) minutes duration of oxygen flow.

Performance Steps

7. Fill the humidifier bottle to the level indicated (about two-thirds full) with sterile water.

8. Attach the humidifier to the flowmeter.

NOTE: If an oxygen tube connector adapter is present, remove it from the flowmeter by turning the wing nut.

a. Attach the humidifier to the flowmeter with the wing nut on the humidifier.

NOTE: Not all humidifiers have wing-style nuts. Some have regular bolt-style nuts.

b. Secure the nut by hand-tightening it.

NOTE: Humidifiers and tubing should be changed at least once every 24 hours (or more often IAW local SOP).

9. Attach the oxygen administration device (Figure 8).

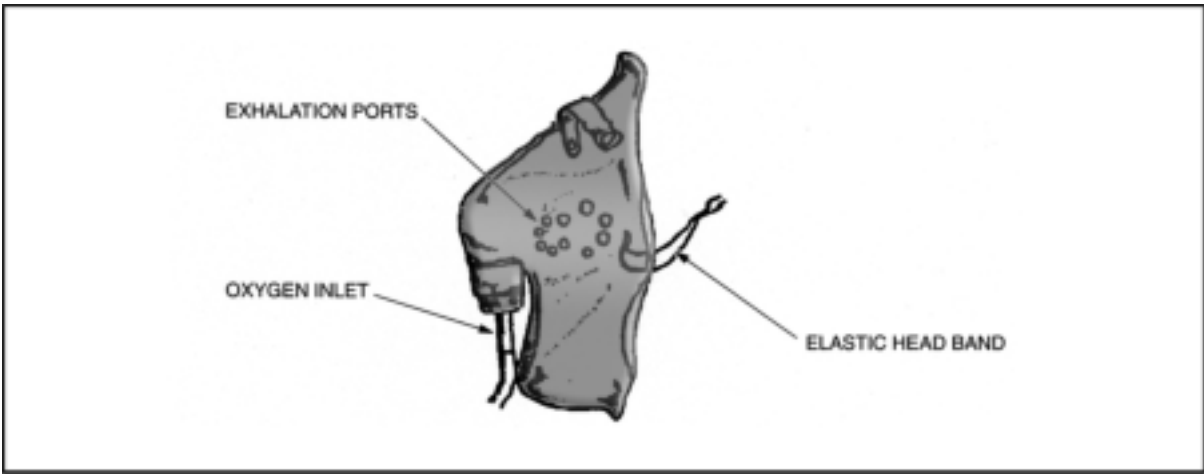


Figure 8. Simple Face Mask

a. Open the package just far enough to expose the end of the connecting tube.

NOTE: Keep the rest of the administration device in the wrapper until ready for use to protect it from dust and contamination.

b. Attach the end of the connecting tube to the oxygen outlet on the humidifier.

c. Use nasal prongs if the flow rate is from 2 L/M through 6 L/M.

d. Use the face mask if the flow rate is 7 L/M or more.

CAUTION: Over-aggressive oxygen therapy may eliminate the respiratory drive of patient's with emphysema and other conditions that cause a hypoxic respiratory drive; however, never withhold oxygen from a hypoxic patient (task 081-833-4176, Manage Chronic Obstructive Pulmonary Disease).

e. Use the Venturi mask on patients with a hypoxic respiratory drive. It has an on-the-mask vent system that prevents the oxygen concentration from becoming too high.

10. Posts warning signs.

CAUTION: Post OXYGEN and NO SMOKING signs in the areas where oxygen is in use or stored.

11. Report and/or record completion of the procedure.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must administer oxygen therapy.

Performance Measures

1. Obtained the necessary equipment.

2. Secured the oxygen cylinder.

GO NO GO

____ ____

____ ____

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Removed the cylinder valve cap.	_____	_____
4. Used either the handwheel or a nonsparking wrench to "crack" (slowly open and quickly close) the cylinder to flush out any debris.	_____	_____
5. Attached the regulator to the cylinder.	_____	_____
6. Calculated the duration of flow of the oxygen cylinder.	_____	_____
7. Filled the humidifier bottle to the level indicated (about two-thirds full) with sterile water.	_____	_____
8. Attached the humidifier to the flowmeter.	_____	_____
9. Attached the oxygen administration device.	_____	_____
10. Posted warning signs.	_____	_____
11. Reported and/or recorded completion of the procedure.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG
STP 8-91V14-SM-TG

Establish Isolation Precautions

081-833-4488

Conditions: Given a hospital or clinical environment that does not have adequate isolation precautions established, soap, water, towels, sterile surgical gloves, nonsterile examination gloves, goggles or face shield, surgical face mask, particulate respirator, surgical gown, surgical cap, and surgical shoe coverings.

Standards: Establish isolation precautions so that disease transmission is prevented or reduced.

Performance Steps

1. Select areas to be used as isolation facilities.
 - a. The area should be climate-controlled, if possible.
 - b. If climate control is not available, the building must be distant from other structures and living areas.
 - c. The area should provide separate rooms for individuals or bays for groups (cohorts) of patients undergoing the same level of isolation.
2. Ensure that all personnel working in the clinic or hospital know and practice the fundamentals of isolation precautions.
 - a. Wash hands as promptly and thoroughly as possible between patient contacts and after contact with blood, body fluids, secretions, excretions, and equipment or articles contaminated by them.

NOTE: Hand washing is the most important method of reducing risk of infection.

- b. Change gloves between patient contacts, and wash hands after gloves are removed.

CAUTION: The wearing of gloves does not replace the need for hand washing.

- c. Place patients in private rooms, if possible.

NOTE: Appropriate patient placement is a significant component of isolation precautions.

- (1) A private room is important to prevent transmission by direct or indirect contact when the source patient has poor hygienic habits, contaminates the environment, or cannot be expected to help maintain infection control precautions to limit transmission of microorganisms (for example, infants, children, and patients with altered mental status).
- (2) If necessary, group patients with same infection together.
- (3) When a private room is not available and grouping is not achievable or recommended, it is very important to consider the epidemiology and mode of transmission of the infecting pathogen and the patient population being served in determining patient placement.
- (4) When possible, a patient with highly transmissible or epidemiologically important microorganisms is placed in a private room with hand-washing and toilet facilities to reduce opportunities for transmission of microorganisms.
- d. Transport of infected patients is limited as much as possible. However, if they are transported, perform the following:
 - (1) Ensure patients use mask, gown, gloves, and so on when being transported.
 - (2) Notify personnel in area to which patients are being taken.
 - (3) Inform patients of ways by which they can help prevent the transmission of their infectious microorganisms to others.
- e. Wear a surgical mask to provide protection against spread of infectious large-particle droplets that are transmitted by close contact and generally travel only short distances (up to 3 feet) from infected patients who are coughing or sneezing.
 - (1) Hospital personnel wear a mask that covers both the nose and the mouth, goggles, or a face shield during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions to provide protection of the mucous membranes of the eyes, nose, and mouth from contact transmission of pathogens.
 - (2) Surgical masks are not effective against airborne (tuberculosis [TB]) transmission.

Performance Steps

- f. Use a partial respirator with a rating of N95 (N category at 95 percent efficiency) for patients with TB.
- g. Wear a gown when splashes or large quantities of infective material are present or anticipated or during the care of patients infected with epidemiologically important microorganisms.
 - (1) Gowns prevent contamination of clothing and protect the skin from blood and body fluid exposures.
 - (2) When wearing gowns around patients with infectious diseases, remove them before leaving the patient's environment. Wash hands after removing gown.
- h. Handle and dispose of used patient-care equipment and articles based on several factors, including the likelihood of contamination with infective material, and the ability to cut, stick, or otherwise cause injury (sharps).
 - (1) Place used sharps in puncture-resistant containers.
 - (2) Place other contaminated waste in a trash bag. One bag is adequate if the bag is sturdy and the article can be placed in the bag without contaminating the outside of the bag; otherwise, two bags are used.
 - (3) Sterilize or disinfect reusable equipment that enters sterile tissue or touches mucous membranes.
 - (4) Clean and disinfect reusable equipment that touches intact skin.
- i. Handle, transport, and launder soiled linen in a manner that avoids transfer of microorganisms to patients, personnel, and environments. If unable to clean the linens, dispose of them the same as other contaminated waste.
- j. Clean, disinfect, or destroy dishes, glasses, cups, and eating utensils, depending on type of contamination and ability to clean
- k. Disinfect the patient's room or area daily. The methods, thoroughness, and frequency of cleaning and the products used are determined by SOP.
 - (1) Certain organisms, such as enterococci, require special disinfecting agents or procedures.
 - (2) Especially thorough cleaning and disinfecting after patient leaves and prior to arrival of new patient.

- 3. Establish SOPs for the precautions to be taken with each level of isolation precaution. Develop the SOPs on the basis of the facilities and equipment available.

NOTE: The goal should be to achieve the level of isolation as required by the Centers for Disease Control (CDC).

- 4. Ensure that all personnel working in the clinic or hospital apply standard precautions to all patients, regardless of diagnosis or presumed infection status.

NOTE: Standard precautions synthesize the major features of universal precautions and body substance isolation and applies them to all patients receiving care in hospitals, regardless of their diagnosis or presumed infection status. Standard precautions apply to: blood; all body fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; skin not intact; and mucous membranes. Standard precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals.

- a. Wash hands after the following:
 - (1) Touching blood, body fluids, secretions, excretions, and contaminated items whether gloves are worn or not.
 - (2) Wash hands immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments.
 - (3) When necessary, wash hands between tasks and procedures on the same patient to prevent cross-contamination of different body sites.
- b. Use a plain (nonantimicrobial) soap for routine hand washing. Use an antimicrobial agent or a waterless antiseptic agent for specific circumstances (for example, control of outbreaks or hyperendemic infections).
- c. Follow the guides listed below to determine when wearing gloves is necessary.
 - (1) Wear gloves when touching blood, body fluid, secretions, excretions, and contaminated items.

Performance Steps

- (2) Put on clean gloves just before touching mucous membranes and skin that is not intact.
- (3) Change gloves between tasks and procedures on the same patient after contact with material that may contain a high concentration of microorganisms.
- (4) Remove gloves promptly after use, before touching noncontaminated items and environmental surfaces, and before going to another patient, and wash hands immediately to avoid transfer of microorganisms to other patient's environments.
- d. Wear a mask and eye protection or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.
- e. Wear a gown (a clean, nonsterile gown is adequate) to protect skin and to prevent soiling of clothing during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Select a gown that is appropriate for the activity and amount of fluid likely to be encountered. Remove a soiled gown as promptly as possible, and wash hands to avoid transfer of microorganisms to other patients or environments.
- f. Handle used patient-care equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately. Ensure that single-use items are discarded properly.
- g. Develop adequate procedures for the routine care, cleaning, and disinfection of environmental surfaces, beds, bed rails, bedside equipment, and other frequently touched surfaces, and ensure that these procedures are being followed.
- h. Handle, transport, and process used linen soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures and contamination of clothing, and that avoids transfer of microorganisms to other patients and environments.
- i. Follow the guides listed below for handling and disposing of needles, scalpels, and other sharp instruments or devices.
 - (1) Never recap used needles by using the hands. Use either a one-handed "scoop" technique or a mechanical device designed for holding the needle sheath.
 - (2) Do not remove used needles from disposable syringes by hand, and do not bend, break, or otherwise manipulate used needles by hand.
 - (3) Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers, which are located as close as practical to the area in which the items were used.
 - (4) Place reusable syringes and needles in a puncture-resistant container for transport to the reprocessing area.
- j. Use mouthpieces, resuscitation bags, or other ventilation devices as an alternative to mouth-to-mouth resuscitation methods in areas where the need for resuscitation is predictable.
- k. Place a patient who contaminates the environment or who does not (or cannot be expected to) help maintain appropriate hygiene or environmental control in a private room. If a private room is not available, consult with infection control professionals regarding patient placement or other alternatives.
- 5. Ensure that all personnel working in the clinic or hospital apply transmission-based precautions for patients known or suspected to be infected with epidemiologically important pathogens spread by direct contact, airborne, or droplet.
 - a. Use airborne precautions, in addition to standard precautions, for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei.

NOTE: Consult the CDC's publication "Guidelines for Preventing the Transmission of Tuberculosis in Health-Care Transmission of Facilities" for additional prevention strategies.

- (1) Patient placement.

Performance Steps

NOTE: Ideally, the patient should be placed in a private room that has monitored negative air pressure in relation to the surrounding area, 6 to 12 air changes per hour, and appropriate discharge of air outdoors. Alternatively, the patient should have monitored, high-efficiency filtration of room air before the air is circulated to other areas in the hospital.

- (a) Keep the room door closed and the patient in the room.
 - (b) When a private room is not available, place the patient in a room with a patient who has active infection by the same microorganism, unless otherwise recommended. However, the patient should have no other infection. When a private room is not available and grouping is not desirable, consultation with infection control professionals is advised before patient placement.
- (2) Respiratory protection.
 - (a) Wear respiratory protection when entering the room of a patient with known or suspected infectious pulmonary TB.
 - (b) Do not allow susceptible persons to enter the room of patients known or suspected to have measles or (rubeola) or varicella (chickenpox) if other immune caregivers are available. If susceptible persons must enter the room of a patient known or suspected to have measles (rubeola) or varicella, they should wear respiratory protection.
 - (c) If a person is immune to measles (rubeola) or varicella, wearing of respiratory protection is not required.
- (3) Patient transport.
 - (a) Limit the movement and transport of the patient from the room to essential purposes only.
 - (b) If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient, if possible.
- b. Use droplet precautions, in addition to standard precautions, for a patient known or suspected to be infected with microorganisms transmitted by droplets (large-particle droplets are larger than 5 micrometers [um] in size) that can be generated by the patient during coughing, sneezing, talking, or the performance of procedures.
 - (1) Patient placement.
 - (a) Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection (cohorts).
 - (b) When a private room is not available and grouping is not achievable, maintain spatial separation of at least 3 feet between the infected patient and other patients and visitors.
 - (c) Special air handling and ventilation are not necessary, and the door may remain open.
 - (2) Mask.
 - (a) In addition to standard precautions, wear a mask when working within 3 feet of the patient.
 - (b) May want to implement the wearing of a mask to enter the room.
 - (3) Patient transport.
 - (a) Limit the movement and transport of the patient from the room to essential purposes only.
 - (b) If transport or movement is necessary, minimize patient dispersal of droplets by masking the patient, if possible.
- c. Use contact precautions, in addition to standard precautions, for specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by direct contact with the patient (hand or skin-to-skin contact that occurs when performing patient-care activities that require touching the patient's dry skin) or indirect contact (touching) with environmental surfaces or patient-care items in the patient's environment.
 - (1) Patient placement.
 - (a) Place the patient in a private room.

Performance Steps

- (b) When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection (cohorts). When a private room is not available and grouping is not achievable, consider the epidemiology of the microorganism and the patient population when determining patient placement.

NOTE: Consultation with infection control professionals is advised before patient placement.

- (2) Gloves and hand washing.
 - (a) In addition to wearing gloves as outlined under standard precautions, wear gloves (clean, nonsterile gloves are adequate) when entering the room.
 - (b) During the course of providing care for a patient, change gloves after having contact with infective material that may contain high concentrations of microorganisms (fecal material and wound drainage).
 - (c) Remove gloves before leaving the patient's environment, and wash hands immediately with an antimicrobial agent or a waterless antiseptic agent.
 - (d) After glove removal and hand washing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the patient's room to avoid transfer of microorganisms to other patients or environments.
- (3) In addition to wearing a gown as outlined under standard precautions, wear a clean, nonsterile gown.

- 6. Establish procedures for managing contacts or possible contacts of patients with infectious diseases.
 - a. Complete quarantine is the limitation of freedom or activities of well persons or animals exposed to a communicable disease for a period to prevent effective contact with those not exposed.
 - b. Modified quarantine is the selective, partial limitation of freedom of movement, commonly on the basis of known or presumed differences in susceptibility to a disease.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an isolation ward.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Selected an area to use as an isolation ward.	—	—
2. Explained the universal precautions to be taken.	—	—
3. Established SOPs for each level of isolation on the basis of the facilities and equipment available and the standards set by the CDC.	—	—
4. Ensured that all personnel working in the clinic or hospital applied standard precautions to all patients.	—	—
5. Ensured that all personnel working in the clinic or hospital applied transmission-based precautions. a. Applied additional airborne precautions for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei. b. Applied additional droplet precautions for a patient known or suspected to be infected with microorganisms transmitted by droplets. c. Applied additional contact precautions for specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by direct contact with the patient.	—	—
6. Established procedures for managing contacts or possible contacts of patients with infectious diseases.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
CDC

Perform a Sterile Dressing Change

081-833-4489

Conditions: You have performed a patient care hand wash and have been given protective pad, scissors, forceps, examination and sterile gloves, basin, sponges, face mask, swabs, towels, tape, dressings, sterile cleaning solution, adhesive solvent, and hand-washing facilities.

Standards: Remove the dressing on a wound, clean the wound, and redress the wound with a secure, sterile dressing without violating aseptic technique.

Performance Steps

NOTE: Under combat conditions, dressings are not normally changed but are reinforced. The second dressing is labeled "Reinforcement." The date, time, and the medic's initials are written on the dressing.

1. Identify the patient.
 2. Gather the equipment.
 3. Prepare the patient.
 - a. Explain the procedure to the patient.
 - b. Expose the wound by moving the patient's clothing and folding the bed linens away from the wound area, if necessary.
 - c. Position the patient to provide maximum wound exposure.
 - d. Place a protective pad under the patient.
 4. Prepare the work area.
 - a. Clear the bedside stand or table.
 - b. Cut the required tape strips, and attach them where they are accessible.
 5. Put on a mask and exam gloves.
 6. Remove the outer dressing.
 - a. Loosen the ends of the tape by peeling toward the wound while supporting the skin around the wound.
- WARNING:** Do not peel the tape away from the wound.
- b. Grasp the edge of the dressing and gently remove it from the wound.
 - c. Note any drainage, color, and odor associated with the dressing.
 - d. Discard the dressing and the gloves in a contaminated waste container.
 7. Perform a patient care hand wash.
 8. Establish a sterile field in accordance with (IAW) task 081-833-0007, Establish a Sterile Field.
 - a. Open and place all sterile equipment and supplies on the sterile field.
 - b. Pour the sterile cleaning solution into a basin.
 9. Put on a mask and sterile gloves.
 10. Remove the inner dressings.
 - a. Using forceps, remove the dressings one at a time.
 - b. Note any drainage, color, and odor associated with the dressings.
 - c. Discard the dressings in a contaminated waste container.
 - d. Drop the forceps on the glove wrap.
 11. Check the wound for signs and symptoms of infection.
 - a. Redness, swelling, foul odor, and/or bleeding.
 - b. Drainage that contains blood, serum, or pus (usually yellow but may be blood-tinged, greenish, or brown).
 - c. Obtain swabs of any drainage and perform a gram stain.
 - d. If drainage is present, irrigate the wound.

Performance Steps

12. Clean the wound with sterile gauze soaked with a sterile cleaning solution.
 - a. Linear wound.
 - (1) First stroke. Clean the area directly over the wound with one wipe, and discard the gauze.
 - (2) Second stroke. Clean the skin area on one side next to the wound with one wipe, and discard the gauze.
 - (3) Third stroke. Clean the skin area on the other side next to the wound with one wipe, and discard the gauze.
 - (4) Continue the procedure, alternating sides of the wound and working away from the wound until the area is cleaned.
 - b. Circular wound.
 - (1) First stroke. Start at the center of the wound, wipe the wounded area with an outward spiral motion, and then discard the gauze.
 - (2) Second stroke. Clean the skin area next to the wound by using an outward spiral motion, about 1 1/2 revolutions, and then discard the gauze.
 - (3) Using successive outward, spiral strokes of about 1 1/2 revolutions, clean the entire area around the wound.
 13. Remove adhesive from around the wound, if necessary.
 - a. Using a solvent-soaked, cotton-tipped applicator or gauze pad, rub gently over the adhesive residue.
 - b. Observe the skin for signs of irritation.
 14. Apply antibacterial ointment, if indicated.
 15. Change sterile gloves.
 16. Apply a sterile dressing.
 - a. Lay the first dressing over the wound so that it extends over the edge.
 - b. Overlap the first dressing with a second dressing.
 - c. Overlap the second dressing with a third dressing.
 - d. Cover all of the dressings with a large, outer dressing.
- NOTE: If the wound has a drain inserted, cut the dressing halfway through and position it around the drain.
17. Remove sterile gloves and face mask.
 18. Secure the dressing with tape.

NOTE: The tape should not form a constricting band around the wound.

 - a. Apply tape to the edge of the dressing with half of the tape on the dressing and the other half on the skin.
 - b. Write the date and time the dressing was changed on a piece of tape, initial it, and secure the tape to the dressing.
 19. Dispose of contaminated materials in a contaminated waste container.
 20. Perform a patient care hand wash.
 21. Record the procedure on the appropriate form.
 - a. Enter the date and time of the dressing change.
 - b. Enter a description of the wound.
 - (1) Type and amount of drainage, if any.
 - (2) Characteristics of the wound before and after cleaning.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must change a sterile dressing.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified the patient.	_____	_____
2. Gathered the equipment.	_____	_____
3. Prepared the patient.	_____	_____
4. Prepared the work area.	_____	_____
5. Put on a mask and exam gloves.	_____	_____
6. Removed the outer dressing.	_____	_____
7. Performed a patient care hand wash.	_____	_____
8. Established a sterile field.	_____	_____
9. Put on a mask and sterile gloves.	_____	_____
10. Removed the inner dressings.	_____	_____
11. Checked the wound for signs and symptoms of infection.	_____	_____
12. Performed a gram stain of any drainage.	_____	_____
13. Cleaned the wound with sterile gauze soaked with a sterile cleaning solution.	_____	_____
14. Removed adhesive from around the wound, if necessary.	_____	_____
15. Applied antibacterial ointment, if indicated.	_____	_____
16. Changed gloves.	_____	_____
17. Applied a sterile dressing.	_____	_____
18. Removed sterile gloves and face mask.	_____	_____
19. Secured the dressing with tape.	_____	_____
20. Disposed of contaminated materials in a contaminated waste container.	_____	_____
21. Performed a patient care hand wash.	_____	_____
22. Recorded the procedure on the appropriate form.	_____	_____
23. Performed steps in order.	_____	_____
24. Did not violate aseptic technique.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG

Irrigate a Wound

081-833-4491

Conditions: Given sterile water or normal saline (NS), sterile solution basin, irrigation syringe, examination gloves, sterile surgical gloves, sterile forceps, catch basin, absorbent pads (chucks), and bandage material.

Standards: Remove the existing bandage, irrigate the wound, and apply a new sterile bandage without violating aseptic technique or causing further injury to the patient.

Performance Steps

1. Identify the patient.
2. Explain the procedure to the patient.
3. Provide privacy, if possible, and position the patient to provide maximum wound exposure.
4. Place a protective pad directly under the wound area.
5. Prepare the irrigation equipment.
 - a. Establish a sterile field by using the wrapper of the sterile solution basin.
 - b. Open and place all other sterile equipment and supplies on the sterile field.
 - c. Verify the prescribed irrigating solution, and pour it into the sterile basin.
6. Don a mask and exam gloves.
7. Remove the soiled outer dressing.
8. Remove the exam gloves.
9. Place a catch basin on the protective pad, against the body, to collect the used solution.
10. Don sterile gloves.
11. Use sterile forceps to remove the inner dressings.
12. Examine the wound to determine if the wound is healing normally or is infected in accordance with (IAW) 081-833-4492, Assess Wound Healing.
13. Irrigate the wound.
 - a. Fill the irrigating syringe with solution from the sterile basin.
 - b. Hold the tip of the syringe as close to the wound as possible without touching it. Depress the bulb or plunger, directing the flow of solution to all parts of the wound in a slow, steady stream.
 - c. Repeat steps a and b until all of the solution is used, or the wound is clear of debris and/or drainage.
 - d. Observe the drainage for blood or characteristics such as unusual color, odor, or consistency.

CAUTION: Use extra care when irrigating a wound in which an abscess has formed. Check all internal surfaces of the wound to inspect for "sinus tract" (resembles tunnels in which pus may be collected). This may require using the gloved hand or a sterile object to gently pull back the flesh. Be careful not to tear healing tissue.
14. Dry the wound, and apply a sterile dressing.
 - a. Pat the wound dry with sterile gauze sponges.
 - (1) Start at the center of the wound.
 - (2) Move outward toward the wound edges.
 - b. Apply a sterile dressing to the wound IAW task 081-833-4489, Perform a Sterile Dressing Change.
 - c. Remove the catch basin and protective pad, if they were still in place.

Performance Steps

15. Remove the mask and gloves.
16. Reposition the patient for comfort, if necessary.
17. Clean and store the equipment IAW local standing operating procedure (SOP).
18. Perform a patient care hand wash.
19. Record the procedure and all observations on the appropriate form.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must perform wound irrigation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified the patient.	_____	_____
2. Explained the procedure to the patient.	_____	_____
3. Provided privacy and positioned the patient.	_____	_____
4. Placed a protective pad directly under the wound area.	_____	_____
5. Prepared the irrigation equipment.	_____	_____
6. Donned a mask and exam gloves.	_____	_____
7. Removed the soiled outer dressing.	_____	_____
8. Removed the exam gloves.	_____	_____
9. Placed a catch basin on the protective pad, against the body.	_____	_____
10. Donned sterile gloves.	_____	_____
11. Used sterile forceps to remove the inner dressings.	_____	_____
12. Examined the wound to determine if the wound is healing normally or infected.	_____	_____
13. Irrigated the wound.	_____	_____
a. Filled the irrigating syringe with sterile solution.		
b. Held the tip of the syringe as close to the wound as possible without touching it.		
c. Directed the flow of solution to all parts of the wound in a slow, steady stream.		
d. Repeated steps 13a. through 13c. until all of the solution is used, or the wound is clear of debris and/or drainage.		
e. Observed the drainage.		
14. Dried the wound.	_____	_____
15. Applied a sterile dressing.	_____	_____
16. Removed the catch basin and protective pad.	_____	_____
17. Removed the mask and gloves.	_____	_____
18. Repositioned the patient for comfort.	_____	_____
19. Cleaned and stored the equipment IAW local SOP.	_____	_____

Performance Measures

20. Performed a patient care hand wash.

GO **NO GO**

21. Recorded the procedure and all observations on the appropriate form.

22. Did not violate aseptic technique.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91B15-SM-TG

Perform Urinary Catheterization

081-833-4495

Conditions: Given sterile urinary catheterization pack containing sterile gauze sponges, urinary catheter, forceps, surgical lubricant, and betadine solution. A patient care hand wash has been performed.

Standards: Perform a urinary catheterization without violating aseptic technique or causing further harm to the patient.

Performance Steps

1. Explain the procedure to the patient.
2. Provide privacy for the patient.
3. Position the patient.
 - a. Female: supine, with the legs extended and spread approximately 45 degrees.

NOTE: The knees may be flexed or the legs extended.

 - b. Male: supine, with the legs extended.
4. Remove the outer wrapper from the catheter kit.

CAUTION: If the kit is damaged, soiled, water-spotted, or outdated, it must be discarded and replaced.
5. Position the catheter kit.
 - a. Female: between the patient's legs at about knee level.
 - b. Male: at the patient's near hip.
6. Unfold the inner wrapper, creating a sterile field.

CAUTION: Touching the inside of the inner wrapper will contaminate the unit.
7. Put on sterile gloves.
8. Position the first drape (plastic-coated).
 - a. Aseptically remove and fully unfold the first drape.
 - b. Grasp the drape at the top edge (plastic side away), and fold the top of the drape over the gloved hands to make a cuff.
 - c. Position the drape.
 - (1) Female: Place the drape, plastic side down, on the bed between the patient's legs. Slip the cuffed edge under the patient's buttocks.
 - (2) Male: Place the drape, plastic side down, across the patient's thighs. Slip the cuffed edge under the penis.
9. Position the second drape (fenestrated).
 - a. Aseptically remove and fully unfold the second drape.
 - b. Place the drape over the genital area.
 - (1) Female: Expose the labia.
 - (2) Male: Extend the penis through the drape opening.
10. Open the package of sterile lubricant, and squeeze it into a corner of the compartment in which it was stored.
11. Open the package of antiseptic solution, and pour it over the cotton balls.

NOTE: If the kit comes with pretreated antiseptic swabs, simply open the package.
12. Remove the plastic cover from the catheter and tubing.

NOTE: Not all catheter and tubing come with a plastic cover.
13. Test the catheter's balloon when inserting an indwelling catheter.
 - a. Attach the prefilled syringe to the valve on the catheter, and twist it to lock it in place.

Performance Steps

- b. Inject the contents of the syringe (usually 5 to 10 centimeters [cc] of water) into the balloon, and observe for leaks.

NOTE: If the balloon leaks, discard the equipment and begin the procedure again with new equipment.

- c. Deflate the balloon by aspirating the water back into the syringe, and leave the syringe in place.

14. Replace the catheter back into the kit.

15. Clean the urinary meatus with cotton balls or swabs covered in providone iodine solution.

NOTE: Cotton balls should be held with forceps.

a. Females:

- (1) Gently spread the labia open with the nondominant hand.

NOTE: This hand is now considered contaminated.

- (a) Place the thumb and forefinger between the labia minora.

- (b) Separate the labia, and pull up slightly.

- (2) With the dominant hand, clean the far labia with a cotton ball or swab, moving from the clitoris toward the anus.

- (3) Use a second cotton ball or swab to clean the near labia.

- (4) Use a third cotton ball or swab to clean down the center, directly over the urinary meatus.

- (5) Keep the labia spread throughout the remainder of the procedure.

b. Males:

- (1) Support the penis with the nondominant hand.

NOTE: This hand is now considered contaminated.

- (2) With the dominant hand, clean the penis with a cotton ball or swab, moving in a circular motion from the urinary meatus toward the base of the penis.

- (3) Repeat the procedure, using a second and third cotton ball or swab.

16. Lubricate the catheter.

- a. Pick up the catheter with the dominant hand about 4 inches from the tip.

- b. Keep the distal end of the catheter coiled in the palm of the hand.

- c. Apply lubricant to the catheter tip.

17. Instruct the patient to relax and breathe through the mouth.

18. Insert the catheter.

a. Female:

- (1) Gently insert the catheter into the urethra about 2 to 3 inches or until resistance is met.

- (2) Continue to advance the catheter until urine begins to flow (about 2 to 3 inches further).

- (3) Release the labia, and hold the catheter securely with the nondominant hand.

- (4) Place the distal end of the catheter in the collection basin.

NOTE: If the vagina is inadvertently catheterized, do not remove the catheter. Assemble new equipment, and repeat the procedure. Leaving the first catheter in place temporarily will prevent catheterizing the vagina a second time.

b. Male.

- (1) Draw the penis upward and forward to a 60- to 90-degree angle to the legs.

- (2) Gently insert the catheter into the urethra, advancing it about 7 to 8 inches or until resistance is felt.

- (3) Continue to advance the catheter until urine begins to flow (about 2 to 3 inches further).

- (4) Lower the penis, and hold the catheter securely with the nondominant hand, resting the hand on the patient's pubis for support.

- (5) Place the distal end of the catheter in the collection basin.

NOTE: With some commercially prepared catheterization kits, the catheter is preconnected to the drainage tubing of the collecting bag.

19. Obtain a urine specimen, if needed.

- a. Place the sterile specimen container from the kit into the collection basin.

- b. Pinch the catheter with the nondominant hand to stop urine flow.

Performance Steps

- c. With the dominant hand, pick up the distal end of the catheter, and hold it over the specimen container.
- d. Release the pinch, and allow enough urine to drain into the specimen container (about 30 cc).
- e. Repinch the catheter, place the distal end into the collection basin, and release the pinch, allowing the urine to flow.

CAUTION: If the patient's bladder is very distended, do not allow more than 500 milliliters (ml) of urine to be released at one time as this may lead to bladder spasm.

- f. Place the lid on the specimen container, and set it aside.

NOTE: If using a commercial kit with the catheter and drainage set preconnected, do not disconnect the catheter to obtain a specimen. Obtain the specimen from the drainage bag at the end of the procedure. The first specimen taken from a new sterile drainage set is considered sterile.

- 20. Inflate the balloon if an indwelling catheter has been inserted.

- a. Inflate the balloon with the water in the prefilled syringe.

NOTE: If the balloon is difficult to inflate, advance the catheter another 1/2 to 1 inch to ensure that the catheter tip is fully within the bladder.

- b. Tug gently on the catheter to ensure that the balloon is fully inflated and seated in the bladder.
- c. Remove the syringe from the catheter by using a twisting motion.

- 21. Attach the distal end of the catheter to the drainage tubing of the collection set, if not preconnected by the manufacturer.

- 22. Remove the drapes and gloves.

- 23. Tape the catheter in place.

- a. Female: to the inner thigh.
- b. Male: to the abdomen or inner thigh.

NOTE: The penis may be positioned up or down (facing the patient's head or feet), depending upon the patient's diagnosis, the physician's order, and/or the patient's comfort preference.

- 24. Secure the drainage bag to the side of the bed on the bottom of the bed frame.

CAUTION: Do not secure the drainage bag to the bedside rails or loop the drainage tubing over or through the side rails.

- 25. Dispose of the used equipment, and clean the area.

- 26. Reposition the patient.

- 27. Record the procedure in the patient's records.

Evaluation Preparation: This task is best evaluated by performance of the steps on a mannequin. Give the soldier a scenario in which he must perform urinary catheterization.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Explained the procedure to the patient.	—	—
2. Provided privacy for the patient.	—	—
3. Positioned the patient.	—	—
4. Removed the outer wrapper from the catheter kit.	—	—
5. Positioned the catheter kit.	—	—
6. Unfolded the inner wrapper, creating a sterile field.	—	—
7. Donned sterile gloves.	—	—
8. Positioned the first drape (plastic-coated).	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
9. Positioned the second drape (fenestrated).	—	—
10. Opened the package of sterile lubricant and squeezed it into a corner of the compartment in which it was stored.	—	—
11. Opened the package of antiseptic solution and poured it over the cotton balls.	—	—
12. Removed the plastic cover from the catheter and tubing.	—	—
13. Tested the catheter's balloon when inserting an indwelling catheter.	—	—
14. Replaced the catheter back into the kit.	—	—
15. Cleaned the urinary meatus with cotton balls or swabs covered in providone iodine solution.	—	—
16. Lubricated the catheter.	—	—
17. Instructed the patient to relax and breathe through the mouth.	—	—
18. Inserted the catheter.	—	—
19. Obtained a urine specimen, if needed.	—	—
20. Inflated the balloon if an indwelling catheter had been inserted.	—	—
21. Attached the distal end of the catheter to the drainage tubing of the collection set, if not preconnected by the manufacturer.	—	—
22. Removed the drapes and gloves.	—	—
23. Taped the catheter in place.	—	—
24. Secured the drainage bag to the side of the bed on the bottom of the bed frame.	—	—
25. Disposed of the used equipment and cleaned the area.	—	—
26. Repositioned the patient.	—	—
27. Recorded the procedure in the patient's records.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91B15-SM-TG

Perform Nasogastric Intubation**081-833-4496**

Conditions: Given a nasogastric (NG) tube, surgical lubricant, large (50 or 60 cubic centimeters [cc]) syringe, small (10 to 20 cc) syringe, container for contaminated waste, adhesive tape, stethoscope, gloves, water, small cup, and a drinking straw. A patient care hand wash has been performed.

Standards: Correctly insert an NG tube without causing further harm.

Performance Steps

1. Determine if the indicators for performing NG intubation are present.
 - a. Requirement to decompress or drain the stomach.
 - (1) Burns.
 - (2) Intestinal obstruction.
 - (3) Preoperative and postoperative care.
 - b. Patient requires a gastrointestinal lavage.
 - (1) Overdose.
 - (2) Gastrointestinal bleeding.
 - c. Patient requires a gavage.
 - (1) Comatose patients.
 - (2) Debilitated patients.
 - d. Need to analyze stomach contents.
 - (1) Patient may be bleeding internally.
 - (2) Overdose.

2. Put on gloves.

WARNING: Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.

3. Explain the procedure to the patient.
 - a. Tell the patient that a tube will be inserted along the nasal (or oral) passage and that he or she may feel some discomfort.
 - b. Tell the patient that breathing through the mouth, panting, and swallowing can help in passing the tube.
 - c. Ask the patient about any history of nasal injury or septal deviation.
 - d. Tell the patient that the tube must be placed about 20 inches down the NG passageway.
 - e. Tell the patient that the procedure may cause him or her to gag.
4. Examine the patient's nose.
 - a. Ensure that the nasal passages are clear.
 - b. Inspect for deviations of the septum.
5. Position the patient.
 - a. Position the responsive, awake, and alert patient in the Fowler's position. Elevate the head of the bed to about 30 to 45 degrees.
 - b. Place a comatose or unconscious patient in the lateral position.
 - (1) Turn the patient onto his or her side.
 - (2) Flex the patient's uppermost arm across the abdomen, or support it on the body and hip.
6. Prepare the equipment.
 - a. Select the type and size of NG tube required.
 - (1) Levin's tube is the standard NG tube.
 - (a) Tube is 28 inches long and comes in 12 to 18 French and has holes for drainage (fenestrated).
 - (b) Used for nasal or oral route.
 - (2) The Ewald tube is used for drainage or irrigation in overdose situations.

Performance Steps

- (a) It is 20 inches long by 36 French with a very large lumen.
- (b) Has a red rubber tube to attach a bulb or funnel.
- (c) Most commonly used by the oral route.

CAUTION: The Ewald tube can cause damage to the larynx or the esophagus if used incorrectly.

- (3) The Miller-Abbott tube is used to drain and decompress the small intestine. It has a double lumen and an inflatable bag at the end to stimulate peristalsis.
- b. Cut four or five pieces of tape 3 to 4 inches long, and attach one end of each where they will be easily accessible.
- c. Unwrap the NG tube from the plastic wrapper.
- d. Measure the tube for insertion.
 - (1) Use the tube to measure the distance between the earlobe and the tip of the nose.
 - (2) Add the distance between the bridge of the nose and the tip of the xiphoid process.
 - (3) Mark the total length to be inserted with a piece of tape.
- e. Lubricate 2 to 3 inches of the distal end of the tube with water-soluble lubricant.

7. Insert the lubricated tip of the tube into the selected nostril.

8. Advance the tube into the nostril.

- a. Gently rotate the tube at the point where the nostril drops into the pharynx, if necessary.
- b. Instruct the patient to swallow to aid advancement of the tube.

NOTE: The patient may take sips of water through a straw.

- c. Advance the tube 3 to 5 inches with each swallow.

CAUTIONS:

- 1. Do not force the advancement of the tube.
- 2. Remove the tube completely, and relubricate it if the patient chokes or coughs or if resistance is felt. Allow the patient to rest for 2 to 3 minutes, and repeat the procedure in the other nostril.

9. Continue advancing the tube until the tape marker touches the nostril.

10. Check the placement of the tube.

a. Aspiration.

- (1) Attach a syringe to the end of the tube. (If a bulb syringe is used, the bulb must be depressed prior to attaching it to the tube.)
- (2) Aspirate the stomach contents.

NOTE: The presence of stomach contents in the tube or syringe indicates correct placement.

- (3) Remove the syringe.

b. Auscultation.

- (1) Position the diaphragm of the stethoscope over the patient's stomach (about 2 inches below the sternum).
- (2) Inject 10 cc of air into the tube.
- (3) Listen for the sound of the air entering the stomach (gurgling or whooshing sound) which indicates correct tube placement. Proceed to step 6 if placement is correct.
- (4) Check for tube placement in the trachea if air is not heard entering the stomach.
 - (a) Reinject 10 cc of air into the tube.
 - (b) Auscultate over the lung field.
 - (c) Remove the tube if air injection is heard over the lungs.
- (5) Repeat steps 2 through 5b(3) to insert the tube.

11. Secure the tube to the patient's nose with the tape.

12. Connect the tube to the suction apparatus, if required.

13. Remove gloves, and wash hands.

NOTE: The following steps relate to removal of the NG tube.

14. Determine that the NG tube is no longer needed.

15. Inform the patient of the procedure and how it will feel.

Performance Steps

- a. Caution the patient about the possible adverse effects: vomiting, pain, and discomfort.
- b. Ensure the patient understands the procedure.

16. Turn the patient's head to the side.

17. Peel off the tape strips from the nose and nostrils.

18. Put on gloves.

WARNING: Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.

19. Clamp or pinch off the end of the tube to prevent release of gastric contents.

20. Remove the tube.

- a. Use a gentle, continuous motion.
 - (1) If resistance is felt, do not try to pull the tube out.
 - (2) Flush the tube with 20 to 30 cc of water while gently rotating the tube.

CAUTION: Unclamp the tube first.

- (3) Once the tube rotates freely, try to pull it out.
- b. After ensuring that the tube is not attached or stuck, pull the tube out rapidly to minimize discomfort.

CAUTION: If the NG tube is removed carelessly, damage could be done to the tissue of the NG passageway.

NOTE: If the patient vomits, stop the procedure immediately. Hand the patient an emesis basin, or place it under his or her chin. Hand the patient a clean towel, or wipe the patient's chin and face with the towel. Continue the procedure when the patient is ready.

21. Discard soiled equipment in the container for contaminated waste.

22. Remove the gloves.

23. Perform a patient care hand wash.

24. Record the procedure on the appropriate form.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must perform NG intubation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined if the indicators for performing NG intubation are present.	—	—
2. Donned gloves.	—	—
3. Explained the procedure to the patient.	—	—
4. Examined the patient's nose.	—	—
5. Positioned the patient.	—	—
6. Prepared the equipment.	—	—
a. Selected the correct type and size of NG tube to use.		
b. Cut four or five pieces of tape 3 to 4 inches long and attached one end of each where they would be easily accessible.		
c. Unwrapped the NG tube from the plastic wrapper.		
d. Measured the tube for insertion.		
e. Lubricated 2 to 3 inches of the distal end of the tube with water-soluble lubricant.		

Performance Measures	<u>GO</u>	<u>NO GO</u>
7. Inserted the lubricated tip of the tube into the selected nostril.	_____	_____
8. Advanced the tube into the nostril.	_____	_____
9. Continued advancing the tube until the tape marker touched the nostril.	_____	_____
10. Checked the placement of the tube, and took corrective action when the tube was not correctly placed.	_____	_____
11. Using tape, secured the tube to the patient's nose.	_____	_____
12. Connected the tube to the suction apparatus when required.	_____	_____
13. Removed gloves and washed hands.	_____	_____
14. Determined that the NG tube is no longer needed.	_____	_____
15. Informed the patient of the procedure and how it would feel.	_____	_____
16. Turned the patient's head to the side.	_____	_____
17. Peeled off the tape strips from the nose and nostrils.	_____	_____
18. Donned gloves.	_____	_____
19. Clamped or pinched off the end of the tube to prevent release of gastric contents.	_____	_____
20. Removed the tube.	_____	_____
21. Discarded soiled equipment in the container for contaminated waste.	_____	_____
22. Removed the gloves.	_____	_____
23. Performed a patient care hand wash.	_____	_____
24. Recorded the procedure on the appropriate form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91C25-SM-TG

Perform Urinary Catheter Care

081-833-4499

Conditions: Having performed a patient care hand wash and explained the procedure to the patient and given a patient with a urinary catheter in place, a basin of water, soap, a hand towel, a wash cloth, antibacterial ointment, protective pads, 4 x 4 gauze, clamps, a drainage set, gloves, sterile needle and syringe, sterile specimen container, thermometer, patient's clinical record, and Department of Defense (DD) Form 792, Twenty-Four Hour Patient Intake and Output Worksheets.

Standards: Perform urinary catheter care and maintain the indwelling catheter without contaminating the equipment or causing further injury to the patient.

Performance Steps

1. Provide privacy for the patient.
 2. Put on exam gloves.
 3. Place the patient in a comfortable position for catheter care.
 - a. If the patient is awake and alert, place him or her in the semi-Fowler's position.
 - b. If the patient is unconscious, place him or her in the supine position.
 4. Inspect the catheter, drainage tubing, all connections, and the drainage bag for cracks, leaks, kinks, or obstruction of drainage.
 4. Inspect the urinary meatus (male) or the urethral opening (female) and the surrounding area for redness, swelling, skin irritation, and leakage of urine.
 5. Withdraw the catheter about 1 inch.
 6. Clean the area with soap and water.
 7. Prepare to aseptically clean the patient and catheter.
 - a. Establish a sterile field.
 - b. Aseptically add sterile cotton balls or gauze, betadine, and forceps.
- Note: If the gauze or cotton balls are placed in a container, you may pour the betadine over them.
- c. Remove the exam gloves, and don sterile gloves.
 - d. Mix the cotton balls or gauze if not already done.
8. Clean the urethral meatus or opening and the catheter.
- NOTE: Sterile catheter care should be performed daily.
- a. Male patient.
 - (1) Retract the foreskin of an uncircumcised patient.
 - (2) Use a separate cotton ball or gauze pad to clean each of the following:
 - (a) Around the meatus.
 - (b) The first 3 to 4 inches of the exposed catheter.
 - (c) The rest of the glans.
- NOTE: If the patient is an uncircumcised male, replace the foreskin over the head of the penis.
- (3) Reinsert the catheter 1 inch.
 - b. Female patient.
 - (1) Separate the labia.
 - (2) Use a separate cotton ball or gauze pad to clean each of the following:
 - (a) Around the urethral opening.
 - (b) The first 3 to 4 inches of exposed catheter.
 - (c) Left side of the labia.
 - (d) Right side of the labia.
 - (3) Reinsert the catheter 1 inch.

Performance Steps

9. Apply antibacterial ointment to the urethral meatus if signs of symptoms of infection or irritation are present.
 10. Ensure the catheter is secured to the patient without causing pressure within the bladder.
 - a. Tape the catheter to the skin of the inner thigh for a female patient.
 - b. Tape the catheter to the skin of the lower abdomen or inner thigh for a male patient.
- NOTE: Position the penis up or down (facing the patient's head or feet), depending upon the patient's diagnosis and/or the patient's comfort preference.
11. Assess the patient for indications of urinary tract infections: chills, fever, back or flank pain, hematuria, and cloudy or foul smelling urine.
 12. Collect a urine specimen on a routine schedule or if a urinary tract infection is suspected.
 - a. Collect a sterile urine specimen without contaminating or disconnecting the closed system.
 - (1) Clamp off the drainage tubing just below the aspiration port.
 - (2) Wait until a sufficient quantity of urine has pooled above the aspiration port (about 15 minutes).
 - (3) Swab the aspiration port with alcohol.
 - (4) Withdraw the desired amount of urine by using a sterile needle and syringe.
 - (5) Remove the clamp from the drainage tubing.
 - (6) Transfer the urine in the syringe to a sterile specimen container.
 - b. Perform a urinalysis (UA) in accordance with (IAW) 081-833-4670, Perform a Urinalysis.
 - c. Perform a culture with the urine sample.
 13. Empty the drainage bag.
 - a. Empty the drainage bag without disconnecting or contaminating the closed system.
 - b. Measure and discard the urine as indicated.
- NOTE: The drainage bag must be emptied before it overfills to prevent reflux of urine into the drainage tubing.
- a. Hang the drainage bag from the bed frame, not the bed rails.
 - b. Do not allow the drainage bag to rest on the floor.
15. Maintain the drainage bag below the level of the patient's bladder to prevent urinary reflux. If the bag must be raised to bladder level for any reason, it must be clamped first.
 15. Maintain patency of the drainage tubing.
 - a. Keep the tubing free from kinks and twists.
 - b. Keep the tubing free of pressure caused by bed rails, mattress, or the patient's body.
 - c. Keep the tubing above the level of the drainage bag to ensure free gravity drainage.
 16. Replace the urinary bag and tubing IAW local standing operating procedure (SOP).
 17. Replace the urinary catheter IAW local SOP.
 18. Maintain an accurate input and output (I&O) record.
 19. Promptly manage any complications and infections.
 19. Document the procedure and all significant observations on the appropriate forms IAW local SOP.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must perform urinary catheter care on a mannequin with a catheter inserted.

Performance Measures

1. Provided privacy for the patient.
2. Placed the patient in a comfortable position for catheter care.

GO NO GO

_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Inspected the catheter, drainage tubing, all connections, and the drainage bag.	—	—
4. Inspected the urinary meatus (male) or the urethral opening (female) and the surrounding area.	—	—
5. Withdrew the catheter about 1 inch.	—	—
6. Cleaned the area with soap and water.	—	—
7. Prepared to aseptically clean the patient and catheter.	—	—
8. Aseptically cleaned the urethral meatus or opening and the catheter in sequence.	—	—
9. Applied antibacterial ointment to the urethral meatus when signs of symptoms of infection or irritation were present.	—	—
10. Ensured that the catheter was secured to the patient without causing pressure within the bladder.	—	—
11. Assessed the patient for indications of urinary tract infections.	—	—
12. Collected a urine specimen if a urinary tract infection was suspected.	—	—
13. Emptied the drainage bag.	—	—
15. Maintained the correct position of the drainage bag at all times.	—	—
15. Maintained patency of the drainage tubing at all times.	—	—
16. Replaced the urinary bag and tubing IAW local SOP.	—	—
17. Replaced the urinary catheter IAW local SOP.	—	—
18. Documented the procedure and all significant nursing observations on the appropriate forms IAW local SOP.	—	—
18. Maintained an accurate I&O record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
DD FORM 792
STP 8-91C25-SM-TG

Manage a Debilitated Patient

081-833-4689

Conditions: Given stethoscope, sphygmomanometer, otoscope/ophthalmoscope set, The Merck Manual, oxygen and oxygen delivery equipment, nasogastric (NG) tube, bulb suction device, feeding bag, intravenous (IV) fluids and IV administration equipment, bed pan, soap, water, wash cloth, and topical antibiotic ointment.

Standards: Manage the airway, breathing, circulation, bodily functions, and integument of a debilitated patient without causing further harm.

Performance Steps

1. Manage the airway and breathing of a debilitated patient. (See tasks 081-833-4175, Perform Pulmonary Nursing Care, and 081-833-4485, Administer Oxygen Therapy.)
 - a. Manage pulmonary atelectasis. (See task 081-833-4174, Manage Pulmonary Atelectasis.)
 - b. Manage aspiration injuries. (See task 081-833-4197, Manage Inhalation/Aspiration Injuries.)
 - c. Manage pneumonia. (See task 081-833-4169, Manage Pneumonia.)
 - d. Manage pulmonary embolism.
 - (1) Embolism: obstruction in one or more of the pulmonary arterioles (or other vessels) due to a solid, liquid, or gaseous mass (generally are air, fat, or blood clot emboli) which is carried in the blood stream and lodges in the pulmonary vasculature.
 - (2) Fat embolisms:
 - (a) Generally associated with multiple fractures. Fat is thought to act as a tissue toxin, causing chemical damage to the endothelial lining of the lungs. The damaged endothelial lining causes injury to capillaries leading to leaking and severe interstitial and intraalveolar edema.
 - (b) Signs and symptoms generally appear 12 to 24 hours after trauma. Symptoms include: respiratory distress (tachypnea or dyspnea), mental disturbances (restlessness, mental confusion, irritability, stupor, and fluctuating level of consciousness (LOC) [fluctuating LOC differentiates fat embolisms from cerebral trauma where deep coma generally is seen]), fever, petechiae in buccal membranes, hard palate, conjunctival sacs, anterior axillary folds due to occlusion of capillaries.
 - (3) Air embolisms: embolisms are caused by thrombi.
 - (a) Air embolisms are generally caused by IV procedures or failure to occlude open wounds involving major vessels.
 - (b) Thrombus-type embolisms are generally caused by coagulation problems, venous stasis following trauma and/or surgery (most post operative pulmonary emboli develop in the pelvic or iliofemoral veins, dislodge, and travel to the lungs).
 - (c) Signs and symptoms: Sharp, stabbing chest pains, anxiety, diaphoresis, progressive drop in LOC, tachycardia, tachypnea, dyspnea, or cyanosis.
 - (4) Management:
 - (a) Semi-Fowler's position with head of bed (HOB) elevated about 45 degrees (except for air embolism).
 - (b) Oxygen therapy: 6 to 8 liters per minute (L/M) by mask or cannula.
 - (c) Bedrest.
 - (d) Monitor vital signs (VS) frequently.
 - (e) Acetylsalicylic acid (ASA) 625 milligrams (mg) by mouth (PO) every day (q.d.) for thrombus-type emboli.
 - (f) Evacuate as soon as possible (ASAP) for heparin/anticoagulant therapy.
 - e. Manage adult respiratory distress syndrome (ARDS). (See task 081-833-4165, Manage Adult Respiratory Distress Syndrome.)
 - f. Manage pulmonary edema. (See task 081-833-4190, Manage Pulmonary Edema.)
2. Manage the circulation of a debilitated patient. (See task 081-833-4043, Manage a Continuous Intravenous Infusion.)

Performance Steps

- a. Hemorrhage:
 - (1) Can occur from time of injury as a result of lack of control, missed injury, or internal injury.
 - (2) After surgery, can occur within matter of hours.
 - (a) If hemorrhage occurs within a couple of hours, it is generally caused by blood pressure (BP) returning to normal, which causes loosening of ligatures and flushing out of weak clots from unligated vessels.
 - (b) Can be caused by slipped sutures, dislodged clots, or wound evisceration, which often occurs within 48 hours.
 - (c) If hemorrhage occurs some time after surgery, it is usually caused by ligature slip from vessel and/or erosion of vessel.
- b. Manage hemorrhage in a debilitated patient.
 - (1) Monitor VS every (q.) 15 minutes until stable.
 - (2) Monitor dressings frequently for increase in drainage, and record color and amount of any drainage.
 - (3) Apply pressure (reinforce dressing with pressure dressing, or apply direct pressure).
 - (4) Notify surgeon if postoperative bleeding occurs.
 - (5) IV fluids (Ringer's lactate).
 - (6) Blood/blood component therapy (plasma or dextran).
 - (7) Oxygen therapy.
- c. Shock (see task 081-833-4073, Manage Shock).
- d. Thrombophlebitis: inflammation of vein associated with thrombus (clot) formation.
 - (1) Posttrauma and postoperatively, thrombophlebitis occurs in pelvic veins and deep veins of lower extremities. Venous thrombi, located above the knee, are a major source of pulmonary emboli.
 - (2) Associated with:
 - (a) Venous stasis.
 - (b) Hypercoagulopathy (common with massive transfusions) or polycythemia.
 - (c) Disseminated intravascular coagulation (DIC) (hypotension, trauma, and sepsis can result in simultaneous or sequential arterial clotting and bleeding).
 - (3) Signs and symptoms of thrombophlebitis are often asymptomatic initially.
 - (a) Pain or tenderness in calf or thigh progressing to painful swelling of entire leg.
 - (b) Warmth and marked tenderness over affected area.
 - (c) Slight fever, chills, and diaphoresis.
 - (d) Impairment of distal circulation (check pulses).
 - (4) Management.
 - (a) Strict bedrest; avoid ambulation.
 - (b) Do not massage or rub limb.
 - (c) Elevate affected limb (promotes venous return and reduces swelling).
 - (d) Apply warm, moist packs to affected limb.
 - (e) Apply elastic bandages or elastic stockings.
 - (f) Monitor distal pulses, check for Homan's sign (calf pain with dorsiflexion of foot--present in 30 percent of cases).
 - (g) Prophylactic anticoagulants (Aspirin or heparin).
 - (h) Monitor for signs and symptoms of pulmonary embolus.
- e. Take measures to prevent post trauma/postoperative circulatory problems.
 - (1) Monitor vital signs, LOC, input and output (I&O) frequently.
 - (2) Frequently monitor injured site/operative site for bleeding.
 - (3) Early ambulation when possible; range of motion (R.O.M.) when ambulation not indicated (5 minutes every 2 hours [q2h]); elastic bandages or elastic stockings to lower extremities to prevent stasis; and elevate lower extremities to promote blood return.
 - (4) Change position q2h while on bedrest. Avoid prolonged pressure on pressure points and on legs while thrombi are likely to occur.
 - (5) Strict aseptic technique in doing all procedures to prevent sepsis.
 - (6) Encourage fluid intake.

Performance Steps

3. Manage the bodily functions of a debilitated patient. (See task 081-833-4495, Perform Urinary Catheterization; 081-833-4496, Perform Nasogastric Intubation; 081-833-4097, Manage a Patient with a Nasogastric Tube; 081-833-4499, Perform Urinary Catheter Care; and 081-833-4101, Perform Gavage.)
 - a. Renal/urinary problems:
 - (1) Renal failure: important complication after trauma and/or surgery. Renal failure follows all types of severe injuries that affect IV volume (decrease IV volume leads to decreased renal perfusion and decreased filtration), myocardial function, and the kidneys and their drainage structures. After resuscitation and/or surgery, renal failure may be caused by internal or external bleeding, peritonitis (which leads to fluid loss into peritoneal cavity), fluid loss into bowel lumen, and spinal or septic shock.
 - (2) Pathology involves decreased filtration, which leads to decreased urine formation and increased levels of nitrogen products of metabolism in the blood. This leads to azotemia, uremia. When hypotension is prolonged, results in severe tubular damage (acute renal failure).
 - (3) Should anticipate with:
 - (a) Hypotension and tachycardia.
 - (b) Urine output < 25 milliliters per hour (ml/hr) at any time.
 - (c) Crushing injuries of extremities with myoglobinuria.
 - (d) Hemolysis and hemoglobinuria with burns (particularly with burns over more than 30 percent of the body surface area [BSA]), and transfusion reactions.
 - (e) Use of aminoglycosides with or without cephalosporins.
 - (4) Signs and symptoms:
 - (a) Suspect based on urinary output < 400 cubic centimeters (cc)/day or < 20 cc/hour.
 - (b) Nausea, vomiting, diarrhea.
 - (c) Somnolence.
 - (5) Management:
 - (6) Urinary retention:
 - (a) Frequently seen after surgery in rectal, anal, vaginal, or low abdominal regions; secondary to spasm of bladder sphincter.
 - (b) Signs and symptoms; distention, oliguria, or anuria.
 - (c) Most commonly seen 6 to 8 hours postoperative.
 - (7) Management.
 - (a) Rapid replacement of fluid and blood to maintain adequate renal perfusion.
 - (b) Monitor I&O, and watch for cardiac arrhythmias.
 - (c) Correct underlying disorder (infection, hemorrhage, and so on).
 - (d) Provide privacy, and assist males to stand.
 - (e) Push fluids, especially warm drinks.
 - (f) Psychological aids (running water, and so on to relax sphincter).
 - (g) Warmth to relax sphincter (drinks or sitz baths).
 - (h) Record color, odor, clarity, and amount (COCA) and time of voiding (especially first voiding after trauma or surgery) for bladder distention.
 - (i) Use an in and out catheter (straight catheter) if the patient's bladder is distended and he can relieve himself.
 - (j) If unable to void after initial catheterization, insert Foley catheter for 24 hours and then remove.
 - b. Gastrointestinal problems:
 - (1) Nausea and vomiting: May be caused by the following:
 - (a) Inhaled anesthetics which irritate stomach and stimulate vomiting center in the brain.
 - (b) Accumulation of fluid/foods before peristalsis returns.
 - (c) Abdominal distention which follows manipulation of abdominal organs.
 - (2) Management.
 - (a) Avoid aspiration by positioning on side or with head turned and avoiding abrupt position changes.

Performance Steps

- (b) Rehydrate with IV fluids and replace electrolytes.
- (c) Maintain a quiet, cool, and odor-free environment, and give emotional support.
- (d) Antiemetics (Compazine, Phenergan, or Tigan).
- (3) Constipation and flatulence:
 - (a) May be caused by the following: trauma and/or manipulation of bowel in surgery, narcotic use, peritonitis, and abscesses retarding peristalsis.
 - (b) Leads to abdominal distention and can progress to obstruction.
- (4) Management.
 - (a) Encourage fluids, stool softeners, and laxatives (enema as last resort).
 - (b) Remove impaction manually.
 - (c) Rectal tube to relieve flatus.
 - (d) Cautious use of narcotics.
 - (e) Neostigmine given 2 mg IV over 3 to 5 minutes OR 0.5 to 1 mg given subcutaneously (SQ) or intramuscularly (IM) to stimulate peristalsis.
 - (f) Monitor bowel sounds.
- (5) Abdominal distention (obstruction): This can occur with constipation and flatulence, but more often with mechanical obstruction or ileus after surgery, blunt or penetrating abdominal trauma, retroperitoneal and spinal injuries, and wound dehiscence (decreased motor activity secondary to toxic or traumatic disturbance of autonomic nervous system leads to ineffective peristalsis). Most obstructions occur at narrowest part of bowel (ileum). They may be caused by:
 - (a) Mechanical etiology: adhesions, volvulus (twisting of bowel), or intussusception (telescoping of bowel).
 - (b) Neurogenic etiology: paralytic secondary to intraoperative bowel manipulation or anesthesia.
 - (c) Vascular etiology: mesenteric arterial occlusion or shock.
- (6) Signs and symptoms.
 - (a) Visible distention of abdomen.
 - (b) Sharp, colicky abdominal pain--comes and goes.
 - (c) Pain localized, progressing to generalized.
 - (d) Absent or decreased bowel sounds. With an obstruction, you hear high-pitched, metallic tinkling sounds above the obstruction.
 - (e) Nausea and vomiting (with complete obstruction, intestinal contents back up into stomach).
 - (f) No bowel movements.
- (7) Management.
 - (a) Rectal tube for flatus.
 - (b) Gastric intubation with suction.
 - (c) Nothing by mouth (NPO).
 - (d) IV fluids to maintain circulating volume.
 - (e) Monitor bowel sounds.
 - (f) Neostigmine as in step 3b(4)(e).

WARNING: Neostigmine is contra-indicated for mechanical obstructions.

- (g) Evacuate patient if unable to relieve obstruction.

4. Manage the integument of a debilitated patient.

- a. Wound infection: (See tasks 081-833-4492, Assess Wound Healing; 081-833-4298, Manage Clostridial Cellulitis, Myositis, and Myonecrosis; 081-833-4297, Manage Necrotizing Subcutaneous Infections; and 081-833-4030, Manage Common Bacterial Skin Conditions.)
- b. Wound dehiscence (evisceration): chiefly associated with abdominal wounds and surgery; results in separation of edges of wound with exposure of organs. May be caused by the following:
 - (1) Abdominal distention from paralytic ileus, mechanical obstruction, air evac while patient has ileus (bowel gas expands at higher altitudes).

Performance Steps

- (2) Postoperative may be caused by inadequate sutures (or sutures too tight and compromising blood supply), infection, excessive coughing, retching, and distention.
- (3) Major burns increase chances of wound dehiscence.
- c. Signs and symptoms.
 - (1) Sudden discharge of serosanguineous drainage.
 - (2) Patient reports something "gave way."
 - (3) Visible separation. Organs may become visible.
- d. Management.
 - (1) If organs are visible, cover with sterile, moistened dressing (use normal saline [NS]).
 - (2) Monitor VS, observe for hypovolemic shock, and start IV fluids.
 - (3) Bedrest with HOB elevated and knees flexed to decrease abdominal tension.
 - (4) NPO, NG tube, and preparation for return to surgery.
- e. Decubitus ulcers (bedsores): localized ulcerations of skin and deeper structures that occur when pressure exceeds normal capillary pressure applied to skin for prolonged periods of time.
 - (1) Certain medical conditions (for example, diabetes, renal disease, chronic disorders, dehydration, and malnourishment) put patients at increased risk for these ulcers.
 - (2) Pathophysiology involves pressure that leads to compression of vessels. Compression leads to tissue anoxia and ischemia, which progresses to necrosis, resulting in sloughing and ulceration with potential invasion by microorganisms. Infection and sepsis may ultimately occur.
 - (a) Common areas are the bony prominences.
 - (b) Associated with immobilization, friction, and moisture (for example, with diaphoresis and incontinence), circulatory insufficiency, edema (impairs circulation and nutrition to area), and infection. All lead to decreased resistance to breakdown.
 - (3) Signs and symptoms: Pressure sores develop in recognized stages.
 - (a) Stage 1: redness of area (will blanch).
 - (b) Stage 2: dusky, cyanotic, bluish-gray mottled discoloration (fails to blanch).
 - (c) Stage 3: vesiculation (blistering) followed by break in skin, which progresses to deep, penetrating necrosis.
 - (4) Management.
 - (a) Change positions, ambulate early.
 - (b) Keep problem areas clean and dry.
 - (c) Local wound care using aseptic technique.
 - (d) Adequate fluids and nutrition.
 - (e) If decubitus ulcers become septic, antibiotic therapy should be started. The following regimen is acceptable as of this writing. Imipenem cilastatin (Primaxin) 0.5 grams (g) every 6 hours (q6h) IV OR meropenem 1g every 8 hours (q8h) IV OR ticarcillin clavulanate (Timentin) 3.1g every 4 hours (q4h) IV.
- f. Prevention of post trauma/postoperative skin problems.
 - (1) Strict aseptic technique in doing all procedures.
 - (2) Encourage fluids and nutrients, as permitted, to strengthen immune system.
 - (3) Monitor wounds and dressings closely for change in drainage.
 - (4) Ambulate early whenever possible, change position q2h, and R.O.M.

5. Record all treatment in the patient's medical record.

6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a debilitated patient.

Performance Measures

- 1. Managed the airway and breathing of a debilitated patient.
- 2. Managed the circulation of a debilitated patient.

GO **NO GO**

____ ____
____ ____

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Managed the bodily functions of a debilitated patient.	_____	_____
4. Managed the integument of a debilitated patient.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required	Related BASIC ARRHYTHMIAS, 4TH ED MERCK MANUAL 17TH ED SANFORD, 1999

Subject Area 5: Preventive Medicine

Establish a Malaria Prevention and Control Program

081-833-4498

Conditions: Given an area assessment that indicates your unit will be deploying to a malarious area, appropriate prophylactic drugs, insect repellants, insecticides, and dispensing equipment.

Standards: Establish and monitor a malaria prevention and control program so that no new cases of malaria occur in your area of control.

Performance Steps

1. Prescribe prophylaxis for team members before deployment into the malarious area in accordance with (IAW) the current United States Army Special Operations Command (USASOC) surgeon's guidance.

NOTE: Ensure adherence to current guidance for the specific area of operations. Chloroquine-resistant areas and chemoprophylaxis and treatment regimens are updated as new information becomes available. The disease and environmental risk assessment available from Armed Forces Medical Intelligence Center (AFMIC) or through the medical intelligence section of the USASOC surgeon's office contains information on malaria prevalence worldwide. The USASOC surgeon's office establishes malaria prophylaxis policy for all Army special operations forces (ARSOF) units.

- a. Give chloroquine to suppress symptoms of malaria (this drug does not prevent infection).
 - (1) Give the soldiers a test dose to ensure they are not allergic to the drug 1 week before leaving for the operational area.
 - (2) Give the soldiers chloroquine phosphate 500 milligrams (mg) weekly while in the malarious area.
 - (3) After return from the malarious area, continue to give soldiers chloroquine 500 mg weekly for 6 weeks after return from the malarious area. Additionally, take primaquine phosphate 23.6 mg (1 tablet) by mouth (PO) every day (q.d.) for 14 days after return from the malarious area.
- b. Use alternate chemoprophylaxis if entering a known chloroquine-resistant area.
 - (1) Give mefloquine 250 mg PO on days 5, 3, and 1 before entering the malarious area.
 - (2) Give mefloquine 250 mg PO every (q.) week while in the malarious area and for 4 weeks after return from the area.
 - (3) Additionally, give primaquine phosphate 23.6 mg (1 tablet) PO q.d. for 14 days after return from the malarious area.
 - (4) If unable to take mefloquine, give doxycycline 100 mg PO q.d. starting 1 day before entering the malarious area and continuing until 4 weeks after return from the malarious area. Warn patients of photosensitivity while taking doxycycline.
2. Prevent exposure in the malarious area:
 - a. Take measures to control mosquitoes (task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means).
 - b. Isolate and treat active cases within the host nation force, considering time available, medications available, and mission requirement (task 081-833-4274, Manage Malaria).
 - c. Maintain a log of all active cases to include the following:
 - (1) Date the diagnosis was made.
 - (2) Length of the chills and occurrence of febrile periods.
 - (3) Medications given.
 - (4) Disposition of the patient and signs of drug resistance.
3. Inspect the area and personnel weekly to ensure adherence to the countermeasures.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish a malaria prevention and control program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prescribed prophylaxis for team members before deployment into the malarious area in accordance with the current USASOC surgeon's guidance.	_____	_____
2. Prevented exposure in the malarious area.	_____	_____
3. Inspected the area and personnel weekly to ensure adherence to countermeasures.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	SANFORD, 1999

Establish a Rabies Control Program

081-833-4500

Conditions: Given rabies vaccine and a means of securing suspect domestic animals.

Standards: Establish a rabies control program so that infected animals are removed from the population, susceptible domestic animals and human populations are vaccinated, and the overall incidence of rabies is reduced to a manageable level on the basis of the resources available.

Performance Steps

1. Vaccinate at-risk individuals with imovax 0.1milliliter (ml) intradermal (ID) on days 1, 7, and 21.
2. Impound stray animals. In conjunction with local authorities, impounded animals that are healthy must be placed under ownership or destroyed.
3. Immunize owned animals, if possible.
4. Reduce the wild host population, if necessary (task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means). If wild host animals in the area come into frequent contact with domestic animals, it may be worthwhile to try to decrease the number of wild host animals.
5. Treat known human exposures (task 081-833-4247, Manage Rabies).
6. Monitor domestic and wild animal populations for presence of the disease. Outbreaks are more easily controlled early in their course.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish a rabies control program.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Vaccinated at-risk individuals.	_____	_____
2. Impounded stray animals.	_____	_____
3. Immunized owned animals, if possible.	_____	_____
4. Reduced the wild host population, if necessary.	_____	_____
5. Treated known human exposures.	_____	_____
6. Monitored domestic and wild animal populations for presence of the disease.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

SANFORD, 1999

Conduct Pest Control Operations with Chemical and Non-Chemical Means

081-833-4501

Conditions: Given shovels, machetes, chemical pesticides approved by the Department of Defense (DOD), screening material, eye protection, rubber gloves, face mask respirator, rattraps, and mousetraps.

Standards: Reduce the target pest population to an acceptable level without endangering yourself and other humans.

Performance Steps

1. Modify or eliminate mosquito vector and other insect breeding sites.
 - a. Draining, if possible, will reduce the number of mosquitoes and other vectors.
 - b. Even a coffee cup full of water is enough to harbor hundreds of mosquito larvae.
 - c. If draining is not possible, use DOD-approved mosquito larvicides in standing water.
2. Clear away dense vegetation and other harborage near living areas.
 - a. Dense vegetation may trap enough moisture to allow insects to breed.
 - b. Dense vegetation, even in dry climates, provides harborage for animal and insect vectors.
 - c. Other harborage can include boxes, empty food containers, plastic bags, or anything else that will allow insects or rodents to find protection from the elements and predators.
3. Apply chemical pesticides.
 - a. Spray DOD-approved chemical pesticide into areas of heavy vegetation that cannot be cleared.
 - b. Apply DOD-approved bait pesticides in areas where rodents are suspected to frequent.

NOTE: Trapping rodents is a safer alternative to chemical pesticides where feasible.

- c. Ensure the chemical pesticide that you are using is effective against the vectors you are trying to control. This information is located on the label of the given pesticide.
- d. Chemical pesticides must be mixed in proper concentration and dispensed in sufficient density to control the desired pest. Concentration and dispensing information is located on the product label.

CAUTION: Dispensing chemical pesticides requires use of personal protective measures. At a minimum, eye protection, rubber gloves, and face mask respirator should be worn when handling pesticides.

- e. Ensure chemical pesticides used inside living areas are labeled as safe for use indoors.

4. Remove food sources.
 - a. Do not eat near the living area. Even a small amount of food spillage can attract a large number of insects and rodents.
 - b. Do not have pets or domestic animals near the living area. These animals themselves are a food source and a place of harborage for fleas, ticks, and other insects.
 - c. Do not leave beer or soda bottles and cans near the living area. If empty bottles must be stored, they should be rinsed out to prevent the food source of the residual liquid from attracting pests.
5. Deny entry of pests into living and eating areas.
 - a. Repair screens on windows and doors.
 - b. Close all holes in walls and floors. Rodents can enter through incredibly small holes. Holes that have evidence of being created by or habitually used by rodents must be reinspected frequently after closure. Rodents are prolific chewers and will reopen holes at a rapid rate.

NOTE: After all routes of entry into the living area have been closed, the living area should be treated with DOD-approved aerosol insecticide to kill insects that are trapped inside.

6. Employ personal protective measures.
 - a. Use the DOD arthropod repellent system, requiring the concurrent use of repellents on skin (N, N diethyl-mtoluamide [DEET]) and clothing (permethrin).

Performance Steps

- b. Ensure soldiers are properly supplied with 33 percent DEET insect and arthropod repellent lotion (national stock number [NSN] 6840-01-284-3982) and that it is applied twice daily to all areas of exposed skin.
 - c. Ensuring that all soldiers correctly wear uniforms treated with permethrin insect and arthropod clothing repellent treated by one of the following methods:
 - (1) Kit method (NSN 6840-01-345-0237): The kit contains a bag into which the uniform is placed along with the permethrin. The uniform is then saturated with the repellent. This treatment should provide protection for the life of the uniform.
 - (2) Two-gallon sprayer method (NSN 6840-01-334-266): provides protection for the life of the uniform. Treatment should be supervised by personnel who are DOD-certified to apply restricted use pesticides.
 - (3) Aerosol spray can method (Insect Repellent Spray, Clothing Treatment, NSN 6840-01-278-1336): Used when permanent application methods are not available. One can of aerosol treats one uniform. Reapplication after 6 weeks or six launderings is required, or when buddy checks find attached ticks or chigger bites.
 - d. As part of the DOD arthropod repellent system, ensure that soldiers sleep under bed netting that has been treated with permethrin by one of the above methods and that has been fumigated with DOD-approved aerosol insecticide.
7. Avoid areas known to harbor pests.
- a. Avoid damp and low-lying areas that provide excellent insect breeding areas.
 - b. Avoid contact with wild animals--especially those behaving in an unnatural manner. An example of this would be a nocturnal animal being out during the day.
 - c. Avoid crawl spaces and other confined areas where rodents frequent. Their droppings and urine-coated dust harbor a number of potentially fatal diseases. If these areas must be entered, soldiers should wear the chemical protective mask or a commercially available face mask respirator.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must conduct pest control operations.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Modified or eliminated mosquito vector and other insect breeding sites.	_____	_____
2. Cleared away dense vegetation and other harborage near living areas.	_____	_____
3. Applied chemical pesticides.	_____	_____
4. Removed food sources.	_____	_____
5. Denied entry of pests into living and eating areas.	_____	_____
6. Employed personal protective measures.	_____	_____
7. Avoided areas known to harbor pests.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Establish an Immunization Program

081-833-4502

Conditions: Given immunization cards and/or shot records, vaccines, alcohol swabs, needles, and syringes.

Standards: Establish an immunization program so that all soldiers receive the proper immunizations at the proper time and in the proper dosage and all immunizations are properly recorded.

Performance Steps

1. Gather all required medical supplies, immunizations, patient records, and blank forms.

NOTE: Ensure all necessary equipment is on hand to manage an anaphylactic reaction when administering injections.

2. Establish an area sufficient for administering the immunizations and recording the paperwork.

3. Issue each soldier an immunization card or shot record.

NOTE: If soldiers already have an immunization record or shot record, check which immunizations they do not require.

4. The following immunizations are required for all Special Forces personnel and should be used as guidelines for immunizing indigenous personnel.

- a. Hepatitis A: 1 milliliter (ml) intramuscularly (IM) (deltoid). This is a two-shot series with shots given on day 1 and at 6 months. Shot 1 should be given at least 14 days before departure. If this is not possible, give immunoglobulin (IG) at an alternate injection site in addition to the vaccine. A booster dose is currently recommended after 4 years.
- b. Hepatitis B: 1 ml IM (deltoid). This is a three-shot series with shots given on day 1 and day 30 and at 6 months. If possible, give complete series before deployment; otherwise, other shots can be given in country.
- c. Influenza: Current annual vaccine given in the fall when the vaccine for that year becomes available. Given 0.5 ml IM (deltoid).
- d. Japanese encephalitis: 1 ml IM (deltoid). Currently only given to soldiers in or en route to 1st Group. This is a series of three shots at days 0, 7, and 30 with the last shot given 10 days before deployment. A single-dose booster is required 3 years after the initial series.
- e. Measles: A single booster of measles vaccine (preferably measles, mumps, rubella [MMR]) given 0.5 ml subcutaneously (SQ) as an adult if born after 1956. When administered with other live viruses, give all on the same day or separate the doses by at least 1 month.
- f. Meningococcal (MGC): Given 0.5 ml SQ every (q) 5 years.
- g. Oral polio: three-dose primary series and one-time dose as an adult.
- h. Tetanus-diphtheria: 0.5 ml IM or SQ q 10 years.
- i. Typhoid: Injectable or oral.
 - (1) Injectable (Wyeth-Ayerst): two-dose primary series given 0.5 ml SQ on days 1 and 30. Booster is 0.5 ml SQ q 3 years.
 - (2) Injectable (Typhim VI): Vaccine was new in 1995. Vaccine is given 0.5 ml IM for (x) 1 day with booster required q 2 years.
 - (3) Oral: Four-dose oral series on days 0, 2, 4, and 6. Booster is given q 5 years with the four-dose series. Do not give concurrently with mefloquine or antibiotics.
 - (4) Yellow fever: Given 0.5 ml SQ q 10 years.
- j. Rabies: Imovax 0.1 ml intradermal (ID) three-shot series given on days 1, 7, and 21.
- k. Anthrax: To be given to all military troops as the vaccine becomes available.

5. Record all vaccinations in the patient's shot record.

6. Ensure immunized personnel wait for a minimum of 15 minutes under observation before departing the area.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish an immunization program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Gathered all required medical supplies, immunizations, patient records, and blank forms.	—	—
2. Ensured that all necessary equipment was on hand to manage an anaphylactic reaction when administering injections.	—	—
3. Established an area sufficient for administering the medications and recording the paperwork.	—	—
4. Issued each soldier an immunization card or shot record or reviewed existing records.	—	—
5. Immunized personnel based on United States Army Special Operations Command (USASOC) guidelines.	—	—
6. Recorded all vaccinations in the patient's shot record.	—	—
7. Ensured that immunized personnel were under observation for 15 minutes before they departed the area.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
AR 40-562

Establish a Field Sanitation Program

081-833-4504

Conditions: Given shovels, 55-gallon barrels, burlap, a meat thermometer, soap, water, and calcium hypochlorite.

Standards: Establish a field sanitation program so that no wasteborne, waterborne, or foodborne illnesses are contracted.

Performance Steps

1. Take measures to prevent foodborne illness.
 - a. Thaw (temper) foods properly. As part of the cooking process, thaw foods in refrigerator, under cold running water, or in a bowl with cold water, which is changed every 15 minutes. Do not thaw foods at room temperature.
 - b. Cook foods thoroughly. Beef should be cooked to a temperature of 170 degrees. Pork should be cooked to a temperature of 150 degrees. Poultry should be cooked to a temperature of 190 degrees. Temperatures should be taken in a thick part of the meat not adjacent to a bone. Obtain a small dial thermometer, and use it to check the temperature of meats and other potentially hazardous foods.
 - c. Wash hands before touching any properly handled food (PHF), after handling raw meats, after smoking and using the latrine, after emptying garbage cans or doing custodial duties, and before and after eating.
 - d. Inspect food service workers to ensure they are free from communicable disease, have no infected cuts on their hands, have clean fingernails, and wear hat or hairnets to preclude hair from falling into food products.
 - e. Ensure proper food storage and disposal. Keep cold PHF at or below 45 degrees Fahrenheit; keep hot PHF at or above 140 degrees Fahrenheit. Do not exceed the 3-hour time limit for PHF to be in the danger zone before consumption. Minimize leftovers. If you have refrigeration, you can keep them 24 hours; if not, then dispose of the leftovers by burial. Keep dry goods and semiperishables on pallets 6 inches above the ground.
 - f. Clean utensils. In a mess kit laundry (four 32-gallon garbage cans), use the first can for scraps, second can for washing in warm, soapy water, and last two cans for boiling water to sanitize. In kitchen sinks, use warm, soapy water to wash and warm, clear water to rinse. Make sure utensils are sanitized properly by boiling or by disinfectant solutions added to warm water. Air-dry utensils; do not wipe them with towels as they can be contaminated. Store the utensils to avoid recontamination--with the eating side down and covered. Storing the utensils in this manner helps prevent dirt and dust from reaching them.
 - g. Prevent cross contamination. Monitor use of cutting boards; if wooden, make sure they are smooth as cuts in them can harbor food particle that breed pathogens. Do not place cooked PHF on a cutting board that was just used to cut raw PHF without first cleaning and sanitizing the board. Wash countertops after they are used for food preparation. Do not allow raw PHF to drip onto cooked PHF.
2. Take measures to prevent waterborne illness.
 - a. Procure water.
 - (1) If the mission allows the time, conduct reconnaissance of potential water source, preferably 1 mile upstream (if river). Look for chemical contaminants, raw sewage, dead animals, and dead fish.
 - (2) Place a filtering material over the opening of water containers to filter some of the larger particles and some of the total dissolved solids that can cause diarrhea. If one is available, use a Katadyn® filtering unit to filter the water. You can construct a water filter if the time and resources allow. Take a 55-gallon drum, remove the top, and drill a 3/4-inch hole in the bottom. Place the water container beneath the drum to catch the filtered water. Inside the drum, fill the bottom 1/3 with rock and the middle 1/3 with sand. Pour water into the top, and allow it to percolate through media.

Performance Steps

- b. Disinfect water.
 - (1) Primary: calcium hypochlorite (powder and ampules), liquid chlorine bleach, and iodine tablets (canteens). Chlorinate the water to 5 parts per million (ppm). Test the residual to ensure it is safe before consumption.
 - (2) Alternate: boiling, which leaves no protective residual in the event the water is contaminated after it is boiled.
 - c. Enforce water discipline.
 - (1) Drink approved sources.
 - (2) Prevent water waste.
 - (3) Protect water resources from contamination by human wastes (bury waste 30 meters from the source and downstream if possible).
3. Take measures to prevent wasteborne illness.
- a. Select a position for a latrine.
 - (1) Thirty meters from water source (river, lake; not water buffalo as it is a supply and is not affected by environmental pollutants).
 - (2) One-hundred meters from dining facility (downwind).
 - (3) Reasonable accessibility by team.
 - b. Select the type of latrine to be constructed.
 - (1) Cat hole (Figure 1).

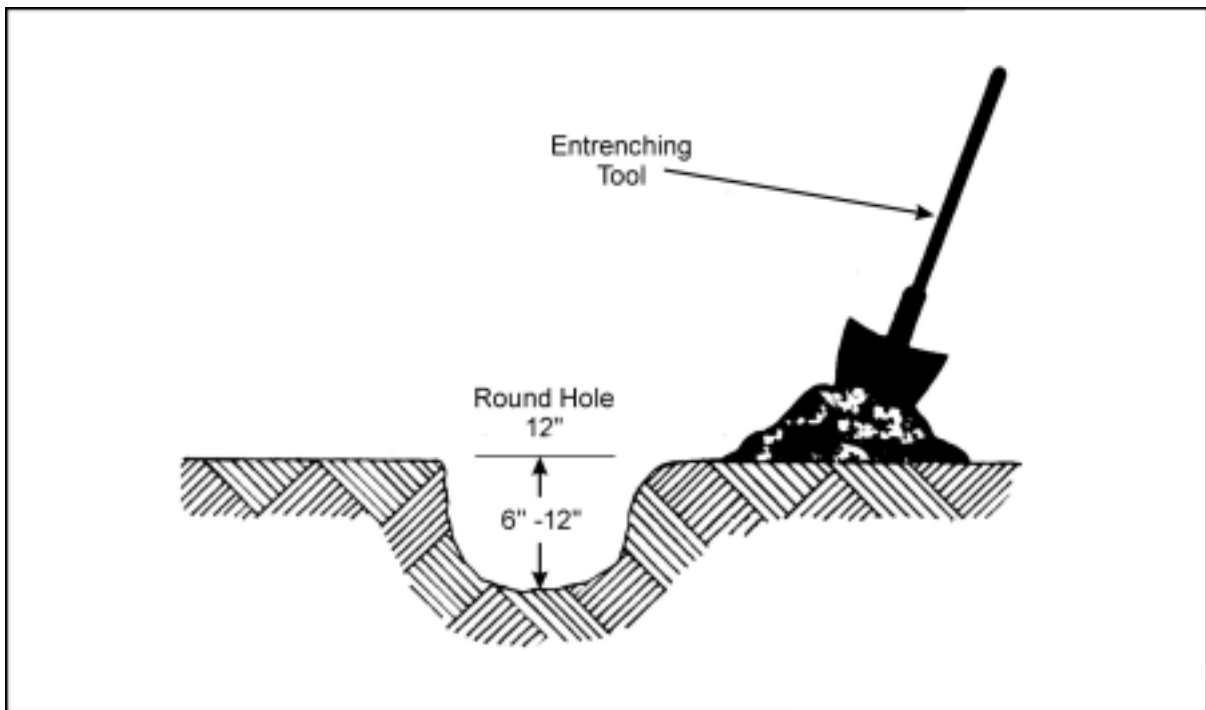


Figure 1. Cat Hole

- (a) Used when on the move or stopped for a short period of time.
 - (b) Consists of a hole at least 6 inches deep, dug by the individual user, and covered and camouflaged after use.
- (2) Straddle trench (Figure 2).

Performance Steps

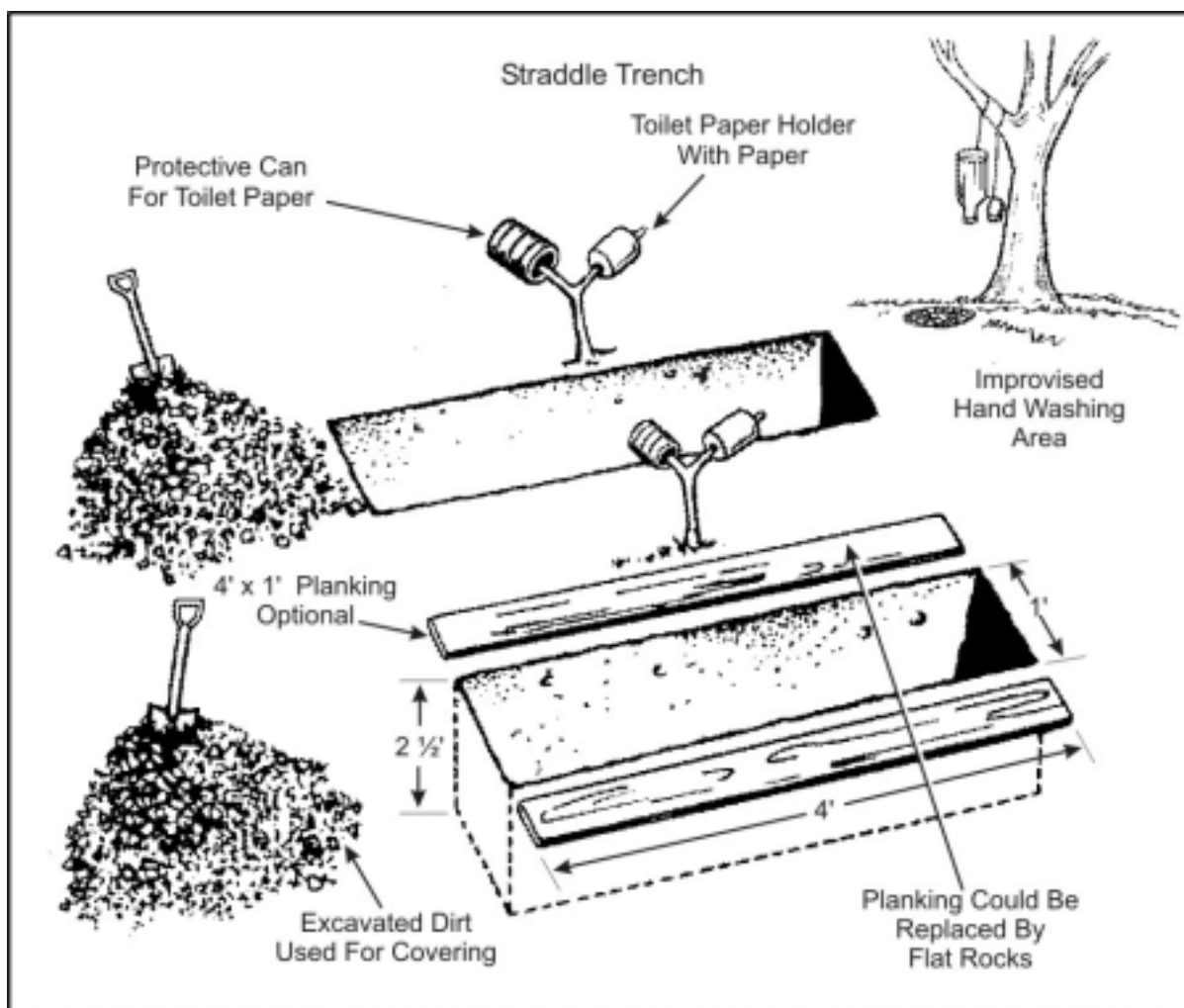


Figure 2. Straddle Trench

- (a) Used by an element stopped in one location for at least 24 hours.
- (b) Dug at least 6 inches wide by 1 foot deep and as long as necessary to accommodate the using unit. The trench may be extended, as necessary, if the unit's stay is longer than expected.
- (3) Deep pit (Figure 3).

Performance Steps

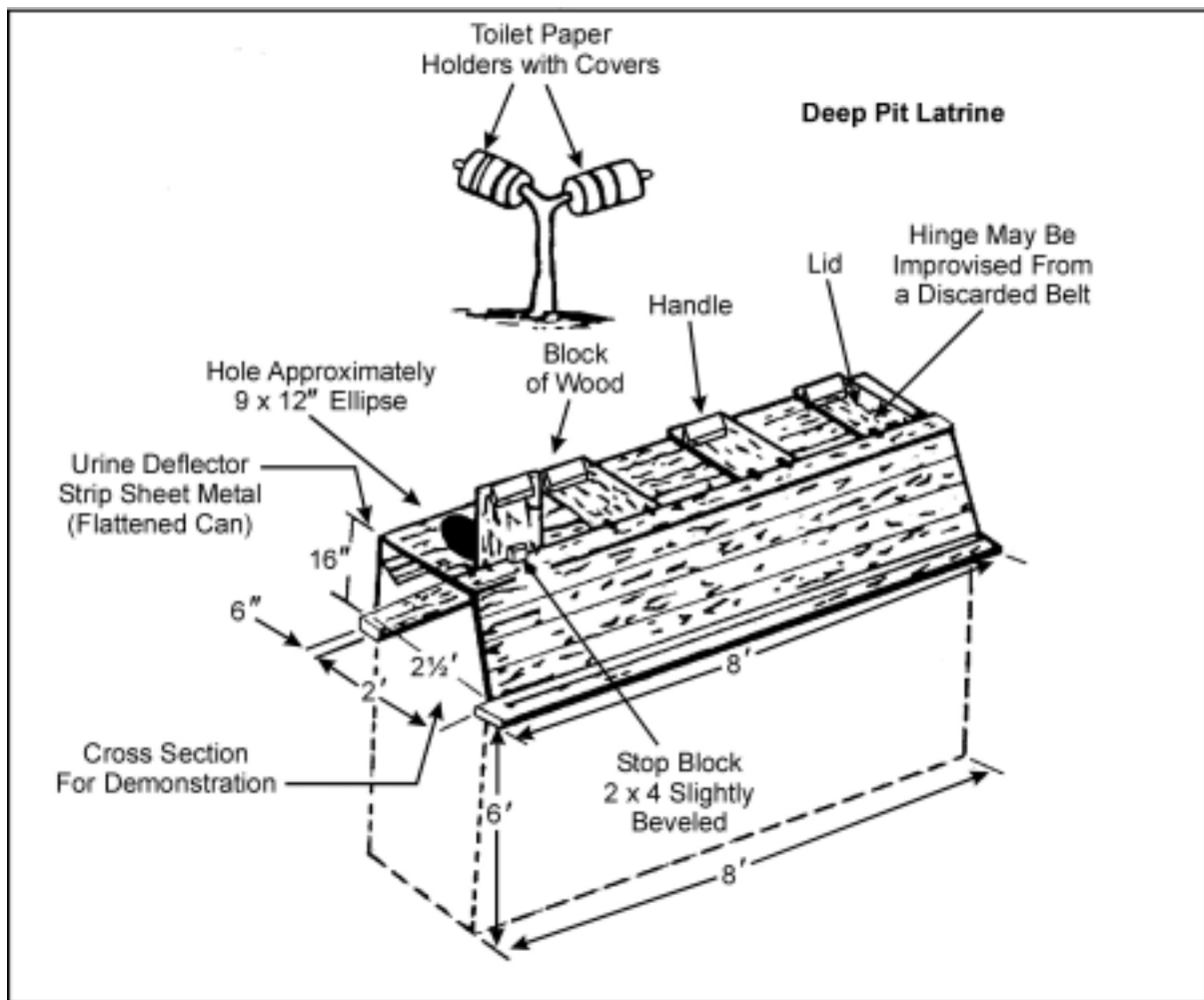


Figure 3. Deep Pit

- (a) Used in temporary camps. Not for rocky or frozen soil or where the water table is high.
- (b) Dig the pit 2 feet wide, 7 1/2 feet long, and 1 foot deep for every week of expected use to a maximum of 6 feet deep.
- (c) Cover with a latrine box.
- (4) Burn-out latrine (Figure 4).

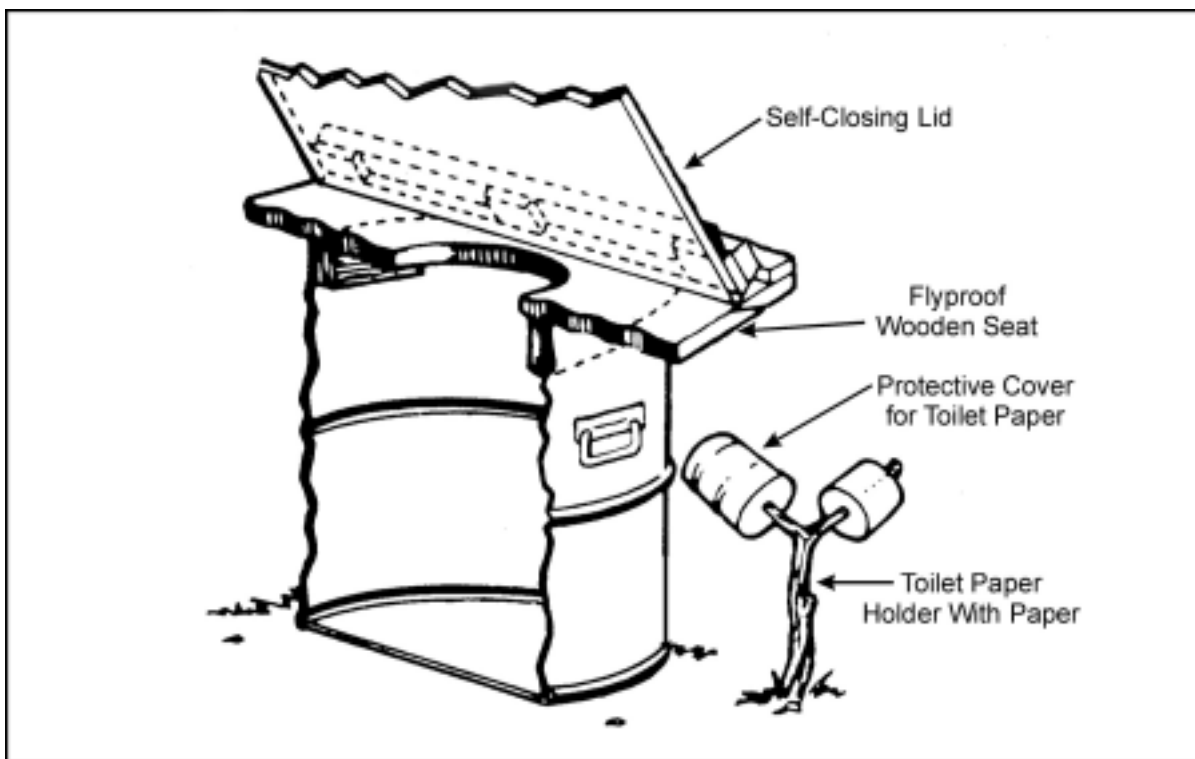
Performance Steps

Figure 4. Burn-out Latrine

- (a) Used in rocky or frozen soil or when the water table is high.
- (b) Constructed with 55-gallon drums. The drums may be cut in half or buried to the desired depth for use.
- (c) Cover the drum with a plywood seat.
- (d) The latrine should be burned out daily.
- (5) Pail latrine (Figure 5).

Performance Steps

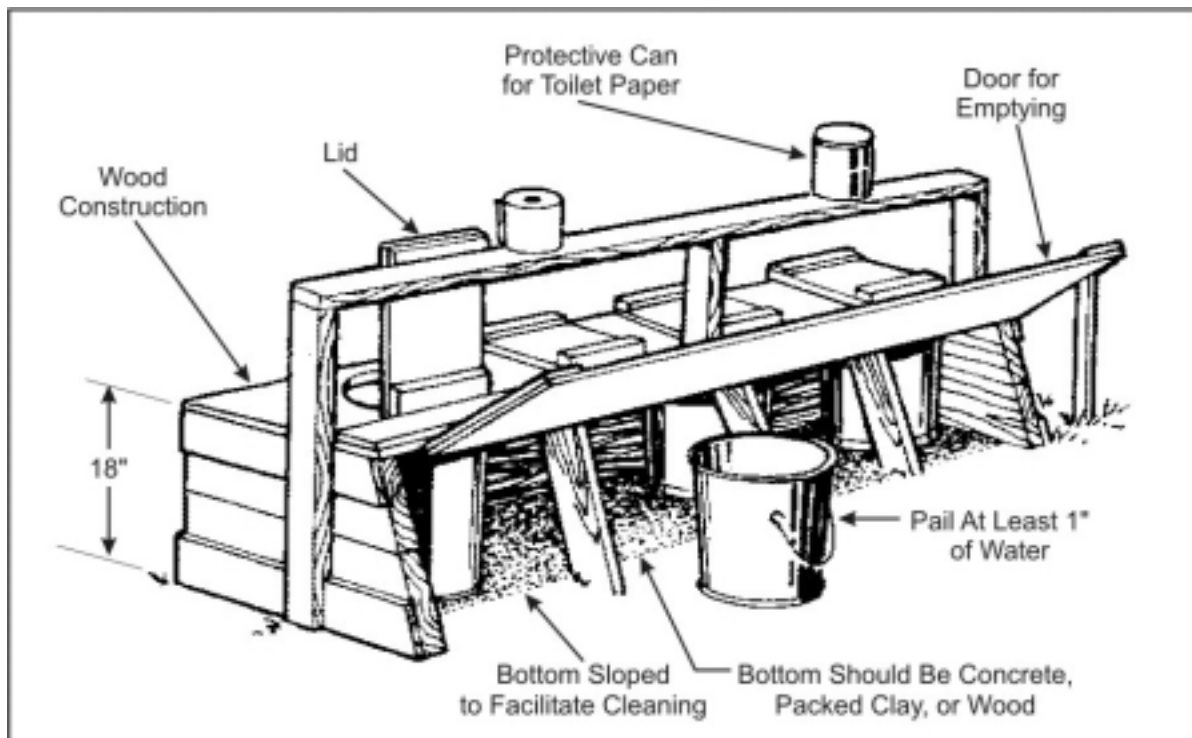


Figure 5. Pail Latrine

(6) Urine soakage pit (Figures 6 and 7).

Performance Steps

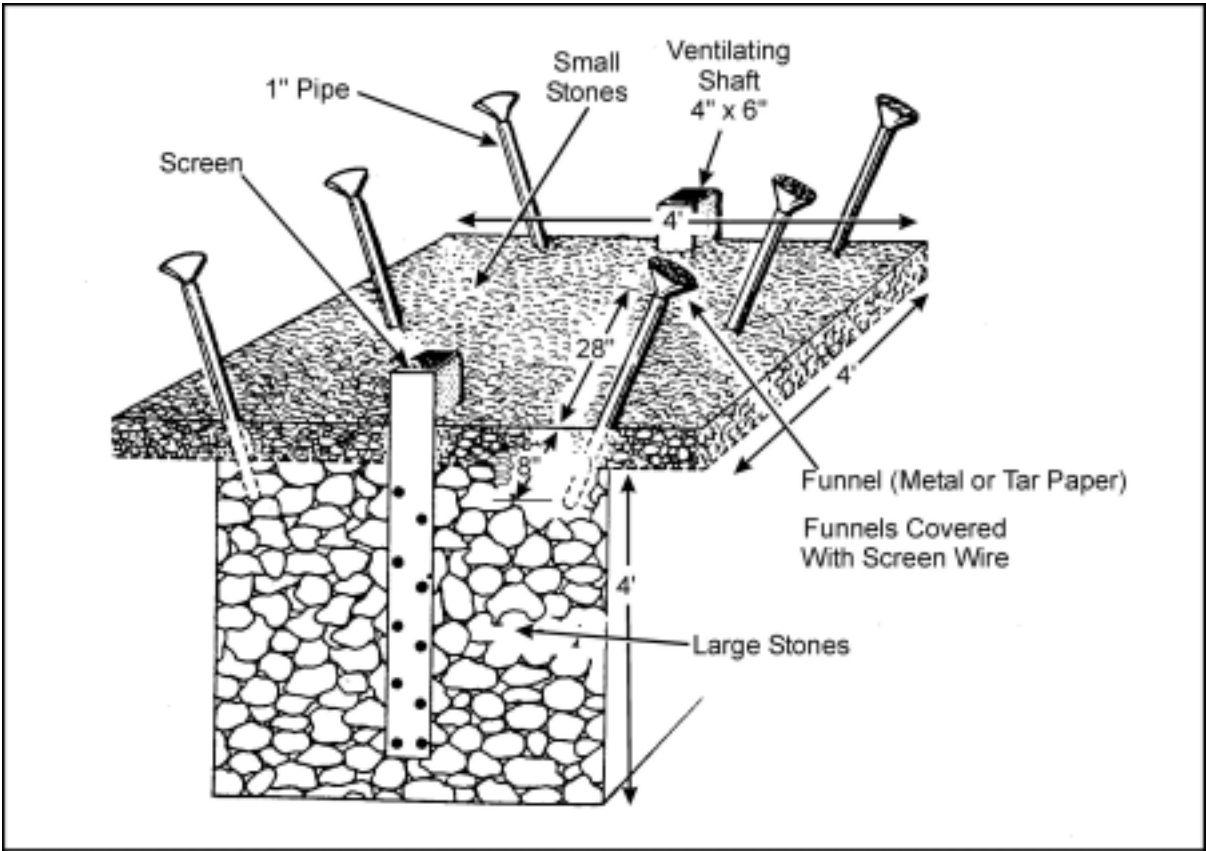


Figure 6. Soakage Pit

Performance Steps

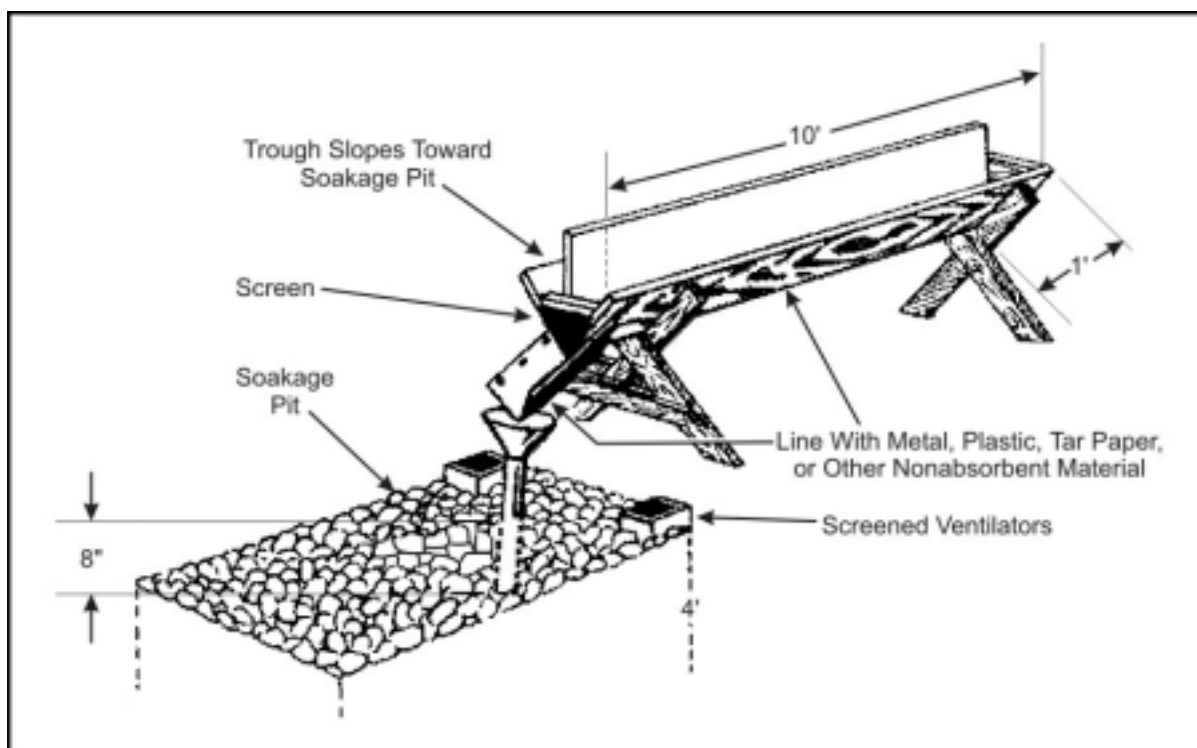


Figure 7. Soakage Pit With Trough Urinal

- (a) Dig a pit 2 feet deep by 3 feet long by 2 feet wide.
- (b) Fill the pit with rocks, bricks, or broken glass.
- (c) Bury 1-inch diameter pipes that are 36 inches long at each corner of the pit. The pipes should be buried 8 inches deep.
- (d) Attach a funnel to the top of each pipe.
- c. Construct the necessary protective and hygiene facilities.
 - (1) Place canvas or brush screens around the latrines, or place tents over them. In a cold climate, the shelters should be heated, if possible.
 - (2) To prevent surface water from flowing into the shelters, dig drainage ditches around them.
 - (3) Place toilet paper in the latrine, and cover it with a tin can or meal, ready to eat (MRE) bag to prevent it from getting wet during inclement weather.
 - (4) Install a simple, easily operable hand washing device just outside the shelter. Ensure that these devices are always supplied with water so that personal hygiene does not become an issue.
- d. Perform operational maintenance on the latrine.
 - (1) Keep the lids to the latrine seats closed at all times.
 - (2) Scrub the latrine seats and boxes with soap and water daily.
 - (3) Spray the inside of the shelters with a residual insecticide twice weekly. If a fly problem exists, also spray the pit contents and inside of the boxes twice weekly.
- e. Perform latrine close-out procedures.
 - (1) When waste is within 1 foot from the surface or when you are ready to leave, spray residual insecticide on top of waste.
 - (2) Place 3-inch layers of soil on top of waste and spray residual insecticide between layers.
 - (3) When soil is even with surface, mound earth 1 foot above surface (to allow for settling) and spray residual insecticide in a 2-foot radius around the mound.
 - (4) Post a sign with "Closed Latrine, [date]" if the tactical situation permits.

Performance Steps

f. Construct garbage disposal devices (Figure 8).

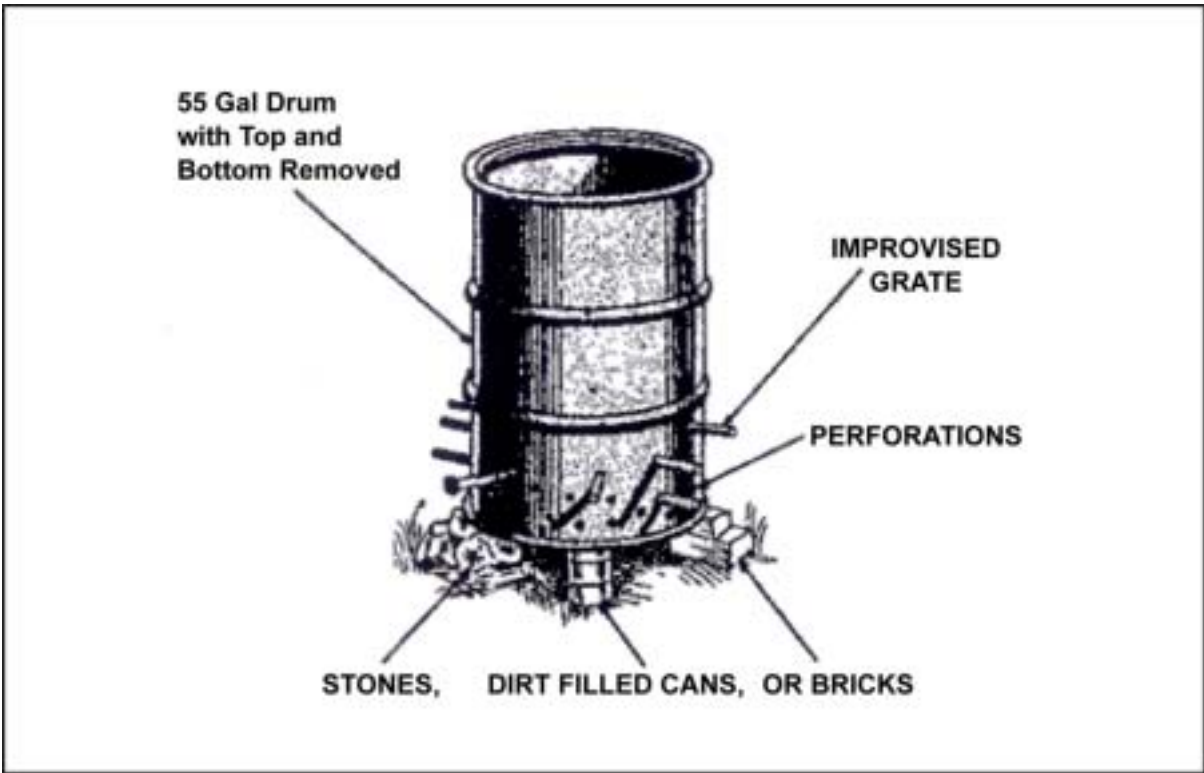


Figure 8. Barrel Incinerator

- (1) Pit (4 feet high, 4 feet wide, and 4 feet deep).
- (2) Barrel incinerator.
- (3) Continuous trench.
- g. Construct liquid (nonhuman) waste disposal devices.
 - (1) Soakage pits (various types).
 - (2) To catch larger particles, use 55-gallon drum with burlap cover. Bury the burlap in garbage pit when burlap becomes clogged.
 - (3) Ensure that showers and hand washing devices are over proportionally sized soakage pits.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish a field sanitation program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Took measures to prevent foodborne illness.	—	—
2. Took measures to prevent waterborne illness.	—	—
3. Took measures to prevent wasteborne illness.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 6: Dental

Examine a Patient's Oral Cavity

081-833-4451

Conditions: As a special operations medic in a field environment and given a dental explorer, a mouth examining mirror, a gauze sponge, flashlight, gloves, a mask, eye protection and the patient's dental health record or a means of recording the findings.

Standards: Identify and record any abnormalities found.

Performance Steps

1. Examine the face for appreciable asymmetry, skin lesions, or other abnormalities such as restricted movement of the mouth during speech.
2. Inspect and palpate the patient's lips. Look for the following abnormalities:
 - a. Herpes simplex: Painful vesicles followed by crusting (Figure 1).



Figure 1. Herpes Simplex

- b. Angular stomatitis (cheilosis).
 - c. Cheilitis: Painful cracking, scaling, and crusting of the lower lip (Figure 2).

Performance Steps



Figure 2. Cheilitis

- d. Mucous retention cyst: A rounded, soft, often bluish nodule (Figure 3). (These are benign.)

Performance Steps



Figure 3. Cheilosis

- e. Carcinoma of the lip: A thickened plaque or irregular nodule that may ulcerate or crust (Figure 4). (These are malignant.)

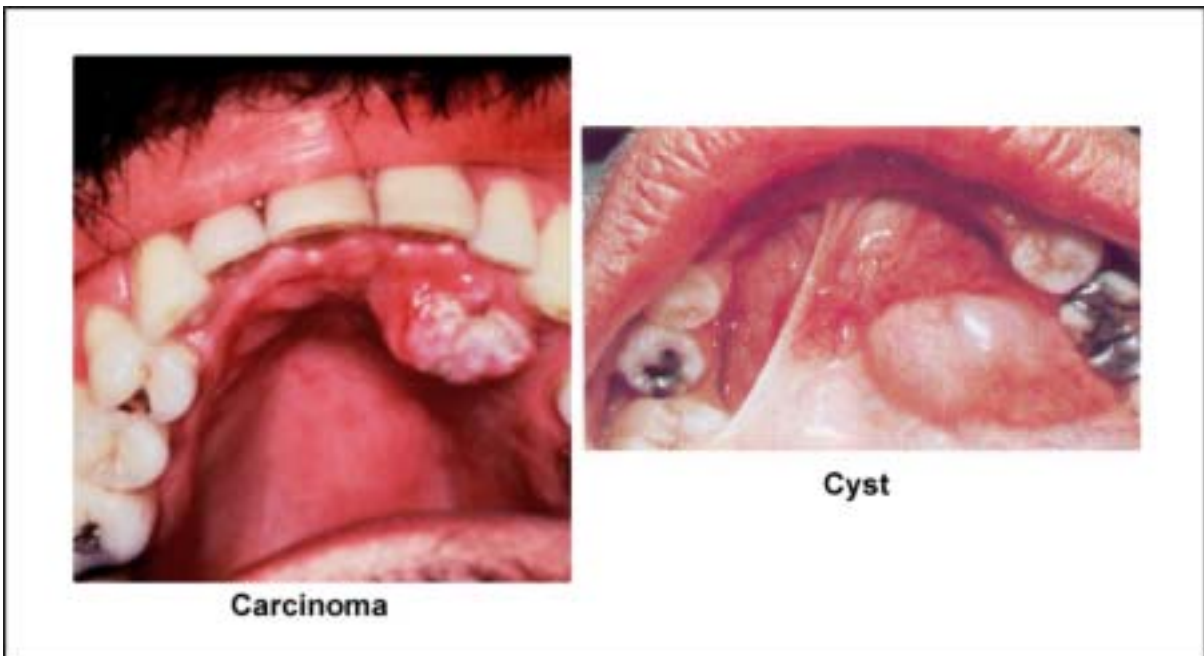


Figure 4. Cyst and Carcinoma

Performance Steps

3. Examine the interior of the patient's mouth by using a tongue blade.

- a. Buccal mucosa for:
 - (1) Ulcerations.
 - (2) Abnormalities of the labial frenum.
- b. Vestibules: growths, fissures, abnormalities, and lesions.
- c. Hard palate: growths, fissures, abnormalities, and lesions.
- d. Soft palate: growths, fissures, abnormalities, and lesions.
- e. Uvula: growths, fissures, abnormalities, and lesions.
- f. Oropharynx for:
 - (1) Exudate.
 - (2) Swelling of the tonsillar tissues.

4. Tell the patient to extend the tongue as far as possible, and examine the tongue as follows:

NOTE: If the patient is unable to extend the tongue far enough to view the circumvallate papillae, you may need to grasp the tip of the tongue with a gauze pad and extend it to the desired distance.

- a. Examine the dorsum for:
 - (1) Smooth tongue: Is caused by loss of papillae caused by vitamin B deficiency, iron deficiency, possibly anticancer drugs, or congenital.
 - (2) Hairy tongue: Is caused by elongated papillae that may look yellowish, brown, or black. This is a harmless condition.
 - (3) Geographic tongue: Scattered areas in which the papillae are lost, giving a map-like appearance. This is a harmless condition.
 - (4) Fissured tongue: Fissures may appear with aging. Harmless.
 - (5) Varicose veins of the tongue (Caviar lesions): dark, round spots on the undersurface of the tongue. Condition is associated with aging.
 - (6) Carcinoma of the tongue: A malignancy that should be considered in any nodule or nonhealing ulcer, older than 2 weeks, at the base or edges of the tongue.

- b. Examine the left and right posterolateral surfaces:

NOTE: Inability to move the tongue laterally indicates paralysis of the hypoglossal nerve, usually with associated atrophy and fasciculations on the involved side.

- c. Ventral surface:
- d. Floor of the mouth:

5. Examine the gingivae for the following:

- a. Gingivitis: Red, swollen gum margins, often caused by the formation of calculus on the teeth.
- b. Acute necrotizing ulcerative gingivitis (NUG): This is a painful condition that, in addition to redness and swelling, causes ulceration of the gums and formation of a grayish membrane.
- c. Periodontitis: A progression of gingivitis to deeper tissues, with resulting recession of the gums and looseness or loss of teeth and bone loss.
- d. Gingival enlargement: Gums are enlarged and partially cover the teeth with heaped-up tissue. (A single local enlargement is called an epulis.)

6. Examine the teeth for the following:

NOTE: Examine the teeth, in numerical order.

- a. Dental caries (tooth decay): This is clinically invisible in its early stages. It may produce chalky white spots that later discolor to brown or black, soften, and cavitate.
- b. Abrasion of the teeth: Facial surfaces have irregularities caused by abrasive toothpastes or firm-bristled toothbrushes.
- c. Attrition of the teeth: Wear that occurs on teeth. The exposed dentin is often yellow or brown.
- d. Sensitivity to hot and cold. (Indication of damage to tooth or caries.)
- e. Sensitivity to gentle taps. (Indication of damage to tooth or caries.)

7. Examine the temporomandibular joint (TMJ) as follows:

- a. Look for jaw deviation during opening and closing.

Performance Steps

- b. Palpate the head of the condyle, anterior to the ear, then place the little finger into the patient's ear canal and have the patient open and close his mouth widely three times. Palpate for crepitus or popping of the TMJ.

NOTE: The patient should be able to comfortably open his mouth wide enough to place three fingers between the incisors.

8. Record all findings in the patient's dental record as follows:
 - a. Use pencil to record carious lesions on chart number 16 of the Standard Form (SF) 603 (Health Record--Dental) and 603A (Health Record--Dental Continuation).
 - b. Use ink to record absent teeth on chart number 15 of the SF 603 and 603A.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must examine a patient's oral cavity.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Examined the face for appreciable asymmetry, skin lesions, or other abnormalities such as restricted movement of the mouth during speech.	_____	_____
2. Inspected and palpated the patient's lips.	_____	_____
3. Examined the interior of the mouth by using a tongue blade.	_____	_____
4. Told the patient to extend the tongue as far as possible and examined the tongue.	_____	_____
5. Examined the gingivae.	_____	_____
6. Examined the teeth.	_____	_____
7. Examined the TMJ.	_____	_____
8. Recorded all findings in the patient's dental record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
TC 8-20-1

Related
BATES PE, 8TH ED. 2002
MERCK MANUAL 17TH ED
SF 603
SF 603A

Manage Fractured and Avulsed Teeth

081-833-4456

Conditions: You are in a field environment. Given a patient with a fractured tooth or teeth, a Special Forces (SF) tactical medical equipment set with a dental component, dental records, and/or a field medical card.

Standards: Manage a fractured or avulsed tooth or teeth without causing further injury to the patient.

Performance Steps

1. Perform oral examination (081-833-4451, Examine a Patient's Oral Cavity).
2. Identify the type of fracture or avulsion as follows:
 - a. Fractures involving little or no dentin are simple fractures and are treated by smoothing the rough edges of the tooth.
 - b. Fractures of the crown involving considerable dentin but not the pulp are considered extensive fractures.
 - c. Fractures which have pulp involvement will be indicated by bleeding in the tooth.
 - d. Luxations or dislocations of teeth may have bleeding around the tooth and the involved teeth will be mobile or misaligned.

NOTE: Minimal misalignment may not be noticeable to the inexperienced examiner; however, the patient will relate a complaint of feeling that the teeth are misaligned, even with minimal displacement.

- e. Complete avulsion occurs when the tooth is in its socket.
 - f. Fractures of the alveolar process will result in the alveolar bone around the tooth or teeth being mobile or detached
 3. Treat the simple fracture by smoothing the rough edges with a tooth rasp.
 4. Treat the extensive fracture as follows:
 - a. Administer the anesthesia as required (task 081-833-4478, Administer Local Dental Anesthesia.)
 - b. Inserting a temporary restoration to cover the exposed dentin (task 081-833-4457, Place Temporary Restorations).
 - c. If the restoration cannot be placed in a retentive cavity preparation, place eugenol or cavity varnish over the exposed dentin instead.
 - d. Refer the patient to a dentist for definitive treatment.
 5. Treat a fracture with pulp involvement.
 - a. Anesthetize the tooth (task 081-833-4478, Administer Local Dental Anesthesia).
 - b. Extracts the tooth (081-833-4476, Perform Dental Extractions) only if the patient will not receive definitive dental treatment (root canal, post and core, or crown).
 - c. Periodically follow up the patient periodically until the patient has a pulpectomy provided in a dental clinic. Check for possible development of dental infection (periapical abscess), or provide pain relief if required (task 081-833-4690, Manage Pain).
 6. Treat a dislocated or avulsed tooth.
- NOTE: Steps which include splinting of teeth may require stabilization of teeth with gentle pressure instead. The equipment (orthodontic wire or heavy fishing line and composite resin kit) necessary for this procedure are not present in the SF tactical medical equipment set.
- a. Luxated or dislocated teeth should be straightened in their socket and splinted with dental wires or heavy nylon filament to the adjacent teeth (Figure 1).

Performance Steps

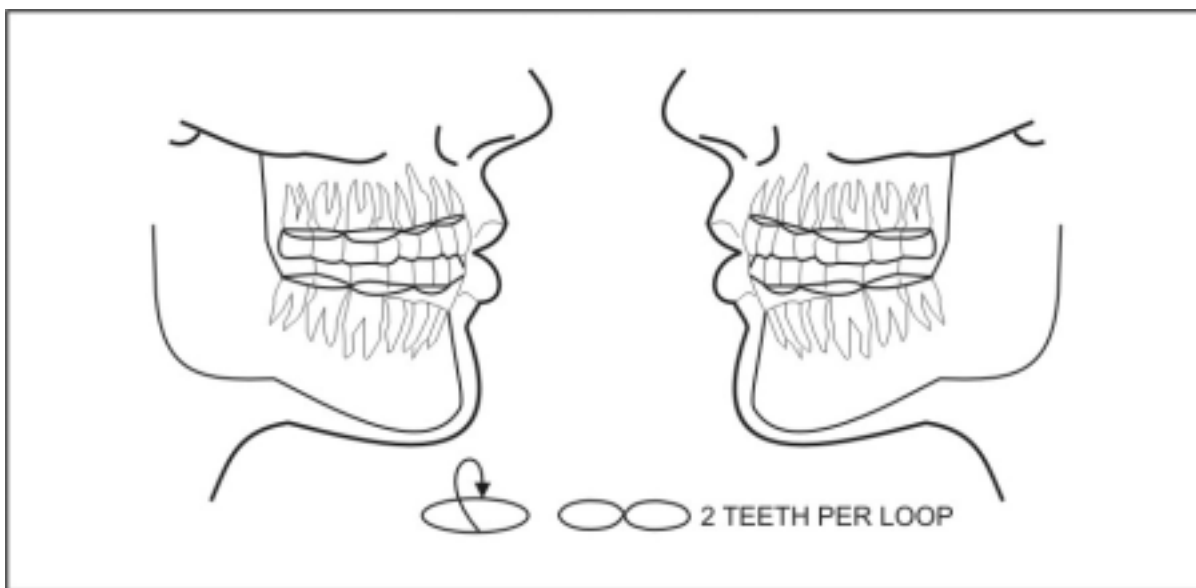


Figure 1. Procedure for Wiring the Jaw

- b. Completely avulsed teeth should be treated in the following manner:
 - (1) Gently rinse the tooth with 0.9 percent normal saline (NS).
 - (2) If blood clot prevents tooth placement, rinse socket to remove blood clot.
 - (3) Replace the tooth into its socket.
 - (4) Splint the tooth to adjacent teeth with dental wires or heavy nylon filament.
 - (5) Provide pain relief (task 081-833-4690).
 - (6) Administer penicillin VK: 1 gram loading dose, followed by 500 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for (x) 10 days, OR erythromycin (base) 500 mg PO q.i.d. x 10 days.

NOTE: A partially avulsed tooth that is repositioned and stabilized is usually permanently retained. A completely avulsed tooth may be permanently retained if replaced in the socket in less than 1 hour with minimal handling. When replacement is delayed, the long-term retention rate drops and root resorption usually occurs. Even with this, a patient may be able to use the tooth for several years.

7. Record the results and all treatment given.
8. Recommend evaluation by a dentist.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage fractured and avulsed teeth.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Performed oral examination (task 081-833-4451).	—	—
2. Identified the type of fracture or avulsion.	—	—
3. Treated the simple fracture by smoothing the rough edges with a tooth rasp.	—	—
4. Treated the extensive fracture.	—	—
5. Treated a fracture with pulp involvement.	—	—
6. Treated a dislocated or avulsed tooth.	—	—
7. Recorded the results and all treatment given.	—	—

Performance Measures

GO **NO GO**

8. Recommended evaluation by a dentist.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED
TC 8-20-1

Place Temporary Restorations

081-833-4457

Conditions: The patient's dental records have been reviewed. The oral examination has been completed, and the required dental care has been recorded. Given a patient requiring a restoration, the patient's dental record, and a Special Forces tactical medical equipment set with a dental component.

Standards: Place a temporary restoration without causing further injury to the patient.

Performance Steps

1. Explain the procedure to the patient.
2. Administer the local dental anesthesia, as required.

NOTE: Anesthesia may not be required.

3. Prepare the tooth to be filled by isolating it with gauze packs and gently drying the cavity with cotton pledgets.
4. Mix the material.
 - a. Prepare material for mixing.
 - (1) Fluff the powder, fill the measuring scoop to excess without packing the powder, and level off the powder with the spatula.
 - (2) Place the powder on the mixing pad.
 - (3) Dispense the correct amount of liquid onto the pad (1 drop of liquid to 1 scoop of powder).

CAUTION: Replace the lids on the containers as quickly as possible to prevent contamination.

NOTE: If you are mixing on a porous mixing pad, more liquid may be necessary.

- b. Mix the intermediate restorative material (IRM).
 - (1) Apply half of the powder to the liquid, and vigorously mix the powder and liquid with the spatula.
 - (2) Continue to add powder, and mix until all of the powder is incorporated into the liquid within 1 minute.
 5. Insert the dental filling.
 - a. Inspect the cavity preparation to ensure that it is dry and free of debris.
 - b. Place the material, using the thumb.
- CAUTION: Do not pack material between the teeth; confine the material to inside the tooth contours.
- (1) Ensure the material is tightly packed against all of the inner surfaces.
 - (2) Ensure all margins (edges) are sealed.
 - c. Have the patient bite together to form the correct height of the occlusal surface while the material is soft.
 6. Instruct the patient in the proper care of the temporary restoration and make another appointment for a permanent restoration.
 7. Record the treatment given.
 8. Recommend evaluation by a dentist.

Performance Measures

1. Explained the procedure to the patient.
2. Administered the local dental anesthesia, if required.
3. Isolated the tooth with gauze packs and dried the cavity with cotton pledgets.
4. Prepared material for mixing.
 - a. Filled the measuring scoop without packing and leveled off the powder.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____

Performance Measures**GO** **NO GO**

b. Placed the powder on the mixing pad. c. Dispensed the correct amount of liquid onto the pad.		
5. Mixed the IRM. a. Applied half of the powder to the liquid and vigorously mixed with the spatula. b. Continued to add powder and mixed until all of the powder was incorporated into the liquid within 1 minute.		
6. Inserted the dental filling. a. Inspected the cavity preparation to ensure that it is dry and free of debris. b. Placed the material tightly packed against all of the inner surfaces. c. Ensured all edges were sealed. d. Had the patient bite together to form the correct height of the occlusal surface while the material was soft.		
7. Instructed the patient in the proper care of the temporary restoration and made another appointment for a permanent restoration.		
8. Recorded the treatment given.		
9. Recommended evaluation by a dentist.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED
TC 8-20-1

Perform Excavation of Carious Material**081-833-4458**

Conditions: As a special operations medic in a field environment and given dental anesthetic and dental equipment.

Standards: Administer dental anesthesia, and excavate carious material without causing further harm to the patient.

Performance Steps

1. Review the patient's dental records.
2. Perform an oral examination (task 081-833-4451, Examine a Patient's Oral Cavity).
3. Identify and record presence of dental caries.
4. Explain the procedure to the patient.
5. Administer local dental anesthesia (task 081-833-4478, Administer Local Dental Anesthesia).
6. Excavate soft caries by using spoon-shaped instruments.
7. Irrigate carie with warm water until loose debris was flushed out.
8. Place a temporary restoration (task 081-833-4457, Place Temporary Restorations).
9. Record all treatment in the patient's dental record.
10. Refer the patient to a dentist as soon as possible.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Reviewed the patient's dental records.	_____	_____
2. Performed an oral examination.	_____	_____
3. Identified and recorded presence of dental caries.	_____	_____
4. Explained the procedure to the patient.	_____	_____
5. Administered local dental anesthesia.	_____	_____
6. Excavated soft caries with spoon-shaped instruments.	_____	_____
7. Irrigated carie with warm water.	_____	_____
8. Placed a temporary restoration.	_____	_____
9. Recorded all treatment in the patient's dental record.	_____	_____
10. Referred the patient to a dentist as soon as possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
 MERCK MANUAL 17TH ED
 TC 8-20-1

Manage Gingivitis

081-833-4460

Conditions: As a special operations medic in a field environment and given a patient with gingivitis, a mouth examining mirror, a dental scaler, a flashlight or other light source, and dental floss.

Standards: Manage gingivitis so that the progression of the disease is halted and the patient is returned to a state of oral health without causing further harm.

Performance Steps

1. Understand the causes and pathophysiology of gingivitis.
 - a. Gingivitis is the inflammation of the gingiva characterized by swelling, redness, change of normal contours, exudate, and bleeding.
 - b. Periodontal pockets form as a result of bacterial plaque and the host response and inflammatory process to the plaque. Bacterial plaque begins with aerobic streptococci and a mixture of other organisms. Over time, anaerobic rods and bacilli with some spirochetes will tend to predominate.
 - c. The cause of gingivitis is bacterial plaque, which is a result of being left on the teeth by poor oral hygiene. Other local factors, such as malocclusion, dental calculus, food impaction, and faulty dental restorations play a secondary role or are called contributing factors.
 - d. Gingivitis commonly occurs at puberty and during menstruation and pregnancy, presumably because of hormonal changes. Oral contraceptives may exacerbate inflammatory changes.

2. Recognize the signs and symptoms of gingivitis.

NOTE: Gingivitis may remain a superficial inflammation for many years, even for the life of the patient, or it may progress to periodontitis.

- a. A band of red, inflamed gingiva along the necks of one or more teeth and edematous swelling of the interdermal papillae.
- b. Bleeding after minimal injury.
- c. Pain is usually absent.
- d. Changes during pregnancy include:
 - (1) Mildly inflamed gingiva.
 - (2) Hyperplasia of the interdermal papillae.
 - (3) Pedunculated gingival growths (pregnancy tumors): soft, reddish masses that develop rapidly and then remain static. They often arise in the interdermal papillae during the first trimester, may persist throughout pregnancy, and may or may not subside after delivery. There is often an underlying irritant, such as a calculus or a rough margin of a restoration.

3. Manage gingivitis.

- a. Remove plaque and calculus with a dental scaler.
- b. Instruct the patient in the importance and proper method of oral hygiene.
 - (1) Daily brushing of the teeth and gums.
 - (2) Daily removal of plaque with dental floss between teeth.
 - (3) Use of a chlorhexidine or other bacteriostatic mouth rinse.

NOTE: Long-term chlorhexidine use causes dark stains to be present on the teeth.

- (4) Annual thorough cleaning by a dental hygienist.

NOTE: Patients with systemic disorders predisposing to gingivitis require more frequent professional cleaning (from every 2 weeks to 4 times per year).

- c. Pregnancy tumors may require excision; however, if they are excised before delivery, they tend to recur.

4. Record all treatment in the patient's dental record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage gingivitis.

Performance Measures

1. Understood the causes and pathophysiology of gingivitis.
2. Recognized the signs and symptoms of gingivitis.
3. Managed gingivitis.
4. Recorded all treatment in the patient's dental record.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Manage Periodontitis

081-833-4462

Conditions: As a special operations medic in a field environment and given a patient with periodontitis, a mouth examining mirror, a dental scaler, irrigation solution, dental anesthetic, and dental extraction equipment.

Standards: Manage chronic periodontitis so that the patient is returned to a state such that the periodontitis is not in an active state of disease process.

Performance Steps

1. Understand the definition, causes, and pathophysiology of periodontitis.
 - a. Periodontitis is the inflammation of the periodontium, which comprises the periodontal ligament, gingiva, cementum, and alveolar bone.
 - b. The etiology of periodontitis is similar to that of gingivitis (task 081-833-4460, Manage Gingivitis); however, in periodontitis, the presence of specific organisms in the plaque may be more important than the total amount of plaque.
 - (1) Abundant calculus deposits build up beneath the marginal gingiva.
 - (2) The gingiva progressively loosens its attachment to the teeth. Connective tissue and or bone levels recede, which results in more apical attachment levels and periodontal pockets.
 - (3) Destruction of the supporting osseous tissue occurs and teeth loosen.
 - c. Typically, periodontitis is first diagnosed when a patient is over 35 years old.
 - d. Faulty occlusion causing an excessive functional load on the teeth may contribute to disease progression.
 - e. Diseases that predispose patients to periodontitis include diabetes, Down syndrome, Chron's disease, and agranulocytosis.
2. Recognize the signs and symptoms of periodontitis.
 - a. The disease usually begins as gingivitis.
 - b. The patient will have abundant calculus deposits beneath the marginal gingiva.
 - c. The teeth will appear excessively long due to gingival recession, especially in the later stages.
 - d. Teeth may be loose.
 - e. Bone loss is evident on X ray.
 - f. Pain is absent unless an acute infection such as an abscess intervenes. Impaction of food in the pockets can cause discomfort and pain at meals.
3. Manage periodontitis.
 - a. Remove plaque and calculus with a dental scaler or dental curette.

NTOE: You will need a dental curette to remove deposits below the marginal gingiva.

 - b. Instruct the patient in the importance and proper method of oral hygiene.
 - (1) Daily brushing of the teeth and gums.
 - (2) Daily removal of plaque with dental floss between teeth.
 - (3) Use of a chlorhexidine or other bacteriostatic mouth rinse for short term use.
 - c. Reevaluate patients after 3 months.
 - (1) If pockets are no deeper than 3 to 4 millimeters (mm) after initial therapy, no further treatment is needed.
 - (2) If deeper pockets persist, give tetracycline 250 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for 10 days to destroy the pathogenic mouth flora.
 - d. Extract teeth that are significantly mobile or do not regain stability after splinting and antibiotic therapy (task 081-833-4476, Perform Dental Extractions).
4. Record all treatment in the patient's dental record.
5. Seek the advice and assistance of a dentist whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage chronic peridontitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition, causes, and pathophysiology of periodontitis.	_____	_____
2. Recognized the signs and symptoms of periodontitis.	_____	_____
3. Managed periodontitis.	_____	_____
4. Recorded all treatment in the patient's dental record.	_____	_____
5. Sought the advice and assistance of a dentist whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Manage Necrotizing Ulcerative Gingivitis

081-833-4464

Conditions: As a special operations medic in a field environment and given a soft toothbrush, a 30 cubic centimeter (cc) syringe, normal saline, analgesics, and a selection of oral antibiotics.

Standards: Manage necrotizing ulcerative gingivitis so that the oral health of the patient is preserved without causing further harm.

Performance Steps

1. Understand the definition, cause, and pathophysiology of necrotizing ulcerative gingivitis (NUG).
 - a. NUG is a noncontagious infection associated with a fusiform bacillus and a spirochete, usually destroying the interdental papillae, and sometimes affecting the marginal and attached gingiva by direct extension.
 - b. The causes of NUG are poor oral hygiene coupled with physical or emotional stress, nutritional deficiencies, blood dyscrasias, debilitating diseases, and insufficient rest. It rarely occurs in nonsmokers.
2. Recognize the signs and symptoms of NUG.
 - a. Abrupt onset, may be accompanied by malaise.
 - b. Painful bleeding gingiva.
 - c. Salivation.
 - d. Overwhelming bad breath.
 - e. Usually there is no fever, unless there is secondary infection.
 - f. The ulcerations, usually limited to the interdental papillae, have a characteristic punched-out appearance.
 - g. The ulcerations are covered by a grayish membrane.
 - h. Regional lymphadenopathy is often present.

NOTE: The disease may involve tonsillar and pharyngeal tissues and must be differentiated from diphtheria. An overwhelming number of fusospirochetal forms in stained smears from the lesions will differentiate NUG involving the oropharynx from diphtheria or other bacterial pharyngitis.

3. Manage NUG.
 - a. Administer local dental anesthesia.
 - b. Remove all underlying plaque and calculus from the teeth.
 - c. Perform thorough local debridement of the affected tissue.
 - d. Instruct the patient on proper dental care.
 - (1) Use a soft toothbrush.
 - (2) Irrigate or rinse the mouth with warm normal saline or 1.5 percent peroxide solution frequently for the first few days after debridement.
 - (3) Avoid irritants such as smoking and hot or spicy foods.
 - (4) Ensure adequate nutrition, high fluid intake, and rest.
 - (5) Improve oral hygiene.
 - e. Administer analgesics for the first 24 to 48 hours after debridement.
 - f. If the patient is febrile or has other signs of systemic infection, give antibiotics.
 - (1) Penicillin VK 500 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for (x) 10 days.
OR
 - (2) Erythromycin 250 mg PO q.i.d. x 10 days.
 - g. After 24 hours, the patient should be reexamined and any remaining affected tissue should be debrided.
4. Record all treatment in the patient's dental record.
5. Seek the advice and assistance of a dentist whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage NUG.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition, cause, and pathophysiology of acute necrotizing ulcerative gingivitis (ANUG).	_____	_____
2. Recognized the signs and symptoms of ANUG.	_____	_____
3. Managed ANUG.	_____	_____
4. Recorded all treatment in the patient's dental record.	_____	_____
5. Sought the advice and assistance of a dentist whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Manage Pericoronitis**081-833-4466**

Conditions: As a special operations medic in a field environment and given a patient with pericoronitis, a periodontal scaler, blunt syringe and sterile saline solution, and appropriate antibiotics.

Standards: Manage pericoronitis so that the oral health of the patient is preserved without causing further harm.

Performance Steps

1. Recognize the definition of pericoronitis--inflammation of tissue around the crown of an impacted tooth or a partially erupted lower molar caused by food and bacteria which accumulate between the tooth and overlying tissue.
 2. Recognize the signs and symptoms of pericoronitis.
 - a. Pain and swelling around the affected tooth (usually the lower third molar).
 - b. May have trismus (cannot open mouth), which is a sign that infection has spread and is serious.
 - c. May have difficulty swallowing, lymphadenopathy, or other systemic manifestations.
 3. Manage mild or moderate pericoronitis.
 - a. Use a periodontal scaler to remove plaque and debris from behind second molar and between third molar and overlying tissue.
 - b. Irrigate the area with a blunt syringe and a sterile saline solution to remove debris.
 - c. If the patient has cervical lymphadenopathy, then perform steps a and b and place him on penicillin VK 500 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for 7 to 10 days.
 - d. If the patient has obvious swelling of extra oral tissues or trismus, then give the patient penicillin VK 500 mg q.i.d. and evacuate to a dentist for treatment.
 - e. If evacuation is impossible, give patient penicillin VK 500 mg q.i.d. for 48 hours and instruct patient to rinse with warm water, and evaluate the infection. At this time if the situation has not improved, the second or third molar could be extracted if its removal will help establish drainage of the affected area.
 4. Manage severe pericoronitis.
 - a. Extract the maxillary third molar on the affected side. The swollen tissue overlying the mandibular third molar is often traumatized by the opposing maxillary third molar during severe pericoronitis.
 - b. Follow substeps a through e in performance step number 3; however, wait for 48 hours for swelling and inflammation to decrease prior to extracting any mandibular second or third molar.
- CAUTION:** Extraction during severe pericoronitis can lead to severe facial space infection.
5. Record all treatment in the patient's dental record.
 6. Seek the advice and assistance of a dentist whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage pericoronitis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the definition of pericoronitis.	_____	_____
2. Recognized the signs and symptoms of pericoronitis.	_____	_____
3. Managed pericoronitis.	_____	_____
4. Recorded all treatment in the patient's dental record.	_____	_____

Performance Measures

GO **NO GO**

5. Sought the advice and assistance of a dentist whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Manage Oral Herpetic Lesions

081-833-4468

Conditions: As a special operations medic in a field environment and given a patient with oral herpetic lesions, a mouth examining mirror, analgesics, and topical anesthetics.

Standards: Manage oral herpetic lesions so that the oral health of the patient is preserved without causing further harm.

Performance Steps

1. Understand the pathophysiology of oral herpetic lesions.
 - a. Primary herpes simplex (typically contracted as a child) results in acute herpetic gingivostomatitis.
 - (1) It is usually the result of herpes simplex virus type 1.
 - (2) Through oral-genital contact, can be caused by herpes simplex virus type 2.
 - (3) After the initial infection, the virus resides in the nerve ganglion and can be reactivated by stress, trauma, or changes in the immune system.
 - b. Secondary herpes simplex occurs as cold sores, usually on the vermilion border of the lip.
 - c. Secondary herpes zoster (shingles) can occur intraorally (task 081-833-4032, Manage Common Viral Skin Conditions).
2. Recognize the signs and symptoms of oral herpetic lesions.
 - a. Acute herpetic gingivostomatitis.
 - (1) It begins as small vesicles that quickly rupture to form ulcers.
 - (2) When initially localized, it may resemble aphthous stomatitis, but primary herpes always affects the attached gingiva and may affect other tissues, whereas aphthous stomatitis never affects attached gingiva.
 - (3) Fever and pain are often present.
 - (4) Difficulty in eating and drinking may lead to dehydration.
 - (5) The infection usually lasts from 10 to 14 days.
 - b. Secondary herpes simplex.
 - (1) Cold sores on the vermilion border of the lip, or less commonly, as ulcerations of the mucosa of the hard palate.
 - (2) Usually, a patient notes a prodromal sensation, typically a tingling or burning of the lip.
3. Manage oral herpetic lesions.
 - a. Acute herpetic gingivostomatitis.
 - (1) Give systemic analgesics such as acetaminophen.
 - (2) Consider the use of topical anesthetics such as dyclonine 0.5 percent liquid or benzocaine 20 percent ointment.
 - (3) When many large areas are affected, 5 percent lidocaine viscous may be used as a mouth rinse 5 minutes before mealtime.

CAUTION: Instruct patient not to swallow lidocaine, because it will anesthetize the oropharynx, hypopharynx, and possibly epiglottis.

 - b. Secondary herpes simplex.
 - (1) During the prodromal phase, treatment with oral acyclovir 200 milligrams (mg) five times a day can lessen the duration and severity of the lesions.
 - (2) The duration of the lesions may be decreased by about a day by applying penciclovir 1percent cream every 2 hours (q2h) while awake. It should be started during the prodrome or immediately upon the first appearance of the lesion.
4. Record all treatment in the patient's medical record.
5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage oral herpetic lesions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the pathophysiology of oral herpetic lesions.	_____	_____
2. Recognized the signs and symptoms of oral herpetic lesions.	_____	_____
3. Managed oral herpetic lesions.	_____	_____
4. Recorded all treatment in the patient's medical record.	_____	_____
5. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Manage a Periodontal Abscess

081-833-4470

Conditions: As a special operations medic in a field environment and given a patient with a periodontal abscess, a mouth examining mirror, a dental scaler, dental anesthesia administration equipment, and dental extraction equipment.

Standards: Manage a periodontal abscess so that the oral health of the patient is preserved without causing further harm.

Performance Steps

1. Know the definition of periodontal abscess, which is swelling caused by blockage of a periodontal pocket from an infection or foreign body.
2. Recognize the signs and symptoms of a periodontal abscess.
 - a. Localized swelling of gingiva adjacent to tooth.
 - b. May have a dull aching pain that is usually mild.
 - c. Affected tooth may be loose.
 - d. Affected tooth may be slightly sensitive to percussion.
3. Manage the periodontal abscess.
 - a. Administer local dental anesthetic (task 081-833-4478, Administer Local Dental Anesthesia).
 - b. Remove all foreign material from the affected area with a dental scaler.
 - c. Irrigate the affected area with low-pressure normal saline.
 - d. If the affected tooth is very mobile, it may be necessary to extract it (task 081-833-4476, Perform Dental Extractions).
4. Record all treatment in the patient's dental record.
5. Seek the advice and assistance of a dentist whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a periodontal abscess.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the definition of periodontal abscess.	—	—
2. Recognized the signs and symptoms of a periodontal abscess.	—	—
3. Managed the periodontal abscess. a. Administered local dental anesthetic. b. Removed all foreign material from the affected area with a dental scaler. c. Irrigated the affected area with low-pressure normal saline. d. Extracted the tooth when it was very mobile.	—	—
4. Recorded all treatment in the patient's dental record.	—	—
5. Sought the advice and assistance of a dentist whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required

Related
MERCK MANUAL 17TH ED
SANFORD, 1999

**References
Required**

Related
TC 8-20-1

Manage a Periapical Abscess**081-833-4472**

Conditions: As a special operations medic in a field environment and given a patient with a periapical abscess, a minor surgery surgical kit, local dental anesthesia equipment, and a selection of antibiotics.

Standards: Manage a periapical abscess without causing further harm or unnecessary injury to the patient.

Performance Steps

1. Know the definition of periapical abscess: a localized collection of pus at the root apex caused by pulp death from an infection of the pulp. Infection is usually caused by caries and/or introduction of bacteria into the pulp. Infection can spread from the apex into and through the associated bone and into the surrounding soft tissue.
2. Recognize the signs and symptoms of periapical abscess.
 - a. May appear similar to periodontal abscess.
 - b. Persistent throbbing pain.
 - c. Usually sensitive to percussion at the time of swelling or before it occurs.
 - d. Swelling may be intra or extra oral.
3. Manage the periapical abscess.
 - a. Perform an incision and drainage of the soft tissue swelling (task 081-833-4537, Drain Abscesses).
 - b. Place the patient on appropriate antibiotic therapy.
 - (1) Penicillin VK 500 milligrams (mg) every 6 hours (q6h) for (x) 10 days. OR
 - (2) Clindamycin 300 mg q6h x 10 days.
4. Remove the source of the infection by extracting the tooth (task 081-833-4476, Perform Dental Extractions) or by referring the patient to a dental officer or dentist for a pulpectomy or root canal procedure.
5. Follow up by examining the patient in 24 hours to see if the patient's condition had improved (task 081-833-4451, Examine a Patient's Oral Cavity).
6. Record all treatment in the patient's dental record.
7. Seek the advice and assistance of a dentist whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage periapical abscess.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Explained the definition of periapical abscess.	_____	_____
2. Recognized the signs and symptoms of periapical abscess.	_____	_____
3. Managed the periapical abscess.	_____	_____
a. Performed an incision and drainage of the soft tissue swelling.		
b. Placed the patient on appropriate antibiotic therapy.		
4. Removed the source of the infection by extracting the tooth or by referring the patient to a dental officer or dentist.	_____	_____
5. Followed up by examining the patient in 24 hours.	_____	_____
6. Recorded all treatment in the patient's dental record.	_____	_____

Performance Measures

GO **NO GO**

7. Sought the advice and assistance of a dentist whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED
SANFORD, 1999
TC 8-20-1

Perform Dental Extractions

081-833-4476

Conditions: An oral examination has been performed and the results recorded. Given a Special Forces tactical medical equipment set with a dental component.

Standards: Extract a tooth without causing further injury to the patient.

Performance Steps

1. Explain the procedure to the patient.
2. Assemble the equipment.
 - a. Anesthesia equipment.
- CAUTION: Assess any known allergy to medication.
- b. Surgical equipment.
 - (1) Forceps.
 - (2) Elevators.
3. Identify the offending tooth or teeth (Figures 1 through 3).

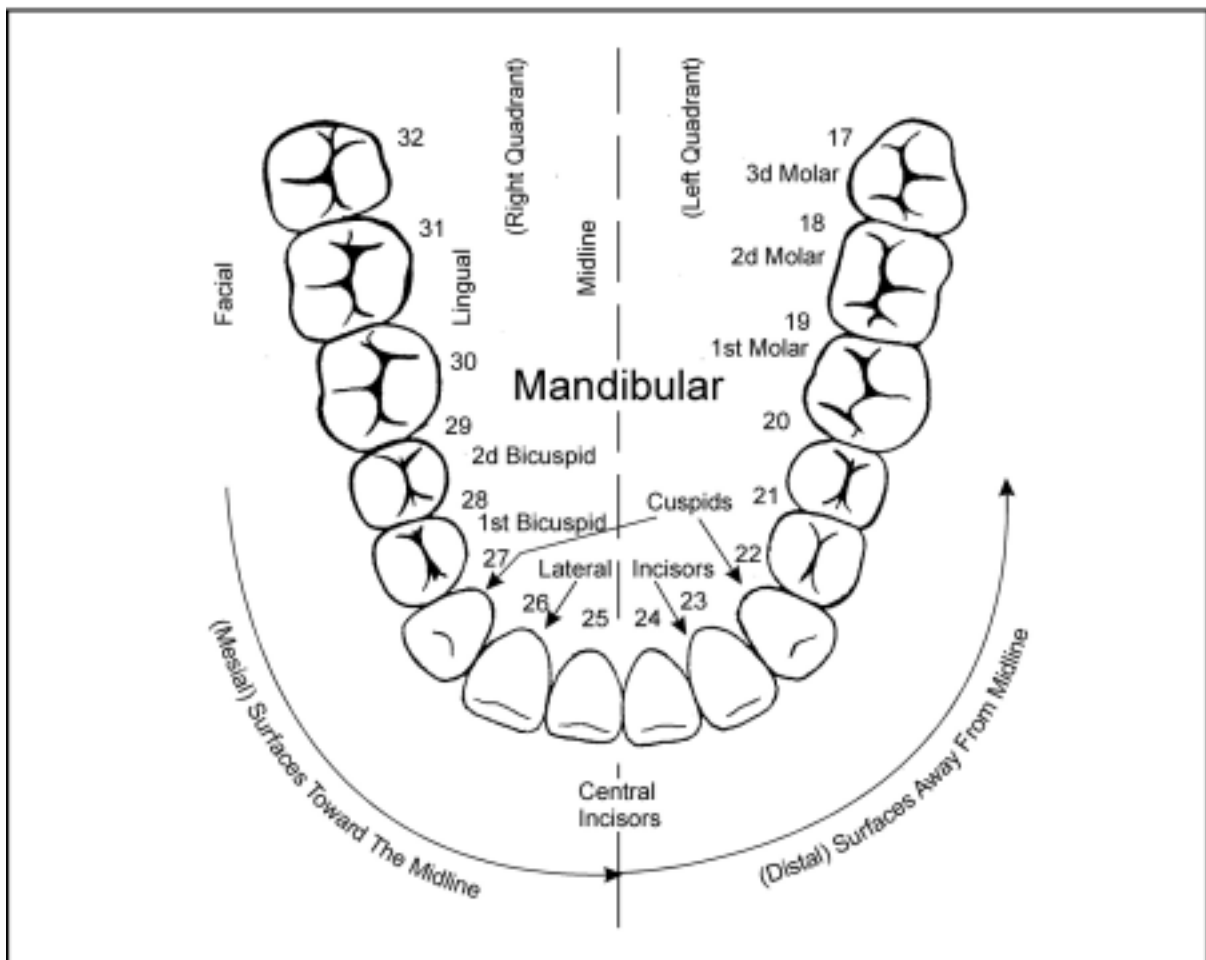


Figure 1. Mandibular Teeth

Performance Steps

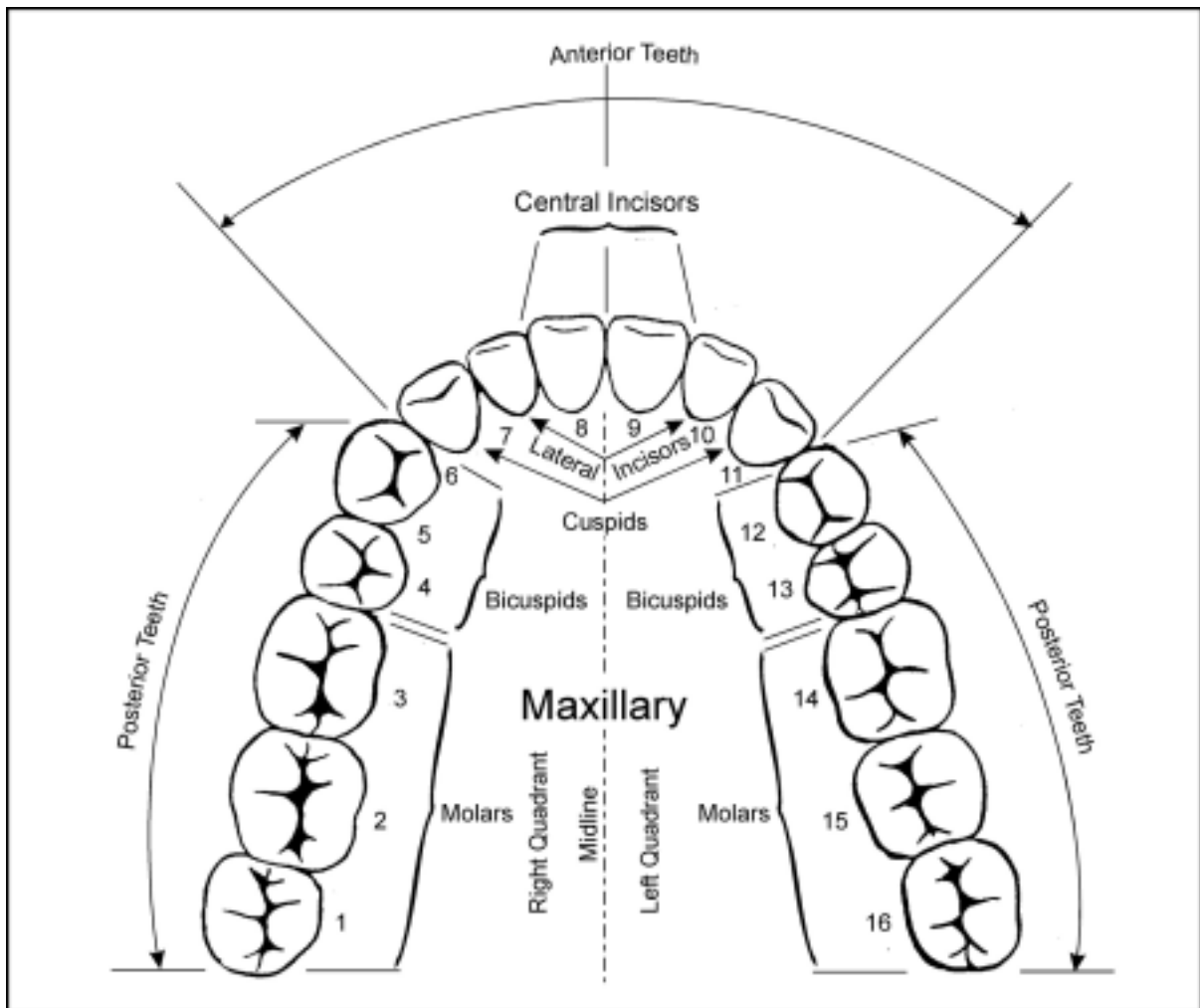


Figure 2. Maxillary Teeth

Performance Steps

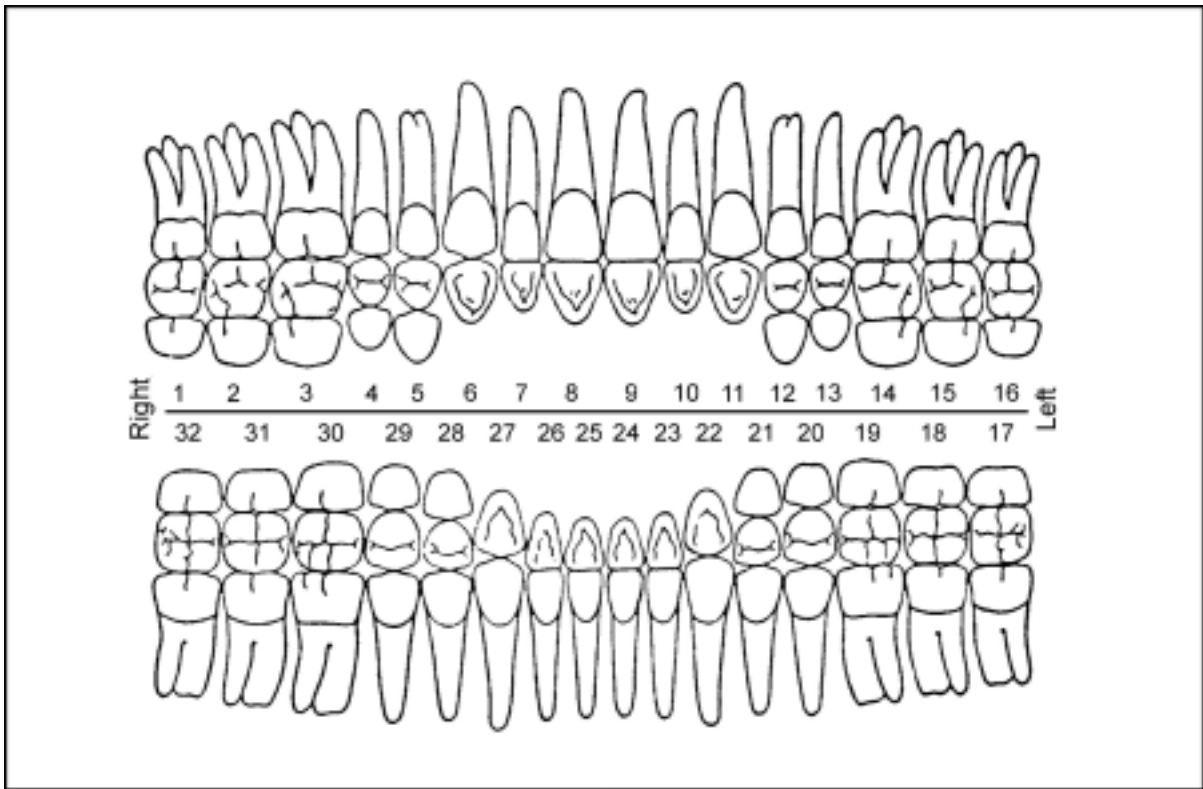


Figure 3. Permanent Teeth

4. Administer anesthesia (task 081-833-4478, Administer Local Dental Anesthesia).

5. Perform the extraction.

- a. Break the attachment of the gingival tissue by forcing a periosteal elevator (Woodson number 1 or Molt number 9) into the crevice between the tooth and gingiva all the way around the tooth.

CAUTION: Operator must exhibit full control of extraction instruments at all times.

- b. Loosen the tooth by using the number 301 root elevator, and then if greater mobility is desired, the number 34S root elevator.
- c. Use the correct forceps, apply pressure toward the root of the tooth to force the tips of the forceps beaks as far down on the root as possible.
- d. Rock the tooth slowly in a facial-lingual direction with progressively increasing pressure. (Applied a greater facial force and a lesser lingual force.)
- e. Support the alveolar bone during the extraction procedure.

CAUTION: With multirooted teeth, rotational forces are not used.

- f. Use a rotational force as a last force for single or conical rooted teeth.

6. Inspect the tooth and extraction socket to ensure roots have not been fractured and left behind in the socket.

7. Compress the sides of the empty socket.

8. Cover the wound with a sterile 2-inch by 2-inch gauze dressing (sponge).

9. Instruct the patient on self care as follows:

- a. Maintain biting pressure for 45 to 60 minutes.
- b. Do not rinse the mouth for 12 hours.

Performance Steps

NOTE: Tell the patient the degree and speed of healing depends on protection and preservation of the clot for 2 to 5 days. Activities to avoid are: spitting, smoking, drinking through a straw, and eating hard, hot, or spicy foods. Patient compliance is important to minimize postextraction complications.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the procedure to the patient.	_____	_____
2. Assembled the equipment.	_____	_____
3. Identified the offending tooth or teeth.	_____	_____
4. Administered anesthesia.	_____	_____
5. Performed the extraction.	_____	_____
a. Broke the attachment of the gingival tissue.		
b. Loosened the tooth,		
c. Using the correct forceps, applied pressure toward the root of the tooth to force the tips of the forceps beaks as far down on the root as possible.		
d. Rocked the tooth slowly in a facial-lingual direction with progressively increasing pressure.		
e. Supported the alveolar bone during the extraction procedure.		
f. Used a rotational force as a last force for single or conical rooted teeth.		
6. Exhibited full control of extraction instruments at all times.	_____	_____
7. Inspected the tooth and extraction socket.	_____	_____
8. Compressed the sides of the empty socket.	_____	_____
9. Covered the wound with a sterile 2-inch by 2-inch gauze dressing.	_____	_____
10. Instructed the patient on self care as follows:	_____	_____
a. Maintain biting pressure for 45 to 60 minutes.		
b. Do not rinse the mouth for 12 hours.		
c. Avoid spitting, smoking, drinking through a straw, and eating hard, hot, or spicy foods.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Administer Local Dental Anesthesia

081-833-4478

Conditions: You are in a field environment. Given a patient's record and a Special Forces tactical medical equipment set with a dental component.

Standards: Administer local dental anesthesia without causing further injury to the patient.

Performance Steps

1. Determine if patient has known allergies to medication or history of anaphylactic reaction.
2. Determine whether the area to be anesthetized is maxillary or mandibular.
3. Understand the potential complications of dental anesthesia.
 - a. Toxicity.
 - (1) Central nervous system (CNS).
 - (2) Myocardial depressant.
 - b. Allergy.
 - c. Hematoma.
 - d. Broken needle.
 - e. Trauma.
 - f. Syncope (most common complication).
4. Gather the equipment.
 - a. An aspirating syringe.
 - b. Appropriate anesthetic agents.
 - (1) 2 percent lidocaine with epinephrine 1:100,000: 1.8 milliliter (ml) carpule (xylocaine), red stopper or lines, duration of 2 to 4 hours, and maximum number is 8.3 carpules (300 milligrams [mg]) in a 70 kilogram (kg) healthy adult. The drug contains the preservatives methylparaben and metabisulfite.

WARNING: Patient will experience soft tissue numbness for much longer than the time pain relief is provided.

- (2) 0.5 percent bupivacaine with epinephrine 1/200,000: 1.8 ml carpule (marcaine), black stopper and blue lines, duration of 6 to 8 hours, and maximum number is 10 carpules in a 70 kg healthy adult. Dose-limiting drug is bupivacaine at 90 mg for 70 kg adult.
 - (3) 3 percent mepivacaine without vasoconstrictor: 1.8 ml carpule (polocaine or carbocaine), black stopper with tan lines, duration of 1/2 to 1 1/2 hour, and maximum number is 5.5 carpules on a 70 kg healthy adult. Dose-limiting drug is mepivacaine at 300 mg for 70 kg adult.
 - c. Appropriate needle.
 - (1) Long needle (1 3/8 inch), 25 or 27 gauge, used in the mandibular arch.
 - (2) Short needle (1 1/2 inch), 25 or 27 gauge, used in the maxillary arch.
- NOTE:** The long needle may be used in lieu of the short needle.
- d. Two-inch by two-inch gauze pads.

5. Assemble the administration equipment.
 - a. Attach the needle to the hub of the syringe.
 - b. Ensure that the metal cap of the cartridge is pointed toward the needle.
 - c. Retract the plunger, and insert the anesthetic cartridge into the hollow barrel of the syringe.
 - d. Strike the plunger ring sharply with the palm of the hand, ensuring the plunger harpoon is seated in the rubber stopper of the anesthetic cartridge.
6. Determine the technique to be used.
 - a. Maxilla, by local infiltration.
 - (1) Facial surface. Anesthetize the facial tissue in the immediate area of the injection.
 - (2) Palatal surface. Anesthetize the palatal tissue in the immediate area of the injection.

Performance Steps

- (a) The greater palatine neurovascular bundle is located palatally to the maxillary second molar. Anesthetizing this area will numb the posterior two-thirds of the hard palate to the median palatine raphae (midline of the hard palate).
- (b) The incisive neurovascular bundle is located just beneath the incisive papilla, located lingual to the maxillary central incisors. Anesthetizing this area will numb the anterior one-third of the hard palate, bilaterally.
- b. Mandible.
 - (1) Mandibular block of the inferior alveolar and lingual nerves. Anesthetizes the following:
 - (a) The facial (labial) gingiva, incisors, and bicuspids.
 - (b) All mandibular teeth on the side of the injection.
 - (c) One-half of the tongue on the side of the injection.
 - (d) All lingual gingiva on the side of the injection.
 - (2) Long buccal block. Anesthetizes the facial (buccal) gingiva and molar area.
 - (3) Infiltration of the mandible is only possible in the anterior teeth (incisors). Anesthesia of the incisors may not be profound by this method.
- 7. Explain the procedure to the patient.
- 8. Administer the anesthetic using the proper technique.
 - a. Maxillary block. Infiltration is the primary choice for anesthesia in the maxilla, both facial and palatal (Figure 1).

Performance Steps

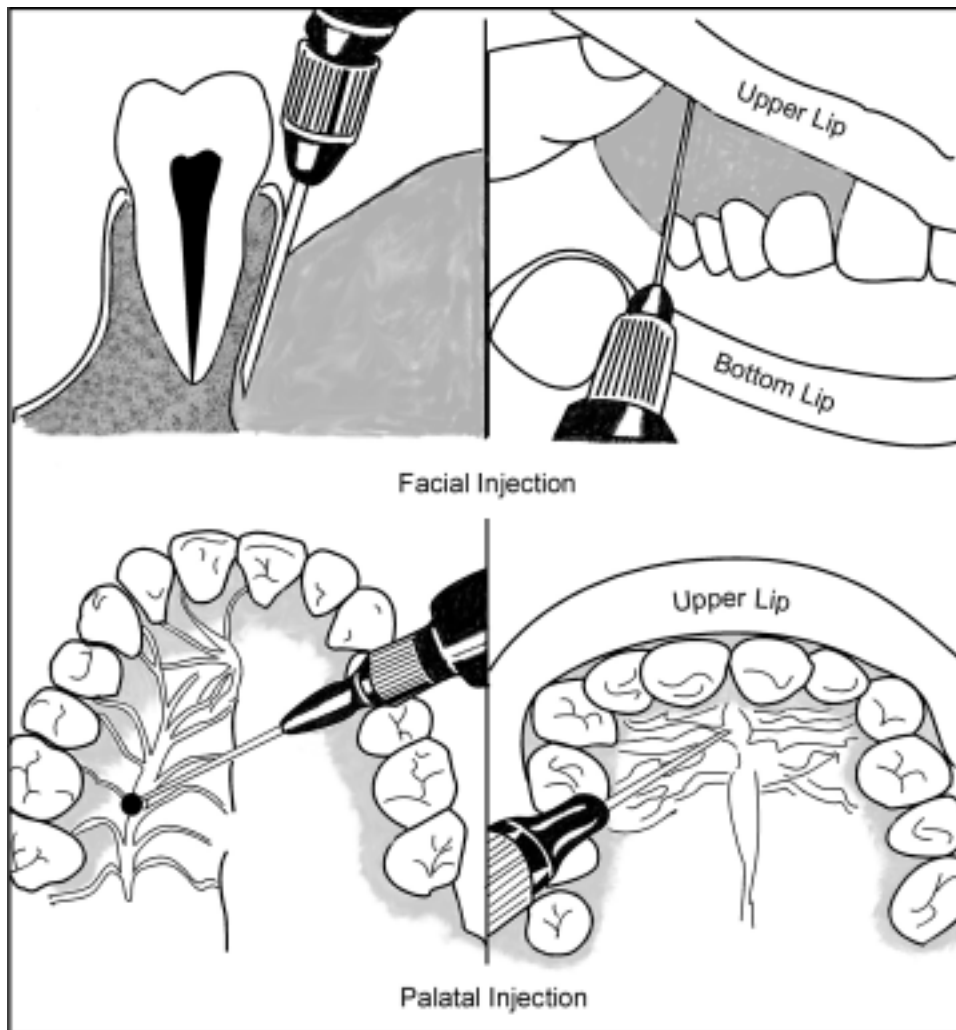


Figure 1. Maxillary Local Infiltration Injections

- (1) Facial.
 - (a) Insert the needle into the mucobuccal fold directly above the tooth to be anesthetized. Penetrate the tissue 1/2 inch above the gingival margin and about 1/4 inch away from the bone (stretch the tissue out and away from the bone). Hold the needle to barely penetrate the tissue.
 - (b) Angle the needle toward the bone, and advance the needle until it touches the bone, ending about 1/2 inch above the gingival margin. This corresponds to the root apex.
 - (c) Aspirate with the syringe to rule out vascular involvement.
 - (d) Deposit 1/2 to 3/4 of a carpule.
- (2) Palatal.
 - (a) Insert the tip of the needle in the palate about 3/8 inch away from the gingival margin of the tooth to be anesthetized.
 - (b) Deposit about 0.1 cubic centimeter (cc) of a carpule, or until the tissue blanches.
- b. Mandibular block. The target area in which to deposit the anesthesia is the mandibular foramen located on the medial surface of the ramus of the mandible, about 1/4 inch above the plane of the mandibular teeth, halfway between the anterior and posterior borders of the ramus.

Performance Steps

- (1) Place your thumb on the anterior border of the ramus just above the level of the teeth intraorally and your index finger extraorally on the posterior border of the ramus.

NOTE: Use your thumb and forefinger as landmarks. The tip of the needle should end up halfway between them against the bone of the ramus.

- (2) Place the barrel of the syringe over the bicuspid on the side opposite that to be anesthetized (Figure 2). Hold parallel to the plane of the mandibular teeth. The tip of the needle should penetrate the tissue about 1/4 inch above the plane of the teeth in the V-shaped depression formed laterally by the palpated ramus and medially by a ligament.

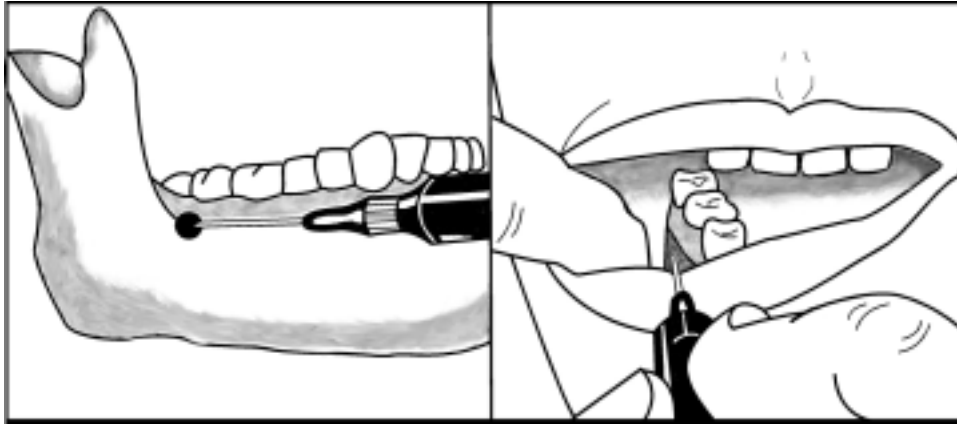


Figure 2. Mandibular Injection

NOTE: Remember your target is the midpoint of the ramus, so adjust the point of the penetration accordingly. Always stay lateral to the ligament and in the depression.

- (3) Advance the needle until you touch the bone or until about 3/4 of the 1 3/8-inch needle penetrates the ramus, whichever comes first. Normally the needle will penetrate about 3/4 to 1 inch.

NOTE: If bone is contacted immediately after insertion of the needle, reposition the needle.

- (4) Aspirate. If blood appears on the carpule, reposition the tip of the needle.

- (5) Slowly deposit 2/3 to 3/4 of the carpule. Continue to inject the remainder of the carpule as you slowly withdraw the needle to anesthetize the lingual nerve.

- c. Long buccal block. Penetrate the buccal mucosa just lateral to the third molar. Deposit about 1/4 of a carpule (Figure 3).

Performance Steps

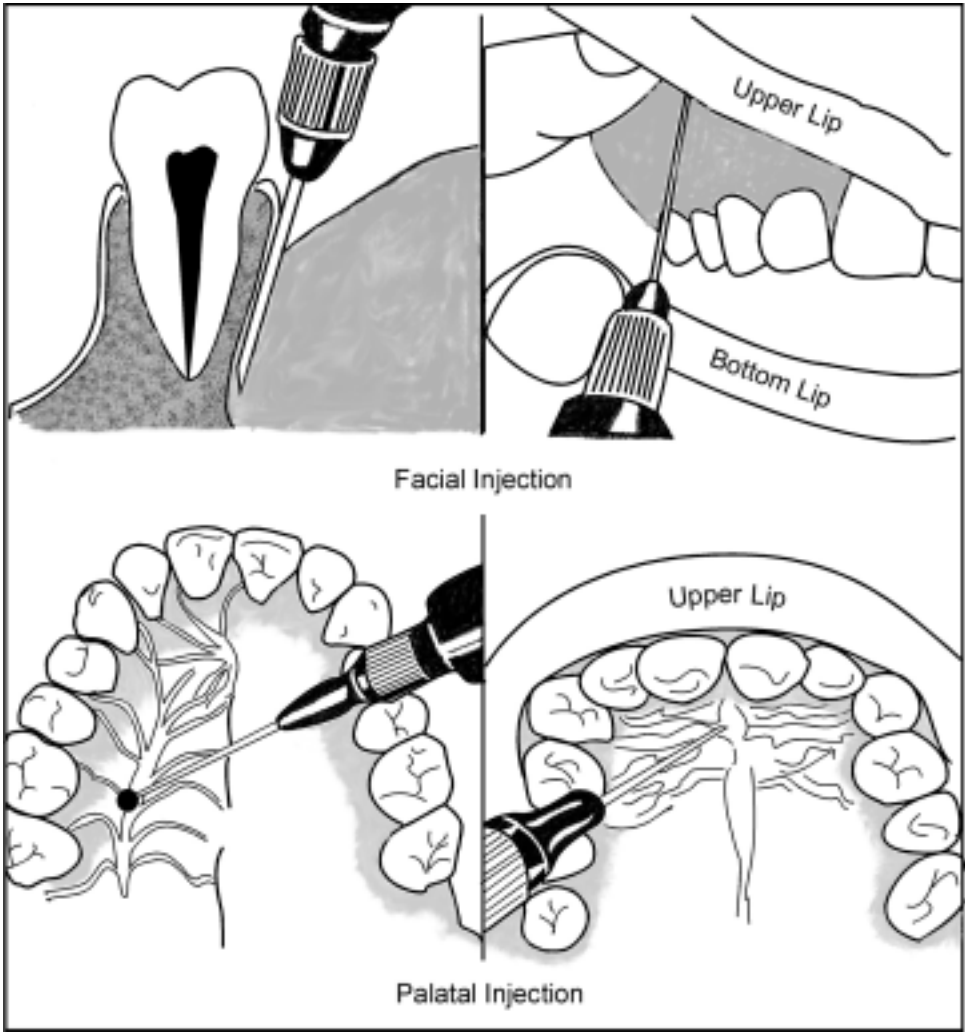


Figure 3. Long Buccal Injection

- 9. Check the degree of anesthesia after 5 minutes. If not effective, readminister as indicated.
- 10. Record the type of anesthetic used and the amount of anesthetic administered in the patient's records.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must administer local dental anesthesia.

Performance Measures	GO	NO GO
1. Reassessed allergies to medication.	—	—
2. Determined the area to be anesthetized.	—	—
3. Gathered the equipment.	—	—
4. Assembled the administration equipment.	—	—
5. Determined the techniques to be used.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
6. Explained the procedure.	_____	_____
7. Administered the anesthetic depending on the area to be anesthetized and known allergies.	_____	_____
8. Checked the result after 5 minutes.	_____	_____
9. Recorded the treatment.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
TC 8-20-1

Manage Complications of Dental Extractions

081-833-4484

Conditions: The patient is suffering from complications of a dental extraction. Given a Special Forces tactical medical equipment set with a dental component and the patient's dental record.

Standards: Manage complications of dental extractions without causing further discomfort.

Performance Steps

1. Perform oral examination.
2. Determine the type of complication.
 - a. Postoperative pain.
 - b. Swelling, fever, or other signs of systemic infection.

NOTE: Swelling may occur on the first postoperative day, but should subside gradually over a week.

- c. Alveolitis (localized osteitis or dry socket).
- d. Osteomyelitis.
- e. Postextraction bleeding.

3. Provide specific treatment for the complications.

- a. Postoperative pain: give ibuprofen 800 milligrams (mg) every 6 hours (q6h) with food or milk; take as needed (prn) for pain.
- b. Persistent swelling and other signs of systemic infection (fever and malaise): give penicillin VK 500 mg orally four times a day (q.i.d.) for 7 to 10 days. If patient is allergic to penicillin, give clindamycin 300 mg orally q.i.d. for 7 to 10 days. Erythromycin can also be given to patients who are allergic to penicillin VK in the following dosage: 500 mg (erythromycin base) orally q.i.d. for 7 to 10 days.

NOTE: If swelling has not subsided after 1 week from the postoperative day, suspect infection.

- c. Alveolitis (localized osteitis):
 - (1) Irrigate with warm saline.
 - (2) Saturate iodiform gauze with eugenol liquid.
 - (3) Mix equal amounts of zinc oxide, petrolatum, and contents of tetracycline capsule.
 - (4) Coat saturated iodiform gauze with mixture.
 - (5) Grab end of iodiform gauze with forceps, and pack the socket.

CAUTION: Do not allow contact between the coated iodiform gauze and lips or mucousal surfaces. Use 2 x 2 gauze or cotton balls to protect the lips and mucousal surfaces.

- (6) Leave the packing for 3 to 5 days. Replace packing if it falls out.

NOTE: If swelling or rise in temperature occurs, treat for infection with penicillin VK, 500 mg orally q.i.d. for 7 to 10 days.

- (7) Treat pain with acetaminophen, 325 mg with codeine q4h.
- d. Osteomyelitis:
 - (1) Evacuate to an oral surgeon at the earliest time.
 - (2) Manage patient prior to evacuation:
 - (a) Irrigate with warm saline.
 - (b) Treat pain with acetaminophen, 325 mg with 30 mg codeine q4h.
 - (c) Place gauze moistened with eugenol in the alveolus.
 - (d) Change the gauze and irrigate the alveolus daily.
 - (e) Give methicillin, 6 to 8 grams (g) per day intramuscularly (IM) every 4 to 6 hours (q4/6h).

NOTE: Patients who are sensitive to penicillin must be changed to a suitable alternative.

- e. Postextraction bleeding:
 - (1) Blot with gauze.
 - (2) Place a pressure pack (cotton-packed gauze or a tea bag) directly on the extraction site for 20 to 30 minutes or longer.
 - (3) Repeat step (2) two to three times. If bleeding continues, perform the following:

Performance Steps

- (a) Anesthetize the area by using 2 percent lidocaine with 1:100,000 epinephrine by nerve block.
- (b) Suture the socket area under tension.
- (c) Allow space between sutures for packing.
- (d) Use hemostatic agents: oxidized cellulose, topical thrombin on a gelatin sponge, or microfibrillar collagen, if available.

NOTE: Unsuccessful attempts at hemorrhage control necessitate evacuation for evaluation by a dental corps officer.

- 4. Record the treatment and findings.
- 5. Recommend evaluation by a dentist or oral surgeon.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Performed oral examination.	_____	_____
2. Determined the type of complication.	_____	_____
3. Provided specific treatment for the complications.	_____	_____
4. Recorded the treatment and findings.	_____	_____
5. Recommended evaluation by a dentist or oral surgeon.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED
TC 8-20-1

Prepare Intermediate Restorative Material (IRM)
081-840-0012

Conditions: The dental specialist is wearing sterile gloves, a mask, and eye protection. Necessary materials and equipment: a polymer paper mixing pad, IRM powder and liquid, a measuring scoop, and a stainless steel spatula.

Standards: The IRM material is mixed to a smooth and adaptable working consistency within 1 minute without contamination. The mix will be stiff and should be stropped (whipped vigorously) for 5 to 10 seconds.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepares the materials for mixing.	_____	_____
NOTE: IRM is also used as an intermediate base material. It is not to be used as a permanent restoration.		
a. Fluffs the powder, fills the measuring scoop to excess without packing the powder, and levels off with the spatula.		
b. Places the powder on the mixing pad.		
c. Dispenses the correct amount of liquid onto the pad (1 drop of liquid to 1 scoop of powder).		
CAUTION: Prolonged contact with eugenol may eventually cause deterioration of the dispenser bulb. To prevent this, the dropper must never be placed in a horizontal position. It must always be emptied and returned to its holder.		
NOTE: The lids must be replaced on the containers as quickly as possible to prevent contamination.		
2. Mixes the IRM.	_____	_____
a. Brings 1/2 of the powder to the liquid and spatulates quickly with a stropping motion.		
b. Adds the remaining powder in 2 or 3 increments and spatulates thoroughly.		
3. Incorporates all the powder into the liquid and completes mixing within 1 minute.	_____	_____
NOTE: Mixture should have a smooth putty-like consistency.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 8-91E15-SM-TG
TC 8-20-1

Subject Area 7: Veterinary Medicine

Perform Physical Restraint on Domestic and Companion Animals

081-833-4597

Conditions: You are in a field environment. Given a twitch (ring type, commercial type, or rope loop with a stick), rope halter, two 40-foot ropes, a D-ring, a squeeze cage or chute, nose tongs, and a cat bag, towel, or small blanket.

Standards: Physically restrain a domestic or companion animal without causing injury to the animal.

Performance Steps

1. Perform physical restraint on a horse (Figure 1).
 - a. Use a squeeze cage or chute, if available.
 - b. Use a rope halter.
 - (1) Place a rope around the animal's neck with a bowline knot.
 - (2) Pull a bite of the standing end of the rope through the loop from the rear to the front and place it over the animal's nose.
 - (3) Pull the halter tight when in place.

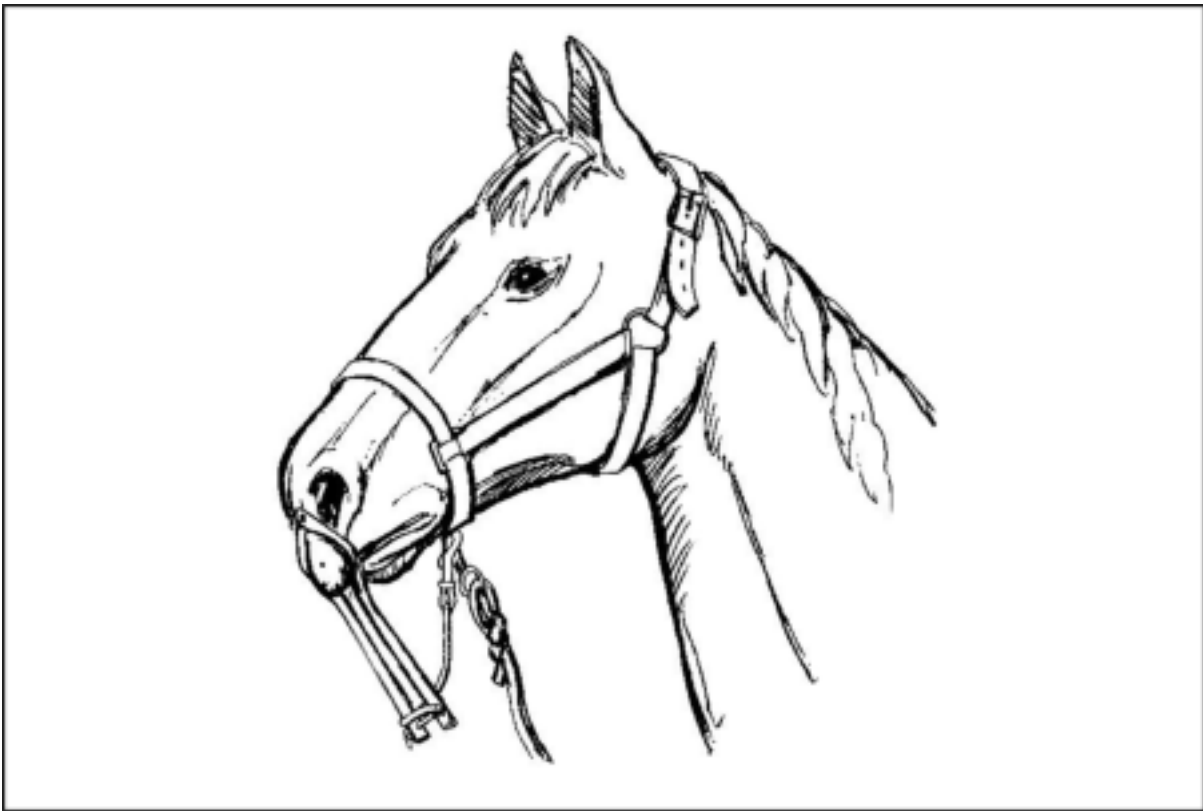


Figure 1. Restraint on Horse

- c. Use a twitch.
 - (1) Twitches are diversionary control apparatuses that use a small loop of rope or chain, which twist the upper lip of the horse.
 - (2) Sticks, rods, or metal rings may be used as a handle to wind down and tighten the rope loop on the animal's lip.

NOTE: Avoid putting twitches on too tight or applying them for too long.

Performance Steps

- (3) When restraining the horse, handlers should control the animal by the halter and stand on the same side as the medic who is treating the animal.

WARNING: Never stand in front of the horse; it may bolt, strike with the hoofs, or rear up.

CAUTION: The handle of the twitch can become a weapon against the handler if it gets away from the individual restraining the animal.

- d. Use a strap hobble.

- (1) Attach one loop of the strap hobble to either fetlock of the foreleg.
- (2) Attach the second loop of the strap hobble to the other foreleg's fetlock.
- (3) Ensure there is about 6 to 8 inches of strap or chain between the legs.

NOTE: A rope may be used to improvise a strap hobble. Consider padding if the rope is tied tightly.

2. Perform physical restraint on a cow (Figure 2).

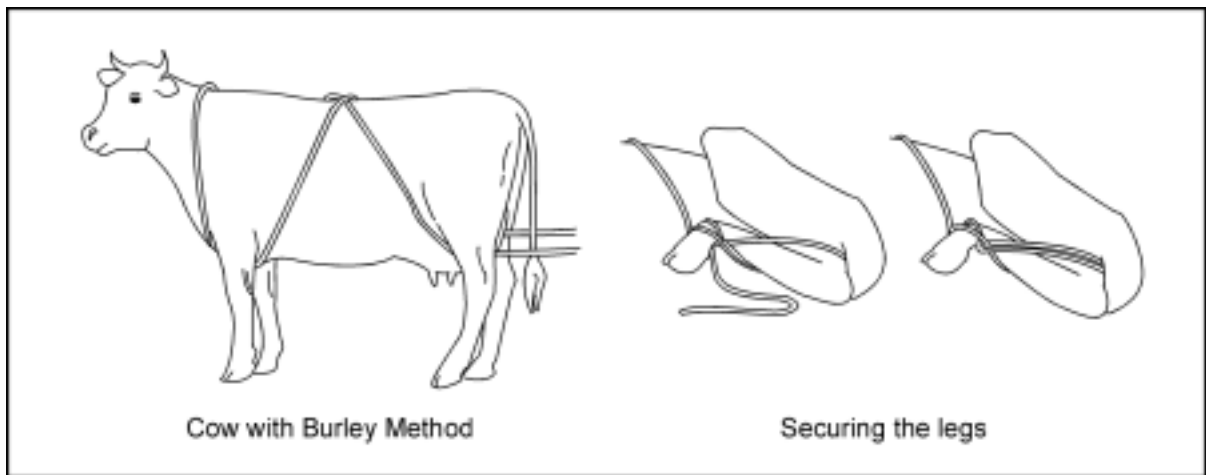


Figure 2. Physical Restraint on a Cow

- a. Use a squeeze cage or chute, if available.
- b. Use a temporary rope halter (same as for horses.)
- c. Use a Burley method of casting (Figure 3).

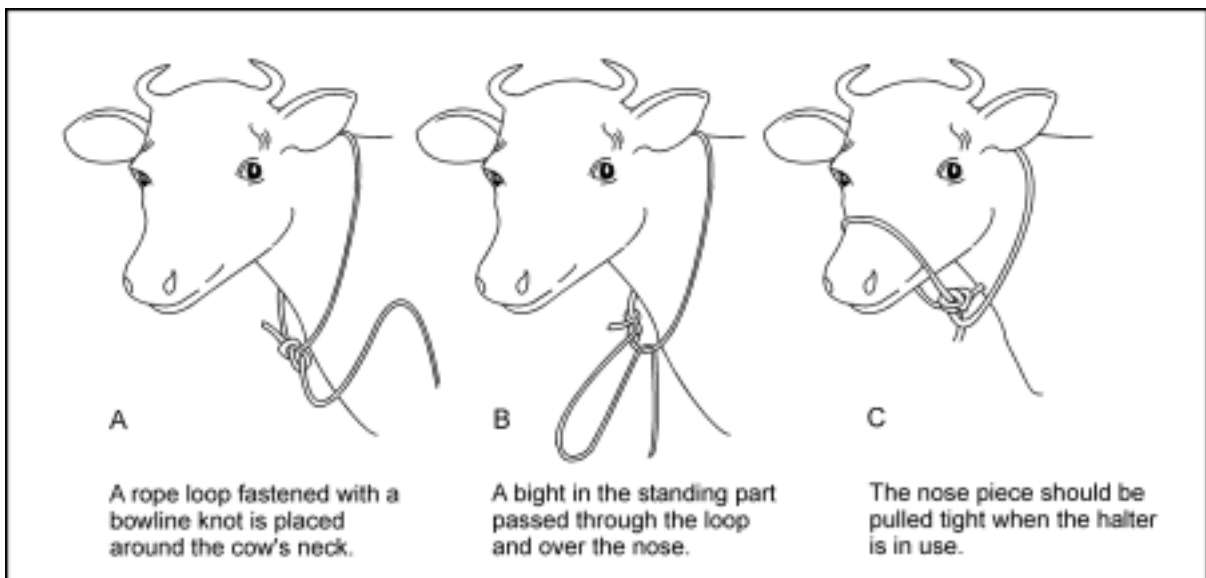


Figure 3. Burley Method of Casting

Performance Steps

- (1) Hold the cow by a strong halter at the head.
- (2) Take 4 feet of rope. Place the rope over the cow's back at the withers, carrying the running ends between the legs and crossing the ends at the sternum, then going up the sides and crossing the running ends again over the back, and passing the legs without crossing the ropes.
- (3) Pull the running ends of the rope, causing the animal to fall.
- (4) Secure the legs.
- d. Use a quick restraint.
 - (1) Nose tongs are good when giving injectable medications.
 - (2) Tail restraints are good to distract the animal's attention from work being performed on another part of the body.

NOTE: Hold the tail at the base to prevent injury to it.

3. Perform physical restraint of a hog.
 - a. A snare can be used to catch a hog in the pen. It can be made from a 1-inch pipe with rope, wire, or chain being used to form the snare. Use the snare to catch the snout.
 - b. A hog's ear may be used for control during worming procedures of medium-sized animals.
4. Perform physical restraint of a dog.
 - a. Construct a hasty muzzle by tying a 3-foot piece of rope or muslin in a granny knot, with a loop over the dog's muzzle.
 - b. Tie behind the ears with a second loop. When the head and mouth are secured, so is the dog.
5. Perform physical restraint of a cat using almost any sack, such as a fabricated canvas bag, sandbag, or pillowcase.
6. Constantly monitor the animal so that it does not incur self-injury while restrained.
7. Record all actions taken.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Performed physical restraint on a horse.	_____	_____
2. Performed physical restraint on a cow.	_____	_____
3. Performed physical restraint of a hog.	_____	_____
4. Performed physical restraint of a dog.	_____	_____
5. Performed physical restraint of a cat by using almost any sack, such as a fabricated canvas bag, sandbag, or pillowcase.	_____	_____
6. Constantly monitored the animal so that it did not incur self-injury while restrained.	_____	_____
7. Recorded all actions taken.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK, VET 1998

Perform Chemical Restraint on Domestic and Companion Animals

081-833-4599

Conditions: You are in a field environment. Given various types and amounts of syringes and needles (3- to 10-cubic centimeter (cc) syringes and 26- to 18-gauge needles), intravenous (IV) equipment, IV solutions, a bite block, and preparation materials.

Standards: Chemically restrain an animal without causing injury to the animal.

Performance Steps

1. Restrain the animal physically, when necessary.
2. Assemble all the equipment needed to complete the procedure.
 - a. Needles.
 - b. Syringes.
 - c. IV equipment.
 - d. IV solutions.
 - e. Bite block.
3. Prepare the animal for sedation or local anesthesia.
4. Restrain horses chemically.
 - a. Use rompum (xylazine) 1milligram per pound (mg/lb) intramuscularly (IM) or 0.5 mg/lb IV.
 - b. Use cepromazine 10 to 40 mg/1,000 lb IV or IM.
5. Restrain cattle chemically.
 - a. Give rompum (xylazine) 5 to 10 mg/100 lb (low dose initially).
 - b. Increase for desired effect.

NOTE: Rompum is not approved in the United States for anything but horses, dogs, and cats.

6. Restrain sheep and goats chemically.
 - a. Use rompum IM 5 to 10 mg/100 lb.
 - b. Use the small animal product (20 milligrams per milliliter [mg/ml] of rompum) on any ruminant animal under 50 lb.
 - c. Use the 100 mg/ml product recommended for horses diluted to 25 mg/ml with distilled water, if the small animal product is not available.
7. Restrain dogs and cats chemically.
 - a. Use rompum IM, IV, or subcutaneously (SQ); 0.5 mg/lb IV or 0.5 mg to 1 mg/lb, IM or SQ.
 - b. Use ketaset in cats, if necessary.
 - (1) Use 5 mg/lb for restraint.
 - (2) Use 10 to 15 mg/lb for anesthesia.
8. Restrain a porcine animal with ketamine hydrochloride (HCL) (100 mg/ml) 3 ml/400 lb (will immobilize for 30 minutes).

NOTE: Rompum metabolizes too rapidly for most procedures in the porcine animal.

WARNING: Chemical restraint (sedation) is not often used in pigs. Pigs are poor anesthesia risks because they are usually overweight, since they are fed to be fat. The autonomic nervous system is easily upset, and excitement or acute pain can induce fatal collapse--especially in fat swine. (Commonly described as porcine stress syndrome.)

9. Constantly monitor the animal's vital signs to ensure the proper level of restraint and the safety of the animal.
10. Record all actions taken.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Restrained the animal physically, when necessary.	_____	_____
2. Assembled all the equipment needed to complete the procedure.	_____	_____
3. Prepared the animal for sedation or local anesthesia.	_____	_____
4. Restrained horses chemically with rompum 1mg/lb IM or 0.5 mg/lb IV OR cepromazine 10 to 40 mg/1,000 lb IV or IM.	_____	_____
5. Restrained cattle chemically with rompum 5 to 10 mg/100 lb initially and then increased for desired effect.	_____	_____
6. Restrained sheep and goats chemically with rompum IM 5 to 10 mg/100 lb.	_____	_____
7. Restrained dogs and cats chemically with rompum IM, IV, or SQ; 0.5 mg/lb IV or 0.5 mg to 1 mg/lb, IM or SQ.	_____	_____
8. Used ketaset in cats, if required, at a dose of 5 mg/lb for restraint and 10 to 15 mg/lb for anesthesia.	_____	_____
9. Restrained a porcine animal with ketamine hydrochloride (100 mg/ml) 3 ml/400 lb.	_____	_____
10. Constantly monitored the animal's vital signs.	_____	_____
11. Recorded all actions taken.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK, VET 1998

Perform Physical Examination of Animals

081-833-4601

Conditions: You are in a field environment. Given a Special Forces (SF) tactical medical equipment set and SF individual combat laboratory set.

Standards: Conduct a complete physical examination on an animal.

Performance Steps

1. Obtain the history of an animal from the owner, caretaker, or witness of the trauma an animal may have sustained.
2. Perform a general inspection of the animal while it is in a natural state.
 - a. General appearance.
 - (1) The demeanor of the animal: aggressive or lethargic.
 - (2) The posture of the animal: holding up an extremity, legs spread to stand, or head down position.
 - (3) The gait of the animal: limping or favoring one side.
 - (4) The condition: emaciated or bloated.
 - (5) The conformation: symmetrical body.
 - (6) The skin: scars, infections, or parasites.
 - b. General behavior.
 - (1) Voice: bellowing, screaming, or coughing.
 - (2) Appetite: Will the animal take food and/or water?
 - (3) Defecation of the animal: profuse or watery.
 - (4) Urination of the animal: color and/or amount.
3. Measure the patient's vital signs.
 - a. Normal rectal temperatures (in degrees Fahrenheit).
 - (1) Horses: 100.5.
 - (2) Cattle: 101.5.
 - (3) Sheep: 103.
 - (4) Goats: 104.
 - (5) Swine: 102.
 - (6) Dogs: 101.5.
 - (7) Cats: 101.5.
 - b. Normal cardiac rates (followed by the average range in parentheses).
 - (1) Horses: 44 (23 to 70).
 - (2) Cattle: 70 (60 to 70).
 - (3) Calves: 110 (80 to 130).
 - (4) Sheep: 80 (60 to 120).
 - (5) Goats: 90 (70 to 135).
 - (6) Swine: 70 (58 to 86).
 - (7) Dogs: 120 (100 to 130).
 - (8) Cats: 120 (110 to 140).
 - c. Normal respiration rates.
 - (1) Horses: 12.
 - (2) Cattle: 30.
 - (3) Sheep: 19.
 - (4) Dogs: 22.
 - (5) Cats: 26.
4. Examine the body systems.
 - a. Skin.
 - (1) Lesions.

Performance Steps

- (2) Color.
 - (3) Texture.
 - (4) State of hydration.
 - b. Respiratory.
 - (1) Auscultate.
 - (2) Measure rate.
 - (3) Note difficult breathing.
 - c. Digestive.
 - (1) Examine mouth.
 - (2) Abdomen.
 - (a) Auscultate.
 - (b) Palpate.
 - (3) Fecal material.
 - (a) Blood.
 - (b) Excessive mucous.
 - (c) Diarrhea.
 - (d) Parasites.
 - d. Neurological.
 - (1) Coordination.
 - (2) Cranial nerves.
 - (3) Segmented reflexes.
 - e. Musculoskeletal.
 - (1) Observe the animal's movements.
 - (2) Palpate the animal's legs.
 - f. Lymph nodes.
 - (1) Cervical.
 - (2) Inguinal and popliteals.
 - g. Cardiovascular.
 - (1) Auscultate.
 - (2) Measure rate.
5. Perform diagnostic laboratory tests.
 - a. Urinalysis, odor, color, potential of hydrogen (pH), specific gravity, and bacteria.
 - b. White blood cell (WBC) count and serology.
 6. Record all findings, and made corrective suggestions to owner.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Obtained the history of an animal.	_____	_____
2. Performed a general inspection of the animal while in a natural state.	_____	_____
3. Measured vital signs.	_____	_____
a. Rectal temperatures.		
b. Cardiac rates.		
c. Respiration rates.		
4. Examined the body systems.	_____	_____
a. Skin.		
b. Respiratory.		
c. Digestive.		
d. Neurological.		
e. Musculoskeletal.		
f. Lymph nodes.		
g. Cardiovascular.		

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Performed diagnostic laboratory tests. a. Urinalysis. b. WBC count and serology.	_____	_____
6. Recorded all findings.	_____	_____
7. Made corrective suggestions to owner.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK, VET 1998

Manage Equine Conditions

081-833-4611

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF medical equipment set, tactical medical equipment set medical laboratory, and SF medical book set.

Standards: Manage equine conditions so that the life of the horse is saved without causing further harm.

Performance Steps

1. Understand the general causes of colic.
 - a. Colic is the leading cause of death in horses and is one of the most common presenting complaints to the equine doctor.
 - b. By definition, colic refers to abdominal pain, which can result from a multitude of causes. The pain can stem from such benign problems as simple indigestion or from life-threatening conditions such as a large colon volvulus. Some of the most common conditions causing colic are:
 - (1) Large intestinal impaction 37.5 percent.
 - (2) Intestinal strangulation 18.4 percent.
 - (3) Enteritis 4.4 percent.
 - (4) Idiopathic 25.4 percent.
 - c. The decisions that must be made to properly treat a "colicky" horse are more important than arriving at a specific diagnosis.
2. Manage the risk factors for colic. There are many factors which make horses susceptible to colic.
 - a. Factors that cannot be changed.
 - (1) The way a horse's gastrointestinal (GI) tract is made.
 - (2) The age of a horse (older horses are more susceptible).
 - b. Environmental or man-made factors.
 - (1) Geography: Horses living in sandy areas are prone to sand impactions. Placing hay up off the ground for feeding or giving laxatives to horses living in sandy areas may help prevent this.
 - (2) High parasite load: Parasites, particularly *Strongylus vulgaris*, may cause inflammation or even perforation of the intestine or colic. Often a horse with a high parasite load that is dewormed will develop colic soon afterward as a result of impaction of the dying worms.
 - (3) Poor feeding habits: Feeding horses a diet high in carbohydrates or working a horse soon after a meal may cause colic (as well as other complications).
3. Recognize the signs and symptoms of colic.
 - a. Pain.
 - (1) The most prominent clinical sign of equine colic.
 - (2) In general, the more severe the disease, the greater the pain, but this is not always true. The severity of the pain and whether it is continuous or intermittent can point to the most probable cause. For example, strangulation lesions often cause severe, continuous pain, whereas obstructions cause intermittent, moderate abdominal pain.
 - (3) Early signs of abdominal pain a horse may exhibit include playing in the water with its mouth, curling its upper lip, lying down, refusing to eat, biting its flanks, and looking at its abdomen.
 - (4) Moderate signs of pain a horse may exhibit are pawing, attempting to lie down because of cramping, stretching out with attempts to urinate, kicking at the abdomen, and rolling.
 - (5) Horses in severe pain will throw themselves on the ground, sweat, roll violently, and continuously move or paw.
 - b. Depression.
 - (1) Horses with proximal enteritis usually have a history of severe pain followed by depression.

Performance Steps

- (2) Any horse that has had prolonged signs of colic and that is severely ill or hypovolemic can become depressed.
 - (3) Depression can greatly cloud the picture and complicate the decision about whether surgery is needed because persistent abdominal pain is one of the most reliable indications that an exploratory laparotomy is needed.
 - c. Signs indicating serious colic condition:
 - (1) Abdominal distention.
 - (2) Respiratory distress.
 - (3) Profound sweating.
 - (4) Horse showing extreme pain suddenly becomes quiet.
 - (5) Horse is cold to the touch.
 - (6) Nasal regurgitation.
 - (7) Weak and ataxic.
 - (8) Lying down and gasping for breath.
 4. Manage colic.
 - a. Remove from the source of colic, if known.
 - b. Pass a nasogastric (NG) tube (if not already done) to check for and relieve gastric tympany and fluid distension.
 - c. Treat for shock, if present, (may require from 20 to 30 liters of IV fluids in 1 to 2 hours).
 - d. Give nonsteroidal anti-inflammatories phenylbutazone: 2 to 4 milligrams per pound (mg/lb) flunixin meglumine (banamine): 0.5 mg/lb intravenous (IV) or intramuscularly (IM).
 - e. Give analgesic to control pain: xylazine 0.2 to 0.4 mg/lb IV or 0.4 to 0.8mg/lb IM.
 - f. Give mineral oil and warm water through NG tube. Mix 1gallon oil with 1 gallon warm water. (No more than 2 gallons at one time!)
 - g. Give antibiotics if fever is present.
 - h. Have owner walk horse. Walking may help to calm a horse and keep him from rolling.
- NOTE: Medical therapy is adequate for most colic cases; however, some will require referral for surgery. Indications for surgery include acute colic not responding to analgesic and medical therapy, "positive" rectal findings (markedly distended loops of bowel), and a declining circulatory status.
- i. The horse should be evaluated closely for 12 to 24 hours to ensure no problems will arise.
 5. Understand the general characteristics of tetanus in horses.
 - a. Tetanus is an infectious nonfebrile disease affecting all animals and man. Tetanus is characterized by spasmodic tetany and hyperaesthesia.
 - b. Tetanus is reported as widespread in Brazil, Haiti, Nicaragua, Bahamas, and Afghanistan.
 - c. Tetanus is caused by nonspecific neurotoxin caused by *Clostridium tetani* in necrotic tissue.
 - d. Infection takes place by contamination of wounds with the micro-organism.
 - e. The typical picture is for the bacteria to be present in soil or, more likely, in animal feces, and from there to be carried into a wound by a penetrating object such as a nail contaminated by dirt--especially into the foot of a horse--or by a dirty knife used in castration.
 - f. The toxin produced from an infected wound travels not via the bloodstream but via the peripheral nerve trunks to the brain where it causes marked exaggeration of the response to normal minor stimuli so that intermittent muscular tension is produced.
 6. Recognize the signs and symptoms of tetanus.
 - a. The incubation period is generally between 1 and 2 weeks. However, the infection may remain latent and many months may pass between contamination of a wound and the appearance of symptoms.
 - b. There is at first an increasing stiffness, developing to rigidity of the muscles, beginning with those of the head, so that there is inability to chew.
 - c. The ears become stiff, erect, and immobile.
 - d. The third eyelid is protruded. Pronounced protrusion of the third eyelid may be initiated by suddenly lifting the jaw.
 - e. The nostrils are dilated, and the jaw muscles become rigid ("lockjaw").
 - f. Horses stand rigid with legs apart and neck stretched.

Performance Steps

- g. Walking is difficult and turning is carried out without flexing the body; the horse remains rigid.
- h. Muscles all over the body are clearly delineated superficially and are hard to the touch.
- i. In all animals, muscular spasms are initiated by slight stimuli such as a light touch, a sharp noise, or a sudden ray of light.
- j. Animals that fall lie with their muscles rigid.

7. Treat tetanus.

NOTE: The object of treatment is to eliminate the micro-organism, neutralize the circulating toxin, and relax the muscles quickly to restore normal respiration and keep them relaxed until all toxin is eliminated.

- a. Give antitoxin (1 million international units for a horse).
- b. Treat the original wound with antiseptics.
- c. Penicillin injection at maximum dosage is beneficial in destroying the bacteria.
- d. Give chlorpromazine 500 mg IM daily until sufficient improvement is obtained.

8. Prevent tetanus.

- a. Prevention is achieved by proper hygiene and cleanliness at castration and other surgical procedures.
- b. Nails and wire should not be allowed to lie around premises where animals are kept.
- c. Short term prophylaxis can be achieved by the injection of antitoxin at the rate of 10,000 international units. This is a useful precaution with horses that suffer traumatic injuries, particularly of the puncture type.
- d. Active immunity can be obtained by the use of tetanus toxoid. The toxoid can be given at the same time as the antitoxin.

9. Record all treatment in the animal's record.

10. Seek the advice and assistance of a veterinarian whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage equine conditions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the general causes of colic.	_____	_____
2. Managed the risk factors for colic.	_____	_____
3. Recognized the signs and symptoms of colic.	_____	_____
4. Managed colic.	_____	_____
5. Understood the general characteristics of tetanus in horses.	_____	_____
6. Recognized the signs and symptoms of tetanus.	_____	_____
7. Treated tetanus.	_____	_____
8. Prevented tetanus.	_____	_____
9. Recorded all treatment in the animal's record.	_____	_____
10. Sought the advice and assistance of a veterinarian whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK, VET 1998

Prepare Domestic and Wild Animals for Consumption

081-833-4613

Conditions: Given a gun, a knife, and an animal that must be slaughtered.

Standards: Humanely kill, bleed, and butcher the animal so that the meat is not contaminated by urine or feces and so that any diseased meat is removed and discarded.

Performance Steps

1. Conduct a live inspection of the animal (task 081-833-4618, Perform a Necropsy).
2. Perform a humane kill by firing into the animal's head at the indicated position and angle (Figure 1).

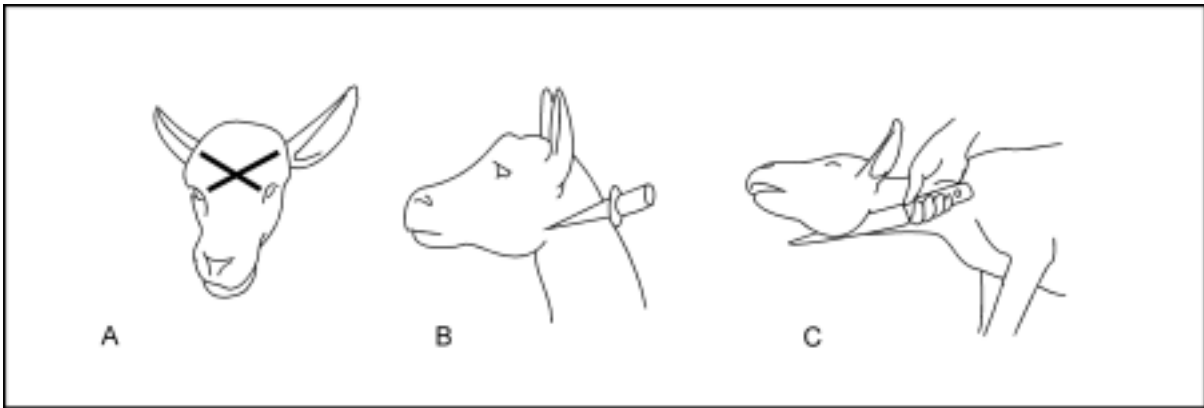


Figure 1. Humane Kill

3. Bleed the animal promptly.
 - a. Hang the animal by the rear legs, if possible.
 - b. If the animal cannot be hung, lay it on its side with the hindquarters uphill.
 - c. Cut through the internal and external jugular veins and carotid arteries.

4. Remove the genitals and/or udder.

NOTE: If the animal is not hanging, it should be rolled onto its back and propped into position with rocks or logs.

5. Make a circular cut around the anogenital area.
 - a. Expose the rectum.
 - b. Tie off the rectum with string to prevent fecal contamination of the meat.
6. Split the hide from the tail to the throat.
 - a. Insert the knife under the skin, but do not enter the body cavity.
 - b. Peel back the hide several inches on each side to keep hair out of the meat.
7. Cut open the abdominal cavity. (A hook knife works well for this.)
 - a. Cut from the caudal side of the previous cut around the anogenital area to the xyphoid process.
 - b. Do not cut into any of the internal organs.
8. Cut through the pelvic bone.
9. Free the large intestines from the pelvic cavity.
 - a. Do not puncture the large intestines.
 - b. Do not sever the intestines from the rest of the viscera.

Performance Steps

10. Cut through the diaphragm.
11. Free the thoracic organs from the carcass.
12. Reach up as far as possible into the chest cavity, and cut through the trachea and esophagus.
13. Pull the thoracic organs out of the chest cavity, and let them hang on the outside.
14. Free the rest of the abdominal organs from the carcass, and allow the viscera to fall free as a unit.
15. Perform a necropsy (task 081-833-4618).
16. Skin the animal.
 - a. Make a circumferential cut on each limb above the "elbow."
 - b. Connect this cut to the midline cut.
 - c. Peel the hide away from the carcass.
 - d. If a vehicle is available, the hide may be removed in this manner.
 - (1) Peel back enough of the hide to allow something to which you can tie.
 - (2) Secure the carcass to a sturdy tree by both hind legs.
 - (3) Using a sturdy rope, tie the hide to the bumper of the vehicle.
 - (4) Use the power of the vehicle to pull the hide off of the carcass.
 - e. If a vehicle is not available or the tactical situation does not permit the above method, the following method may be used:
 - (1) With your hand, pull back the hide as far as possible, starting with a distal limb.
 - (2) Using a very sharp knife, relieve the hide from the carcass. (A scalpel blade works well for this.)
17. Preserve and store the meat.
 - a. Preservation and storage are best done by cold.
 - b. If refrigeration is not available, the meat may be preserved by:
 - (1) Smoking.
 - (2) Curing with salt or other spices.
 - (3) Making jerky.
 - (4) Making pemican.
 - (5) Pickling.
 - (6) Canning.
18. Prepare meat preservation records. Records should include the following information:
 - a. Type of meat prepared.
 - b. Source and date the meat was obtained.
 - c. Weight and cut of meat.
 - d. Time cured or smoked, as applicable.
 - e. Type and amount of wood used, if applicable.
 - f. Approximate temperature of smoke.
 - g. Type and amount of salt used, if applicable.
 - h. Type and amount of other seasonings used, if applicable.
 - i. Color and texture of the meat when newly preserved.
19. Inspect preserved meat to determine its safety.
 - a. Factors that influence the length of time preserved meat will keep are:
 - (1) Weather.
 - (2) The condition of the meat prior to preservation.
 - (3) Insect and rodent control.
 - b. Inspect preserved meat regularly for moisture patches or small holes on the surface of the meat. This indicates that the meat is going sour.
 - (1) If the area can be cut out and the remainder of the meat appears good, it can be kept.
 - (2) If holes and moisture are throughout the meat, it is ruined and must be disposed of.

Performance Steps

REMEMBER: When in doubt, throw it out.

- c. If meat appears sour around a bone area, do the following:
 - (1) Section the meat to expose the sour area to the air for 24 hours.
 - (2) If the sour area clears up, the meat is probably safe.
 - (3) If the sour area does not clear up, dispose of the meat.
 - (4) In all cases, meat that has signs of problems but is still good should be eaten as soon as possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier an animal that must be prepared for consumption.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Conducted a live inspection of the animal.	_____	_____
2. Performed a humane kill.	_____	_____
3. Bled the animal promptly.	_____	_____
4. Removed the genitals and/or udder.	_____	_____
5. Made a circular cut around the anogenital area.	_____	_____
6. Split the hide from the tail to the throat.	_____	_____
7. Cut open the abdominal cavity.	_____	_____
8. Cut through the pelvic bone.	_____	_____
9. Freed the large intestines from the pelvic cavity.	_____	_____
10. Cut through the diaphragm.	_____	_____
11. Freed the thoracic organs from the carcass.	_____	_____
12. Reached up as far as possible into the chest cavity and cut through the trachea and esophagus.	_____	_____
13. Pulled the thoracic organs out of the chest cavity and let them hang on the outside.	_____	_____
14. Freed the rest of the abdominal organs from the carcass and allowed the viscera to fall free as a unit.	_____	_____
15. Performed a necropsy.	_____	_____
16. Skinned the animal.	_____	_____
17. Preserved and stored the meat.	_____	_____
18. Prepared meat preservation records.	_____	_____
19. Inspected preserved meat to determine its safety.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Laminitis

081-833-4614

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF medical equipment set, tactical medical equipment set medical laboratory, and SF medical book set.

Standards: Manage laminitis so that the function of the animal is restored without causing further harm.

Performance Steps

1. Understand the pathophysiology and cause of laminitis.
 - a. Pathophysiology:
 - (1) Inflammatory (degenerative) process within the sensitive laminae of the hoof wall.
 - (2) This causes a breakdown of the union between the sensitive and horny laminae and may allow downward rotation of the third phalanx.
 - b. Cause:
 - (1) Sudden rich dietary changes.
 - (2) High-concentrate diet.
 - (3) Sudden decrease in work.
 - (4) Severe lameness in another leg.
 - (5) Colic.
 - (6) Metritis (or other severe infection).
 - (7) Cold water after hot work.
 - (8) Shipping.
 - (9) Concussion (road founder).
 - (10) Grass (especially ponies).
2. Recognize the signs and symptoms of acute laminitis.
 - a. The animal appears to be "walking on eggs."
 - b. Recumbency.
 - c. Elevated pulse and respiration.
 - d. Muscle tremors from pain.
 - e. Throbbing digital pulse.
 - f. Injected membranes.
 - g. Pain over sole (especially at toe) with hoof testers.
 - h. Feet usually warm or hot generally. Only front feet are warm or hot but can be all four.
3. Manage acute laminitis.

NOTE: Acute laminitis is a veterinary emergency.

 - a. Eliminate cause, if possible.
 - b. Give 1 gallon mineral oil by nasogastric tube; may add antibiotics to suppress intestinal flora.
 - c. Antihistamines, lasix, phenylbutazone, or banamine may also be helpful.

NOTE: Do not give steroids.

 - d. Restrict diet (especially grain).
 - e. Allow the animal to stand in sand for even sole pressure.
 - f. Send the animal for corrective shoeing in severe cases to elevate heel.
4. Recognize the signs and symptoms of chronic laminitis.
 - a. Heel-to-toe walkers.
 - b. Dished toe with diverging founder rings.
 - c. Sole hemorrhage or rotation of P-3 through sole.
 - d. Pain with hoof testers is variable.
5. Treat chronic laminitis.
 - a. Try to prevent recurrence of acute state.
 - b. Have the animal reshod.

Performance Steps

- (1) Object is to restore P-3 to its correct angular relationship to the ground. This requires decreasing the toe angle, thus making the foot look worse but function better.
- (2) The toe is then dubbed off to ease breakover and prevent further wedging of the wall away from P-3.
- (3) Changes of foot angle greater than 5 degrees should be carried out in several stages to minimize risk of precipitating tendinitis.

NOTE: Animals with septic laminitis or rotation of P-3 through sole have a very poor prognosis. These animals should be considered for euthanasia.

- c. Monitor the effectiveness of all treatment, and seek the advice and assistance of a veterinarian whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage laminitis.

Performance Measures

1. Understand the pathophysiology and cause of laminitis.
2. Recognize the signs and symptoms of acute laminitis.
3. Manage acute laminitis.
4. Recognize the signs and symptoms of chronic laminitis.
5. Treat chronic laminitis.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

FM 8-52
MERCK, VET 1998

Manage Lameness**081-833-4616**

Conditions: Given a field environment and a history and physical examination of the animal, a Special Forces tactical medical equipment set, The Merck Veterinary Manual, and an equine.

Standards: Manage lameness in an equine without causing injury to the animal.

Performance Steps

1. Review the animal's history and physical examination.
2. Try to observe the animal's motion in a natural environment.
3. Obtain a differential diagnosis by eliminating either disease process or trauma as the cause.

NOTE: Lameness is not a disease but an indication of pain, weakness, deformity, or other impediment in the musculoskeletal system.

4. Manage the lameness after the definitive cause has been determined.
 - a. Bruised sole and corns.
 - (1) Relieve the pressure from the affected area.
 - (2) If the corn is suppurating, drain the corn by a surgical opening.
 - (3) After completing initial drainage, dress the corn to permit further drainage.
 - (4) Keep the animal in a dry, clean box stall.
 - (5) After controlling the infection, loosely pack the cavity and place a metal or leather sole between the foot and shoe.

NOTE: Systemic antibacterial therapy would be indicated only in severe septic cases.

- b. Puncture wounds of the foot.
 - (1) Treat with disinfectants and poultices promptly.
 - (2) Ensure drainage from the site to prevent abscess from forming.
 - (3) Place the foot in a rubber or plastic boot with a suitable poultice for 3 to 5 days.
 - (4) Give tetanus immunizations.

NOTE: Continuous severe pain may require a palmar nerve block.

5. Provide symptomatic care throughout the animal's condition.
6. Record and maintain a log of each individual animal treated.
7. Recommend an evaluation by a veterinarian, if possible.

Performance Measures

1. Reviewed the animal's history and physical examination.	_____	_____
2. Attempted to observe the animal's motion in a natural environment.	_____	_____
3. Obtained a differential diagnosis.	_____	_____
4. Managed lameness caused by bruised sole and corns.	_____	_____
a. Relieved the pressure from the affected area.		
b. Drained corn by a surgical opening if it was suppurating.		
c. Dressed the corn to permit further drainage.		
d. Kept the animal in a dry, clean box stall.		
e. Loosely packed the cavity and placed a metal or leather sole between the foot and shoe, after the infection was controlled.		
5. Managed lameness caused by puncture wounds of the foot.	_____	_____
a. Treated with disinfectants and poultices promptly.		
b. Ensured drainage from the site.		

GO NO GO

Performance Measures

GO **NO GO**

c. Placed the foot in a rubber or plastic boot with a suitable poultice for 3 to 5 days.		
d. Gave tetanus immunizations.		
6. Provided symptomatic care.	_____	_____
7. Recorded and maintained a log of each individual animal treated.	_____	_____
8. Recommended an evaluation by a veterinarian, if possible.	_____	_____

Evaluation Guidance: Give the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK, VET 1998

Manage Choke and Bloat in a Ruminant Animal

081-833-4617

Conditions: Given a restrained, sick ruminant animal and a Special Forces (SF) tactical medical equipment set, the animal's history, and its physical examination.

Standards: Manage choke or bloat in a ruminant animal without causing further injury to the animal.

Performance Steps

1. Review the animal's history and physical examination, if possible.
2. Restrain the animal in accordance with task 081-833-4597, Perform Physical Restraint on Domestic and Companion Animals.
3. Confirm a definitive diagnosis.
 - a. Choke.
 - (1) An obstruction of the esophagus by food masses or foreign bodies.
 - (a) Ruminants usually choke on solid objects such as apples, pears, potatoes, or ears of corn.
 - (b) Obstruction occurs most frequently in the cervical and less often in the thoracic portion of the esophagus.
 - (2) Characteristic signs include bloating, salivation, chewing movements, protrusion of the tongue, extension of the head and neck, dyspnea, grunting, and coughing.
 - b. Bloat.
 - (1) Excessive accumulation of gas in the rumen and reticulum.
 - (a) Severe bloat causes great discomfort and is frequently fatal.
 - (b) Bloat may be classified as primary (pasture bloat) or secondary (choke).
 - (2) Pasture bloat may occur at any time, but the incidence is higher in wet summers on legume pastures (clover).
 - (a) Distension occurs on the left side, breathing becomes labored, and profuse salivation may occur.
 - (b) Grazing usually ceases; eructation usually continues but with decreased frequency.
 - (c) Tympany becomes severe, mucous membranes become cyanotic, and the gait staggering.
 - (d) Death usually occurs within a few minutes of the animal going down.
4. Manage choke.
 - a. Object causing obstruction in the cervical esophagus may be located by external palpation and passage of a stomach tube.
 - b. Solid objects may be massaged upward and removed from the mouth.
 - c. Stiff stomach tube may be used to dislodge objects, if necessary.
5. Manage bloat.
 - a. Pass a large stomach tube and manipulate it to encounter gas pockets.
 - b. Trocarization of the rumen through the left paralumber fossa may be necessary.
 - c. Provide defoaming agents immediately.
 - (1) Peanut oil.
 - (2) Corn oil.
 - (3) Soybean oil.
6. Record all treatment given.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Reviewed the animal's history and physical examination, if possible.	—	—
2. Restrained the animal.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Diagnosed choke or bloat from the history and physical exam.	_____	_____
4. Managed choke.	_____	_____
a. Massaged object upward and removed from the mouth.		
b. Used stiff stomach tube to dislodge objects when necessary.		
5. Managed bloat.	_____	_____
a. Passed a large stomach tube and manipulated it to decompress gas pockets.		
b. Trocarization of the rumen through the left paralumber fossa may be necessary.		
c. Provided defoaming agents immediately.		
6. Recorded all treatment given.	_____	_____

Evaluation Guidance: Give the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK, VET 1998

Perform a Necropsy
081-833-4618

Conditions: Given a knife and an animal that has been selected for slaughter.

Standards: Inspect the animal before and after slaughter to ensure the animal does not suffer from any disease that may be passed to humans during consumption.

Performance Steps

1. Inspect the animal prior to death, if possible.
 - a. Posture and gait: note deformities, lameness, gait abnormalities, or "down" animal.
 - b. State of nutrition: note very poor nutrition which may indicate chronic disease. Examine the animal for the presence of rumination and fecal production.
 - c. Reaction to environment: note animals that are very lethargic (ill) or hyperexcitable (rabies or tetanus).
 - d. Respiratory system: note labored breathing or coughing.
 - e. Vulva, mammary glands: note signs of infection.
 - f. Hide, skin, and hair: note diffuse lesions.
 - g. Temperature: note if elevated (may recheck later).
 2. Reject animals found to be sick or debilitated.
 3. Inspect the animal after death.
 - a. State of nutrition: note poor nutrition.
 - b. Bruising: If the animal was to be consumed, cut off bruised area, if bruising was local.
 - c. Swelling in joints, muscle, and bones: If the animal was to be consumed, cut out the bruising if it is local; reject the carcass, if swelling is found in more than one body area.
 - d. Edema: sign of disease.
 - e. Inflammation; adhesion; abscessed pleura, peritoneum, or viscera; signs of septicemia: reject the carcass if it is to be consumed.
- NOTE: If the animal is to be consumed, viscera should always be discarded in the field environment, if possible.
- f. Parasitism and signs of other infection: Cut through the tongue, cheek, diaphragm, lung, liver, and several lymph nodes (thoracic and mesenteric lymph are most important) to check for parasitism and other signs of infection. If parasitism or infection is present and carcass is to be consumed, reject carcass.
 - g. Jaundice and arthritis (poultry): Check eyes, gonads, and visceral organs for jaundice and arthritis. If jaundice or arthritis are present and carcass is to be consumed, reject carcass.
 4. Reject any part of the carcass that contains parasites or abnormalities.
 5. Reject carcass if signs of systemic parasitism, disease, and/or infection are found.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier an animal that must be inspected and necropsied for signs of disease.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Inspected the animal prior to death, if possible.	—	—
2. Rejected animals found to be sick or debilitated.	—	—
3. Inspected the animal after death.	—	—
4. Rejected any part of the carcass that contained parasites or abnormalities.	—	—

Performance Measures

GO **NO GO**

5. Rejected carcass if signs of systemic parasitism, disease, and/or infection were found.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
FM 8-52
MERCK, VET 1998

Treat Zoonotic Diseases in Livestock and Domestic Animals

081-833-4619

Conditions: Given a field environment, animals within the surrounding area transported to you for treatment, a Special Forces individual combat laboratory set, and the animal's history.

Standards: Recognize and treat the symptoms of a particular disease without causing further injury to the animal.

Performance Steps

1. Review the animal's history with the owner.
2. Perform a physical examination of the animal (081-833-4601, Perform Physical Examination of Animals).
3. Perform all necessary diagnostic laboratory tests.
4. Obtain a differential diagnosis.
5. Identify and treat the disease.
 - a. Trichinosis.
 - (1) Infection occurs by ingestion of muscle tissue containing viable trichinae. The diaphragm, tongue, masseter, and deltoid muscles are the most heavily involved. The larvae may invade tissues other than striated muscle and can cause heart or central nervous system (CNS) damage.

NOTE: Most infections are light and go undiagnosed.

- (2) In heavy infections that produce serious illness and occasional deaths, three clinical phases are evident:
 - (a) Intestinal phase: starts 24 hours after ingestion of infected meat and continues for about 1 week. It results in nonspecific gastroenteritis that may cause diarrhea, slight fever, and mild abdominal pain.
 - (b) Muscle invasion phase: starts about 1 week after infection and continues for several weeks. It is characterized by anorexia, emaciation, muscular pains, dyspnea, edema, low fever, and eosinophilia. The invaded muscles are hard, swollen, tense, and painful--especially the muscles of respiration, mastication, and movement. Peak eosinophilia occurs 2 to 3 weeks after infection.
 - (c) Convalescent phase: begins 5 to 6 weeks after infection.
 - (3) Tentative antemortem diagnosis: swine, cats, and dogs with the above signs are prime suspects--especially if there is a history of feeding them raw or undercooked pork.
 - (4) Most domestic animals are infected by eating garbage containing raw or insufficiently cooked pork. Prophylaxis can be accomplished by either of the following methods:
 - (a) Eliminating the feeding of garbage or wildlife carcasses to domestic animals.
 - (b) Boiling all garbage and carcasses at 212 degrees Fahrenheit (100 degrees Celsius) for 30 minutes.
 - (5) Treatment of the individual will be mainly symptomatic and supportive therapy to alleviate pain until the infection has subsided. Steroids are commonly used and thiabendazole should be given.
- b. Leptospirosis.
 - (1) Common mode of natural infection is from contact with urine or by intake of urine-contaminated feed or water. Rats are important reservoirs of infection and spreaders of the disease.
 - (2) Signs in a contaminated herd include the abortion of animals in the middle or last third of gestation.
 - (3) Kidney damage will be the leading cause of mortality.
 - (4) White blood cells will be elevated.

Performance Steps

- (5) Calves are more affected with clinical signs of icterus and hemoglobinuria than adult cattle.
- (6) Animal necropsy findings include the following:
 - (a) Engorged liver.
 - (b) Icterus.
 - (c) Hemorrhagic gastroenteritis.
 - (d) Hemorrhagic lymph nodes (found often).
 - (e) Enlarged kidneys (found often).
 - (f) Oral ulcers (if uremic).
 - (g) Diffusely hemorrhagic myocardium (found often).
- (7) Prophylaxis includes the following:
 - (a) Rodent control.
 - (b) Fencing off certain surface water areas that may be contaminated.
 - (c) Vaccination with bacterins.
- c. Salmonellosis.
 - (1) Clinical presentation of the disease is as follows:
 - (a) The disease caused by many species of salmonellae is characterized by one or more of three major syndromes: septicemia, acute enteritis, and chronic enteritis.
 - (b) A clinically normal animal carrier is of major concern for all host species.
 - (c) Young animals (foals, calves, lambs, and piglets) usually develop the septicemic form.
 - (d) Adult cattle, sheep, and horses commonly develop acute enteritis.
 - (e) Chronic enteritis may occur in pigs and adult cattle.
 - (f) The source of infection includes the feces of infected animals that can contaminate feed, water, and milk.
 - (g) The causative organism can survive for months in wet, warm areas.
 - (h) Route of the infection is oral, and the organism multiplies in the intestine causing the enteritis.
 - (i) Septicemia can result in localization in the brain and meninges, pregnant uterus, and the distal extremities of the tips of the ears and tail. Gangrene of the feet, tail, and ears may occur as well.
 - (2) Treatment requires broad-spectrum antibiotics (task 081-833-4623, Medicate Domestic Animals).
 - (3) Prevention requires rodent-proof grain storage, rodent control, good sanitation of pens, isolation of newly purchased animals, and isolation of newborns and dams from the rest of the herd.
- d. Tularemia.
 - (1) The infection is transmitted directly to domestic animals and man by arthropod vectors.
 - (2) Domestic animals are usually infected by ticks or the ingestion of infected wildlife.

NOTE: Man can become infected from handling, skinning, and cleaning infected wildlife or game birds; from eating undercooked, infected meat; drinking contaminated water; inhalation, or arthropod bites.

 - (3) The causative agent, a nonspore-forming gram-negative organism is killed quickly by heat but may survive 3 to 4 months in mud, water, or carcasses.
 - (4) Common signs include a high fever (104 to 107 degrees Fahrenheit), stiffness, weakness, lassitude, increased respiration, coughing, and diarrhea. Incoordination, prostration, and death may follow.
 - (5) The necropsy shows characteristic lesions: miliary, whitish to yellowish foci (2 to 8 millimeters [mm]) in the lymph nodes, liver, and spleen.
 - (6) Control and treatment include tetracycline at levels up to 5.7 milligrams per pound (mg/lb) of body weight daily. Tick control and preventing ingestion of contaminated food and water should be the primary considerations.
- e. Anthrax.

Performance Steps

- (1) A gram-positive, nonmotile, spore-forming bacterium. Once discharged from an infected animal or opened carcass, the bacteria form spores which are resistant to heat, low temperature, chemical disinfectants, and prolonged drying. They may persist for years in dry products such as feed, animal by-products, or in the soil.
- (2) Cattle, horses, mules, sheep, and goats may become infected through grazing. Swine, dogs, and cats frequently acquire the disease from consuming contaminated meat.
- (3) Clinical findings.
 - (a) The peracute form has a sudden onset and rapidly fatal course. Staggering, difficult breathing, trembling, collapse, a few convulsive movements, and death may occur in cattle, sheep, or goats without any previous evidence of illness.
 - (b) In acute anthrax of cattle, horses, and sheep, there is first a rise in temperature and a period of excitement followed by depression, stupor, respiratory and cardiac distress, staggering, convulsion, and death.
 - (c) The chronic form of anthrax with local lesions confined to the tongue and throat is seen mostly in swine and occasionally in cattle, horses, and dogs.
 - (d) A cutaneous form of anthrax, characterized by swelling in various parts of the body, occurs in cattle and horses when anthrax organisms lodge in wounds or abrasions of the skin.
- (4) The carcass of an animal dead of anthrax should not be subjected to a necropsy. Rigor mortis is frequently absent or incomplete. There may be dark blood oozing from the nostrils and anus, marked bloating, and rapid decomposition.

NOTE: Sudden death should not be considered a diagnosis for anthrax. In cattle and sheep, the clostridial infections, bloat, and lightning strike may be mistaken for anthrax. Acute leptospirosis, bacillary hemoglobinuria, anaplasmosis, and acute poisonings from broken fern must be considered in cattle. In horses, equine infectious anemia, severe colic, and heat stroke may resemble anthrax. In swine, acute hog cholera and malignant edema may resemble anthrax.

- (5) Anthrax requires early treatment, and rigid control measures are essential.
 - (a) Treat early stages of the disease with penicillin or oxytetracyclines.
 - (b) Control the disease with annual vaccination.
 - (c) When an outbreak occurs, use vaccination, quarantine, burial (deep) of dead animals, scavenger control, and destruction of manure and bedding that are contaminated.

f. Brucellosis.

- (1) Cattle, swine, sheep, goats, and dogs are affected by the disease. It is characterized by abortion in the female, orchitis in the male, and infertility in both sexes.
- (2) Abortion of the fetus is the most obvious manifestation of the disease.
- (3) Diagnosis is based on bacteriologic or serologic examination. A brucella card test is the best in the field. (See task 081-833-4608, Test Serum Specimen for Brucellosis.)
- (4) No practical treatment is known. Control and prevention are the measures to be taken.

g. Tuberculosis.

- (1) Three main types of tubercle bacilli are recognized: human, bovine, and avian.
- (2) All three types may produce infection in a host species other than their own.
- (3) The bovine type is the most cosmopolitan and is capable of causing progressive disease in almost all warm-blooded vertebrates.
- (4) The disease commences with the formation of a primary focus, which in man and cattle is in the lung in about 90 percent of the cases. The primary lesion in poultry is nearly always in the intestinal tract. Lymphatic drainage from the primary focus in mammals leads to the formation of caseous lesions in the corresponding lymph node. This lesion, together with the primary focus, is known as the "primary complex."
- (5) In mammals, tubercles may become enclosed in dense fibrous tissue, and the disease becomes arrested.
- (6) When bacilli are numerous in the lymph and bloodstream, many tubercles develop in the major organs and the acute form of generalization known as miliary tuberculosis begins and is often rapidly fatal.

Performance Steps

- (7) Clinical signs exhibited depend upon the extent and location of the lesions. Small lesions located in deep lymph nodes may show no clinical signs.
 - (a) When the disease is progressive, the signs are weakness, anorexia, emaciation, and low-grade, fluctuating fever.
 - (b) The principal sign of tuberculosis commonly seen is the chronic wasting, or emaciation, that occurs despite good feeding and care.
 - (8) Diagnosis with the tuberculin test, which consists of intradermal .1 milliliter (ml) using a strain of *Myobacterium bovis* (M. bovis) for mammalian tuberculin preparation and .5 ml of tuberculin of *Myobacterium* (M. avium) for poultry.
 - (9) There are four principal control approaches:
 - (a) Test and slaughter.
 - (b) Test and segregate.
 - (c) Immunization (not very good).
 - (d) Chemotherapy and isoniazid (INH).
6. Record all actions taken.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Reviewed the animal's history.	_____	_____
2. Performed a physical examination of the animal. (See task 081-833-4601.)	_____	_____
3. Performed diagnostic tests.	_____	_____
4. Obtained a differential diagnosis.	_____	_____
5. Identified and treated the disease.	_____	_____
6. Recorded all actions taken.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK, VET 1998

Manage Domestic Animals

081-833-4620

Conditions: Given herds or flocks of domestic animals, animal feed products, animal pens or pastures, animal shelters, and a requirement to manage domestic animals.

Standards: Manage domestic animals so that the productivity of the herd is maximized, without compromising the health of the individual animals.

Performance Steps

1. Select herd animals.
 - a. Establish goals for the herd, and select animals that will upgrade herd quality.
 - b. Select animals on the basis of type, production testing (milk, litter size, and so on), performance testing, and progeny testing.
2. Provide food and water for domestic animals.
 - a. Ensure that the feed is clean.
 - b. Sources of food are:
 - (1) Forage: Good quality pasture and hay makes up the majority of the bovine diet. The higher the quality, the less supplementation is necessary.
 - (a) Divide pasture into sections depending on herd size, pasture productivity, and weather conditions.
 - (b) Rotate animals from section to section to avoid depleting the pasture and prevent the buildup of parasites in the soil.
 - (c) Allow animals to feed on grass only 2 to 8 inches in height. If the grass is over 8 inches high, it should be cut and baled for storage, if possible.
 - (d) Ensure that pastures are replanted with seasonal grasses, as necessary.
 - (2) Grain and/or carbohydrate source: Many animals must be supplemented with grain or some other carbohydrate source for maximum production. This source can be corn, rice, wheat, or any other carbohydrate source that is readily available in the country. Economics must be considered when determining this source.
 - (3) Protein supplement: Adding protein supplements may be necessary--especially in dairy animals--for maximum production. Sources include cottonseed meal, soybean meal, meat and bone meal, fish meal, blood meal, distiller's or brewer's grains, and so on. Often these are byproducts from other food processing.
 - (4) Vitamins and/or minerals: Providing a vitamin and/or mineral supplement to balance out the diet is often much more economical than other portions of the diet. These supplements may be in the form of salt or mineral blocks, granules added to other supplements or feed, or free choice granules. They should be given free choice or force-fed mixed with other feed. Selenium supplementation has been found to be very helpful in preventing many diseases and conditions.
 - c. Store food in dry shelters that are protected from vermin.
 - d. Does not overfeed the herd. There is no advantage to overfeeding, and it may result in health problems for individual animals.
 - e. Water: A good source of fresh, clean water must be available at all times. In hot, humid areas, cattle may drink from 15 to 20 gallons per head per day (gal/head/day). This may be even higher in dairy cattle.
3. Provide shelter.
 - a. Ensure that the shelter is feasible for its intended use.
 - (1) Are materials available?
 - (2) Is the necessary construction expertise available?
 - (3) Is an appropriate location available?
 - (4) Is the shelter necessary?
 - b. Ensure that the shelter is of the appropriate size and type.

Performance Steps

- c. Ensure that the shelter is well ventilated.

NOTE: In poorly ventilated shelters, ammonia concentrations can build up to harmful levels.

4. Provide disease control.
 - a. Quarantine sick and new animals for at least 21 days.
 - b. Immunize the herd (task 081-833-4622, Establish a Veterinary Immunization Program).
 - c. Ensure that feed remains clean.
 - (1) Store the feed in a clean area, protected from vermin.
 - (2) Provide food troughs, if possible, to keep feed off the ground.
 - d. Clean stalls and pens daily, and remove waste from confined enclosures.

5. Breed the animals.

NOTE: Breeding is a natural act and will usually take place without intervention. The goal of selective breeding is to prevent undesirable animals from breeding, thus preventing the production of undesirable offspring which would ultimately lower herd quality.

- a. Establish herd goals, and select animals for breeding that will upgrade the herd quality.
 - b. Select animals for breeding based on type, production testing (milk, litter size, and so on), performance testing, and progeny testing.
 - c. Prevent father-to-daughter and brother-to-sister breeding to lower the risk of selecting for genetic mutations.
6. Manage newborn and mother animals.
 - a. Move the mother to a birthing stall or enclosure before the birth.
 - b. Increase the daily feed allotment for the mother.
 - c. Ensure that the stall remains clean.
 - d. Aid and assist the birthing process, as necessary (task 081-833-4626, Manage [Nonsurgically] Obstetric Complications in Domestic Animals).
 7. Cull the herd.
 - a. Select the least desirable animals on the basis of age, health, low productivity, and poor feed to weight conversion.
 - b. Eliminate animals by sale or slaughter.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage domestic animals.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Selected herd animals.	_____	_____
2. Provided food and water for domestic animals.	_____	_____
3. Provided shelter.	_____	_____
4. Provided disease control.	_____	_____
5. Breeded the animals.	_____	_____
6. Managed newborn and mother animals.	_____	_____
7. Culled the herd.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required

Related
FM 8-52

**References
Required**

Related
MERCK, VET 1998

Treat Ectodermal/Endoparasitic Diseases in Domestic Animals

081-833-4621

Conditions: Given a field environment and a Special Forces (SF) tactical medical equipment set, SF individual combat laboratory set, and the animal's history.

Standards: Identify and treat ectodermal parasitic and endoparasitic infections without causing injury to the animal.

Performance Steps

1. Review the animal's history.
2. Perform a physical examination of the animal (task 081-833-4601, Perform Physical Examinations of Animals).
3. Take specimens, and perform diagnostic laboratory work.
 - a. Check for parasite eggs.
 - (1) Direct smear gives a good idea of the number of eggs being passed in fecal material and an idea of the severity of the problem.
 - (2) Concentration technique of flotation.
 - (a) Use a commercial flotation solution.
 - (b) A field-expedient method can be used. For example, dissolve 1 pound of granulated sugar into 12 fluid ounces of water by using the double boiler technique. After this solution cools, add 6 milliliters (ml) of formaldehyde to act as a deterrent to mold and yeast growth.
 - (c) Add table salt to water until saturated (no more salt will go into solution with stirring).

NOTE: Salt is corrosive to metal parts of a microscope; therefore, the microscope base should be cleaned after looking at the slide.

- b. Identify mites.
 - (1) Perform skin scraping.
 - (a) Materials used are: any light lubricating oil (mineral oil is good), a number 10 scalpel blade, and microscope slide and microscope.
 - (b) Put one drop of oil on the microscope slide, and use a number 10 scalpel blade to pick up a small amount of oil on the blade. Squeeze the skin to be scraped between the thumb and forefinger, and scrape the lesion with the blade while squeezing. The best site is at the sides of the lesion, not the center. Place the skin scraping on the microscope slide, and examine.
 - (2) Identify lice infestation by a good examination of the animal, looking for lice and eggs attached to the hair.
 - (3) Identify fleas and ticks by an examination of the skin.
4. Treat the animal for parasites.
 - a. Try to give one broad-spectrum antihelminthic for each species considering cost, refrigeration capabilities, the spectrum, and ease of administration to the herd or flock.

NOTE: The treatment program you set up should be inexpensive and easily taught to the indigenous population so that it may be continued after you leave.

- (1) Equine: strongylid T paste or panacur paste.
- (2) Bovine: omnizole 43 percent paste wormer or panacur paste.
- (3) Caprine: omnizole suspension or boluses.
- (4) Ovine: omnizole suspension or boluses.
- (5) Canine: strongylid T suspension or Pinex (Pyrantel pamoate 50 milligrams per milliliter (mg/ml) (1 cubic centimeter per 10 pounds (cc/10 lb)).
- (6) Feline: strongylid T suspension (1 cc/10 lb).
- (7) Porcine: levamasole soluble pig wormer in drinking water or strongylid T suspension (1 cc/10 lb) for piglets or panacur paste for large sows or boars.

Performance Steps

- b. Ectodermal parasites require insecticide dips, dusting, or sprays.

NOTE: Herds require a dip vat.

- (1) Sevin dust.
- (2) Coumaphos (Co-Ral) 5 percent livestock duster.
- (3) Conav can be used on dogs, cattle, sheep, goats, horses, and swine as a spray or dip.

5. Take reinfestation preventive measures.

- a. Control of parasite diseases.

- (1) Fundamental ecological concepts of helminthic parasitism in general and especially of grazing animals are that every animal is infected and that contamination of the environment is continuous.
- (2) The objective of a parasite control program must be the achievement of a maximum economic gain. This goal may not be synonymous with total control of infection.

- b. Principles of control:

- (1) Maintain nutritional levels.
- (2) Ensure rotational grazing and pasture management.
 - (a) Move from a pasture after 1 week to a pasture that has been rested for 4 weeks.
 - (b) Short pastures increase infestations.
 - (c) Do not allow range animals to graze in marshy areas, if possible.
- (3) Conduct barn management.
 - (a) Remove manure frequently.
 - (b) Provide adequate feeding space.
- (4) Protect young animals by the regular treatment of breeding females.
- (5) Control by protective treatments.
 - (a) Carry out treatments at the same time every year or at the same stage in the management program with the specific purpose of eliminating known high-risk periods.
 - (b) Add tactical treatments to the strategic program to abort outbreaks when abnormal climate or nutritional conditions arise.

6. Record all treatment in a logbook.

Performance Measures

GO **NO GO**

1. Reviewed the animal's history.	_____	_____
2. Performed a physical examination of the animal. (See task 081-833-4601.)	_____	_____
3. Took specimens and performed diagnostic laboratory work.	_____	_____
4. Treated the animal for parasites.	_____	_____
5. Took reinfestation preventive measures.	_____	_____
6. Recorded all treatment in a logbook.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK, VET 1998

Establish a Veterinary Immunization Program

081-833-4622

Conditions: Given a field environment, a completed area study of animals and diseases determined to be in the area, needles, syringes, and the required amount of serum (immunization medications).

Standards: Establish a veterinary immunization program in the area of operation.

Performance Steps

1. Understand the possible diseases in the area from the area study.
2. Ensure the public is educated on the importance of vaccination in disease control.
3. Establish an identification system and log for the animals that have been vaccinated.
4. Administer immunizations following manufacturer's directions.
 - a. Passive immunization: Transferring preformed antibodies from a resistant to a susceptible animal produces an immediate but short-lived resistance.
 - b. Active immunization: Although relatively slow to develop active immunization is long-lasting and will protect an animal for many months or years.
5. Ensure the public understands the importance of revaccination.
6. Isolate the animal vaccinated, if necessary.
7. Dispose of used immunization bottles and equipment properly.
8. Record all treatment given and maintain a record of treatment of the herd or individual animal, if possible.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the possible diseases in the area from the area study.	—	—
2. Ensured the public was educated on the importance of vaccination in disease control.	—	—
3. Established an identification system and log for the animals that have been vaccinated.	—	—
4. Administered immunizations following manufacturer's directions.	—	—
5. Ensured the public understood the importance of revaccination.	—	—
6. Isolated the animal vaccinated when necessary.	—	—
7. Properly disposed of used immunization bottles and equipment.	—	—
8. Recorded all treatment given and maintained a record of treatment of the herd or individual animal when possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK, VET 1998

Medicate Domestic Animals

081-833-4623

Conditions: Given needles, syringes, topical medications, and various tubing for oral administration of medications.

Standards: Administer a medication to an individual animal, caprine, bovine, swine, or equine in a correct manner topically, orally, or intramuscularly (IM).

Performance Steps

1. Administer an injectable medication to an animal.

- a. Inject a medication into an equine IM by one of the following procedures:

- (1) Use a 16- to 18-gauge needle for injections.

WARNING: No more than 20 milliliters (ml) should be injected at any one time.

- (2) Use the gluteal muscles halfway between the greater trochanter and the tuber coxae.

NOTE: When using this area for injection, the medic should stand on the opposite side of the injection site and reach across the back to administer the injection. The animal will usually kick to the injected side.

- (3) Use the brachiocephalicus muscle in the neck.

NOTE: This site requires little restraint; however, this site is not to be used for large quantities of medication.

- (4) Use the tricep muscle for medications that are not easily absorbed.

WARNING: This site should not be used on an animal that will be harnessed or saddled within several weeks.

- b. Inject a medication into a bovine IM by one of the following methods:

- (1) Use the gluteal muscle.

- (a) Restrain the animal in a stanchion while crowded in an alley.

- (b) Clean the injection site with 70 percent alcohol.

- (c) Strike the animal with the flat of the hand.

- (d) Turn the hand slightly and strike the animal with the needle, popping the skin perpendicular to the surface of the skin.

NOTE: Striking the animal in this manner lessens the awareness of the needle being inserted.

WARNING: The needle should not be attached to a syringe as this procedure is taking place since a sudden movement of the animal could cause the needle or syringe tip to break.

- (e) With slight negative pressure applied to the syringe, ensure that the needle is not in a blood vessel.

- (f) Inject the medication, and withdraw the needle.

NOTE: Regularly avoid administering large quantities of medication into the gluteal muscles in dairy cows, because these muscles are thin and there is the possibility of abscesses or cellulitis.

- (2) Use the semitendinosus muscle.

NOTE: Apply tail restraint when performing this injection.

- (3) Use the triceps for small quantities of medication when the animal can be restrained from making lateral movements.

NOTE: Give injections for very young animals in the lateral femoral muscle, but take care to avoid damage to the sciatic nerve.

- (4) Use the neck muscle in the area just anterior to the scapula in heavily muscled animals such as a bull.

- c. Inject a bovine or equine subcutaneously (SQ) by one of the following methods:

- (1) Use SQ injections for drugs that are not irritating to the tissues.

- (a) Prepare the site by cleaning the skin with 70 percent alcohol.

- (b) Use an 18- to 20-gauge needle.

- (c) Grasp a fold of tissue, and administer the injection.

- (d) Massage the injection site to aid absorption.

- (2) Use the middle area of the neck between the scapula and the ramus of the mandible.

Performance Steps

NOTE: When you are administering a medication that is not easily absorbed, the injection site should be just over or behind the spine of the scapula. The movement of the animal aids in the absorption.

d. Give an injection to a caprine by one of the following methods:

(1) Use the semitendinosus or semimembranosus muscles for IM injections.

NOTE: Few caprines have enough muscle mass anywhere else to safely give an intramuscular injection.

(2) Use the neck or shoulder area to administer SQ injections.

e. Give an injection to a swine by one of the following methods:

(1) Use a 16- to 18-gauge needle in the dorsal neck muscle for IM injections.

(2) Use an 18- to 19-gauge needle in the medial side of the ham for IM injections in a piglet.

(3) Use a 16- to 18-gauge needle to administer a subcutaneous injection posteriorly to the base of the ear.

NOTE: Inserting the needle and injecting the medication takes place quickly.

2. Administer an oral medication to an animal by one of the following methods:

a. Give oral medications by balling gun.

(1) Restrain the animal so it cannot move.

NOTE: Ensure the balling gun's end is smooth and preferably made of soft plastic.

(2) Pry open the side of the mouth.

(3) Slide the balling gun over the base of the tongue.

(4) Release the lubricated bolus.

b. Give an oral medication by a dose syringe.

(1) Use a dose syringe with a large bulb tip.

NOTE: Ensure the dose syringe has a large bulb tip to keep the animal from receiving injuries to the mucous membranes.

(2) Stabilize the head of the animal in a horizontal position.

(3) Introduce the bulb end into the interdental space and over the base of the tongue.

(4) Deliver the medication.

WARNING: If the animal coughs, the head should be lowered to prevent aspiration into the trachea.

c. Give an oral medication by stomach tube.

(1) Restrain the animal.

(2) Place a block to maintain an open mouth.

(3) Use the correct size speculum for the size of the animal.

(4) Gather and measure the appropriate size tube for the size of the animal.

(5) Place the tube into the esophagus over the base of the tongue.

NOTE: Take care to visualize or feel the passing of the tube through the esophagus to ensure placement of the medication in the rumen.

WARNING: If any doubt exists regarding the location of the tube, it should either be passed again or air should be blown into the tube so that an assistant listening with a stethoscope over the left paralumbar fossa can hear air bubbling through the rumen contents.

3. Administer a topical medication to an animal.

a. Apply a topical medication to the eye.

(1) Place the hand holding the dropper on the animal's head.

(2) Use the free hand to evert the animal's lower lid.

(3) Place the drops on the inner canthus without the dropper touching the eye.

NOTE: Place eye ointment in a 3-millimeter (mm) wide strip on the lower palpebral border.

b. Apply a topical medication to the ear.

(1) Straighten the ear canal by pulling the earflap upward and backward.

(2) Place the nozzle or tube slightly downward and medially a short distance into the ear canal.

(3) Administer the medication.

(4) Gently massage the base of the ear to spread the medication over the lining of the horizontal and vertical ear canal.

4. Record all treatment given.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Administered an injectable medication to an animal.	_____	_____
2. Administered an oral medication to an animal.	_____	_____
3. Administered a topical medication to an animal.	_____	_____
4. Recorded all treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 8-52
	MERCK, VET 1998

Administer an Intravenous Infusion to an Animal

081-833-4625

Conditions: Given intravenous (IV) catheters, IV administration sets, alcohol or betadine swabs, and appropriate fluids.

Standards: Soldier must administer an IV to an animal without causing further harm.

Performance Steps

1. Prepare the equipment for an IV infusion as per task 081-833-0033, Perform an IV.
2. Prepare the IV site. The IV site should be shaved if possible and cleaned in accordance with the above noted task.
3. Administer an IV to an equine (Figure 1).

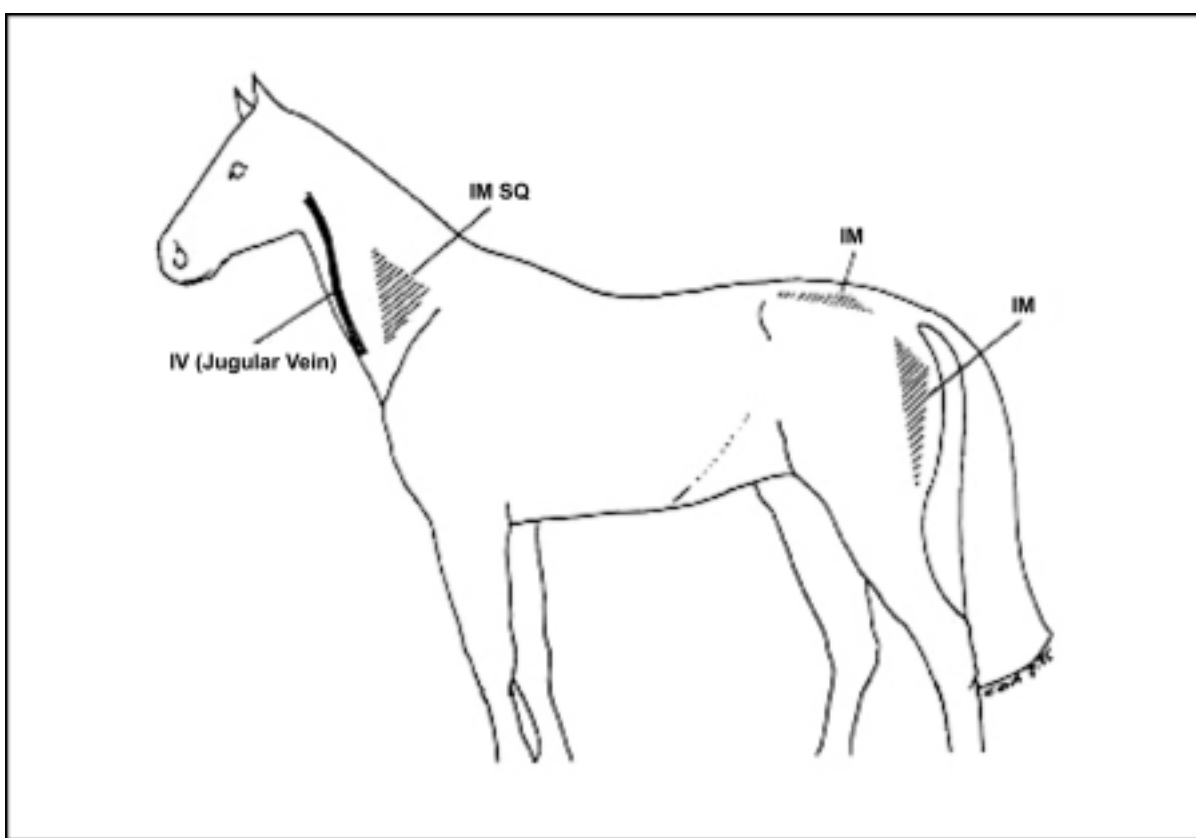


Figure 1. Administer the IV to an Equine

- a. Administer the IV in the jugular vein.
 - b. Avoid the upper 1/3 of the vein to minimize the risk of perforating the carotid artery.
4. Administer an IV to a bovine, caprine, or ovine (Figure 2).

Performance Steps

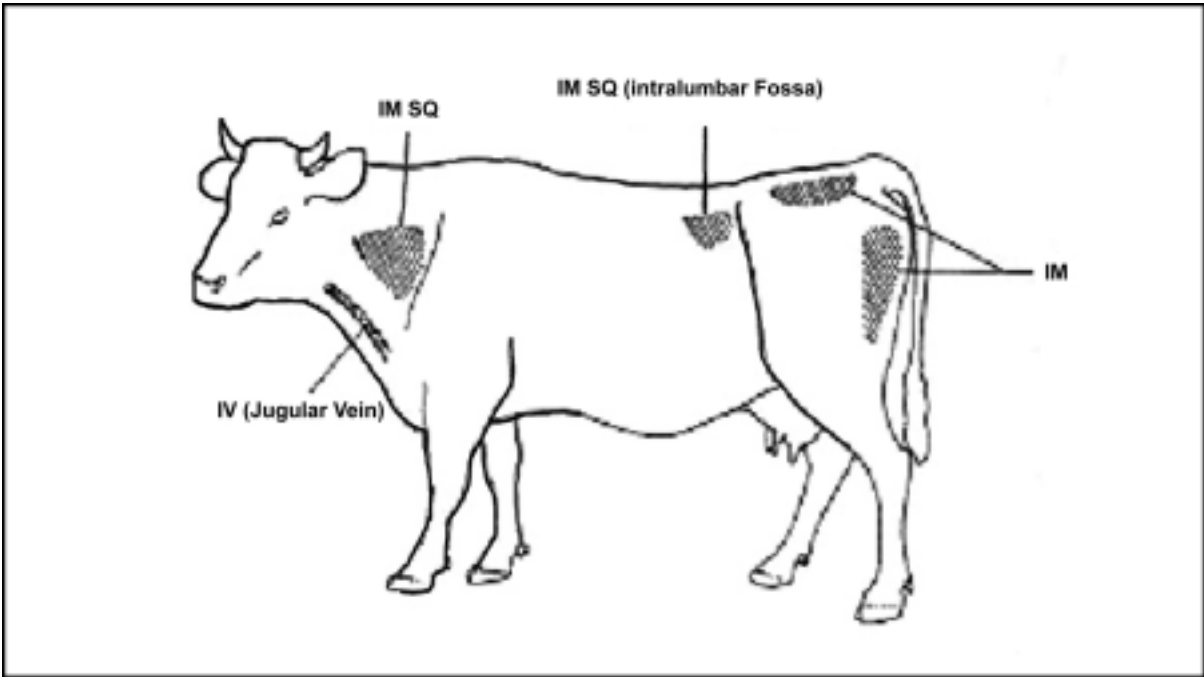


Figure 2. Administer an IV to an Bovine

- a. The jugular vein may be used in these animals.
- b. Alternative sites are the tail vein and the milk vein in females.
- 5. Administer an IV to a canine or feline.
 - a. The jugular vein is normally used.
 - b. The cephalic vein is an alternate site.
- 6. Secure the IV.
- 7. Record the procedure.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated animal patient and a scenario in which he must perform an IV.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepared the equipment for an IV infusion.	—	—
2. Prepared the IV site.	—	—
3. Administered an IV to an equine in the distal 2/3 of the jugular vein.	—	—
4. Administered an IV to a bovine, caprine, or ovine. a. Tried the jugular vein first. b. Tried alternative sites if unable to obtain a jugular IV.	—	—
5. Administered an IV to a canine or feline. a. Tried the jugular vein first. b. Tried the cephalic vein if unable to obtain a jugular IV.	—	—
6. Secured the IV.	—	—
7. Recorded the procedure.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

STP 31-18-SM-TG

Related

MERCK, VET 1998

Manage (Nonsurgically) Obstetric Complications in Domestic Animals

081-833-4626

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book set.

Standards: Manage obstetric complications in domestic animals so that the life of the animal is preserved without causing further harm.

Performance Steps

Note: For this task, the bovine is used as the example species. Similar principles can be used for other species.

1. Understand the general principles associated with dystocia.
 - a. The definition of dystocia is any condition which causes parturition to be prolonged.
 - b. The objective in any dystocia is to deliver a living fetus while preventing injury to the mother.
 - c. Most dystocias are due to twinning, malpositioning of the fetus, or fetal dam diparity, which can be corrected nonsurgically.
 - d. As a general rule, delivery is considered prolonged (in a bovine) if not complete within 1.5 to 2 hours after the water sac ruptures.
 - e. Another indication that help is needed is when a portion of the calf can be seen, and it is not in the normal front feetfirst position.
2. Perform a physical examination (exam) of the animal (task 081-833-4601, Perform a Physical Examination on an Animal).
 - a. Restrain the animal (task 081-833-4597, Perform Physical Restraint on Domestic and Companion Animals).
 - b. Specific findings to be aware of in the obstetric exam are:
 - (1) The animal's behavior and posture as well as the character of her breathing.
 - (2) The animal's ability to get up and stand.
 - (3) Her response to stimulation.
 - (4) The degree and frequency of straining.
 - (5) The presence of placenta, visceral organs, or fetal extremities from the vulva.
 - (6) The character of any vulvar discharges.
 - (7) The appearance of the vulva itself.
3. Prepare for the procedure.
 - a. In preparation for exam of the animal's genital tract and the fetus, the mother's tail (if she has one) should be secured to her neck with a cord.
 - b. At this point, the medic must protect himself from being infected with the many organisms (brucellosis, Q fever, leptospirosis, or staphylococcus) that may be present in the fetal tissues and fluids.
 - c. Cover all exposed skin by wearing shoulder-length plastic gloves (a garbage bag and exam glove with duct tape around the wrist may be substituted) and goggles.
 - d. Clean the anus, perineum, vulva, and any protruding placenta or fetal extremities with soap or betadine and water.
 - e. From this point, all genital exam and obstetrical procedures should be performed as aseptically as possible.
4. Determine fetal viability and position.
 - a. Place a hand into the birth canal to palpate the fetus to determine its presentation, position, posture, and viability.
 - b. To determine the viability of a fetus before performing any obstetrical procedure, several reflexes can be tested.
 - (1) Depression of an eyeball should initiate either movement of the fetal head or, in a depressed fetus, movement of the eye.

Performance Steps

- (2) A finger inserted deeply into the mouth should stimulate the sucking reflex.
- (3) With a posterior presentation, a finger can be inserted into the fetal anus to detect movement of the entire fetus or contraction of the anal sphincter.
- (4) The skin of the fetus can be pinched or a limb flexed maximally to stimulate a response and thus indicate fetal viability.
- (5) The size of the fetus and that of the pelvis and birth canal should be compared.

c. Determine the fetal position.

NOTE: Most dystocias are due to the malposition of the fetus. Therefore, the correct determination of fetal positioning is paramount in the success of the delivery.

- (1) Normal fetal presentation is headfirst with legs extended.
- (2) Malpositions include:
 - (a) Lateral deviation of the head.
 - (b) Rear deflection of one or both extremities.
 - (c) Butt-first (breech) presentation.
 - (d) Upside-down presentation.

5. Manipulate the fetus into normal position.

- a. Manipulation of the fetus is greatly facilitated by pushing the fetus out of the birth canal into the uterus within the abdominal cavity.
- b. This enables use of the larger space in the abdomen cranial to the pelvic inlet for manipulating the fetus.
- c. It may be impossible to push the fetus into the uterus following a prolonged dystocia because the uterus has contracted around the fetus.
- d. In such cases, instilling a gallon of warm mineral oil or other lubricant will relax the uterus, lubricate the fetal hair, and greatly facilitate manipulation (use copious amounts of lubricant).

6. Extract the fetus.

- a. Once the fetus is brought into proper alignment, forced extraction may be necessary.
- b. Forced extraction is relatively safe. It can cause various injuries including damage to the head, limbs, and spinal cord of the fetus; damage to all areas of the birth canal and adjacent structures; and lacerations of the vulva, vagina, and rectal floor. The fetus may become wedged in the birth canal and become difficult to extract.
- c. Use of excessive force in such cases can result in damage to the obturator nerves of the mother's pelvis and subsequent paralysis. It has been recommended that the maximum traction applied should be equal to what can be provided by three adults.
- d. Forced extraction is accomplished by using obstetrical chains or ropes looped around the fetal extremities.
 - (1) The first loop should be placed above the fetlock joint.
 - (2) The second loop should be placed below the joint.
 - (3) Placement of two loops is believed to spread the extractive force over a larger area and reduce the probability of an epiphyseal fracture or damage to fetal nerves or tendons.
 - (4) The points of traction should include the limbs of the fetus and, with anterior presentation, the head.
 - (5) A loop of chain on the head should be secured as a bridle bit through the mouth of the fetus and around the poll of the fetal head.
 - (6) When the fetus is alive, this technique eliminates the possibility of damaging the cervical vertebrae or the trachea, which can occur if the chain is placed around the neck.
- e. With an anterior presentation, the traction should be applied in an upward and a backward direction until the head of the fetus is at the area of the vulva.
- f. Then the traction should be directed more downward and posterior.
- g. Traction should be alternated from limb to limb.
- h. By alternating traction on the forelimbs, it is possible to bring the shoulders of the fetus through the pelvis at an angle rather than squarely.
- i. After the shoulders have reached the vulva, the fetus should be rotated about 45 to 90 degrees so that its pelvis enters the mother's pelvis at its greatest diameter.

Performance Steps

7. Care for the fetus after extraction.
 - a. Once the fetus is out, the medic should clean the fluid out of the lungs, mouth, and nose. This is facilitated by hanging the neonate from its hind legs, thus allowing the fluid to run out.
 - b. A piece of grass or straw may also be stuck up the neonate's nose, causing it to sneeze and blow out the fluid.
 - c. Treat the calf's navel with tincture of iodine to prevent naval infections.
 - d. Provide a clean, dry area away from the wind.
 8. Care for the dam after extraction.
 - a. The cow's vulva and uterus should be checked for tears (using the same aseptic technique used during the pulling).
 - b. If placenta is still attached, but loose, it may be removed.
 - c. If the placenta is not very loose, leave it alone.
 - d. If oxytocin is available, 5 cubic centimeters (cc) intramuscularly (IM) or intravenously (IV) will help the uterus contract down and decrease the chance of uterine prolapse.
 - e. Antibiotic infusion into the uterus may be required if the procedure was very dirty and the potential for infection seems good. Oxytet (approximately 50 cubic centimeters [cc] infused with a pipette) is a commonly available antibiotic that works well.
 - f. If the cow is down, she must be made to get up. A down cow, if left down, will do damage to the muscles and nerves of her legs that may be irreversible.
 9. Recognize uterine prolapse.
 - a. Prolapse of the uterus usually occurs within a few hours after parturition when the cervix is open and the uterus lacks tone.
 - b. Prolapse is usually complete and the mass of uterus usually hangs below the hocks of the affected animal.
 10. Manage uterine prolapse.
 - a. Adequately restrain the animal.
 - b. Remove the placenta, if it is still attached, and thoroughly clean the endometrial surface.
 - c. The uterus is then returned to its normal position by first administering an epidural.
 - d. If the animal is standing, the uterus should be elevated to the level of the vulva on a tray held by assistants.
 - e. The uterus is then replaced by applying steady anterior pressure beginning at the cervical portion and gradually working toward the apex.
 - f. Once the uterus is replaced, the hand should be inserted to the tip of both uterine horns to be sure that there is no remaining invagination.
 - g. If the animal is recumbent, she should be placed in a position with the hindquarters elevated.
 - h. This can be done by moving her onto a sloping area or she may be placed in sternal recumbency with her hind legs extended backwards.
 - i. Following return of the uterus to its normal position, antibiotics (60 milliliters [ml] penicillin or oxytetracycline) are placed in the uterine cavity and oxytocin (5 ml IM) is administered.
 11. Recognize the signs and symptoms of milk fever (parturient paresis).
 - a. An afebrile disease of mature dairy cows occurring most commonly at or soon after parturition.
 - b. Manifested by circulatory collapse.
 - c. Generalized paresis.
 - d. Depression.
- NOTE: The disease is caused by acute hypocalcemia.
- e. Early in the onset the cow may exhibit some unsteadiness as she walks.
 - f. More frequently she is unable to rise and is found lying on her sternum with her head displaced to the side or turned into the flank.
 - g. The muzzle tends to be dry, and the extremities are cold.
12. Manage milk fever.

Performance Steps

- a. Treatment is directed toward restoring the serum calcium level to the normal range, and this must be done at the earliest possible opportunity.
- b. Calcium borogluconate is most commonly used (500+ ml, 25 % soln.).
- c. Preferably it is injected IV, but the subcutaneous (SQ) and intraperitoneal (IP) routes also are used (task 081-833-4625, Administer an Intravenous Infusion to an Animal).
- d. Animals that relapse or fail to get up after 8 to 12 hours should be re-treated.
- e. Providing a diet of normal to high phosphorus with low calcium during late pregnancy helps to prevent the condition.

13. Recognize the signs and symptoms of grass tetany (hypomagnesemic tetany).

- a. A metabolic disturbance characterized by hypomagnesemia, occurring most commonly in adult cows and ewes, especially those in heavy lactation and on lush grass pastures.
- b. It also occurs in cattle of any age or condition, particularly beef cattle, that are grazing on wheat or other cereal crops.
- c. It is manifested by irritability, tetany, and convulsions.
- d. In the most acute form of the disease, affected cows and sheep, which may be grazing in a normal manner, suddenly throw up their heads, bellow, gallop in a blind and frenzied manner, fall, and undergo severe paddling convulsions.
- e. In less severe cases, the animal is obviously ill at ease, walks with a stiff gait, is hypersensitive to touch and sound, urinates frequently, and may progress to the acute, convulsive stage.
- f. In all cases the loudness of the heart sounds and tachycardia are characteristic signs.

NOTE: The cause of the disease is hypomagnesemia.

14. Manage grass tetany.

- a. Treatment includes IV magnesium and calcium solutions: 500 ml 25 percent calcium borogluconate and 5 percent magnesium hypochlorite for cattle and 50 ml of same solution for sheep.
- b. This infusion must be slow and the effect on the heart watched carefully.
- c. Prophylaxis consists of providing magnesium salts during seasonal danger periods: 60 grams (g) for cattle, 10 g for sheep.
- d. Another method is to fertilize pastures with magnesium-rich substances.

15. Recognize the signs and symptoms of mastitis.

- a. Although of greatest economic importance in the dairy cow, mastitis may affect any species and is handled in much the same way in each of them.
- b. It may be defined as inflammation of the mammary gland, almost always due to the effects of infection by bacterial or mycotic pathogens.
- c. Factors that predispose to infection within the gland are poor milking hygiene, milking machine faults, faulty milking management, teat injuries, and environmental populations of pathogens.
- d. The four clinical types of mastitis are:
 - (1) Peracute--swelling, heat, pain, and abnormal secretion in the gland are accompanied by fever and other signs of a systemic disturbance such as marked depression, rapid and weak pulse, sunken eyes, weakness, and complete anorexia.
 - (2) Acute--changes in the gland are similar to those above, but fever and depression are slight to moderate
 - (3) Subacute--there are no systemic changes and the changes, in the gland and secretion are less marked.
 - (4) Subclinical--the inflammatory reaction within the gland is detectable only by tests.
- e. Changes in the secretion can vary from a slight wateriness with a few flecks to serous with large yellow clots. With severe chronic mastitis, the affected gland gradually loses its productive capacity and may either atrophy or slowly develop firm nodular abscesses or granuloma-like masses within the parenchyma.

16. Manage mastitis.

Performance Steps

- a. Treatment almost always is recommended when clinical mastitis occurs. The individual case will govern whether just intramammary or a combination of intramammary and systemic antibiotics are used.
- b. Penicillin is the drug of choice for streptococcal mastitis and nonresistant staphylococci. However, most staphylococcal isolates in some herds are resistant so that semisynthetic penicillins, such as cloxacillin are more effective (task 081-833-4623, Medicate Domestic Animals).
- c. Oxytetracycline is the drug of choice for most cases of coliform mastitis.
- d. In addition to antibiotic infusion, frequent "stripping" of the affected quarter(s) to empty them of milk is very helpful. This may be facilitated by oxytocin injection (IM or IV) to ensure full emptying of the gland.
- e. Control of mastitis is accomplished by reducing the predisposing factors such as poor milking hygiene, milking machine faults, teat injuries, and pathogen population in the environment.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage obstetric complications in domestic animals.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the general principles associated with distocia.	—	—
2. Performed a physical exam of the animal.	—	—
3. Prepared for the procedure.	—	—
4. Determined fetal viability and position.	—	—
5. Manipulated the fetus into normal position.	—	—
6. Extracted the fetus.	—	—
7. Cared for the fetus after extraction.	—	—
8. Cared for the dam after extraction.	—	—
9. Recognized uterine prolapse.	—	—
10. Managed uterine prolapse.	—	—
11. Recognized the signs and symptoms of milk fever (parturient paresis).	—	—
12. Managed milk fever.	—	—
13. Recognized the signs and symptoms of grass tetany (hypomagnesemic tetany).	—	—
14. Managed grass tetany.	—	—
15. Recognized the signs and symptoms of mastitis.	—	—
16. Managed mastitis.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

FM 8-52

MERCK, VET 1998

Manage Poisoned Animals

081-833-4628

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF tactical medical equipment set.

Standards: Manage poisoned animals so that the life of the animal is preserved without causing further harm.

Performance Steps

1. Define poison.
 - a. Poison is any substance taken into the body by ingestion, inhalation, injection, or absorption that interferes with normal physiological functions.
 - b. Virtually any substance can be poisonous if consumed in sufficient quantity.
 - c. The term "poison" more often refers to an excessive dosage of a substance rather than to a specific group of substances.
2. Recognize the types of poisoning.
 - a. Intentional poisoning (someone is intentionally trying to kill the animal).
 - b. Accidental poisoning (the animal has gained access to something poisonous).
3. Recognize the signs and symptoms of acute poisoning.
 - a. Symptoms may be delayed for up to 8 hours following some poisonings.
 - b. Some common toxic syndromes signs and symptoms are:
 - (1) Anticholinergic agent ingestion:
 - (a) Dry mucous membranes.
 - (b) Dilated pupils.
 - (c) Hyperthermia.
 - (d) Urinary retention.
 - (e) Decreased bowel sounds.
 - (f) Tachycardia.
 - (g) Lethargy.
 - (h) Seizures.
 - (2) Cholinergic agent ingestion:
 - (a) Salivation.
 - (b) Lacrimation.
 - (c) Urinary and fecal incontinence.
 - (d) Diaphoresis.
 - (e) Bradycardia or tachycardia.
 - (f) Muscle fasciculations.
 - (g) Seizures.
4. Recognize significant clinical findings for poisoning.
 - a. Odors: Their presence may aid in making the diagnosis; however, their absence is not reliable in excluding any intoxications.
 - (1) Garlic: arsenic, organophosphates.
 - (2) Bitter almonds: cyanide.
 - (3) Rotten eggs: hydrogen sulfide.
 - b. Neurological exam: important components include:
 - (1) Observation for evidence of seizure activity.
 - (2) Pupillary size:
 - (a) Common causes of mydriasis are anticholinergics, mushrooms, and sympathomimetics.
 - (b) Common causes of miosis are cholinergics, clonidine, mushrooms, insecticides, and nicotine.

Performance Steps

5. Manage acute poisoning.
 - a. Gastric decontamination.
 - b. Gastric lavage.
 - c. Manage complications symptomatically with appropriate supportive care.
6. Record all treatment in the animal's record.
7. Seek the advice and assistance of a veterinarian whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage poisoned animals.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined poison.	_____	_____
2. Recognized the types of poisoning. a. Intentional poisoning. b. Accidental poisoning.	_____	_____
3. Recognized the signs and symptoms of acute poisoning.	_____	_____
4. Recognized significant clinical findings for poisoning.	_____	_____
5. Managed acute poisoning. a. Performed gastric decontamination. b. Performed gastric lavage. c. Managed complications symptomatically with appropriate supportive care.	_____	_____
6. Recorded all treatment in the animal's record.	_____	_____
7. Sought the advice and assistance of a veterinarian whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
 MERCK, VET 1998

Administer Local/Regional Anesthesia in Animals **081-833-4629**

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF tactical medical equipment set.

Standards: Anesthetize the area so that the suffering of the animal is minimized.

Performance Steps

1. Administer local anesthesia.
 - a. Assemble the equipment.
 - b. Prepare the area to be anesthetized.
 - c. Draw up the anesthetic agent.
 - d. Infiltrate the area with local anesthetic.
 - e. Assess anesthesia before starting the procedure.
 - f. Periodically test the area for anesthetic effect until the procedure is completed.
2. Administer regional anesthesia.
 - a. Administer an intravenous (IV) to provide an access line when administering IV regional anesthesia.
 - b. Assess vital signs.
 - c. Perform the required procedure as per task 081-833-4547, Perform Regional Anesthesia, keeping in mind the anatomy of the animal.
3. Record all treatment given.
4. Seek the advice and assistance of a veterinarian whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must administer local or regional anesthesia in animals.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Administered local anesthesia.	_____	_____
a. Assembled the equipment.		
b. Prepared the area to be anesthetized.		
c. Drew up the anesthetic agent.		
d. Infiltrated the area with local anesthetic.		
e. Assessed anesthesia before starting the procedure.		
f. Periodically tested the area for anesthetic effect until the procedure was completed.		
2. Administered regional anesthesia.	_____	_____
a. Administered an IV to provide an access line when administering IV regional anesthesia.		
b. Assessed vital signs.		
c. Performed the required procedure as per task 081-833-4547, Perform Regional Anesthesia, keeping in mind the anatomy of the animal.		
3. Recorded all treatment given.	_____	_____
4. Sought the advice and assistance of a veterinarian whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK, VET 1998

Treat for Shock in Animals

081-833-4630

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book set.

Standards: Manage shock so that the life of the animal is preserved without causing further harm.

Performance Steps

1. Recognize the signs and symptoms of shock in an animal.
 - a. Pale mucous membranes.
 - b. Rapid heart rate.
 - c. Weak pulse.
 - d. Slow capillary refill time.
 - e. Weakness or unconsciousness.
 - f. Decreased body temperature and/or cold extremities.
 2. Secure the airway.
 3. Ensure that the animal is breathing sufficiently. Assist respirations when necessary.
 4. Control external hemorrhage.
 5. Treat for shock (task 081-833-4625, Administer an Intravenous Infusion to an Animal).
 - a. For hypovolemic shock due to dehydration, give normal saline or Ringer's lactate 60 to 90 milliliters per kilogram (ml/kg).
 - b. For hypovolemic shock caused by exsanguineation, give hetastarch at a ratio of 1 to 1 for the estimated blood loss.
 - c. For severe hemorrhage, blood replacement therapy would be necessary.
- NOTE:** As with all animal treatment, the value of the animal and the strain on available resources must be considered. It may not be possible or feasible to expend large amounts of resources to save an animal in the short term if that animal is so severely injured that its long-term chance of survival is small.
- d. Administer dexamethasone sodium phosphate 4 to 15 milligrams per kilogram (mg/kg) intravenous (IV).
 - e. For animals with contaminated wounds, administer broad spectrum antibiotic therapy and tetanus prophylaxis.
6. Monitor the animal, and seek veterinary assistance when possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated animal patient and a scenario in which he must manage shock in animals.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of shock in an animal.	_____	_____
2. Secured the airway.	_____	_____
3. Ensured that the animal is breathing sufficiently.	_____	_____
4. Controlled external hemorrhage.	_____	_____
5. Treated for shock.	_____	_____
a. For hypovolemic shock due to dehydration, gave normal saline or Ringer's lactate 60 to 90 milliliters per kilogram (ml/kg).		
b. For hypovolemic shock due to exsanguineation, gave hetastarch at a ratio of 1 to 1 for the estimated blood loss.		
c. Administered dexamethasone sodium phosphate 4 to 15 mg/kg IV.		

Performance Measures	<u>GO</u>	<u>NO GO</u>
d. For animals with contaminated wounds, administered broad spectrum antibiotic therapy and tetanus prophylaxis.		
6. Monitored the animal and sought veterinary assistance when possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required	Related
	FM 8-52 MERCK, VET 1998

Subject Area 8: Dermatologic Conditions

Manage Common Skin Conditions

081-833-4027

Conditions: Given hydrocortisone cream 1percent, triamcinolone acetonide, caladryl lotion, Burow's solution, atarax, diphenhydramine, benzoyl peroxide, topical clindamycin, erythromycin, topical tretinoin (retinoic acid), and minocycline.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Recognize the etiology, signs, and symptoms of psoriasis.
 - a. Etiology: Unknown (not contagious).
 - b. Assessment (signs and symptoms):
 - (1) Salmon-colored erythematous plaques with white, silvery scales or flakes.
 - (2) Frequently appears on elbows, knees, scalp, back, and penis.
 - (3) Nail involvement--pitting and oil spots.
 - (4) Condition worsens if patient exposed for too long to sunlight. (Small amount of sun is good.)
 - (5) Chronic, lifetime disease that may be a social burden.
 - (6) May be complicated by arthritis.
 - (7) May be made worse by chloroquine prophylaxis.

2. Manage psoriasis.
 - a. Initially may need to use Class I topical steroids for control.
 - b. Mild sun exposure.
 - c. Hydrocortisone cream 1percent four times a day (q.i.d.) (for lesions on the face). OR
 - d. Triamcinolone acetonide (kenalog spray or cream). OR
 - e. Tar preparations (for example, Estar).

NOTE: Steps 3 through 5 pertain to the management of contact dermatitis.

3. Understand the etiology of contact dermatitis.
 - a. Immediate: contact with irritant such as fuel, soap, and so on.
 - b. Delayed: allergic reaction as with poison ivy, copper, lead, and nickel.
4. Recognize the signs and symptoms of contact dermatitis.
 - a. Immediate when caused by irritant contact. A good history of present illness (HPI) will reveal this sign.
 - b. Stinging or pruritic, erythematous tissue with blisters (vesicles) that later ooze and form crusty areas.
 - c. Secondary bacterial infections are common.
5. Manage contact dermatitis.
 - a. Cool soaks, caladryl lotion, and Burow's solution.
 - b. Hydrocortisone cream 1percent.
 - c. Atarax or diphenhydramine by mouth (PO) for pruritis.
 - d. Remove irritant (watches, rings, and so on).

NOTE: Oral prednisone may be used at a dose of 60 milligrams (mg) PO every day (q.d.) for (x) up to 2 weeks without adrenal suppression. Too short a course may lead to recurrence of contact dermatitis.

- e. Oral corticosteroids-prednisone 60 mg q.d. x 5 to 10 days (dose may be decreased by 10 mg q.d.).

NOTE: Steps 6 through 8 pertain to pseudofolliculitis.

Performance Steps

6. Recognize the cause of pseudofolliculitis as being an ingrown hair tip caused by close shaving.
 7. Recognize the signs and symptoms of pseudofolliculitis.
 - a. Small, white pustules "shaving bumps" on the beard area.
 - b. Hyperpigmentation of the beard area.
 8. Manage pseudofolliculitis.
 - a. Stop close shaving.
 - b. Use electric clippers or depilatories; for example Magic Shave and Nair. (Follow label directions closely.)
 - c. Maintain a temporary shaving profile of 1/8 inch beard growth. (Styling of the beard is not allowed.)
 - d. Patient education (very important).
- NOTE: Steps 9 through 12 pertain to acne.
9. Recognize the signs and symptoms of acne.
 - a. Multiple spreading papules, pustules, cysts, and nodules with pain.
 - b. Frequently appears on face, back, and chest.
 - c. Often heals with scar (if pustules are deep).
 10. Manage acne. Referral to dermatology is indicated in severe cases to avoid permanent scarring.
 - a. Superficial acne.
 - (1) Phisohex or Fostex wash q.i.d.
 - (2) Benzoyl peroxide 5 to 10 percent applied each morning.
 - (3) Topical clindamycin or erythromycin: the antibiotics may be used alone or in conjunction with the following:
 - (a) Topical tretinoin (retinoic acid). Apply at night (every other night if irritation is excessive), going over the entire affected area only once. Patients should be instructed to avoid sunlight while using the drug. Mild erythema and dryness are desired side effects of the drug.
 - (b) Benzoyl peroxide 5 to 10 percent applied each morning.
 - b. Severe cases may require oral antibiotic therapy with the following:
- NOTE: Caution patients about increased photosensitivity and the need for avoidance of sun or the use of sunscreen when taking tetracycline.
- (1) Tetracycline 250 mg q.i.d. between meals and at bedtime for 4 weeks then tapered to the lowest effective dose. OR
 - (2) Minocycline 100 mg twice daily (b.i.d.).
 - (3) Either antibiotic may need to be continued for years.
11. Record all treatment in the patient's medical record.
 12. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a common skin condition.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the etiology, signs, and symptoms of psoriasis.	—	—
2. Managed psoriasis.	—	—
3. Understood the etiology of contact dermatitis.	—	—
4. Recognized the signs and symptoms of contact dermatitis.	—	—
5. Managed contact dermatitis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Recognized the cause of pseudofolliculitis.	_____	_____
7. Recognized the signs and symptoms of pseudofolliculitis.	_____	_____
8. Managed pseudofolliculitis.	_____	_____
9. Recognized the signs and symptoms of acne.	_____	_____
10. Managed acne.	_____	_____
11. Recorded all treatment in the patient's medical record.	_____	_____
12. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

BATES PE, 5TH ED. 1991

Assess Common Skin Conditions

081-833-4028

Conditions: Given a Wood's lamp, the Bates Guide to Physical Examination, and the patient's medical record.

Standards: Assess common skin conditions so that the condition is identified with 100 percent accuracy.

Performance Steps

1. Examine the skin for the following:
 - a. Color:
 - (1) Brown: increased melanin caused by sun exposure, pregnancy, or Addison's disease.
 - (2) Grayish tan or bronze: hemosiderin and increased melanin caused by hemochromatosis.
 - (3) Blue (cyanosis): caused by poor tissue oxygenation.
 - (4) Red: dilated superficial blood vessels caused by fever, blushing, alcohol intake, or local inflammation.
 - (5) Yellow: increased bilirubin or jaundice caused by liver disease (sclera looks yellow) or carotenemia caused by increased intake of carotene (sclera does not look yellow).
 - (6) Pale: caused by decreased melanin as in albinism or tinea versicolor or decreased blood flow to the skin as in shock.
 - (7) Vitiligo: sharply demarcated, often symmetric depigmented areas due to unknown causes, but associated with Addison's disease, diabetes mellitus (DM), and pernicious anemia.
 - b. Moisture: note as moist, dry, or oily.
 - c. Temperature: note as cool or warm.
 - d. Texture: note as smooth or rough.
 - e. Mobility (the ease with which a fold of skin can be moved): normally increased with dehydration and decreased with edema.
 - f. Turgor (the speed with which a displaced skin fold returns to its original place): normally decreased with dehydration.
 - g. Lesions: Note the following:
 - (1) Anatomic location: generalized or localized.
 - (2) Grouping or arrangement: linear, clustered, annular, arciform, or dermatomal (following the dermatome lines).
 - (3) Type:
 - (a) Circumscribed, flat, nonpalpable change in skin color. Macule = up to 1centimeter (cm). Patch = larger than 1 cm.
 - (b) Palpable, elevated solid mass: papule = up to 0.5 cm, plaque = larger than 0.5 cm, nodule = 0.5-2 cm but often deeper and firmer than a papule, tumor = larger than 2 cm, and wheal = a transient, superficial area of local skin edema.
 - (c) Circumscribed superficial elevations of the skin formed by free fluid in a cavity between the skin layers: vesicle = up to 0.5 cm (filled with serous fluid), bulla = greater than 0.5 cm (filled with serous fluid), and pustule = any size lesion filled with pus.
 - (d) Loss of skin surface: erosion = loss of epidermis, leaving a moist area that does not bleed, ulcer = a deeper loss of skin surface that may bleed and scar, and fissure = a linear crack.
 - (e) Material on the skin surface: crust = the dried residue of serum, pus, or blood and scale = a thin flake of exfoliated epidermis.
2. Inspect and palpate the fingernails and toenails. Note the following:
 - a. Color of the nail and nail bed.
 - b. Shape--clubbing or spoon nails.
 - c. Lesions such as splinter hemorrhages.
 - d. Bogginess of nail on bed.

Performance Steps

- e. Tenderness (possibly from subungual hematoma or paronychia).
- 3. Inspect and palpate the hair. Note the following:
 - a. Quantity: thick or thin.
 - b. Distribution: note patchy or total alopecia.
 - c. Texture: fine or coarse.
 - d. Dry or oily.
 - e. Brittle.
- 4. Recognize the signs and symptoms of specific dermatologic conditions.
 - a. Impetigo (Figure1):

Performance Steps



Figure 1. Impetigo

- (1) Small blisters that rupture and leave shallow, red erosions.
 - (2) Lesions are usually covered by a yellow- or honey-colored crust.
- b. Furuncle (boil) (Figure 2):

Performance Steps



Figure 2. Furuncle

- (1) Any area, but especially neck, axillae, and buttocks.
 - (2) Starts with hair follicle.
 - (3) Round, tender abscess.
 - (4) Local lymphadenitis.
- c. Carbuncle (Figure 3):

Performance Steps



Figure 3. Carbuncle

- (1) Lower neck and upper back are common sites.
 - (2) Cluster of furuncles.
 - (3) Deeper than furuncle.
 - (4) Multiple draining abscesses.
- d. Cellulitis: acute or chronic infection of skin (Figure 4).

Performance Steps



Figure 4. Cellulitis

- (1) Warm, red, tender, diffuse swelling with pitting edema when pressure is applied. (Skin may appear shiny.)
 - (2) Late blisters.
 - (3) Systemic reaction if large area. (Fever may be present.)
 - (4) Lower extremities most often involved.
 - (5) Lymphangitis with lymphadenitis.
- e. Herpes simplex (fever blister) and herpes zoster (shingles) (Figure 5).

Performance Steps



Figure 5. Herpes

- (1) Prodromal local pruritis.
 - (2) Grouped vesicles on erythematous base.
 - (3) Erosions and crust.
 - (4) Periodic relapses forever.
 - (5) Herpes zoster will also be associated with significant pain along the involved dermatome lines.
- f. Warts (verrucae) (Figure 6):

Performance Steps



Figure 6. Warts

- (1) Common warts: sharply demarcated, rough surfaced, round or irregular, firm, and light gray, yellow, brown, or grayish-black tumors 2 to 10 millimeters (mm) in diameter. Frequently found on fingers, elbows, knees, face, and scalp.
 - (2) Plantar warts: similar to common warts only flattened by pressure and surrounded by cornified epithelium. Plantar warts are found only on the soles of the feet, hence the name "plantar."
 - (3) Filiform warts: small growths that are long and narrow. Common on eyelids, face, neck, and lips. They have very superficial growth.
 - (4) Flat warts: common in children and young adults. Appear as smooth, flat, and yellow-brown lesions on face and along scratch marks.
- g. Psoriasis (Figure 7):

Performance Steps



Figure 7. Psoriasis

- (1) Salmon-colored erythematous plaques with white, silvery scales or flakes.
 - (2) Frequently appears on elbows, knees, scalp, back, and penis.
 - (3) Worse if exposed too long to sunlight. Small amount of sun may improve the condition.
- h. Contact dermatitis (Figure 8):

Performance Steps



Figure 8. Contact Dermatitis

- (1) Immediate symptoms caused by irritant contact. A good history of present illness (HPI) will have a list of allergies.
- (2) Delayed symptoms caused by hypersensitivity or allergic reaction.
 - (a) Stinging or pruritic, erythematous tissue with blisters (vesicles).
 - (b) Later, oozing, crusty areas.
 - (c) The rash must be differentiated from secondary syphilis.
- i. Pityriasis rosea (Figure 9):

Performance Steps



Figure 9. Pityriasis Rosea

- (1) Pruritic, red, oval, and scaly patches or plaque between neck and knee.
 - (2) Herald patch: The first lesion, which may appear 1 or more weeks before other lesions, and may fade before the appearance of the satellite lesions. It is salmon pink and larger than satellite lesions. History is very important in determining the existence of the herald patch, because it may no longer be present when you see the patient.
 - (3) "Christmas tree" symmetry with lines of skin tension.
 - (4) In blacks, you will see reverse pityriasis on arms, legs, face, and even hands and feet.
- j. Moniliasis (candidiasis) (Figure 10):



Figure 10. Moniliasis

- (1) Located in moist skin folds (groin, axillae, or under breast).
- (2) Red, moist lesions without central clearing.

Performance Steps

- (3) For penis, appears under foreskin; for vagina or mouth (thrush) appears as whitish, thick, cheesy coat (curds with flecks).
- (4) Typical satellite or advance lesions out from border of main lesion (pustular).
- k. Tinea (dermatomycosis or dermatophytosis):
 - (1) Skin (tinea corporis, or ringworm (Figure 11); tinea cruris, or jock itch; or tinea capitis).



Figure 11. Ringworm

- (a) Erythematous, scaly, and annular lesion with central clearing.
 - (b) Border raised and more erythematous with tiny vesicles or scales.
 - (c) Very pruritic--may go deep and become a kerion. This is common in children, and only occurs in tinea capitis and is then called inflammatory tinea capitis.
 - (d) Commonly found on face, hands, neck, and groin.
- (2) Nails (tinea unguium or onychomycosis) (Figure 12):

Performance Steps



Figure 12. Tinea Unguium or Onychomycosis

- (a) Thickening, disintegration to chalky white powder.
 - (b) No inflammation around nail.
- (3) Feet (tinea pedis, or athletes foot) (Figure 13):

Performance Steps



Figure 13. Tinea Pedis

- (a) Chronic--erythematous, dry, and scaly.
 - (b) Acute--moist, scaly blisters and cracks between toes.
 - (c) Pruritis with all types.
 - (d) Secondary bacterial infection and cellulitis common.
- I. Tinea versicolor (Figure 14):

Performance Steps



Figure 14. Tinea Versicolor

- (1) Dry, scaly macules and patches above the waist on neck, back, chest, and arms that have sharp borders.
 - (2) Brown or tan patches in skin not exposed to the sun. White patches in sun-exposed skin.
 - (3) Only mild, occasional itch.
5. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess common skin conditions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Examined the skin.	—	—
2. Inspected and palpated the fingernails and toenails.	—	—
3. Inspected and palpated the hair.	—	—
4. Recognized the signs and symptoms of specific dermatologic conditions.	—	—
5. Recorded all findings in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

BATES PE, 8TH ED. 2002
MERCK MANUAL 17TH ED

Manage Common Bacterial Skin Conditions

081-833-4030

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Recognize the etiology and causes of impetigo.
 - a. Etiology: bacterial (very contagious).
 - (1) Staphylococcus: most common cause and Gram-positive cocci.
 - (2) Streptococcus: Group A, beta hemolytic and Gram-positive cocci.
 - b. Cause.
 - (1) Poor hygiene.
 - (2) Minor superficial skin injuries (scratches, insect bites, and so on).
2. Recognize the signs and symptoms of impetigo.
 - a. Small blisters form.
 - b. Blisters rupture, leaving shallow, red erosions.
 - c. Erosions develop yellow- or honey-colored crusts.
3. Manage impetigo.
 - a. Soap and water three times a day (t.i.d.) (antibacterial soap is best).
 - b. Gentle scrubbing to remove crusts.
 - c. Bactroban (mupirocin) ointment every day (q.d.) twice daily (b.i.d.).
 - d. Dicloxacillin or cephalexin 250 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for (x) 10 days.

NOTE: Steps 4 through 6 pertain to the management of a furuncle (boil).

4. Recognize the etiology and causes of a furuncle (boil).
 - a. Etiology: bacterial (Gram-positive staphylococcus).
 - b. Causes are as follows:
 - (1) Poor hygiene.
 - (2) Chronic diseases.
 - (a) Diabetes: poor peripheral perfusion.
 - (b) Anemia: poor tissue oxygenation.
 - (c) Malnutrition: decreased immune system.
 - (d) Alcoholism: malnutrition and vitamin deficiency.
 - (e) Other states of lowered resistance: acquired immunodeficiency syndrome (AIDS).
 - (3) Trauma to skin.
 - (a) Shaving.
 - (b) Squeezing.
5. Recognize the signs and symptoms of a furuncle.
 - a. Starts with hair follicle.
 - b. Appears in any area of body but especially on neck, axillae, and buttocks.
 - c. Round, tender abscess.
 - d. May be associated with local lymphadenitis.
6. Manage a furuncle.
 - a. Warm soaks to form head.
 - b. Incision and drainage (I&D) (task 081-833-4537, Drain Abscesses).
 - c. Loose dressing with optional wick drain (Iodoform gauze).

Performance Steps

- d. Dicloxacillin, cephalexin, or erythromycin 250 mg PO q.i.d. x 10 days.

NOTE: Steps 7 through 8 pertain to the management of a carbuncle.

- 7. Recognize the etiology, signs, and symptoms of a carbuncle.
 - a. Etiology: bacterial (Gram-positive staphylococcus).
 - b. Assessment (signs and symptoms):
 - (1) Cluster of furuncles.
 - (2) Multiple draining abscesses.
 - (3) Deeper than furuncle.
 - (4) Lower neck and upper back are common locations.
- 8. Manage a carbuncle: same as for a furuncle. (Antibiotics effective against penicillin-resistant microbes are usually indicated.)

NOTE: Steps 9 through 13 pertain to the management of cellulitis.

- 9. Identify cellulitis on the basis of the patient's history. Cellulitis is a diffuse, spreading, and acute inflammation within solid tissues. Cellulitis is characterized by hyperemia, leukocytic infiltration, and edema without cellular necrosis or supuration. Cellulitis usually appears in the skin or subcutaneously, but may go deeper.
 - a. Ask the patient about any recent injuries or wounds. Determining the cause of the original injury will help determine the exposure to various organisms.
 - b. Sometimes there may not be a history of an injury or wound.
 - c. Causative organisms:
 - (1) *Streptococcus pyogenes* are responsible for most cellulitises.
 - (2) *Staphylococcus aureus* is usually associated with an open wound or ulcer.
 - (3) *Pasteurella multocida* is associated with dog and cat bites.
- 10. Identify the type of cellulitis on the basis of the patient's signs and symptoms.
 - a. General signs and symptoms of cellulitis are as follows:
 - (1) Local erythema and tenderness.
 - (2) Skin is red, hot, and edematous (resembles skin of orange).
 - (3) Borders are usually indistinct.
 - (4) Petechiae are common.
 - (5) Large areas of echymosis are rare.
 - (6) Vesicles and bullae are present.
 - (7) Occasionally, there is necrosis of involved skin.
 - (8) Occasionally, systemic symptoms occur: fever, chills, tachycardia, headache, hypotension, and delirium.
 - b. Signs and symptoms pertaining to streptococcal cellulitis are as follows:
 - (1) Rapid spread through skin and subcutaneous tissue.
 - (2) Lymphangitis is very common
 - (3) Lymphadenitis.
 - (4) Signs of systemic infection.
 - c. Signs and symptoms pertaining to staphylococcal cellulitis are as follows:
 - (1) Local abscess formation.
 - (2) Lymphadenitis is very common.
 - (3) Lymphangitis.
- 11. Perform lab tests to identify the causative organism.
 - a. Usually there will not be any wound or discharge on which to perform a gram stain.
 - b. Streptococcal.
 - (1) Gram-positive appears dark blue.
 - (2) Arranged in chains.
 - c. Staphylococcal.
 - (1) Gram-positive appears dark blue.
 - (2) Arranged in grape-like clusters.

Performance Steps

12. Differentiate and diagnose the type of cellulitis on the basis of the following:
 - a. Clinical findings (different bacterial infections produce different signs and symptoms).
 - b. Gram stain of pus.
 - c. Blood culture and serologic tests, if available.
13. Manage cellulitis.
 - a. Abscesses and/or wounds:
 - (1) Incision and drainage, if fluctuant.
 - (2) Debridement of devitalized tissue.
 - (3) Copious irrigation with normal saline.
 - (4) Sterile gauze placed over wound.
 - (5) Loose dressing with optional wick.
 - (6) Daily dressing changes.
 - b. Immobilize and elevate extremity.
 - c. Antibiotic management for streptococcal cellulitis is as follows:
 - (1) Mild infection: Penicillin 250 to 500 mg PO q.i.d. x 7 to 10 days or benzathine penicillin 1.2 million units (u) intramuscularly (IM).
 - (2) Severe infection: aqueous penicillin G 400,000 u intravenous (IV) every 6 hours (q6h) piggyback (PB).
 - (3) Penicillin allergy: in mild cases, erythromycin 250 mg q.i.d. PO or in severe cases, clindamycin 150 mg IV q6h.
 - d. Antibiotic management for staphylococcal cellulitis.

NOTE: This protocol is also effective against streptococcal cellulitis.

 - (1) Mild infection: dicloxacillin 500 mg q.i.d. PO or cefazolin 1gram (g) t.i.d. IV.
 - (2) Severe infection: IV oxacillin or IV nafcillin 2 g IV q4h.
 - (3) Alternate or penicillin allergy:
 - (a) Mild: Erythromycin 250 to 500 mg q.i.d.
 - (b) Severe: parenteral first-generation cephalosporin, azithromycin, or clarithromycin.
 - (4) Methicillin-resistant staphylococcus aureus (MRSA): vancomycin 1g IV q12h.
 - e. Monitor patient for possible complications.
 - (1) Streptococcal gangrene.
 - (2) Necrotizing fasciitis.
 - (3) Bacteremia with metastatic foci of infection.
14. Manage complications symptomatically with appropriate supportive care.
15. Record all treatment in the patient's medical record.
16. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage common bacterial skin conditions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the etiology and causes of impetigo.	—	—
2. Recognized the signs and symptoms of impetigo.	—	—
3. Managed impetigo.	—	—
4. Recognized the etiology and causes of a furuncle (boil).	—	—
5. Recognized the signs and symptoms of a furuncle.	—	—
6. Managed a furuncle.	—	—
7. Recognized the etiology, signs, and symptoms of a carbuncle.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
8. Managed a carbuncle.	_____	_____
9. Identified cellulitis on the basis of patient's history.	_____	_____
10. Identified the type of cellulitis on the basis of the patient's signs and symptoms.	_____	_____
11. Performed lab tests to identify the causative organism for cellulitis.	_____	_____
12. Differentiated and diagnosed the type of cellulitis.	_____	_____
13. Managed cellulitis.	_____	_____
14. Managed complications symptomatically with appropriate supportive care.	_____	_____
15. Recorded all treatment in the patient's medical record.	_____	_____
16. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
BATES PE, 8TH ED. 2002
MERCK MANUAL 17TH ED
SANFORD, 1999

Manage Common Viral Skin Conditions

081-833-4032

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, the patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Solicit a patient history.
2. Perform a physical examination.
3. Recognize the signs and symptoms of common viral skin conditions.
 - a. Herpes simplex (fever blister) and herpes zoster (shingles).
 - (1) Prodromal local pruritus.
 - (2) Grouped vesicles on erythematous base.
 - (3) Erosions and crusts.
 - (4) Periodic relapses forever.
 - b. Warts (verrucae).
 - (1) Common warts: sharply demarcated, rough surfaced, round or irregular, firm, and light gray, yellow, brown, or grayish-black tumors 2 to 10 millimeters (mm) in diameter. Common warts are frequently found on fingers, elbows, knees, face, and scalp.
 - (2) Plantar warts: similar to common warts except flattened by pressure and surrounded by cornified epithelium. Common on sole of foot.
 - (3) Filiform warts: small growths that are long and narrow. Common on eyelids, face, neck, and lips.
 - (4) Flat warts: common in children and young adults. Flat warts appear as smooth, flat, and yellow-brown lesions on the face and along scratch marks.
4. Manage common viral skin conditions.
 - a. Herpes simplex (fever blister) and herpes zoster (shingles).
 - (1) Management is symptomatic and supportive. The disease is noncurable.
 - (2) Ice may help with itching.
 - (3) Phenol/camphor (Blistex and Camphorphenic).
 - (4) Burow's solution 1:10.
 - (5) Topical acyclovir or parenteral 200 milligrams (mg) 5 intradermal (ID) for (x) 5 days for (herpes simplex virus (HSV) and 800 mg 5 ID x 10 days for herpes zoster virus (HZV). Typically, acyclovir is used to decrease patient discomfort and reduce the length of the illness.

NOTE: Topical acyclovir is not very effective; oral dosages work much better. After lesions present, oral acyclovir may be of little help. Patients who present in the prodromal phase will benefit more from oral acyclovir.

- b. Warts (verrucae):
 - (1) Common warts:
 - (a) Apply a collodion solution containing 17 percent salicylic acid and 17 percent lactic acid b.i.d. until the wart disappears (commercial solutions are available). OR
 - (b) Freezing with liquid nitrogen for 15 to 30 seconds. Ensure that the lesion is frozen, not the surrounding tissue. These may require retreatment.

NOTE: Wart location may limit the application of liquid nitrogen.

- (2) Plantar warts: Both debridement and freezing may be necessary.
 - (a) Apply 40 percent salicylic acid tape for several days.

Performance Steps

- (b) Debride the wart while it is still damp.
- (c) Destroy any remnants by freezing with liquid nitrogen for 15 to 30 seconds.
- (3) Filiform warts: Excision is the preferred method of treatment.
- (4) Flat warts: Tretinoin is applied daily (0.05 percent retinoic acid) until the wart resolves.

NOTE: For management of molluscum contagiosum, see task 081-833-4135, Manage Sexually Transmitted Diseases.

- 5. Record all treatment in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage common viral skin conditions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Performed a physical examination.	_____	_____
3. Recognized the signs and symptoms of common viral skin conditions.	_____	_____
4. Managed common viral skin conditions.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required

Related
BATES PE, 8TH ED. 2002
MERCK MANUAL 17TH ED

Manage Common Fungal Skin Conditions

081-833-4034

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the etiologies of fungal skin conditions (dermatomycosis or dermatophytosis).
 - a. Skin (tinea corporis, or ringworm).
 - b. Genital area (tinea cruris, or jock itch).
 - c. Nails (tinea unguium or onychomycosis).
 - d. Feet (tinea pedis, or athlete's foot).
 - e. Tinea versicolor (patchy discoloration of skin pigment).
2. Solicit a patient history.
3. Perform a physical examination.
4. Recognize the signs and symptoms of fungal skin conditions.
 - a. Skin (tinea corporis, or ringworm; tinea cruris, or jock itch; or tinea capitis).
 - (1) Erythematous, scaly, and annular lesion with central clearing.
 - (2) Raised border and more erythematous with tiny vesicles or scales
 - (3) Very pruritic--may go deep and become a kerion. Kerion is common in children and is only seen in tinea capitis. It is then called inflammatory tinea capitis.
 - (4) Commonly affected areas are face, hands, neck, and groin.
 - b. Nails (tinea unguium or onychomycosis).
 - (1) Nails thicken and then disintegrate to a chalky white powder.
 - (2) No inflammation around nail expected.
 - c. Feet (tinea pedis, or athlete's foot).
 - (1) Chronic: erythematous, dry, and scaly rash.
 - (2) Acute: moist, scaly, blisters, and cracks between toes.
 - (3) Pruritus occurs with all types.
 - (4) Secondary bacterial infection and cellulitis are common.
 - d. Tinea versicolor.
 - (1) Dry, scaly macules and patches occur above the waist. They commonly occur on neck, back, chest, and arms and have sharp borders.
 - (2) Tinea versicolor appears brown or tan in areas not exposed to the sun and as white patches in areas exposed to the sun.
 - (3) Only mild, occasional itching occurs.
5. Perform a potassium hydroxide (KOH) preparation and microscopic examination to verify suspected fungal infections (task 081-821-1056, Perform a Potassium (Sodium) Hydroxide Preparation of Skin Scrapings).
6. Manage common fungal skin conditions.
 - a. Tinea corporis, tinea cruris, and tinea pedis.
 - (1) Keep the area clean and as dry as possible.
 - (2) Administer lotrimin cream topically three times a day (t.i.d.). OR
 - (3) Administer tolnaftate 1percent (Tinactin) t.i.d. OR
 - (4) Administer micatin t.i.d. until symptoms subside. Continue treatment for 2 weeks postcondition.

Performance Steps

- (5) Administer Desenex powder four times a day (q.i.d.).
- (6) With severe or intransigent infections, refer the patient for baseline liver function tests. In healthy patients with normal liver function, give itraconazole 200 milligrams per day (mg/day) for 1 month.

Note: Dosage duration varies with type and location.

b. Tinea unguium.

- (1) Refer the patient for baseline liver function tests. In healthy patients, with normal liver function, give itraconazole 200 mg by mouth (PO) twice daily (b.i.d.) 1 week per month for 4 months. There is less liver toxicity with pulse dosing.
- (2) Alternatively, give terbinafine 250 mg/day for 6 weeks to treat fingernail fungus; 12 weeks for toenails. You do not need to continue treatment until all abnormal nail is gone, because these drugs remain bound to the nail plate and continue to function after oral administration has ceased.

NOTE: Griseofulvin (Grispeg) is no longer considered a first-line drug for the treatment of fungal infections because of hepatotoxicity.

c. Tinea versicolor.

- (1) Pulse dosing with oral agent (ketoconazole 200 mg every day (q.d.) x 1 week; repeat monthly for 3 months. Works well, especially in extensive disease. All topical treatments should be pulsed the same way for best results.
- (2) Administer tinver lotion b.i.d. OR
- (3) Administer selenium sulfide shampoo (Selsun) scrubbed in with brush and left 1 to 2 hours and then rinsed. OR
- (4) Administer 3 percent sulfur salicylic acid cream (leave overnight, and wash off in morning).
- (5) Maintain all of the above treatments until 1 week after the signs and symptoms have abated.

7. Record all treatment in the patient's medical record.

8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage common fungal skin conditions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the etiologies of fungal skin conditions.	—	—
2. Solicited a patient history.	—	—
3. Performed a physical examination.	—	—
4. Recognized the signs and symptoms of fungal skin conditions.	—	—
5. Performed a KOH preparation and microscopic examination to verify suspected fungal infections.	—	—
6. Managed common fungal skin conditions.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

BATES PE, 8TH ED. 2002

Manage Common Parasitic Skin Conditions

081-833-4036

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition, etiology, and pathophysiology of scabies.
 - a. Definition: a skin infection caused by a burrowing mite.
 - b. Etiology: *sarcoptes scabiei*. The turtle-shaped female measures 0.4 millimeters (mm) in length and possesses four pairs of legs.
 - c. Pathogenesis:
 - (1) Although the disease is more common in the poor and unclean, it affects all socioeconomic groups.
 - (2) The parasite is transmitted from person to person by close body contact, particularly among bed partners. An entire family may be affected. Infestation will usually spare the head and neck, but these areas may be involved in infants. Pustular lesions on the soles of the feet in an infant is scabies until proven otherwise.
 - (3) After copulation, the female mite with the help of her two anterior pair of legs and her mouth, burrows into the epidermis.
 - (4) Female mite deposits two or three eggs a day for 30 days.
 - (5) The larvae hatch in 3 to 4 days and migrate to the skin surface. The females feed on the cells of the stratum corneum. The female mite's secretions and excretions sensitize the host and produce the irritation.
 - (6) Newly infested persons may have large populations before the infestation is noticed.
 - (7) There is a period of about a month before sensitization and symptoms develop.
 - (8) Within 100 days from the arrival of a single mite, several hundred females can develop.
 - (9) Mite mortality is high, since scratching kills them.
2. Solicit a patient history.
3. Perform a physical examination.
4. Recognize the signs and symptoms of scabies.
 - a. The main complaint is itching. Some people will present with bruising from scratching.
 - b. The mites may burrow anywhere on the skin. There are certain sites that are more commonly affected:
 - (1) Hands and wrist (especially in the web spaces).
 - (2) Female breast.
 - (3) Penis and natal cleft.
 - (4) Children's feet (also in web spaces).
 - c. Scratching and secondary infection often cause puzzling skin lesions.
 - d. The classic sign is a run or burrow and is seldom seen. (Look in areas the patient cannot reach to scratch.)
 - (1) Run appears as a short, wavy, and reddish line.
 - (2) Tiny blister at the distal extremity contains the female mite.
 - e. Erythematous pruritic papules are common lesions. May turn to pustules as a result of secondary staphylococcal infection.

Performance Steps

NOTE: An eczematous reaction may occur, or in long-standing infections, erythematous nodules may develop. Further, epidemics of acute glomerulonephritis have been associated with pyoderma and scabies, which have been documented in Trinidad.

f. Scabies usually ends spontaneously in a few months, but chronic cases do occur.

5. Perform microscopic examination for scabies.

- a. "Derroof" the lesion with a scalpel blade.
- b. Transfer the scraping onto a glass slide.
- c. Add a drop of immersion oil.

NOTE: Immersion oil will not destroy eggs or feces.

d. Place a coverslip over the top of the slide, and examine the slide for adults, larvae, feces, and eggs.

e. Apply india ink to highlight the burrows.

6. Manage scabies.

NOTE: The therapeutic agents are applied topically, covering the skin thinly but completely from the neck down. Several agents are available as follows:

- a. Permethrin cream (Elimite) applied to dry skin and washed off after 8 hours. Repeat the application in 7 days, which results in an 85 to 90 percent cure rate. Elimite does not cause neurotoxicity in young children.
- b. Crotamiton (Eurax 10 percent) is massaged into the skin from the neck down--especially creases. Repeat in 24 hours. Bathe at 48 hours.
- c. Benzyl benzoate (25 percent) is applied to the whole body except the head and neck.

NOTE: Keep benzyl benzoate away from eyes and mucous membranes.

d. Lindane (1percent gamma benzene hexachloride) (Kwell) is applied to all areas from the neck down. Wash off after 8 hours. If patient shows no improvement, reapply after 1 week.

NOTE: Lindane is the last choice in therapy (except sulfur). It is only 65 percent effective and has been shown to be neurotoxic in young children.

e. Antihistamines or salicylates are helpful in countering pruritus.

NOTES:

1. All sexual contacts and household members should be managed at the same time as the patient to prevent the occurrence of "ping-pong infections." Patients should bathe, discard their clothes, and launder their bed linen. Although the patient is rendered noninfectious within 24 hours, up to 2 months may be required for the clinical manifestations of the disease to disappear completely.

2. Steps 7 through 12 pertain only to the management of chigger mite infestation.

7. Understand the definition, etiology, and pathophysiology of chigger mites.

- a. Definition: Chiggers are the larvae of harvest mites.
- b. Etiology: part of the trombiculidae family.
 - (1) Natural environment for chiggers is grassy, rodent-infested area.
 - (2) The adult feeds on vegetable matter and deposits its eggs upon the ground.
 - (3) Here, the larva await the passage of a vertebrate host upon which they feed before dropping to the ground and molting.
- c. Pathogenesis in humans.
 - (1) Mite is strongly anchored to the skin--frequently in hair follicles and pores.
 - (2) Mite releases a digestant to liquefy tissue cells and feeds for 3 to 4 days.
 - (3) Mite ingests tissue fluids and predigested cells. Some blood cells are ingested.
 - (4) Within 24 hours, the following occurs:
 - (a) Chigger's secretions produce an intensely pruritic papule that is up to 0.5 centimeters (cm) in diameter.
 - (b) A tiny dot in the center may be the larva--just barely visible.
 - (c) Welts and swelling around the mite may make it appear as though the chigger burrowed into the skin.
 - (5) After the mite is replete, it leaves the host, but itching may continue.
 - (6) Host's skin usually vesiculates--resulting in a chickenpox-like lesion.

Performance Steps

8. Ensure that soldiers take measures to prevent chigger mite infestation. (See task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means.)

9. Solicit a patient history.

NOTE: In the United States, most clinical cases are seen during the summer months. In warm climates, the seasonal pattern is missing.

10. Perform a physical examination.

11. Recognize the signs and symptoms of chigger mite infestation as follows:

- a. Pruritic, vesicular lesions especially at areas of clothing constriction (waistbands, knees, or boot tops).
- b. Occasional subcutaneous bleeding--results in a surrounding area of ecchymosis.
- c. Lesion and itching may persist for several weeks.

12. Manage chigger mite infestation.

- a. Apply clear nail polish or Chigg-A-Way may be applied to kill mites that are still attached to the skin.
- b. Direct management at the relief of itching and the prevention of secondary infections.
- c. Keep the area as clean as possible.
- d. Apply topical hydrocortisone to relieve itching.

13. Understand the definition, etiology, and pathophysiology of flea infestation.

NOTE: The following steps pertain only to the management of flea infestation.

- a. Definition: Fleas are small, wingless ectoparasites of humans and other warm-blooded animals.
- b. Etiology: Genus *Xenopsylla*.
 - (1) Rodent fleas are most important because of the diseases they carry.
 - (2) Fleas tend to be found on the hairy portion of the host where they feed and deposit their eggs.
 - (3) Active larvae, which hatch in 3 days, can be found on the host, in the nest, or in the dust.
 - (4) These arthropods are very resilient. They can last several weeks without food.
 - (5) Can be found wherever warm-blooded animals exist.
- c. Pathogenesis.
 - (1) Fleas hop from one host to another.
 - (2) Fleas feed on the blood of the host.
 - (3) Medically, fleas serve as vectors and agents of disease.

14. Solicit a patient history.

15. Perform a physical examination.

16. Recognize the signs and symptoms of flea infestation.

- a. In many individuals, the bite seems completely innocuous.
- b. Fleas may induce dermatitis.
- c. In sensitive persons, the saliva induces an erythematous, raised, pruritic papule that lasts for several days.
- d. Repeated scratching may result in secondary infection with pustulation and ulceration.

17. Prevent flea infestations (task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means).

18. Understand the definition, etiology, and pathophysiology of pediculosis.

NOTE: Steps 18 through 23 pertain only to the management of pediculosis.

- a. Definition: ectoparasites that infest an obligate human and complete their entire 30- to 40-day life cycle on or near the body of the host.
- b. Etiology:

Performance Steps

- (1) Pediculus (P.) humanus capitis (head louse)--infests the scalp.
- (2) P. humanus corporis (body louse)--infests the body and clothing.

NOTE: P. humanus corporis is the only louse known to carry disease.

- (3) Phthirus pubis (crab louse)--infests the genital and occasionally other hairy areas of the body.

c. Pathogenesis:

- (1) The female lays five or six eggs daily, which she firmly attaches to the hairs or, in the case of the body louse, the clothing of the host.
- (2) These clearly visible, tiny, white nits hatch in 8 to 10 days.
- (3) The resulting nymph matures to adulthood in an additional 2 weeks.
- (4) Lice can be transferred from person to person by:
 - (a) Direct contact.
 - (b) Via discarded clothing. Body lice can survive in clothing for up to a week.

19. Ensure soldiers take measures to prevent pediculosis (task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means).

20. Solicit a patient history.

21. Perform a physical examination.

22. Recognize the signs and symptoms of pediculosis.

- a. Both the larvae and adults take two blood meals daily, leaving behind a small pruritic puncture site.
- b. With repeated exposure, the host develops an inflammatory hypersensitivity reaction manifested as a small red papule at each new feeding site.
- c. Chronic infections of the scalp may result in a fetid mass of matted hair and exudate.
- d. On the body and genital areas, the lesions may become pigmented. Therefore, pediculosis is called the "vagabond disease."

NOTE: Pediculosis is suggested by the typical dermatitis and confirmed by finding the adults, the adult waste, and nits on the hair or clothing of the patient.

- e. Use Wood's light to fluoresce lice and nits in hair or clothing seams.

23. Manage pediculosis.

- a. The management of choice for body lice is permethrin cream (Elimite) applied to dry skin, washed off after 8 hours, and repeated in 7 days. Elimite has an 85 to 90 percent cure rate and causes no neurotoxicity in young children.
- b. Piperonal butoxide is an alternative treatment.
 - (1) Apply lotion for 10 minutes; then bathe.
 - (2) Treat close contacts; wash sheets and clothing.
- c. Management for head and crab lice:
 - (1) First, shampoo hair with ordinary soap.
 - (2) Apply permethrin (Nix), and rub it in for 10 minutes.
 - (3) Rinse, dry, and comb hair with a fine-tooth comb to remove the nits.
- d. The therapy for either type of lice may be repeated in 7 days.

24. Record all treatment in the patient's medical record.

25. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage common parasitic skin conditions.

Performance Measures

1. Understood the definition, etiology, and pathophysiology of scabies.
2. Solicited a patient history.

GO NO GO

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Performed a physical examination.	_____	_____
4. Recognized the signs and symptoms of scabies.	_____	_____
5. Performed microscopic examination for scabies.	_____	_____
6. Managed scabies.	_____	_____
7. Understood the definition, etiology, and pathophysiology of chigger mites.	_____	_____
8. Ensured that soldiers took measures to prevent chigger mite infestation.	_____	_____
9. Solicited a patient history.	_____	_____
10. Performed a physical examination.	_____	_____
11. Recognized the signs and symptoms of chigger mite infestation.	_____	_____
12. Managed chigger mite infestation.	_____	_____
13. Understood the definition, etiology, and pathophysiology of flea infestation.	_____	_____
14. Solicited a patient history.	_____	_____
15. Performed a physical examination.	_____	_____
16. Recognized the signs and symptoms of flea infestation.	_____	_____
17. Prevented flea infestations.	_____	_____
18. Understood the definition, etiology, and pathophysiology of pediculosis.	_____	_____
19. Ensured that soldiers took measures to prevent pediculosis.	_____	_____
20. Solicited a patient history.	_____	_____
21. Performed a physical examination.	_____	_____
22. Recognized the signs and symptoms of pediculosis.	_____	_____
23. Managed pediculosis.	_____	_____
24. Recorded all treatment in the patient's medical record.	_____	_____
25. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

BATES PE, 8TH ED. 2002

Subject Area 9: HEENT Conditions

Manage Tonsillitis**081-833-4179**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify tonsillitis on the basis of the patient's history.
 - a. Patients will complain of pain on swallowing.
 - b. Sore throat.
 - c. Headache.
 - d. Malaise.
2. Identify tonsillitis on the basis of the patient's signs and symptoms.
 - a. Fever.
 - b. Vomiting.
 - c. The tonsils are edematous and hyperemic.
 - d. There may be a purulent exudate from the crypts.
 - e. There may be a thin, white, nonconfluent membrane that is confined to the tonsil and peels away without bleeding.
3. Identify tonsillitis by using other lab tests, if available.
 - a. Culture the exudate to determine the exact causative agent.
 - b. Culture family members so that asymptomatic carriers can all be treated at the same time.
4. Differentiate between tonsillitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Diphtheria: The membrane will be dirty gray, fibrinous, and tough.
 - b. Vincent's angina: This is characterized by superficial ulcers with erythematous borders.
 - c. Infectious mononucleosis: This is characterized by micropetechiae of the soft palate and a positive monospot.
5. Manage tonsillitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Penicillin V 250 milligrams (mg) by mouth (PO) for (x) 10 days or benzathine penicillin 1.2 million units (mu) intramuscularly (IM) 1 dose.

NOTE: Give penicillin only with positive culture of group A beta-hemolytic strep, or if cultures are not available, prophylactically to prevent endocarditis.

 - b. Alternatively, use erythromycin 250 mg PO four times a day (q.i.d.) x 10 days.
6. Treat complications symptomatically with appropriate supportive care.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage tonsillitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified tonsillitis on the basis of the patient's history.	—	—
2. Identified tonsillitis on the basis of the patient's signs and symptoms.	—	—
3. Identified tonsillitis by using other lab tests, if available.	—	—
4. Differentiated between tonsillitis and other diseases with similar signs and symptoms.	—	—
5. Managed tonsillitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

SANFORD, 1999

Related

MERCK MANUAL 17TH ED

Assess Conditions of the EENT

081-833-4210

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and The Merck Manual.

Standards: Correctly determine the cause of the disease by soliciting a patient history, performing a physical examination, and performing and/or requesting laboratory (lab) studies.

Performance Steps

1. Solicit a patient history.
 2. Perform a physical examination.
- NOTE: The following steps relate to conditions of the eye.
3. Recognize the signs and symptoms of bacterial conjunctivitis.
 - a. Usually unilateral.
 - b. Conjunctiva:
 - (1) Red, swollen, and painful (usually unilaterally).
 - (2) Discharge is copious and purulent.
 - (3) Usually self-limited to 10 to 14 days if unmanaged, but disease process time can be reduced to 2 to 3 days with topical antibiotics
 4. Recognize the signs and symptoms of viral conjunctivitis.
 - a. Usually bilateral.
 - b. Red conjunctiva.
 - c. Often associated with pharyngitis, fever, malaise, and cervical lymphadenopathy.
 - d. Disease lasts about 10 days.
 5. Recognize the signs and symptoms of allergic conjunctivitis.
 - a. Common--especially in hay fever.
 - b. Bilateral tearing, itching, redness, and minimal discharge.
 - c. Associated with rhinorrhea and sneezing.
 6. Recognize the signs and symptoms of trachoma (granular conjunctivitis).
 - a. Conjunctival congestion.
 - b. Lid edema.
 - c. Photophobia.
 - d. Lacrimation.
 - e. Follicle development. Trachoma is an old Greek word for follicle, hence the name of the disease.
 - f. Vascularization and scarring of cornea.
 - g. Blindness.
 7. Recognize the signs and symptoms of adult gonococcal conjunctivitis.
 - a. Symptoms appear 12 to 48 hours after exposure.
 - b. Severe eyelid edema.
 - c. Chemosis (edema of conjunctiva around the cornea).
 - d. Profuse purulent discharge.
 - e. Corneal ulceration.
 - f. Panophthalmitis (inflammation of the entire eye).
 8. Recognize the signs and symptoms of scleritis.
 - a. Deep inflammation of scleral tissue, extremely painful, and vision-threatening.
 - b. May be associated with rheumatic disorders.
 - c. Tender "purple" patch under the conjunctiva.
 - d. Extreme tenderness.

Performance Steps

9. Recognize the signs and symptoms of superficial punctate keratitis.
 - a. Associated with adenovirus, blepharitis, keratitis sicca, trachoma, and ultraviolet (UV) light exposure.
 - b. Can also be secondary to contact lens overwear and systemic drug or preservative toxicity.
 - c. Photophobia.
 - d. Pain.
 - e. Conjunctival infection.
 - f. Decreased visual acuity.

NOTE: Steps 10 through 12 relate to conditions of the ear.

10. Recognize the signs and symptoms of otitis media.
 - a. Usually occurs in children.
 - b. Ear pain.
 - c. Fever.
 - d. Chills.
 - e. Dullness and hyperemia of eardrum.
 - f. Loss of landmarks (no single light reflex).
 - g. Bulging of tympanic membrane (TM) from pus accumulation.
 - h. If TM ruptures, then pus is found in the ear canal.
 - i. White blood cell (WBC) count is increased with a left shift.
11. Recognize the signs and symptoms of serous otitis media.
 - a. Can occur at any age.
 - b. Accumulation of sterile serous fluid in middle ear.
 - c. Decreased hearing.
 - d. Full, plugged feeling in ear
 - e. Unnatural reverberation of patient's voice.
 - f. Retracted TM.
 - g. Malleus and incus seen in sharp relief.
 - h. "Ground glass," amber-colored TM.
 - i. Decreased TM mobility.
 - j. Air or fluid line or bubbles--if insufflation occurred during nose or throat clearing.
12. Recognize the signs and symptoms of otitis externa.
 - a. Can occur at any age.
 - b. Pain and itching in ear canal.
 - c. Discharge usually present--may be watery or purulent.
 - d. Pain on movement of auricle
 - e. Ear canal is red, swollen, sometimes scaly, crusted, or bloody.
 - f. TM is normal.
 - g. WBC count is normal or elevated.

NOTE: Steps 13 through 16 relate to conditions of the nose and throat.

13. Recognize the signs and symptoms of sinusitis.
 - a. History of upper respiratory infection (URI), dental infection, or nasal allergy.
 - b. Pain, tenderness, redness, and swelling over involved sinus.
 - c. Frequent headache.
 - d. Fever is common.
 - e. Nasal congestion and purulent discharge.
 - f. Upper teeth may hurt.
 - g. WBC count is elevated.
14. Recognize the signs and symptoms of URI.
 - a. Viral.
 - (1) Rhinorrhea.
 - (2) Sore throat (pharyngitis).

Performance Steps

- (3) Nonproductive cough.
- (4) Low-grade fever.
- (5) Posterior cervical lymph nodes palpable.
- (6) Watery nasal discharge.
- (7) Erythematous, but nonexudative pharynx.
- (8) Normal chest findings.
- b. Bacterial.
 - (1) Productive cough.
 - (2) Exudate in throat with pharyngitis.
 - (3) Posterior cervical lymphadenopathy.

15. Recognize the signs and symptoms of "strep" (Streptococcus) throat.

- a. Pharyngitis.
- b. Fever.
- c. Anterior cervical lymphadenopathy, but as the infective process continues both anterior and posterior chains can become involved.
- d. Erythematous pharynx with thick white or yellow exudate over pharynx or tonsils with much swelling of oropharynx or tonsils.
- e. Foul-smelling strep breath.

CAUTION: In a field environment, without the ability to perform a throat culture, you may treat "presumptive" strep on the basis of the clinical manifestation. However, in a clinical setting, you should culture all suspected strep and notify patients if lab findings show antibiotic therapy is required.

16. Recognize the signs and symptoms of acute epiglottitis.

- a. Most often seen in children 2 to 5 years.
- b. Acute onset.
- c. Hoarseness.
- d. High fever.
- e. Dysphagia.
- f. Respiratory distress.
 - (1) Drooling.
 - (2) Tachypnea.
 - (3) Inspiratory stridor. Patient will lean forward and hyperextend the neck to facilitate air exchange.
- g. Deep suprasternal, supraclavicular, intercostal, and subcostal inspiratory retractions are common.
- h. Decreased breath sounds bilateral with rhonchi.
- i. Pharynx is usually inflamed.

Note: Patient should be hospitalized as soon as possible (ASAP) whenever epiglottitis is suspected.

17. Record all findings in the patient's medical record.

18. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess conditions of the eyes, ears, nose, and throat (EENT).

Performance Measures

- 1. Solicited a patient history.
- 2. Performed a physical examination.
- 3. Recognized the signs and symptoms of bacterial conjunctivitis.
- 4. Recognized the signs and symptoms of viral conjunctivitis.
- 5. Recognized the signs and symptoms of allergic conjunctivitis.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Recognized the signs and symptoms of trachoma (granular conjunctivitis).	—	—
7. Recognized the signs and symptoms of adult gonococcal conjunctivitis.	—	—
8. Recognized the signs and symptoms of scleritis.	—	—
9. Recognized the signs and symptoms of superficial punctate keratitis.	—	—
10. Recognized the signs and symptoms of otitis media.	—	—
11. Recognized the signs and symptoms of otitis externa.	—	—
12. Recognized the signs and symptoms of sinusitis.	—	—
13. Recognized the signs and symptoms of URI.	—	—
14. Recognized the signs and symptoms of strep throat.	—	—
15. Recognized the signs and symptoms of acute epiglottitis.	—	—
16. Recorded all findings in the patient's medical record.	—	—
17. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

BATES PE, 8TH ED. 2002

Related

MERCK MANUAL 17TH ED

Manage Conjunctivitis

081-833-4213

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify bacterial conjunctivitis on the basis of patient history.
 - a. The patient may have a history of conjunctival irritation from smoke or other pollutants or of irritation caused by overexposure to UV light or arc welding. Any of these irritations can predispose the conjunctivae to opportunistic infection.
 - b. The patient may have a history of a cold, allergic reaction, or other disease process that predisposes him to opportunistic infection.
2. Identify bacterial conjunctivitis on the basis of patient's signs and symptoms.
 - a. Conjunctiva will be red, swollen, and painful (usually unilaterally).
 - b. Discharge is copious and purulent.
 - c. Usually self-limited to 10 to 14 days if unmanaged, but disease process time can be reduced to 2 to 3 days with topical antibiotics.
3. Identify bacterial conjunctivitis by using the Special Forces (SF) lab set.
 - a. Perform a Gram stain on the discharge, and examine it microscopically to identify the presence of bacteria.
 - b. Perform a giemsa's stain on the discharge to determine the lymphocytic response. The discharge will contain polymorphonuclear leukocytes.
4. Identify bacterial conjunctivitis by using other lab tests, if available.
 - a. Exudate and scrapings may be cultured to determine the exact strain of bacteria involved.
 - b. Viral cultures are also possible, but are unnecessary, as the viral disease is self-limiting.
5. Differentiate between bacterial conjunctivitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Viral conjunctivitis.
 - (1) Usually bilateral.
 - (2) Red conjunctiva.
 - (3) Clear discharge.
 - (4) Often associated with pharyngitis, fever, malaise, and cervical lymphadenopathy.
 - (5) Management of condition is to reassure patient.
 - (6) Disease lasts about 10 days.
 - b. Allergic conjunctivitis.
 - (1) Common--especially in hay fever.
 - (2) Bilateral tearing.
 - (3) Itching.
 - (4) Redness.
 - (5) Minimal mucoid discharge.
 - (6) Associated with rhinorrhea and sneezing.
 - (7) Management of condition is with antihistamine.
 - c. Trachoma.
 - (1) Conjunctival congestion.
 - (2) Eyelid edema.

Performance Steps

- (3) Progressive exacerbations and remissions over a period of weeks, eventually leading to blindness.

NOTE: In conjunctivitis that does not respond to antibiotic therapy, rule out Trachoma. (See task 081-833-4218, Manage Trachoma.)

6. Perform a patient care hand wash after examination and ensure that all instruments used in the examination are sterilized.
7. Manage bacterial conjunctivitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Ophthalmic erythromycin, gentamicin, or bacitracin-polymixin B ointment or drops four times daily (q.i.d.) for 7 to 10 days. (A poor clinical response after 2 to 3 days indicates an insensitive bacterium [change drugs] or that the cause is viral or allergic.)
 - b. The eyes should be kept free of discharge and not patched.
 - c. Patients should be advised to ensure that no one else uses their towels or other articles that have come into contact with their eyes.
 - d. Management of viral and allergic conjunctivitis is symptomatic. Commercially available eyedrops may be palliative. Antihistamines will alleviate some of the inflammation. Nonsteroidal anti-inflammatory drugs (NSAIDs) will provide analgesia and also help to reduce the inflammation.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage conjunctivitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified bacterial conjunctivitis on the basis of the patient's history.	—	—
2. Identified bacterial conjunctivitis on the basis of the patient's signs and symptoms.	—	—
3. Identified bacterial conjunctivitis by using the SF lab set.	—	—
4. Identified bacterial conjunctivitis by using other lab tests, if available.	—	—
5. Differentiated between bacterial conjunctivitis and other diseases with similar signs and symptoms.	—	—
6. After examination, the operator washed his hands thoroughly and ensured that all instruments used in the examination were sterilized.	—	—
7. Managed bacterial conjunctivitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
8. Recorded all treatment in the patient's medical record.	—	—
9. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

References
Required
SANFORD, 1999

Related

Manage Trachoma

081-833-4218

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify trachoma on the basis of the patient's history.
 - a. The patient may have a history of travel to North Africa, the Mediterranean, or the Far East. It also occurs sporadically among American Indians and in mountainous areas of the southern United States.
 - b. The patient will have a history of exposure to the disease. It is spread by hand-to-eye contact, by eye-seeking flies, or by sharing contaminated articles such as towels or handkerchiefs.
2. Identify Trachoma on the basis of the patient's signs and symptoms.
 - a. The symptoms appear gradually and usually bilaterally. Symptoms include the following:
 - (1) Conjunctival congestion.
 - (2) Eyelid edema.
 - (3) Photophobia.
 - (4) Lacrimation.
 - b. The above symptoms are followed 7 to 10 days later by the development of small follicles in the conjunctiva of the upper lids. These follicles gradually increase in size and number for 3 to 4 weeks. The follicles form yellow-gray, semitransparent, "sago-grain" granulations surrounded by inflammatory papillae.
 - c. Pannus development also occurs during this stage, with the upper half of the cornea being invaded by loops of vessels from the limbus. The entire cornea may ultimately be involved, reducing vision.
 - d. Without adequate treatment, the critical stage follows. The follicles and papillae gradually shrink and are replaced by scar tissue that often causes entropion and lacrimal duct occlusion. The corneal epithelium becomes dull and thickened, and lacrimation decreases.
 - e. On healing, the conjunctiva is smooth and grayish white. the extent of residual corneal opacity and vision loss varies.

NOTE: Trachoma cannot be effectively identified by using the Special Forces (SF) laboratory (lab) set.

3. Identify trachoma by using other lab tests, if available.
 - a. Chlamydia trachomatis can be isolated in culture.
 - b. In the early stage, the presence of minute basophilic cytoplasmic inclusion bodies in Giemsa-stained conjunctival scrapings differentiates trachoma from acute conjunctivitis.
4. Differentiate between trachoma and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Viral conjunctivitis.
 - b. Bacterial conjunctivitis.
 - c. Allergic conjunctivitis.

NOTE: You must differentiate trachoma from the above self-limiting conjunctival irritations. Failure to recognize and properly treat trachoma will lead to blindness.

5. Manage trachoma on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. The drug of choice is azithromycin 20 milligrams per kilogram (mg/kg) by mouth (PO) as a single dose (78 percent effective).

Performance Steps

- b. Alternatively, use doxycycline 100 mg PO twice a day (b.i.d.) for (x) 14 days.
 - c. Topical antibiotics are of little benefit.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage trachoma.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified trachoma on the basis of the patient's history.	_____	_____
2. Identified trachoma on the basis of the patient's signs and symptoms.	_____	_____
3. Identified trachoma by using other lab tests, if available.	_____	_____
4. Differentiated between trachoma and other diseases with similar signs and symptoms.	_____	_____
5. Managed trachoma on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	
Required	Related
MERCK MANUAL 17TH ED	
SANFORD, 1999	

Manage Hyphema

081-833-4220

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, and administer supportive care in accordance with The Merck Manual.

Performance Steps

1. Identify hyphema.
 - a. Blood will be in the anterior chamber of the eye.
 - b. Blood will be visible behind the cornea.
2. Assess the patient for other injuries on the basis of history and mechanism of injury.
3. Place the patient in a sitting position, reclining at a 45-degree angle, to prevent blood from staining the cornea at a higher level.
4. Place the patient on complete bedrest.
5. Bandage both eyes to prevent unnecessary eye movement.
6. Sedate the patient to improve compliance and patient comfort.
7. Consider giving aminocaproic acid 50 to 100 milligrams (mg) by mouth (PO) every 4 hours (q4h) for 5 days to reduce recurrent bleeding.
8. If increased intraocular pressure is suspected based on patient complaints of eye pain or headache, administer acetazolamide 250 to 1,000 mg PO per day in equally divided doses to reduce intraocular pressure.

NOTE: Accurate measurement of intraocular pressure is only possible with a tonometer.

9. Record all treatment in the patient's medical record.
10. Evacuate or refer the patient to an ophthalmologist at the earliest possible time.

CAUTION: Do not give aspirin or other blood-thinning agents, as these may worsen the patient's condition.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a hyphema.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified hyphema.	_____	_____
2. Assessed the patient for other injuries.	_____	_____
3. Placed the patient in a sitting position, reclining at a 45-degree angle.	_____	_____
4. Placed the patient on complete bedrest.	_____	_____
5. Bandaged both eyes.	_____	_____
6. Sedated the patient.	_____	_____
7. Considered giving aminocaproic acid 50 to 100 mg PO q4h for 5 days.	_____	_____
8. Administered acetazolamide 250 to 1,000 mg PO per day in equally divided doses when patient complained of eye pain or headache.	_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Evacuated or referred the patient to an ophthalmologist at the earliest possible time.	_____	_____
11. Did not give aspirin or other blood-thinning agents.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED	

Manage a Corneal Abrasion and/or a Foreign Body in the Eye

081-833-4221

Conditions: Given the M-5 medical kit.

Standards: Correctly identify the injury by soliciting a patient history and performing a physical examination. Correctly manage the injury by irrigating the eye, removing the foreign body, and bandaging the eye.

Performance Steps

1. Identify a foreign body in the eye or a corneal abrasion on the basis of the patient's history.
NOTE: Corneal foreign bodies comprise about 25 percent of all ocular injuries.
 - a. History of "getting something" in his eye.
 - b. History of being exposed to blowing dust.
 - c. Obtain details about the injury.
 - (1) Source and type of foreign bodies.
 - (2) Whether the foreign bodies were windblown or high velocity.
 - (3) Time of onset and length of discomfort.
 - (4) Any previous injuries to the eye.
 2. Identify foreign bodies in the eye and corneal abrasions on the basis of the patient's signs and symptoms.
 - a. Signs and symptoms of foreign bodies.
 - (1) The patient will complain of a feeling of something in the eye.
 - (2) Other symptoms are headache, excessive lacrimation, eye pain, photophobia, slight to severe pain, blurred vision, and redness.
 - b. Signs and symptoms of corneal abrasions.
 - (1) Symptoms same as foreign body.
 - (2) With corneal abrasions, even without the presence of a foreign body, the patient will state that there is something in the eye.
 3. Examine the eye for the foreign body or corneal abrasion.
 - a. Examine the eye without special equipment by using one of the two following methods:
 - (1) Method one.
 - (a) Pull the lower lid down.
 - (b) Tell the casualty to look up and to both sides, and check for foreign bodies.
 - (c) Pull the upper lid up.
 - (d) Tell the casualty to look down and to both sides, and check for foreign bodies.
 - (2) Method two.
 - (a) Tell the casualty to look down.
 - (b) Grasp the casualty's upper eyelashes, and gently pull the eyelid away from the eyeball.
 - (c) Place a cotton-tipped swab horizontally along the outer surface of the upper lid, and fold the lid back over the swab.
 - (d) Look for the foreign bodies or damage to the eyeball.
 - b. If unable to see any foreign body or corneal abrasion by using method one or two, repeat the procedures with Wood's light.
 - c. If still unable to see the foreign body or corneal abrasion, examine the eye by using fluorescein dye 2 percent strip (sterile, individually wrapped flouriscine strips) or fluorescein drops (sterile ophthalmic solution) 0.25 percent containing topical anesthetic.
- CAUTION:** Any object or medication placed in the eye must be sterile and made for ophthalmic use only.
- NOTE:** Fluorescein staining makes corneal abrasions more apparent.
- (1) Place the patient in the supine position.

Performance Steps

- (2) If pain and photophobia make it difficult for the patient to open the eye, apply topical anesthesia before examining the eye by instilling 1 drop of proparacaine or tetracaine.
- (3) Moisten the strip with 1 drop of sterile saline and, with the patient's eye turned upward, the strip is touched to the inside of the lower lid for several seconds. If using the drops, place 1 to 2 drops in each eye.
- (4) After the eye is closed for 5 seconds, examine it with a cobalt blue light or Wood's lamp. The affected areas will stain green. Trachoma cannot be effectively identified by using the Special Forces (SF) laboratory (lab) set.
 - (a) Ensure that both lids are everted by rolling them onto a cotton swab.
 - (b) Examine underlying conjunctiva and fornices for foreign bodies, corneal abrasions, and signs of inflammation.
- (5) Flush the eye with normal saline after use of fluorescein.
- m. If a corneal abrasion is visualized but no foreign body is seen after using fluorescein, manage the patient for a corneal abrasion.

4. Remove foreign bodies by using the following techniques in this sequence:

- a. Irrigate the eye with normal saline in accordance with (IAW) task 081-833-0054, Irrigate Eyes. This step should be done after the use of fluorescein stain regardless of the presence of a foreign body.

- (1) Hold the casualty's eye open.

CAUTION: Do not put pressure on the eyeball.

- (2) Irrigate the eye.

- b. If the foreign body cannot be flushed out, moisten the tip of a cotton-tipped applicator with sterile water or normal saline and gently lift the foreign body from the eye. You may need to use a topical anesthetic such as tetracaine 0.5 percent, 2 drops (gtt) to numb the eye.

CAUTION: Never give the patient anesthetic drops to use.

- c. If unable to remove the foreign body with a wet cotton-tipped applicator, use a dry cotton-tipped applicator.
- d. If you are still unable to remove the foreign body, you may need to use a 25-gauge sterile needle or a spud to lift it out of the eye.

NOTE: If the foreign body is steel or iron and it is not removed immediately, it will leave a rust ring that will also ultimately have to be removed.

5. Prepare the patient for evacuation if unable to remove foreign body.

- a. Irrigate the eye with normal saline if not done previously.
- b. Instill an ophthalmic antibiotic ointment or drops, such as erythromycin, bacitracin, Polysporin (polymyxin B-bacitracin), or gentamycin, without corticosteroids.

NOTE: Ophthalmic corticosteroid preparations tend to promote the growth of fungi and are contraindicated in this situation.

- c. Bandage both eyes if foreign bodies are not easily removed or if there is pain or loss of vision in the eye.

NOTE: In hazardous conditions, leave the good eye uncovered long enough to ensure the casualty's safety.

- d. The patient should be evacuated immediately for treatment by a physician in the following instances:

- (1) Difficulty in lifting the foreign body. Embedded foreign bodies should only be removed by a physician.
 - (2) Suspicion that the foreign body has penetrated the globe of the eye (task 081-833-4223, Manage Eye Trauma).

6. Provide treatment for the eye following the removal of the foreign body or the diagnosis of a corneal abrasion.

- a. Dilate the pupil with a short-acting cycloplegic such as cyclopentolate 1 percent.
- b. Irrigate the eye with normal saline if not done previously.
- c. Instill an ophthalmic antibiotic ointment or drops, such as erythromycin, bacitracin, Polysporin (polymyxin B-bacitracin), or gentamycin, without corticosteroids.

Performance Steps

- d. Apply a patch to the affected eye firmly enough to keep the eye closed.
 - e. Examine eye daily for evidence of infection.
 - f. If healing is longer than 48 hours, do a medical evacuation (MEDEVAC) for an emergency case. Serious intraocular infection may ensue.
7. Do not cause additional injury to the eye.
 - a. Do not probe for foreign bodies.
 - b. Do not put pressure on the eyeball.
 - c. Do not remove an impaled object.
 8. Record all treatment on the appropriate forms.
 9. Evacuate the patient, if necessary.
 10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a foreign body to the eye or a corneal abrasion.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified a foreign body in the eye or a corneal abrasion on the basis of the patient's history.	—	—
2. Identified foreign bodies in the eye and corneal abrasions on the basis of the patient's signs and symptoms.	—	—
3. Examined the eye for a foreign body or corneal abrasion.	—	—
4. If foreign bodies were found, tried to remove them by using the proper sequence of steps.	—	—
5. If unable to remove foreign body, prepared the patient for evacuation.	—	—
6. Provided treatment for the eye after the foreign body was removed or a corneal abrasion was diagnosed.	—	—
7. Did not cause further injury to the eye.	—	—
8. Recorded all treatment on the appropriate forms.	—	—
9. Evacuated the patient when necessary.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Subconjunctival Hemorrhage

081-833-4224

Conditions: Given the M-5 medical kit and the patient's record.

Standards: Solicit a patient history, perform a physical examination, and reassure the patient in accordance with The Merck Manual.

Performance Steps

1. Identify subconjunctival hemorrhage on the basis of the patient's history.
 - a. Review patient's record for history of subconjunctival hemorrhage.
 - b. Question the patient concerning a history of straining, sneezing, or forceful coughing. Rarely do the hemorrhages occur spontaneously.
2. Identify subconjunctival hemorrhage on the basis of the patient's signs and symptoms.
 - a. The patient may appear alarmed by the appearance of his eye.
 - b. The sclera will appear red or rust brown, usually in one corner, although extensive amounts of the sclera may be covered.

3. Manage subconjunctival hemorrhage.

NOTE: In rare cases, subconjunctival hemorrhage can be an indicator of certain blood dyscrasias. A person with a history of numerous spontaneous hemorrhages requires further screening.

- a. Reassure the patient.
- b. Tell the patient that the blood is usually reabsorbed spontaneously within 2 weeks.
- c. Instruct patient to return if the hemorrhage does not improve within 1 week or gets worse in the next 48 hours.
- d. Topical corticosteroids, antibiotics, vasoconstrictors, and compresses are of no value in speeding reabsorption.

4. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage subconjunctival hemorrhage.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified subconjunctival hemorrhage on the basis of the patient's history.	—	—
2. Identified subconjunctival hemorrhage on the basis of the patient's signs and symptoms.	—	—
3. Reassured the patient by telling him that the blood is usually reabsorbed spontaneously within 2 weeks.	—	—
4. Instructed patient to return if the hemorrhage does not improve within 1 week or gets worse in the next 48 hours.	—	—
5. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Otitis Media**081-833-4226**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify otitis media on the basis of the patient's history.
 - a. Patient will usually have a history of an upper respiratory infection.
 - b. Occurs most commonly in young children ages 3 months to 3 years.
 - c. Patients will complain of earache and possibly hearing loss.
2. Identify otitis media on the basis of the patient's signs and symptoms.
 - a. Fever.
 - b. Nausea and vomiting.
 - c. Diarrhea, especially in young children.
 - d. The tympanic membrane (TM) is erythematous and may bulge. The landmarks will be indistinct, and the light reflex will be displaced. (For otoscopic examination of the ear, see task 081-833-4002, Perform a Complete Physical Examination.)
 - e. With spontaneous rupture of the TM, bloody, then serosanguineous, and finally purulent otorrhea may result. Take a culture of exudate from spontaneous rupture of TM, if possible.

NOTE: Diagnosis is usually made on clinical grounds and no lab tests are indicated.

3. Manage otitis media on the basis of the treatment modality in the most current edition of The Sanford's Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. To improve drainage and eustacean tube function, topical vasoconstrictors such as phenylephrine 0.25 percent may be instilled into each nasal cavity every 3 hours (q3h) for (x) no more than 7 days. For best results, the patient should be supine with the neck extended. Systemic vasoconstrictors such as pseudoephedrine may also be helpful.
 - b. Drug of choice (DOC) is sepra double strength (DS) by mouth (PO) twice daily (b.i.d.) x 10 days or augmentin 825/125 milligrams (mg) PO b.i.d. x 10 days.
 - c. Alternatives are erythromycin-sulfisoxazole combination with the erythromycin portion equivalent to 50 milligrams per kilogram per day (mg/kg/day) divided every 6 hours (q6h) x 10 days or clarithromycin 15 mg/kg/day every 12 hours (q12h).
 - d. Referral for myringotomy should be considered if the TM is bulging or if pain, fever, vomiting, and diarrhea are severe or persistent.
4. Treat complications symptomatically with appropriate supportive care.
5. Record all treatment in the patient's medical record.
6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage otitis media.

Performance Measures

1. Identified otitis media on the basis of the patient's history.
2. Identified otitis media on the basis of the patient's signs and symptoms.

GO NO GO

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Managed otitis media on the basis of the treatment modality in the most current edition of The Sanfords Guide to Antimicrobial Therapy.	_____	_____
4. Treated complications symptomatically with appropriate supportive care.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED SANFORD, 1999	

Manage Otitis

081-833-4227

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify external otitis on the basis of the patient's history.
 - a. The patient will often relate a history of swimming (thus the name swimmer's ear) or allowing chlorinated water or other irritants to enter the ear canal.
 - b. Very often, patients will have a regular practice of cleaning the ear canal with cotton swabs. This practice pushes cerumen and desquamated cells back against the tympanic membrane (TM), creating a breeding ground for bacteria.
2. Identify external otitis on the basis of the patient's signs and symptoms.
 - a. Itching.
 - b. Pain, especially on traction of the pinna or pressure over the tragus
 - c. Foul-smelling discharge.
 - d. Skin of the external auditory canal appears red, swollen, and littered with moist, purulent debris.

NOTE: Lab tests are seldom indicated as the diagnosis is usually based on clinical grounds.

3. Differentiate between external otitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Otitis media will not usually result in inflammation of the external canal. External otitis will not cause distention of the TM.
 - b. Localized infection of the ear canal, such as a furuncle, will cause severe pain and possibly brief, purulent otorrhea should the furuncle spontaneously rupture. Allow furuncles to drain on their own. Topical antibiotics are ineffective; however, analgesics are affective. Dry heat may also help to relieve pain and hasten resolution.
4. Manage external otitis on the basis of the treatment modality in the most current edition of The Sanford's Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Ear drops: polymixin B+neomycin+hydrocortisone 5 drops (gtt) four times a day (q.i.d.) for (x) 7 days.
 - b. Systemic antibiotics are rarely indicated. However, in acute disease, you may use dicloxacillin 500 milligrams (mg) by mouth (PO) q.i.d. x 7 days.
 - c. Analgesics, such as codeine, may be indicated for relief of pain.
5. Treat complications symptomatically with appropriate supportive care.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage otitis.

Performance Measures

1. Identified external otitis on the basis of the patient's history.

GO **NO GO**

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Identified external otitis on the basis of the patient's signs and symptoms.	—	—
3. Differentiated between external otitis and other diseases with similar signs and symptoms.	—	—
4. Managed external otitis on the basis of the treatment modality in the most current edition of The Sanford's Guide to Antimicrobial Therapy.	—	—
5. Treated complications symptomatically with appropriate supportive care.	—	—
6. Recorded all treatment in the patient's medical record.	—	—
7. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Epistaxis

081-833-4229

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify epistaxis on the basis of blood coming from the nose of the patient.
2. Determine the possible severity of this and other associated injuries on the basis of the patient's history and mechanism of injury.
 - a. Does the patient have a history of bleeding disorders or high blood pressure.
 - b. Was the patient involved in an accident, and if so, what was the nature of the accident.
 - c. Does the mechanism of injury raise a high degree of suspicion for other associated injuries.
3. Examine the patient for other associated injuries.
4. Manage epistaxis:
 - a. Have the patient sit and lean forward with the head tilted forward. This position stops the blood from trickling down the throat or being drawn into the lungs.
 - b. Apply direct pressure for at least 15 minutes by pinching the fleshy part of the nostrils together.
 - c. Alternatively, or in addition to the above, you may place a rolled 4 by 4 inches gauze bandage between the upper lip and gum. Press the bandage against the gum with your gloved fingers. The patient can sometimes apply enough pressure by stretching the upper lip against the rolled bandage, and pulling the lip up against the base of the nose.
 - d. Keep the patient calm and quiet. This is particularly important if the patient has high blood pressure or is anxious.
 - e. Apply an ice pack over the nose.

NOTE: Most failures of management result from not allowing enough time for a clot to form and the bleeding to stop.

5. Remember the following facts when managing epistaxis:
 - a. It is possible for a patient, especially a child, to lose enough blood through epistaxis to go into shock. The blood you see is only a small part of the total blood loss, much of which passes into the stomach. Be prepared to manage shock, as necessary.
 - b. A patient who swallows large amounts of blood may become nauseated and start to vomit. This can be confused with internal bleeding.
 - c. A patient who has a history of frequent, nontraumatic nosebleeds may be suffering from high blood pressure or a bleeding disorder. As such, the patient should be evaluated further to discover the cause of the problem.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage epistaxis.

Performance Measures

1. Identified epistaxis on the basis of blood coming from the nose of the patient.

GO NO GO

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Determined the possible severity of this and other associated injuries on the basis of the patient's history and mechanism of injury.	—	—
3. On the basis of the patient's history, examined the patient for other associated injuries.	—	—
4. Managed epistaxis by keeping the following facts in mind: a. It is possible for a patient, especially a child, to lose enough blood through epistaxis to go into shock. The blood you see is only a small part of the total blood loss, much of which passes into the stomach. Be prepared to manage shock, as necessary. b. A patient who swallows large amounts of blood may become nauseated and start to vomit. This can be confused with internal bleeding. c. A patient who has a history of frequent nontraumatic nosebleeds may be suffering from high blood pressure or a bleeding disorder. As such, the patient should be evaluated further to discover the cause of the problem.	—	—
5. Recorded all treatment in the patient's medical record.	—	—
6. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Sinusitis**081-833-4230**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify sinusitis on the basis of the patient's history.
 - a. Patient may have a history of a recent, untreated upper respiratory infection.
 - b. In 25 percent of patients, chronic maxillary sinusitis is secondary to dental infection.
 - c. Patients will often complain of pain in the maxillary area, toothache, and headache.
2. Identify sinusitis on the basis of the patient's signs and symptoms.
 - a. Tenderness and swelling over the involved sinuses.
 - b. Malaise may be present.
 - c. Fever and chills suggest an extension of the infection beyond the sinuses.
 - d. Nasal mucosa is red and turgescient.
 - e. Yellow or green purulent rhinorrhea may be present.
 - f. Since acute or chronic sinusitis are rarely caused by viruses; base diagnosis on physical examination.

NOTE: In chronic sinusitis, X rays of the apices of the teeth may be needed to rule out periapical abscess.

3. Manage sinusitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Improve drainage through the use of steam inhalation and topical vasoconstrictors such as phenylephrine 0.25 percent spray every 3 hours (q3h) for (x) no more than 7 days. Systemic vasoconstrictors such as pseudoephedrine are less reliably effective.
 - b. Drug of choice (DOC) is augmentin 825/125 milligrams (mg) by mouth (PO) twice daily (b.i.d.) x 10 days, cefuroxime axetil 250 mg PO b.i.d. x 10 days, or sepra double strength (DS) PO b.i.d. x 10 days.
 - c. Antibiotics are usually not effective in chronic sinusitis. These patients should be referred to otolaryngology for consultation.
4. Treat complications symptomatically with appropriate supportive care.
5. Record all treatment in the patient's medical record.
6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage sinusitis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified sinusitis on the basis of the patient's history.	_____	_____
2. Identified sinusitis on the basis of the patient's signs and symptoms.	_____	_____
3. Managed sinusitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Treated complications symptomatically with appropriate supportive care.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED SANFORD, 1999	

Remove a Foreign Body from the External Auditory Canal

081-833-4234

Conditions: Given the M-5 medical kit.

Standards: Examine the ear, and remove a foreign body by the least invasive means possible.

Performance Steps

1. Explain the procedure to the patient.
2. Position the patient supine on the examining table.
3. Perform an otoscopic examination to determine the type and location of the foreign body.
 - a. Position the patient to allow a good view into the ear.
 - b. Insert the otoscope speculum into the external ear canal.
 - c. Straighten the external ear canal by gently pulling the outer ear upward and backward for an adult or downward and backward for a child.

NOTE: Use the largest speculum that will fit comfortably in the patient's ear.

- d. Turn on the otoscope light, and insert the speculum just inside the opening of the ear.

NOTE: To avoid causing pain, gently insert the speculum. Do not insert the speculum not too far into the ear canal.

- e. View the ear canal by looking through the lens of the otoscope.
- f. Check for abnormalities.

(1) Check the external ear canal for redness, swelling, drainage, or foreign bodies.

(2) Check the tympanic membrane (TM) for any abnormal conditions.

NOTE: A normal eardrum is slightly cone-shaped, shiny, translucent, and pearly gray.

(3) A blue, yellow, amber, red, or pink eardrum indicates disease or infection.

(4) A bulge in the eardrum indicates possible pus or fluid in the middle ear.

(5) A hole or tear indicates rupture of the TM.

CAUTION: If an abnormal condition of the TM is suspected, do not irrigate the ear. To do so could cause pain and carry debris or infectious discharge into the middle ear.

4. Remove the foreign body by one of the following methods:

- a. Irrigate the ear canal with warm tap water, and apply gentle suction to remove the foreign body.

CAUTION: Never place cold water in the ear canal. It is extremely painful and may cause dizziness and nausea.

- (1) Position the patient in a sitting or prone position with the head slightly tilted toward the affected side.

NOTE: Do not tilt the head toward the unaffected side, since this interferes with the return of the irrigating solution.

- (2) Drape the patient's shoulder and upper arm area under the affected ear.

- (3) Clean the external ear and the entrance to the ear canal. Use 4 by 4 inches gauze sponges slightly moistened with the irrigating solution.

WARNING: If you use a cotton-tipped applicator to clean the ear, make sure it does not stick far enough into the ear to rupture the TM.

- (4) Fill the irrigating syringe.

- (5) Test the flow of solution from the syringe by expelling a small amount back into the solution container.

- (6) Position the catch basin firmly against the neck and just under the affected ear.

- (7) Straighten the external ear canal by gently pulling the outer ear upward and backward for an adult or downward and backward for a child.

- (8) Irrigate the patient's ear.

- (a) Place the tip of the irrigating syringe just inside the ear with the tip directed toward the roof of the ear canal.

Performance Steps

WARNING: Never allow the syringe to completely block the ear canal. If space is not left around the tip, the solution will not be able to return, and undue pressure will build up in the canal.

- (b) Depress the bulb or plunger of the syringe. Direct a slow, steady stream of solution against the roof of the ear canal.
- (c) Repeat the procedure until the foreign body is removed, the solution returns free of wax or debris, or the proper amount of solution has been used.
- (9) Remove the catch basin, and dry the external ear with a gauze sponge.
- (10) Instruct the patient to continue tilting the head toward the affected side for a few minutes to allow any remaining solution to drain from the ear.
- (11) Remove the drapes from the patient.
- b. Remove porous material with a wire loop curette or cerumen spoon.
 - (1) Position the patient as above.
 - (2) Insert the device just beyond the obstruction while directly observing the device with the otoscope.
 - (3) Move the "crook" of the device behind the obstruction.
 - (4) Pull the obstruction out of the ear canal.
- c. Remove odd-shaped or tightly packed foreign bodies with small forceps in conjunction with irrigation.

CAUTION: Be cautious when placing objects into the ear canal. The TM could easily be damaged, resulting in hearing loss.

- 5. Inspect the canal and TM for trauma and damage, and treat as needed.
- 6. Record the procedure in the patient's medical records.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a foreign body in the ear canal.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Explained the procedure to the patient.	—	—
2. Positioned the patient supine on the examining table	—	—
3. Performed an otoscopic examination to determine the type and location of the foreign body.	—	—
4. Removed the foreign body.	—	—
5. After removal, inspected the canal and TM for trauma and damage, treating as needed.	—	—
6. Recorded the procedure in the patient's medical records.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 10: Cardiovascular Conditions

Detect Abnormal Cardiac Sounds

081-833-4040

Conditions: Given a stethoscope.

Standards: Detect abnormal cardiac sounds in accordance with (IAW) Bate's Pocket Guide to Physical Examination and The Merk Manual.

Performance Steps

1. Determine abnormal sounds associated with the first heart sound (S1).
 - a. S1 is loud in mitral stenosis.
 - b. S1 is soft or absent in mitral regurgitation because of valve leaflet sclerosis and rigidity, but it is often well heard in other forms of mitral regurgitation caused by myxomatous degeneration of the mitral apparatus or to ventricular myocardial abnormality. Under normal conditions, the S1 is often split and has a high pitch.
2. Determine abnormal sounds associated with the second heart sound (S2).
 - a. This sound normally consists of two components--the first is caused by aortic valve closure and the second by pulmonic valve closure. Aortic normally precedes pulmonic.
 - b. Late aortic valve closure occurs in left bundle branch block or aortic stenosis.
 - c. Early pulmonic valve closure occurs in some forms of pre-excitation phenomena.
 - d. Delayed pulmonic valve closure occurs when there is an increase in volume of flow through the right ventricle such as an atrial septal defect of the common secundum variety.
 - e. A single S2 may occur when the aortic valve is regurgitant, severely stenotic, or atretic.
3. Determine abnormal clicks.
 - a. Clicks are sounds similar to S1 and S2. They are high-pitched sounds of short duration that occur only in systole. They are distinguished from S1 and S2 by their higher pitch and shorter duration, and their mobility in systole as a result of hemodynamic manipulation. Clicks may be single or multiple.
 - b. Clicks occur in congenital aortic and pulmonic valve stenosis in which they are thought to arise from abnormal ventricular wall tension. Here they occur early in systole, very near S1, and do not change in relation to S1 with altered hemodynamics.
 - c. Clicks occur in mitral and tricuspid valve prolapse. Here they are thought to be due to abnormal tension on redundant or elongated cordae tendinae or valve leaflets. Clicks due to myxomatous degeneration of valves may occur anywhere in systole, but move toward S1 during maneuvers that decrease ventricular volume, such as standing or the Valsalva maneuver. If ventricular filling volume is increased, such as by lying down, then the clicks move toward S2, particularly in mitral valve prolapse. For unknown reasons, characteristics of the clicks may vary greatly between examinations and they may even come and go.
4. Determine abnormal myocardial sounds.
 - a. Diastolic sounds are early diastolic (the third heart sound [S3] or pericardial knock) and late diastolic (the fourth heart sound [S4]). Unlike systolic sounds, they are low-pitched, softer in intensity, and longer in duration.
 - b. S3 occurs in early diastole, when the ventricle is dilated and noncompliant. It occurs during passive diastolic ventricular filling and indicates serious ventricular dysfunction, except in children, in whom it can be normal. Right ventricular S3 increases with inspiration because of augmentation of right ventricular filling volume and is best heard with the patient supine. Left ventricular S3 is best heard during expiration (because of the closer proximity of the heart and chest wall) with the patient in the left lateral decubitus position.

Performance Steps

- c. S4 is produced by the augmented diastolic ventricular filling near the end of diastole caused by atrial contraction. Like S3, it is a low pitched sound heard only or at best with the bell of the stethoscope. Right ventricular S4 increases with inspiration, while left ventricular S4 decreases. S4 is heard much more often than S3 and indicates a lesser degree of ventricular dysfunction. It is absent in atrial fibrillation but almost always present during active myocardial ischemia or early myocardial infarction (MI).
 - d. A summation gallop occurs when S3 and S4 are present in a patient with tachycardia. Diastole may be shortened such that the two sounds merge. When quite loud, S3 and S4 may be palpable at the apex with the patient in the left lateral decubitus position.
 - e. A diastolic knock occurs at the same point in early diastole as an S3. It is not accompanied by an S4 and is a duller thudding sound, which indicates an abrupt arrest of ventricular filling by a noncompliant constricting pericardium.
 - f. Mitral valve snap is the only other diastolic sound. It is the opening snap of mitral stenosis or, rarely, of tricuspid stenosis. The snap is a very high-pitched, brief sound that is heard best with the diaphragm of the stethoscope. Its proximity to the pulmonic component of S2 is directly proportional to the severity of the mitral stenosis.
5. Determine heart murmurs.
- a. Murmurs are graded according to intensity as follows: Grade 1: barely audible. Grade 2: Soft but easily heard. Grade 3: loud without a thrill. Grade 4: loud with a thrill. Grade 5: loud with little contact between stethoscope and chest wall. Grade 6: heard with stethoscope off chest wall.
 - (1) Grade 1: barely audible.
 - (2) Grade 2: soft but easily heard.
 - (3) Grade 3: loud without a thrill.
 - (4) Grade 4: loud with a thrill.
 - (5) Grade 5: loud with little contact between stethoscope and chest wall.
 - (6) Grade 6: heard with stethoscope off chest wall.
 - b. Systolic murmurs are divided into ejection murmurs and holosystolic murmurs.
 - (1) Ejection murmurs are associated with aortic stenosis, hypertrophic obstructive cardiomyopathy, and pulmonic stenosis.
 - (2) Holosystolic (regurgitation) murmurs are associated with mitral valve insufficiency, tricuspid regurgitation, and ventricular septal defect.
 - c. Diastolic murmurs are due to stenosis of the mitral or tricuspid valves or regurgitation of the aortic or pulmonic valves.
 - d. Continuous murmurs indicate a constant shunt flow throughout systole and diastole and may be due to patent ductus arteriosus, coarctation of the aorta or pulmonary artery, aortopulmonary window, and branch stenosis of the pulmonary artery and others. Some of these produce a thrill and may be associated with signs of left or right ventricular hypertrophy.
6. Determine a pericardial friction rub: This is a superficial, high-pitched, or scratchy sound that may be systolic, diastolic and systolic, or triphasic. Rubs are best heard with the patient leaning forward or on hands and knees with the breath held in expiration. The sound has the character of pieces of leather squeaking as they are rubbed together.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must detect abnormal heart sounds.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined abnormal sounds associated with the first heart sound (S1).	—	—
2. Determined abnormal sounds associated with the second heart sound (S2).	—	—
3. Determined abnormal clicks.	—	—
4. Determined abnormal myocardial sounds.	—	—

Performance Measures

GO **NO GO**

5. Determined heart murmurs.

6. Determined pericardial friction rub.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

BATES PE, 5TH ED. 1991
MERCK MANUAL 17TH ED

Related

Manage Abnormal Blood Conditions

081-833-4042

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, patient's medical record, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the causes of blood disorders involving white blood cells (WBCs).
 - a. These disorders are generally associated with abnormal functioning of blood-forming tissue (for example, bone marrow, lymphatic system, and spleen) that cause an increase or a decrease in the number of circulating WBCs.
 - b. Leukocytosis has a WBC count greater than 10,000 and could be associated with the following:
 - (1) Infection--especially bacterial.
 - (2) Trauma or hemorrhage.
 - (3) Steroid therapy.
 - (4) Leukemia.
 - (5) Transient--myocardial infarction and pulmonary embolism or stress.
 - c. Leukopenia has a WBC count less than 5,000 and could be associated with the following:
 - (1) Typhoid or viral infections.
 - (2) Leukemias.
 - (3) Drug toxicity, chronic alcoholism, or any serious debility.
 2. Define leukemia.
 - a. Group of neoplastic (malignant) diseases primarily of the WBCs.
 - b. Specific types of leukemias are based on specific WBC lines that are affected and the nature of the disease (for example, insidious versus chronic type onset).
 3. Understand the causes of leukemia.
 - a. The exact cause of leukemia is not known. However, several factors are associated with a higher incidence of the disease.
 - (1) Exposure to radiation or chemicals.
 - (2) Some forms of retroviruses.
 - (3) Hereditary tendencies (family tendencies and chromosomal abnormalities such as Down's syndrome).
 - (4) Following the treatment for other diseases (especially malignancies).
 - b. Acute and chronic forms of leukemia include the following:
 - (1) Acute lymphocytic leukemia (ALL) affects lymphocytes and occurs in the lymph tissue.
 - (2) Acute myelocytic leukemia (AML) affects myelocytes in the bone marrow.
 - (3) Chronic granulocytic leukemia (CGL) or myelocytic leukemia (CML) slower onset of myelocytic problem in bone marrow.
 - (4) Chronic lymphocytic leukemia (CLL) slower onset of lymphocytic problem.
- NOTE: Chronic forms eventually convert to acute forms. When they convert, generally severe infections are seen, requiring treatment.
4. Identify leukemia on the basis of the patient's signs and symptoms. Signs and symptoms are related to controlled proliferation of WBCs in the bone marrow and replacement of bone marrow elements.
 - a. Abnormal WBC counts are secondary to proliferation of mutated cells.

Performance Steps

- b. Anemia-associated signs and symptoms are secondary to limited red blood cell (RBC) production.
 - c. Bleeding tendencies are secondary to decreased platelets.
 - d. Fevers and infections are secondary to granulocytopenia.
 - e. Discomfort caused by engorgement of organs and bones by leukemic cells (affects lymph nodes, spleen, and joints).
 - f. Signs and symptoms of increased metabolism (for example, tachycardia, weight loss, and intolerance to heat).
5. Identify leukemia on the basis of laboratory (lab) findings; for example, significantly altered blood counts and significant increase in the numbers of immature cells.
6. Manage leukemia as follows:
 - a. Evacuate as soon as possible (ASAP) for further evaluation, possible chemotherapy, or radiation therapy.
 - b. Administer supportive care transfusions of antibiotics, since most deaths are caused by overwhelming infections.
 - c. Educate patient and family on the following:
 - (1) Personal hygiene to protect from infection.
 - (2) Diet to maintain and strengthen the immune response.
 - (3) Precautions versus injury and bleeding.
 - (4) Progress of the disease.
 - (5) Emotional support during the dying process.
7. Understand the definition and causes of bleeding disorders and clotting abnormalities.
 - a. Abnormal bleeding is generally due to an abnormality in the number of circulating platelets (thrombocytes) or in a coagulation defect.
 - b. Thrombocytopenia is generally less than 100,000 circulating platelets. It could be caused by the following:
 - (1) Decreased production of platelets (occur with infiltrating disease of the bone marrow, leukemia, myelosuppressive therapy, and drugs such as acetylsalicylic acid [ASA], radiation, and aplastic anemia).
 - (2) Increased destruction of platelets (secondary to infection, drugs, and disorders where platelets are consumed quickly; for example, disseminated intravascular coagulation (DIC), immune response, and self-destruction).
 - (3) Abnormal distribution or sequestering of platelets caused by hypersplenism and other spleen problems or liver problems.
 - (4) Increased loss of platelets (through blood loss or dilution with multiple blood transfusions).
 - c. Thrombocytosis generally is considered in excess of 500,000 platelets and is generally associated with hemorrhage, infection, malignancies, and iron deficiency.
 - d. Clotting abnormalities result in bleeding. The clotting process might be too slow or too fast.
 - (1) Slow clotting might be caused by the following:
 - (a) Clotting factor deficiency.
 - (b) Thrombocytopenia.
 - (c) Medications (steroids and ASA impair the function of platelets).
 - (d) Liver disease (leads to vitamin K deficiency).
 - (2) Very rapid clotting is also dangerous and might be seen in such conditions as the following:
 - (a) Systemic infections.
 - (b) Use of birth control pills.
 - (c) Occult malignancy.
8. Manage disorders associated with deficiency of clotting factors.

Performance Steps

- a. Hemophilia is primarily a genetically inherited bleeding disorder. Hemophilia affects primarily males even though it is transmitted by their mothers. It is caused by a deficiency of the clotting factors VIII or IX. Complications are associated with hemorrhage, obstruction, and compression of nerves (decreased oxygenation affects multiple organs and the joints).
 - (1) Identify hemophilia on the basis of the patient's signs and symptoms. Signs and symptoms depend on the degree of factor deficiency--abnormal bleeding may be severe, moderate, or mild.
 - (a) Frequent or easy bleeding or bruising.
 - (b) Prolonged bleeding (from nose, mouth, or a laceration).
 - (c) Bleeding into the joints (especially elbows, knees, and ankles).
 - (d) Spontaneous bleeding (gastrointestinal [GI] bleeding, resulting in hematuria. Bleeding is near peripheral nerves; it could cause neuropathies and/or paresthesias.
 - (2) Identify hemophilia on the basis of lab findings.
 - (a) Normal platelet count and function and normal bleeding time (however, bleeding can start again later).
 - (b) A definitive diagnosis is based on assessment of the specific clotting factors.
 - (3) Manage hemophilia. The disorder is not curable; however, it can be managed.
 - (a) Refer patient to hematology for evaluation.
 - (b) Symptomatic treatment with clotting factors.
 - (c) Patient education to monitor activity and body function to reduce the risk of bleeding.
- b. Vitamin K deficiency.
 - (1) Understand the causes of vitamin K deficiency.
 - (a) Poor placental transfer (could be seen in newborns).
 - (b) Prolonged use of drugs that destroy the intestinal flora.
 - (c) Liver and bile duct problems (infections or anything that decreases bile flow to the small intestine).
 - (d) Malabsorption of fats and vitamin K (secondary to small intestinal disease).
 - (e) Rarely actually caused by dietary intake.
 - (2) Identify vitamin K deficiency on the basis of the patient's signs and symptoms. Signs and symptoms are primarily abnormal bleeding tendencies.
 - (3) Identify vitamin K deficiency on the basis of lab findings--prolonged prothrombin times (PTs) in conjunction with abnormal bleeding (manifested by continual oozing after performing the bleeding time test).
 - (4) Manage vitamin K deficiency.
 - (a) Replace the vitamin K until the prothrombin time is shortened.
 - (b) Supportive care.
 - (c) Patient education (diet should be high in leafy green vegetables, tomatoes, cheese, egg yolks, liver, safflower oil, and yogurt).
- c. Understand the definition and cause of infectious mononucleosis (mono).
 - (1) An acute infectious disease of the lymphatic system that primarily affects young adults and children (often overlooked in children).
 - (2) Etiology of mono is the Epstein-Barr virus (EBV), which is a member of the herpes virus group.
 - (a) Virus is transmitted in the saliva of patients with active disease or by carriers. It is usually transmitted by intimate contact, and thus the reference to this disease as the "kissing disease."
 - (b) The disease is commonly found where young people live in close proximity to one another.
 - (c) Host susceptibility is important (debility from other disorders increases the risk; for example, high stress and physical exertion increases susceptibility).
 - (3) Identify mono on the basis of the patient's signs and symptoms. Signs and symptoms are rather vague and similar to many other disorders.
 - (a) Fluctuating fevers (101 to 102 degrees Fahrenheit), sore throat of a long duration, and cervical lymphadenopathy are the hallmark symptoms of the disease (lymphadenopathy could be tender or nontender).

Performance Steps

- (b) Prodromal symptoms include headache, malaise, and fatigue.
- (c) Splenomegaly is seen in about 50 percent of the cases.
- (d) The patient could display hepatomegaly, or skin rashes, petechiae on the soft palate, pharyngitis, and eyelid and orbital edema.
- (e) Icterus (jaundice) is seen in about 5 to 10 percent of the cases.
- (4) Identify mono on the basis of lab findings.
 - (a) Leukocytosis (10,000 to 20,000 during the second and third week of the illness).
 - (b) Increase in atypical lymphocytes (so leukocytosis is primarily lymphocytosis).
 - (c) Abnormal liver function tests.
 - (d) Positive mono spot test (the mono spot test is a specific test for the antibody to EBV).
- (5) Understand complications of infectious mono.
 - (a) Splenic rupture usually associated with trauma.
 - (b) Chronic fatigue syndrome.
 - (c) Hemolytic anemia and/or immune thrombocytopenia.
 - (d) Neurologic, cardiac, and liver complications.
- (6) Manage infectious mono.
 - (a) Symptomatic treatment and supportive care.
 - (b) Strict bedrest during the acute phase of the illness. Eliminate ALL physical activity to avoid splenic rupture.
 - (c) Proper diet.
 - (d) Increase patient activity as tolerated.
 - (e) Acetaminophen (Tylenol) for discomfort.
 - (f) Steroids for severe thrombocytopenia or impending airway compromise (steroids suppress lymphocytosis).
 - (g) Patient education (regarding diet, activity and safety, expected duration [1 to 4 weeks], and the length of convalescence [could be months to years]).
- 9. Record all treatment in the patient's medical record.
- 10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage abnormal blood conditions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of blood disorders involving WBCs.	—	—
2. Defined leukemia.	—	—
3. Understood the causes of leukemia.	—	—
4. Identified leukemia on the basis of the patient's signs and symptoms.	—	—
5. Identified leukemia on the basis of lab findings.	—	—
6. Managed leukemia appropriately.	—	—
7. Understood the definition and causes of bleeding disorders and clotting abnormalities.	—	—
8. Managed disorders associated with deficiency of clotting factors.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Anemia

081-833-4044

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, the patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

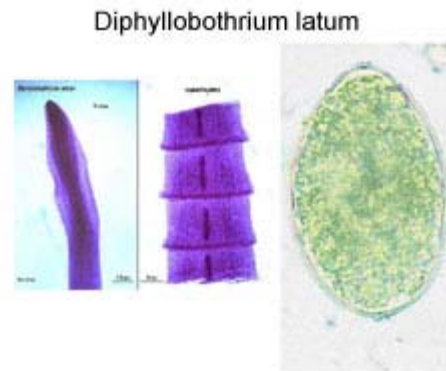
1. Understand the definition and cause of anemia.
 - a. Anemia is defined as a condition that causes a low red blood cell (RBC) count and/or hemoglobin (Hb) and hematocrit (Hct) below normal levels.
 - b. Causes of anemia are as follows:
 - (1) Impaired production: decreased or abnormal production of RBCs secondary to bone marrow dysfunction or a deficiency of essential nutrients. The abnormal production of RBCs occurs when bone marrow is damaged by drugs, alcohol, radiation, or the growth of a tumor.
 - (2) Excess blood loss: hemorrhage, either chronic or acute.
 - (3) Increased destruction of RBCs or hemolysis occurs when there is an RBC defect (for example, sickle cell anemia) and with conditions where the spleen or liver increases RBC destruction (malaria and gangrene increase phagocytic activity of the liver and spleen).
2. Identify anemia on the basis of the patient's signs and symptoms.
 - a. Most signs and symptoms of anemias are caused by a decrease in the oxygen-carrying capabilities.
 - (1) Fatigue and weakness.
 - (2) Shortness of breath and palpitations.
 - (3) Pallor (of conjunctiva, nail beds, lips, oral mucosa, or palmar creases).
 - (4) Central nervous system signs, such as headache, altered or loss of consciousness, and dizziness.
 - (5) Symptoms of local ischemia (angina pectoris and paresthesias).
 - b. The severity of the signs and symptoms as related to the onset of anemia determines the overall condition of the patient.
3. Identify the type of anemia on the basis of the assessment of the following:
 - a. Number of RBCs.
 - b. Size of the RBCs (referred to as macrocytic, microcytic, or normocytic).
 - c. Staining property of RBCs (referred to as hypochromic, hyperchromic, polychromic, or normochromic).

NOTE: For evaluation of RBC size, color, and quality, see task 081-833-4574, Perform RBC Count/Morphology.

4. Manage anemias caused by impaired or abnormal production of RBCs.
 - a. Iron deficiency anemia: most common anemia in all age groups throughout the world. It is caused by inadequate iron stores in the body.
 - (1) Inadequate iron stores are caused by the following:
 - (a) Chronic blood loss (from ulcers, excess menses, hookworm infestation, and malignancy).
 - (b) Malabsorption (as in small bowel disease, postgastrectomy, and gastroenterostomy).
 - (c) Increased need (pregnancy, rapid growth spurts in children, and menstruation).
 - (d) Insufficient intake (particularly in tropical areas of the world where meat intake is low and in patients on fad or weight loss diets).

Performance Steps

- (2) Decreased oxygen: signs and symptoms typically develop slowly. Signs and symptoms could also include the following:
 - (a) Pica: craving unusual substances.
 - (b) Pagophagia: craving large amounts of ice.
 - (c) Glossitis: tender and smooth tongue and sores and cracks at the corners of the mouth.
- (3) Lab findings are as follows:
 - (a) Microcytic and hypochromic RBCs.
 - (b) Hb and Hct smaller than normal.
- (4) Medical and nursing management include the following:
 - (a) Correct chronic blood loss.
 - (b) Administer supplemental iron therapy.
 - (c) Educate patient regarding diet, drug compliance, and symptomatic treatment.
- b. Vitamin B12 deficiency anemia (type of pernicious anemia):
 - (1) Inadequate vitamin B12 could be caused by the following:
 - (a) Poor diet (low in meats, legumes, and animal proteins).
 - (b) Postgastrectomy (defects in gastric mucosa).
 - (c) Intestinal organisms (tapeworms [*Diphyllobothrium latum*] and excess bacteria) (Figure 1).

Figure 1. *Diphyllobothrium Latum*

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- (d) Ileal abnormalities (regional enteritis, tuberculosis [TB], or anything which compromises absorption)
- (2) Signs and symptoms develop slowly and include most of the normal signs and symptoms of other anemias. However, the following may also be present:
 - (a) Symptoms related to gastrointestinal (GI) tract changes (sore mouth with beefy red tongue, anorexia, nausea and vomiting, decreased weight, altered bowel function, indigestion, and abdominal pain).
 - (b) Symptoms related to neurologic changes (paresthesias, a disturbed sense of position, gait or ataxia problems, altered sphincter control, psychotic type behavior, forgetfulness, and irritability).
- (3) Laboratory findings:
 - (a) Macrocytic: normochromic RBCs.
 - (b) Decreased RBC, Hct, and Hb levels.
 - (c) White blood cell (WBC) count could be normal.
- (4) Medical and nursing management:
 - (a) Treat the underlying disorder (antituberculous, antiparasitics, and so on).
 - (b) Replace vitamin B12.
 - (c) Educate patient (regarding hygiene, diet, and compliance with drug therapy).

Performance Steps

- c. Folic acid (folate) deficiency anemia:
 - (1) Deficiency in folic acid caused by the following:
 - (a) Inadequate intake. (Alcoholics have poor caloric intake because of excessive alcohol or eating wrong foods. Drug addicts, the poor or indigent, and the elderly have poor intake when they survive on canned foods or overcooked foods, since overcooking destroys the folate.)
 - (b) Increased demand (with the demands of the fetus during pregnancy, during rapid child growth spurts, and with malignancies where increased tissue and cell proliferation requires large amounts of folate).
 - (c) Impaired absorption (with small bowel disease or if jejunum (site of folate absorption) is not functioning correctly).
 - (d) Impaired utilization (occurs with antagonistic drugs, including oral contraceptives and some anticancer drugs).
 - (2) Signs and symptoms are similar to that of vitamin B12 deficiency, however, without the neurological symptoms (also GI symptoms could be more severe).
 - (3) Laboratory findings:
 - (a) Macrocytic and normochromic RBC.
 - (b) Hemoglobin decreased from normal.
 - (4) Nursing and medical management:
 - (a) Administer supplemental folate (folic acid).
 - (b) Educate patient (a diet consisting of leafy green vegetables [asparagus, broccoli, and spinach], liver or other organ meats, and a variety of fresh fruits). Avoid overcooking food.
- d. Aplastic anemia: impaired and decreased production of RBCs, which results in a decrease of all the bone marrow elements (bone marrow failure).
 - (1) Can be caused by the following:
 - (a) Drugs (some anti-inflammatory agents, anti-bacterial, and anti-epileptic agents).
 - (b) Chemical toxins (chemotherapy and radiation treatment [tx]).
 - (c) Viral infections.
 - (d) Alcohol (chronic use leads to bone marrow suppression).
 - (e) Tumors (replace the normal marrow).
 - (2) Signs and symptoms congruent with decrease in all cell lines (abnormal bleeding, anemia, and infections)
 - (3) Laboratory findings:
 - (a) Pancytopenia (decrease in all blood cells).
 - (b) Normochromic, normocytic, or slightly macrocytic RBCs.
 - (4) Medical and nursing management:
 - (a) Evacuate and refer to hematology for exact determination of the underlying cause.
 - (b) Correct the underlying cause.
 - (c) Provide supportive care (transfusions).
 - (d) Educate patient (avoid acetylsalicylic acid [ASA] and toxins, use good personal hygiene to prevent infections, and caution patient who is taking ASA that their clotting ability is decreased; that is, were they to become a combat casualty).
- e. Impaired and increased production of RBCs (polycythemia vera) results in increased RBC mass and increased Hb.
 - (1) Cause is unknown; however, affects are seen in all organ systems.
 - (2) Pathophysiology is one of hyperplasia (increased activity and production) of bone marrow, which leads to increased blood volume secondary to increased RBC mass, increased Hct and Hb, increased viscosity, and enlarged spleen.
 - (3) Signs and symptoms related to the pathophysiology include the following:
 - (a) Ruddy color.
 - (b) Pain in the digits (secondary to circulatory insufficiency or ischemia).
 - (c) Bleeding tendencies (secondary to overcrowding of the bone marrow and resultant decrease in platelet production and function).
 - (d) Mental changes (secondary to decreased cerebral circulation).

Performance Steps

- (e) Abdominal distention and discomfort (secondary to splenomegaly).
 - (f) Hypertension (secondary to vessel engorgement).
 - (g) Kidney stones (secondary to hyperuricemia associated with increased formation and destruction of RBCs and WBCs, with increased metabolism of nucleic acids).
- (4) Laboratory findings:
 - (a) Macrocytic, hyperchromic RBCs, and increased Hct and Hb.
 - (b) Thrombocytosis.
 - (c) Leukocytosis.
- (5) Medical and nursing management:
 - (a) Evacuate and refer to hematology for evaluation.
 - (b) Reduce the viscosity (phlebotomy, hydration, or hyperuricemia).
 - (c) Administer myelosuppressive therapy (radioactive-type drugs).
 - (d) Monitor for thrombus formation, bleeding, congestive heart failure (CHF), and ulcers.
 - (e) Encourage ambulation, and educate patient (ambulation promotes circulation and decreases stasis and thrombus formation, and patient needs to stay hydrated, keep bleeding precaution in mind, and advocate good personal hygiene).
- 5. Manage anemias caused by hemorrhage:
 - a. Hemorrhage may be chronic or acute (ulcers and trauma).
 - b. Signs and symptoms are dependent on rate of blood loss.
 - c. Laboratory findings:
 - (1) Normocytic and normochromic RBCs.
 - (2) Decrease in all cell lines.
 - d. Treatment is aimed at stopping blood loss and replacing blood with transfusion.
- 6. Manage anemias due to hemolysis:
 - a. Hemolysis (destruction of RBCs) occurs with the following:
 - (1) Drugs and chemicals.
 - (2) Infections and malaria.
 - (3) Burns.
 - (4) Poisonings, including lead poisoning.
 - (5) Antibody reactions (transfusion type).
 - (6) Enzyme defects; for example, G6PD (glucose 6 dihydrogenase).
 - (7) Abnormal Hb proteins. (There are a number of abnormal Hb proteins identified by the letters "C," "E," "I," "J," and "S." They differ in organization of polypeptide chains. Many of these "abnormal" Hb are harmless; however, some lead to anemic conditions.)
 - b. Sickle cell anemia is congenital, chronic hemolytic anemia associated with abnormal Hb.
 - (1) Seen mainly in the black population, particularly in children.
 - (2) Genetically transmitted through an altered amino sequence on the Hb. Under conditions of decreased oxygen concentration, acidosis, or dehydration, this altered Hb leads to distortion in RBC membrane resulting in the sickle shape, the sickle shape causes the cells to entangle and mesh leading to increased viscosity, vessel occlusion, and tissue necrosis.
 - (3) Sickle celled RBCs are fragile and rapidly destroyed in the circulation.
 - (4) Signs and symptoms generally occur during periods of crisis; for example, during periods of stress, increased altitude, and decreased oxygenation (trauma, infection, physical exertion, dehydration, exposure to cold temperatures, and acidosis are all conditions which could provoke hypoxia).
 - (5) Many of the signs are similar to those of other forms of anemia or more specifically chronic hemolytic type anemias (for example, anorexia, pallor, weakness, fever, irritability, and jaundice secondary to released bilirubin from the action of hemolysis).
 - (6) Signs and symptoms associated with vessel occlusion generally bring the patient in for the evaluation:
 - (a) Weakness and headache (HA).

Performance Steps

- (b) Bone pain and painful and swollen joints.
- (c) Abdominal pain due to enlarged spleen (this is secondary to the increase in activity at the site of RBC hemolysis and as the spleen becomes engorged with sickle cells).
- (d) Seizures, stroke, and paraplegias (secondary to decreased cerebral blood flow).
- (7) Complications of the disease involve occlusion syndromes of multiple organ systems including the following:
 - (a) Cardiopulmonary impairment (secondary to chronic severe anemia and hypoxia, both of which increase the work burden of the heart).
 - (b) Joint deformity (decreased tissue perfusion leads to inflammation, swelling, and subperiosteal necrosis).
 - (c) Renal failure (large Hb molecules clog the nephron filters).
 - (d) Autosplenectomy. (When multiple thrombi occur in the spleen, the spleen tissue fibroses and atrophies. With a decrease of the normal functioning of the spleen, there becomes an increased risk of infection.)
 - (e) Strokes and paraplegias.
 - (f) Cholelithiasis (secondary to bilirubin production), which exceeds the capability of the liver to convert it and prepare it for excretion.
 - (g) Blindness.
- (8) Laboratory findings:
 - (a) Normocytic normochromic RBCs but with sickle shape during crisis period.
 - (b) Positive test for sickling: Use sodium (Na) metabisulfate 2 percent, and apply one drop to one drop of blood. Observe for sickling.
- (9) Medical and nursing management:
 - (a) Vigorous hydration (to dilute the patient's blood and reverse agglutination of the sickled cells in the small vessels) given orally or intravenously (IV).
 - (b) Oxygen therapy (energy-conserving measures).
 - (c) Pain medication (usually narcotics).
 - (d) Possible need for antibiotics if infections are present or suspected.
 - (e) Transfusion in severe cases only (occasionally do exchange transfusions in these patients).
 - (f) Patient and family education (the prevention of crises, prevention of infection, and precautions against bleeding problems and injuries).

7. Record all treatment in the patient's medical record.

8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage anemia.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and cause of anemia.	—	—
2. Identified anemia on the basis of the patient's signs and symptoms.	—	—
3. Identified the type of anemia	—	—
4. Managed anemias caused by impaired or abnormal production of RBCs.	—	—
5. Managed anemias caused by hemorrhage	—	—
6. Managed anemias caused by hemolysis.	—	—
7. Recorded all treatment in the patient's medical record.	—	—

Performance Measures

GO **NO GO**

8. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLO

Assess Cardiovascular Diseases

081-833-4046

Conditions: Given a stethoscope, patient's medical record, The Merck Manual, and the American Heart Association textbook Advanced Cardiac Life Support.

Standards: Assess cardiovascular disease in accordance with The Merck Manual and the American Heart Association textbook Advanced Cardiac Life Support.

Performance Steps

1. Identify cardiovascular disease on the basis of the patient's history.
 - a. A family history should be carefully elicited since many cardiac disorders such as coronary artery disease, systemic hypertension, bicuspid aortic valve, hypertrophic cardiomyopathy, and mitral valve prolapse have an inherited element.
 - b. Many patients with cardiovascular disease will complain of pain. This pain can be divided into three types for purposes of analysis: ischemic pain, pericardial pain, and atypical pain syndrome. Cardiac pain is transmitted to the cerebral cortex along autonomic nerve fibers and has a variable referral area that can extend from the ear to the umbilicus.
 - c. Myocardial ischemic pain is caused by accumulation of metabolites in the myocardium.
 - (1) Myocardial ischemic pain is usually described as pressing, squeezing, or weightlike.
 - (2) Other diseases, such as pleuritis, peptic ulcer disease, gastritis, cholecystitis, esophageal spasm, and musculoskeletal disorders can mimic cardiac pain.
 - (3) If the pain is brought on by exertion and relieved by rest or nitroglycerin, the probability of the pain being myocardial is great.
 - (4) Myocardial ischemic pain is usually limited in duration.
 - d. Pericardial pain is caused by inflammation involving the parietal pericardium.
 - (1) Pericardial pain is less variable in character, position, and referral area than myocardial ischemic pain. It is stabbing, burning, or cutting and is made worse by coughing, swallowing, deep breathing, and lying down.
 - (2) Pericardial pain is diminished by leaning forward and remaining still.
 - (3) Pericardial pain can last for hours or days and is relieved by aspirin or other anti-inflammatory drugs but not by nitroglycerin.
 - e. Atypical pain:
 - (1) Pain caused by mitral valve prolapse is poorly understood.
 - (a) The pain tends to be stabbing or burning in nature and is often quite variable in location from one episode to another. It varies greatly in intensity. Its duration may be short or persist for many hours or days.
 - (b) Atypical pain is unrelated to physical exertion and unresponsive to nitroglycerine.
 - (2) Pain arising from the great vessels is usually caused by dissection of the aorta, but rarely may be caused by the pulmonary artery.
 - (a) The pain is usually very severe and of a tearing or rending nature.
 - (b) There is usually an initial pain with the beginning of the dissection, followed by a quiescent period of hours or days before pain recurs with extension of the dissection.
 - (c) The pain is central in the chest, radiates through to the back, and is unaffected by position unless dissection into the pericardium has occurred with hemopericardium and acute pericarditis.
 - (3) Pulmonary embolism pain may result when infarction of the lung results in pleuritis or when right ventricular ischemia occurs secondary to sudden onset of pulmonary hypertension.
2. Identify cardiovascular disease on the basis of patient's signs and symptoms.
 - a. Dyspnea, the perception of increased work of breathing, occurs with stiffening of the lung caused by parenchymal or alveolar edema and edema in bronchiolar walls that interferes with airflow.

Performance Steps

- b. Dyspnea also results when cardiac output is inadequate for metabolic demands of the periphery and can occur in the absence of pulmonary edema.
 - (1) Cardiac dyspnea is always worsened by exertion and partly or completely relieved by rest.
 - (2) If the dyspnea is caused by elevated pulmonary venous pressure and pulmonary edema, the dyspnea is increased in the recumbent position and decreased by sitting or standing. This is called orthopnea. If orthopnea causes awakening during the night and is relieved by sitting up, it is called paroxysmal nocturnal dyspnea.
 - (3) Dyspnea in the presence of bronchial edema is associated with the following:
 - (a) Wheezing caused by airflow obstruction.
 - (b) Frothy and sometimes blood-tinged sputum is sometimes expectorated.
 - (4) Dyspnea caused exclusively by inadequate cardiac output is not affected by posture, but varies with physical exertion and may be associated with weakness and fatigue.
 - c. Weakness and fatigue are the result of inadequate cardiac output for the metabolic needs of the body, initially on exertion and eventually, as the disease progresses, at rest.
 - d. Palpitations are the perception of heart action by the patient.
 - (1) "Skipped beats" often indicate atrial or ventricular premature contractions.
 - (2) "Irregular" beats often indicate atrial fibrillation.
 - (3) "Rapid regular" noticeable beats that have a sudden onset often indicate supraventricular or ventricular tachycardia.
 - (4) Palpitations associated with syncope or light-headedness indicate an abrupt drop in cardiac output and denote a serious arrhythmia or serious underlying organic heart disease.
 - e. Light-headedness, presyncope, and syncope are usually caused by serious heart disease or arrhythmias that significantly limit cardiac output.
 - (1) Exertional syncope is seen in aortic stenosis or hypertrophic cardiomyopathy which limit a rise of cardiac output on exertion.
 - (2) Postural hypotension and vasovagal syncope are benign disorders and should be differentiated from cardiac causes of syncope. Both of them occur in the upright position and are accompanied by a warning aura of air hunger, nausea, malaise, diaphoresis, and a gradual gray-out to syncope.
3. Identify remote cardiac or noncardiac symptoms associated with cardiac disease.
 - a. A history of infection such as strep throat with or without rheumatic fever may raise suspicion of a cardiac disorder, resulting from active or temporally remote infectious agents. Endocarditis should be considered in any patient with fever and an unexplained heart murmur
 - b. A cardiac cause should be sought for peripheral or cerebral emboli, which can arise from recent myocardial infarction, valve disease, or cardiomyopathy. A history of cerebrovascular or peripheral vascular disease increases the likelihood of associated coronary artery disease.
 - c. Central cyanosis should raise a high degree of suspicion of a congenital cardiac disorder in young patients.
 4. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess cardiovascular diseases.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified cardiovascular disease on the basis of patient's history.	—	—
2. Identified cardiovascular disease on the basis of patient's signs and symptoms.	—	—
3. Identified remote cardiac or noncardiac symptoms associated with cardiac disease.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

ACLS 1997-1999

BATES PE, 8TH ED. 2002

MERCK MANUAL 17TH ED

Related

Manage Cardiac Arrest**081-833-4047**

Conditions: In a noncombat environment and given a cardiac monitor-defibrillator, intravenous (IV) and airway medical supplies, patient's medical record, and all current cardiac drugs as per the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Standards: Manage cardiac arrest in accordance with the current AHA textbook Advanced Cardiac Life Support.

Performance Steps

1. Identify cardiac arrest.
 - a. The patient will be unconscious.
 - b. The patient will not be breathing.
 - c. The patient will not have a pulse.
 2. Perform the following steps simultaneously if there are other trained personnel available to help you.
 - a. Manage the patient's airway, breathing, and circulation.
 - b. Perform cardiopulmonary resuscitation (CPR) until the defibrillator is attached.
 3. Prepare the defibrillator.
 - a. Ensure the synchronizer switch is in the OFF position.
 - b. Evenly apply conductive material to the paddles by squeezing electrode paste on the working face of one paddle and rubbing the working face of both paddles together.
- WARNING:** Do not use alcohol or alcohol pads as they may ignite.
- c. Turn the main power switch button to the ON position.
 - d. Turn the energy level switch dial to 200 joules for the average size adult.
 4. Place the paddles firmly on the patient's chest (Figure 1).

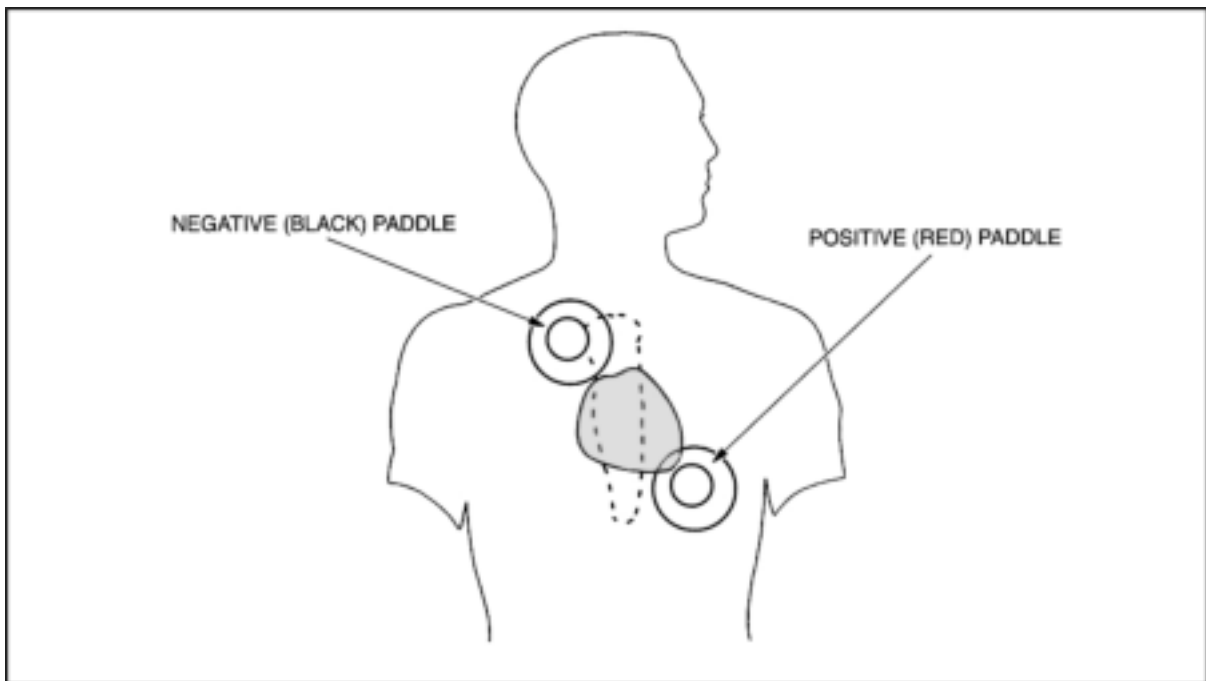


Figure 1. Defibrillator Paddle Placement

Performance Steps

- a. Place the negative (sternum) paddle to the right of the upper sternum and below the right clavicle.
- b. Place the positive (apex) paddle below the area of the left nipple along the midaxillary line.
- c. Apply downward pressure (about 25 pounds of pressure) to each paddle.

WARNING: Poor contact with the patient's skin will decrease effectiveness of the defibrillation and cause the patient to get burned when the machine is discharged.

5. Determine if the rhythm is shockable or not.
 - a. Verify that ventricular fibrillation (VF) and/or ventricular tachycardia (VT) is present on the monitor.
 - b. If asystole, go to step 11.
 - c. If pulseless electrical activity (PEA), go to step 12.
6. Depress the "charge" button(s) on the paddles or defibrillator to charge the paddles, and announce "Charging."
7. State the following: "I am going to shock on 3. One, I am clear." (The operator ensures he has no contact with the patient or equipment.) "Two, you are clear." (The operator checks the personnel doing ventilations and chest compressions to ensure they are clear.) "Three, everybody is clear." (The operator checks to ensure no one else has contact with the patient or any equipment that is touching the patient.)
8. Defibrillate up to three times without removing the paddles from the chest.
 - a. Shock at 200 joules. Quickly check the monitor to verify VF or pulseless VT is still present.
 - b. Shock at 200 to 300 joules. Quickly check the monitor to verify VF or pulseless VT is still present.
 - c. Shock at 360 joules. Quickly check the monitor to verify VF or pulseless VT is still present.
 - d. If at any time during the shock sequence the patient converts into another rhythm, remove the paddles from the chest and disarm them and check for a pulse.
9. If the patient has a return of spontaneous circulation, do the following:
 - a. Assess the patient's vital signs.
 - b. Maintain the airway, and support breathing, as needed.
 - b. Provide medications appropriate for blood pressure, heart rate, and rhythm.
10. If VF or pulseless VT persists, do the following:
 - a. Resume CPR.
 - b. Administer high-flow oxygen via reservoir bag through the endotracheal (ET) tube.
 - b. Secure the patient's airway via ET intubation.
 - c. Obtain IV access.
 - d. Give epinephrine 1 milligram (mg) IV push. Repeat every 3 to 5 minutes.
 - e. Clear the patient. Defibrillate at 360 joules. Reassess the patient. Resume CPR.
 - f. Give lidocaine 1 to 1.5 milligrams per kilogram (mg/kg) IV push. Consider repeating in 3 to 5 minutes to a maximum dose of 3 mg/kg. A single dose of 1.5 mg/kg is acceptable in cardiac arrest.
 - g. Clear the patient. Defibrillate at 360 joules. Reassess the patient. Resume CPR.
 - h. Give bretylium 5 mg/kg IV push. Repeat in 5 minutes at 10 mg/kg to a maximum dose of 30 mg/kg.
 - i. Clear the patient. Defibrillate at 360 joules. Reassess the patient. Resume CPR.
 - j. Give procainamide 31 milligrams per minute (mg/min) to a total of 17 mg/kg.
 - k. Clear the patient. Defibrillate at 360 joules. Reassess the patient. Resume CPR.
 - l. Give magnesium sulfate 1 to 2 grams (g) IV in torsade de pointes or suspected hypomagnesemic state or refractory VF.
 - m. Clear the patient. Defibrillate at 360 joules. Reassess the patient. Resume CPR.

Performance Steps

- n. Give sodium bicarbonate 1 milliequivalent per kilogram (mEq/kg) IV with known preexisting bicarbonate-responsive acidosis and overdose with tricyclic antidepressants, to alkalinize the urine in drug overdose, if intubated and continued long arrest interval, or upon return of spontaneous circulation after long arrest interval.

CAUTION: Do NOT use in hypoxic lactic acidosis.

11. If the patient is in asystole, take the following steps:
 - a. Continue CPR.
 - b. Intubate the patient, and administer high-flow oxygen.
 - c. Obtain IV access.
 - d. Confirm asystole in more than one lead.
 - e. Consider the possible causes of asystole, and manage them if found.
 - (1) Hypoxemia.
 - (2) Hyperkalemia.
 - (3) Hypokalemia.
 - (4) Preexisting acidosis.
 - (5) Drug overdose.
 - (6) Hypothermia.
 - f. Consider immediate transcutaneous pacing.
 - g. Give epinephrine 1 mg IV push. Repeat every 3 to 5 minutes.
 - h. Give atropine 1 mg IV. Repeat every 3 to 5 minutes up to a total dose of 0.03 to 0.04 mg/kg.
 - i. Consider termination of efforts on the basis of local protocols.
12. If the patient has pulseless electrical activity, take the following steps:
 - a. Continue CPR.
 - b. Intubate at once, and administer high-flow oxygen.
 - c. Obtain IV access.
 - d. Assess blood flow by using Doppler ultrasound, end tidal carbon dioxide (CO₂), echocardiography or arterial line.
 - e. Consider the possible causes, and manage them if found.
 - (1) Hypovolemia: give volume infusion.
 - (2) Hypoxia: assure adequate ventilation.
 - (3) Cardiac tamponade: perform pericardiocentesis.
 - (4) Tension pneumothorax: perform needle decompression.
 - (5) Hypothermia (task 081-833-4162, Manage Cold Injuries).
 - (6) Massive pulmonary embolism: requires surgery and thrombolytics.
 - (7) Drug overdoses such as tricyclics, digitalis, beta-blockers, and calcium channel blockers: give appropriate antidote, if available.
 - (8) Hyperkalemia.
 - (9) Acidosis.
 - (10) Massive acute myocardial infarction (task 081-833-4054, Manage Myocardial Infarction).
 - f. Give epinephrine 1 mg IV push. Repeat every 3 to 5 minutes.
 - g. If absolute or relative bradycardia, give atropine 1 mg IV. Repeat every 3 to 5 minutes up to a total dose of 0.03 to 0.04 mg/kg.
13. Within the United States, continue treatment until you are relieved by a higher medical authority or the patient is pronounced dead by a higher medical authority on the basis of your local protocols.
14. Seek the advice and assistance of a higher medical authority whenever possible.
15. Record all treatment in the patient's medical record.
16. When outside the United States, refer to your local protocol or see task 081-833-4014, Determine Death.

Evaluation Preparation: This task is best evaluated by demonstration of proficiency by using a cardiac mannequin and cardiac monitor-defibrillator. The soldier may verbalize the drugs he would give and the doseages as they become necessary during the progress of the scenario. Give the soldier a scenario in which he must manage cardiac arrest.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified cardiac arrest.	—	—
2. Performed the following steps simultaneously when there were other trained personnel available.	—	—
a. Managed the patient's airway, breathing, and circulation.		
b. Performed CPR until the defibrillator was attached.		
3. Prepared the defibrillator.	—	—
4. Placed the paddles firmly on the patient's chest.	—	—
5. Determined if the rhythm was shockable or not.	—	—
6. If indicated, charged the defibrillator while informing others.	—	—
7. If indicated, defibrillated up to three times without removing the paddles from the chest.	—	—
a. Gave warning before delivering shock.		
b. Ensured everyone was clear.		
c. Checked for return of rhythm between shocks.		
d. Increased power each time.		
8. Performed supportive care when the patient's rhythm returns to normal.	—	—
9. Identified the arrhythmia.	—	—
10. Managed the arrhythmia correctly.	—	—
11. Within the United States, continued treatment until you were relieved by a higher medical authority or the patient was pronounced dead by a higher medical authority on the basis of your local protocols.	—	—
12. Outside the United States, referred to your local protocol.	—	—
13. Sought the advice and assistance of a higher medical authority whenever possible.	—	—
14. Recorded all treatment in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

ACLS 1997-1999

Related

EMT-P, BRADY 3RD ED. 1997

Manage Angina Pectoris

081-833-4048

Conditions: Given a patient in a hospital or clinical setting who is suffering from angina pectoris and the necessary equipment and pharmacological agents for managing angina pectoris.

Standards: Manage angina in accordance with the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Performance Steps

1. Define angina pectoris as a clinical syndrome caused by myocardial ischemia, which is usually secondary to coronary artery disease, and characterized by episodes of precordial discomfort or pressure, which is typically precipitated by exertion and relieved by rest or sublingual nitroglycerine.
 2. Understand the cause and progression of angina pectoris.
 - a. Angina pectoris occurs when cardiac work and myocardial oxygen demand exceed the ability of the coronary arterial system to supply oxygenated blood.
 - b. The pain is thought to be a direct result of myocardial ischemia and the resultant accumulation of hypoxic metabolites.
 - c. As the myocardium becomes ischemic, coronary sinus blood potential of hydrogen (pH) falls, cellular potassium loss occurs, lactate production replaces utilization, electrocardiogram (ECG) abnormalities appear, and ventricular performance deteriorates.
 - d. Left ventricular diastolic pressure frequently rises during angina, at times to levels inducing pulmonary congestion and dyspnea.
 3. Identify angina on the basis of the patient's signs and symptoms.
 - a. The discomfort of angina is highly variable.
 - (1) Angina is most often felt beneath the sternum.
 - (2) Angina may be a vague, barely troublesome ache or may rapidly become a severe, intense precordial crushing sensation.
 - (3) Often, patients do not perceive the discomfort as pain.
 - (4) Pain may radiate to the left shoulder and down the inside of the arm all the way to the fingers. It may radiate straight through to the back, into the throat, the jaw, the teeth, and occasionally to the right arm. The pain may also be felt in the upper abdomen.
 - (5) Patients who have pain over the cardiac apex or who describe the pain as fleeting, sharp, or hot, usually do not have angina.
 - b. Angina is usually triggered by physical activity and usually persists no more than a few minutes, subsiding with rest.
 - (1) The response to exertion is usually predictable, but in some persons a given exercise may be tolerated one day and precipitate an attack the next.
 - (2) Angina is worsened when exertion follows a meal. It is also exaggerated in cold weather.
 - (3) Angina may occur at night (nocturnal angina) when dreams cause an increase in respiration, pulse, and blood pressure (BP) or when the patient is resting calmly (angina decubitus). Nocturnal angina may also be a sign of left ventricular failure equivalent to nocturnal dyspnea.
 - c. Attacks may vary from several per day to occasional episodes separated by symptom-free intervals of weeks to years.
- NOTE:** The characteristics of angina are usually constant for a given individual. Any change in the pattern of symptoms should be viewed as serious. This is termed unstable angina. Studies have shown that at least 30 percent of patients with unstable angina will suffer a myocardial infarction (MI) within 3 months of onset.
- d. Variant angina (Prinzmetal's angina) is usually secondary to large vessel spasm. It is characterized by pain at rest and by S-T wave segment elevation on ECG during the attack. Ventricular arrhythmias are common, and attacks tend to occur with regularity at certain times of day.

Performance Steps

- e. During the attack look for the following physical findings:
 - (1) Heart rate may increase modestly.
 - (2) BP is often elevated.
 - (3) Heart sounds become more distant.
 - (4) Apical impulse is more diffuse.
 - (5) Second heart sound may become paradoxical because of more prolonged left ventricular ejection during the ischemic episode.
 - (6) A fourth heart sound is common.
 - (7) A mid or late systolic apical murmur may be heard.
 - (8) ECG may show S-T wave segment depression or elevation, a decrease in R wave height, intraventricular or bundle branch conduction disturbances, and other arrhythmias.

4. Identify special procedures that may be beneficial in evaluating a patient for angina.

- a. Exercise tolerance test.
- b. Radionuclide imaging.
- c. Stress echocardiography.
- d. Coronary arteriography.

NOTE: Angina pectoris is a clinical diagnosis that is based on a characteristic complaint of chest discomfort brought on by exertion and relieved by rest.

5. Differentiate between angina pectoris and other diseases with similar signs and symptoms.

Consider the following diseases.

- a. Costochondral separation.
- b. Abnormalities of the cervicothoracic spine.
- c. Peptic ulcer.
- d. Hiatal hernia.
- e. Indigestion.

6. Manage angina pectoris on the basis of management of the angina itself and treatment of the underlying coronary artery disease.

- a. Management of the angina is based on the use of three classes of drugs--beta-adrenergic blockers, nitrates, and calcium channel blockers.
 - (1) Nitrates, most commonly sublingual nitroglycerine 0.3 to 0.6 mg, are given for relief of acute episodes of angina. Long acting nitrates are also available and improve exercise tolerance for several hours in patients with angina; however, the body rapidly develops a tolerance to nitrates so their use should be monitored carefully.
 - (2) Beta blockers block the sympathetic stimulation of the heart and reduce systolic pressure, heart rate, contractility, and cardiac output, thus decreasing myocardial oxygen demand and increasing exercise tolerance.
 - (3) Calcium channel blockers are effective vasodilators and counter coronary spasm if present. They also have the added benefit of reducing BP in patients with elevated BP.
- b. Management of the underlying coronary disease.
 - (1) The patient's risk factors should be delineated and reduced to the fullest extent possible to include:
 - (a) Weight reduction.
 - (b) Smoking cessation.
 - (c) Dietary changes, and possibly drugs to lower low-density lipoprotein (LDL) cholesterol.
 - (d) Exercise.
 - (e) Stress management.
 - (2) If the patient does not tolerate medication or if symptoms remain intolerable despite treatment or are progressive, coronary arteriography may be indicated to evaluate the possibility of revascularization with coronary angioplasty or surgical bypass grafting.

7. Record all treatment in the patient's medical record.

Performance Steps

8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage angina pectoris.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined angina pectoris	_____	_____
2. Understood the cause and progression of angina pectoris.	_____	_____
3. Identified angina on the basis of the patient's signs and symptoms.	_____	_____
4. Identified special procedures that may be beneficial in evaluating a patient for angina.	_____	_____
5. Differentiated between angina pectoris and other diseases with similar signs and symptoms.	_____	_____
6. Managed angina pectoris.	_____	_____
7. Recorded all treatment in the patient's medical record.	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

ACLS 1997-1999

Related

EMT-P, BRADY 3RD ED. 1997
 MERCK MANUAL 17TH ED

Manage Hypertension

081-833-4050

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, patient's medical record, and selection of antihypertensive agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the condition, and administer supportive care and antihypertensive therapy in accordance with The Merck Manual, 17th Edition.

Performance Steps

1. Understand the definition, etiology, and pathophysiology of hypertension.
 - a. Hypertension is defined as an elevation of systolic and/or diastolic blood pressure and can be either primary (also called essential hypertension and of unknown etiology) or secondary (associated with bilateral renal parenchymal disease or other potentially curable diseases). Secondary hypertension may also be associated with the use of oral contraceptives and the excessive use of alcohol.
 - b. Primary hypertension is thought to be influenced by the following causes:
 - (1) Stimulation of the sympathetic nervous system.
 - (2) The renin-angiotensin-aldosterone system.
 - (3) The mosaic theory, which states that multiple factors work to sustain elevated BP even though an aberration of only one factor was initially responsible.
 - (4) Miscellaneous factors that may contribute to elevated blood pressure (BP) are as follows:
 - (a) Abnormal sodium transport across the cell wall caused by a defect in or inhibition of the sodium-potassium pump.
 - (b) Deficiency of a vasodilator substance may also contribute to primary hypertension.
 - c. Whatever the responsible mechanism, it leads to either increased total peripheral vascular resistance by inducing vasoconstriction, to increased cardiac output, or both, since BP equals cardiac output times resistance.
2. Identify hypertension on the basis of the patient's signs and symptoms.
 - a. Primary hypertension is asymptomatic until complications develop. Symptoms and signs are nonspecific and arise from complications in target organs.
 - b. Dizziness, flushed facies, headache, fatigue, epistaxis, and nervousness are NOT caused by uncomplicated hypertension.
 - c. Complications that may be linked to hypertension that will produce signs and symptoms are:
 - (1) Left ventricular failure.
 - (2) Atherosclerotic heart disease.
 - (3) Retinal hemorrhages.
 - (4) Exudates.
 - (5) Papilledema.
 - (6) Vascular accidents.
 - (7) Cerebrovascular insufficiency with or without stroke.
 - (8) Renal failure.
 - (9) Hypertensive encephalopathy.
 - d. Hypertension has been grouped into categories of severity on the basis of retinal changes as follows:
 - (1) Group 1: constriction of retinal arterioles only.
 - (2) Group 2: constriction and sclerosis of retinal arterioles.
 - (3) Group 3: hemorrhages and exudates in addition to vascular changes.
 - (4) Group 4: malignant hypertension (papilledema).
 - e. A fourth heart sound and broad notched P wave on ECG are among the earliest signs of hypertensive heart disease.

Performance Steps

3. Identify hypertension on the basis of patient's BP. Identification of primary hypertension depends on the following:
 - a. Demonstrating that systolic and diastolic BP are usually, but not always, higher than normal. At least two BP determinations on three separate days should be made before labeling a patient as hypertensive.
 - b. Exclusion of secondary causes of hypertension.
 4. Manage hypertension on the basis of the five-step approach. There is no cure for primary hypertension, but therapy can modify its course.
 - a. Step 1. Nonpharmacologic approaches:
 - (1) Weight reduction.
 - (2) Smoking cessation.
 - (3) Alcohol reduction to less than 1 ounce per day.
 - (4) Sodium restriction.
 - (5) Control of other cardiovascular risk factors.
 - b. Step 2. Pharmacological measures. Initially include a choice of ONE of the following drugs on the basis of the patient.
 - (1) Diuretics are indicated as initial treatment for blacks, older patients, obesity, heart failure, and chronic renal failure.
 - (2) Beta blockers are indicated as initial treatment for whites and younger patients, angina, hyperkinetic circulation, postmyocardial infarction (post-MI), migraines, and senile tremor.
 - (3) Calcium channel blockers are indicated in the treatment of blacks and older patients, angina, paroxysmal supraventricular tachycardia (PSVT), and migraine.
 - (4) Angiotensin-converting enzyme (ACE) inhibitors are indicated in the treatment of whites and younger patients, heart failure, heavy proteinuria, and impotence from other drugs.
 - c. Step 3. Add a second drug of a different class, increase the dose of the first drug, or substitute another drug for the first.
 - d. Step 4. Add a third drug of a different class or substitute the second drug.
 - e. Step 5. Evaluate patient further and possibly administer a third or fourth drug.
- NOTE:** Always continue the nonpharmacological approach, and consider stepping down the drug therapy on the basis of the patients response.
5. Recognize hypertensive emergencies. These require prompt reduction of BP with parenteral agents. Hypertensive emergencies are classified as conditions in which a BP increase leads to significant, irreversible end-organ damage within hours if not treated. These conditions include:
 - a. Hypertensive encephalopathy.
 - b. Acute left ventricular failure.
 - c. Severe hypertension accompanying unstable angina or acute myocardial infarction (AMI).
 6. Manage hypertensive emergencies with the following:
 - a. Sublingual nitroglycerine or sodium nitroprusside 0.5 to 10 micrograms per kilogram per minute (ug/kg/min) intravenous (IV) in 5 percent dextrose 5 percent in water (D5W). Requires constant monitoring of BP and titration to desired effects.
 - b. Diazoxide 1 to 1.5 milligrams per kilogram (mg/kg) IV, not to exceed 100 milligrams (mg) per dose given every 5 to 10 minutes until the BP reaches an optimal level. In conjunction with this, give furosemide 40 or 80 mg IV to prevent fluid retention.
 7. Treat complications symptomatically with appropriate supportive care.
 8. Record all treatment in the patient's medical record.
 9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage hypertension.

Performance Measures

1. Understood the definition, etiology, and pathophysiology of hypertension.
2. Identified hypertension on the basis of the patient's signs and symptoms.
3. Identified hypertension on the basis of patient's BP.
4. Managed hypertension on the basis of the five-step approach.
5. Recognized hypertensive emergencies.
6. Managed hypertensive emergencies.
7. Treated complications symptomatically with appropriate supportive care.
8. Recorded all treatment in the patient's medical record.
9. Sought the advice and assistance of a higher medical authority whenever possible.

GO **NO GO**

_____	_____
_____	_____
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Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

ACLS 1997-1999

EMT-P, BRADY 3RD ED. 1997

Manage Tachycardia**081-833-4052**

Conditions: Given a cardiac monitor-defibrillator, all current cardiac drugs, the patient's medical record, and the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Standards: Manage tachycardia in accordance with the AHA textbook Advanced Cardiac Life Support.

Performance Steps

1. Identify tachycardia as a heart rate above 100 beats per minute (BPM) with serious signs and symptoms.
2. Secure the patient's airway, and assess the patient's breathing.
3. Administer high-flow oxygen.
4. Initiate an intravenous (IV).
5. Attach cardiac monitor, pulse oximeter, and automatic blood pressure (BP), if available.
6. Assess vital signs, history, and physical examination (PE).
7. If the patient is unstable with serious signs or symptoms and the ventricular rate is greater than 150 BPM, prepare for immediate cardioversion.
 - a. Check the patient's oxygen saturation. Ensure that suction is available, an IV is in place, and intubation equipment is available.
 - b. Premedicate the patient with a sedative and an analgesic whenever possible.
 - c. Perform synchronized cardioversion at 100 joules (J), 200 J, 300 J, and 360 J. (Paroxysmal supraventricular tachycardia [PSVT] and atrial flutter may respond to lower energy levels, so start with 50 J).

NOTE: You may need to reset the synchronization mode after each synchronized cardioversion, depending on the type of monitor-defibrillator.

8. If the patient is not unstable or is borderline, management is based on the specific dysrhythmia.
 - a. With atrial fibrillation or atrial flutter, consider diltiazem, beta blockers, verapamil, digoxin, procainamide, quinidine, or anticoagulants.
 - b. With PSVT, consider the following:
 - (1) Vagal maneuvers.
 - (2) Adenosine, 6 milligrams (mg) rapid intravenous (IV) push over 1 to 3 seconds followed by a second dose of 12 mg if no effect.
 - (3) If the QRS complex is wide, give lidocaine 1 to 1.5 milligrams per kilogram (mg/kg) IV push. If the lidocaine has no effect, use procainamide 20 to 30 milligrams per minute (mg/min) to a maximum of 17 mg/kg. If the procainamide has no effect, use synchronized cardioversion.
 - (4) If the QRS complex is narrow and the blood pressure is low or unstable, go to synchronized cardioversion.
 - (5) If the QRS complex is narrow and the blood pressure is normal or elevated, use verapamil 2.5 to 5 mg IV. If the verapamil has no effect, repeat in 15 to 30 minutes at 5 to 10 mg IV. If the verapamil still has no effect, consider digoxin, beta-blockers, or diltiazem. Consider synchronized cardioversion.
 - c. With ventricular tachycardia with a pulse, consider the following:
 - (1) Lidocaine 1 to 1.5 mg/kg. If this dosage has no effect, give lidocaine 0.5 to 0.75 mg/kg to a maximum of 3 mg/kg.
 - (2) If lidocaine has no effect and it is possible the rhythm is a wide-complex tachycardia of uncertain type and not ventricular tachycardia (VT), give adenosine 6 mg rapid IV in 1 to 3 seconds. If the adenosine has no effect, give a second dose of adenosine 12 mg rapid IV push over 1 to 3 seconds.

Performance Steps

- (3) If lidocaine has no effect and it is VT, give procainamide 20 to 30 mg/min to a maximum of 17 mg/kg.
- (4) If procainamide has no effect, give bretylium 5 to 10 mg/kg over 8 to 10 min to a maximum of 30 mg/kg over 24 hours.
- (5) If all of these fail, go to synchronized cardioversion.

9. Record all treatment in the patient's medical record.

10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by demonstration of proficiency by using a cardiac mannequin and cardiac monitor-defibrillator. The soldier may verbalize the drugs he would give and the dosages as they become necessary during the progress of the scenario. Give the soldier a scenario in which he must manage tachycardia.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified tachycardia.	—	—
2. Secured the patient's airway and assessed the patient's breathing.	—	—
3. Administered high-flow oxygen.	—	—
4. Initiated an IV.	—	—
5. Attached cardiac monitor, pulse oximeter, and automatic BP, if available.	—	—
6. Assessed vital signs, history, and PE.	—	—
7. Managed tachycardia.	—	—
8. Recorded all treatment in the patient's medical record.	—	—
9. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

ACLS 1997-1999

Related

BASIC ARRHYTHMIAS, 4TH ED

EMT-P, BRADY 3RD ED. 1997

Manage Myocardial Infarction

081-833-4054

Conditions: Given a cardiac monitor-defibrillator, all current cardiac drugs, and the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Standards: The soldier must manage myocardial infarction in accordance with the AHA textbook Advanced Cardiac Life Support.

Performance Steps

1. Understand the definition and cause of myocardial infarction (MI).
 - a. MI is ischemic myocardial necrosis usually resulting from abrupt reduction in coronary blood flow to a segment of myocardium.
 - b. In 90 percent of patients with acute MI, an acute thrombus, often associated with plaque rupture, occludes the artery that supplies the damaged area.
2. Identify MI on the basis of the patient's signs and symptoms.
 - a. Some two-thirds of patients experience prodromal symptoms days to weeks before the event. These symptoms are characterized by crescendo angina, shortness of breath, or fatigue.
 - b. The first symptom of MI is usually deep substernal, visceral pain described as aching or pressure, often with radiation to the back, jaw, or left arm. The pain is similar to that of angina, but is usually more severe and not relieved by rest or nitroglycerine.
 - c. In some patients, the discomfort may be mild, and a significant percentage of MIs are silent or unrecognized by the patient.
 - d. On examination, the patient may exhibit the following symptoms:
 - (1) Restless.
 - (2) Pale.
 - (3) Diaphoretic.
 - (4) Severe pain.
 - (5) Peripheral or central cyanosis may be present.
 - (6) Skin is usually cool.
 - (7) Blood pressure (BP) is variable, although many patients initially display some degree of hypertension unless cardiogenic shock is developing.

NOTE: In patients with suspected MI, initial management should be conducted concurrently with definitive assessment. (See step 4.)

3. Identify MI on the basis of laboratory tests and other studies.
 - a. Measurement of oxygen saturation levels.
 - b. Twelve-lead electrocardiogram (ECG) with review by cardiology, if possible.
 - c. Chest X ray.
 - d. Blood studies (electrolytes, enzymes, and coagulation factors).
4. Manage MI on the basis of advanced cardiac life support (ACLS) protocols.
 - a. Oxygen at 4 liters per minute (L/M) via mask or nasal cannula.
 - b. Sublingual nitroglycerine initially followed by nitroglycerine intravenous (IV). Limit the systolic BP drop to 10 percent if normotensive and 30 percent if hypertensive. Never drop the systolic BP below 90 millimeters (mm) mercury (Hg).
 - c. Morphine IV in 1 to 3 milligram (mg) doses every 5 minutes (q5min) as needed (prn) for pain. Pain relief is a high priority.
 - d. Aspirin 150 to 325 mg by mouth (PO) is strongly recommended in all acute MI patients.
 - e. Thrombolytic agents are Class 1 (definitely helpful) in those patients treated within 6 hours and should be considered for all patients with ECG findings of acute MI.
 - f. Heparin IV may prevent recurrence of thrombosis after spontaneous thrombolysis has occurred.

Performance Steps

- g. Beta blockers IV followed by oral beta blockers given within the first 4 to 6 hours have been shown to reduce long-term mortality by 33 percent.
 - h. Magnesium sulfate IV if hypomagnesemia is detected or suspected on the basis of the patient's history.
 - i. If available, consider percutaneous transluminal coronary angioplasty (PTCA) in all patients who for some reason cannot receive thrombolytics.
5. Treat complications symptomatically with appropriate supportive care.
 6. Record all treatment in the patient's medical record.
 7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by demonstration of proficiency by using a cardiac mannequin and cardiac monitor-defibrillator. The soldier may verbalize the drugs he would give and the dosages as they become necessary during the progress of the scenario. Give the soldier a scenario in which he must manage MI.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and cause of MI.	_____	_____
2. Identified MI on the basis of the patient's signs and symptoms.	_____	_____
3. Identified MI on the basis of laboratory tests and other studies.	_____	_____
4. Managed MI on the basis of ACLS protocols.	_____	_____
5. Treated complications symptomatically with appropriate supportive care.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

ACLS 1997-1999

Related

EMT-P, BRADY 3RD ED. 1997
 MERCK MANUAL 17TH ED

Manage Bradycardia
081-833-4058

Conditions: Given a cardiac monitor-defibrillator, all current cardiac drugs, and the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Standards: The soldier must manage bradycardia in accordance with the AHA textbook Advanced Cardiac Life Support.

Performance Steps

1. Identify bradycardia as either absolute (less than 60 beats per minute [BPM]) or relative (so much lower than the patient's normal BPM that patient has signs and symptoms). Serious signs and symptoms of bradycardia must be related to the slow rate.
 - a. Serious signs are low blood pressure (BP), shock, pulmonary congestion, congestive heart failure (CHF), and acute myocardial infarction (MI).
 - b. Serious symptoms are chest pain, shortness of breath, and decreased level of consciousness.
 2. Secure the patient's airway, and assess the patient's breathing.
 3. Administer high-flow oxygen.
 4. Initiate an intravenous (IV).
 5. Attach cardiac monitor, pulse oximeter, and automatic BP, if available.
 6. Assess vital signs, history, and physical examination (PE).
- NOTE: Patients without serious signs and symptoms but who have Type II, second-degree atrioventricular (AV) block or third-degree AV block should be prepared for transcutaneous pacing (TCP).
7. When the patient has serious signs and symptoms, give atropine 0.5 to 1 milligram (mg) every 3 to 5 minutes (q3/5min) to a total of 0.03 to 0.04 milligrams per kilograms (mg/kg).
 8. Use TCP, if available. Patients will usually require sedation and analgesia with TCP.
- NOTE: Do not delay TCP while awaiting IV access or for atropine to take effect in a symptomatic patient.
9. If the patient still has serious signs and symptoms, the following drugs may be considered:
 - a. Dopamine 5 to 20 micrograms per kilogram per minute (ug/kg/min).
 - b. Epinephrine 2 to 10 micrograms per minute (ug/min).
 - c. Isoproteranol, with extreme caution and in low doses. Start at 2 ug/min, and titrate upward until a heart rate of 60 is achieved.
 10. Record all treatment in the patient's medical record.
 11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by demonstration of proficiency by using a cardiac mannequin and cardiac monitor-defibrillator. The soldier may verbalize the drugs he would give and the dosages as they become necessary during the progress of the scenario. Give the soldier a scenario in which he must manage bradycardia.

Performance Measures	GO	NO GO
1. Identified bradycardia as either absolute or relative.	_____	_____
2. Secured the patient's airway, and assessed the patient's breathing.	_____	_____
3. Administered high-flow oxygen.	_____	_____
4. Initiated an IV.	_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Attached cardiac monitor, pulse oximeter, and automatic BP, if available.	_____	_____
6. Assessed vital signs, history, and PE.	_____	_____
7. Managed bradycardia.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

ACLS 1997-1999

Related

BASIC ARRHYTHMIAS, 4TH ED
EMT-P, BRADY 3RD ED. 1997

Manage Endocarditis

081-833-4061

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, the patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) the Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition and cause of infectious endocarditis.
 - a. Infectious endocarditis is defined as a microbial infection of the endocardium.
 - b. Infectious endocarditis usually manifests as one of the following:
 - (1) Acute bacterial endocarditis, which is usually caused by *Staphylococcus* (staph) aureus, group A hemolytic *Streptococcus* (strep), pneumococcus, or gonococcus and other less virulent microorganisms.
 - (2) Subacute bacterial endocarditis (SBE) is usually caused by strep species enterococci and less commonly by staph and hemophilus species. SBE often develops in abnormal valves after asymptomatic bacteremias from infected gums, genitourinary (GU), or gastrointestinal (GI) tract infections.
 - c. The intravascular nidus for microorganisms within the heart and blood vessels is thought to be a sterile fibrin platelet vegetation formed when tissue factor is released by damaged endothelial cells. Microorganisms colonizing vegetations are covered by a layer of fibrin and platelets that prevents access by neutrophils, immunoglobulin, and complement, thus permitting the pathogens to resist host defenses. Without treatment, all forms of infective endocarditis are progressive and uniformly fatal. Death is usually the result of heart failure caused by exacerbation of underlying heart disease or acute valve dysfunction, embolization of vegetations to vital organs producing infarction, rupture of mycotic aneurysm, septic shock, or renal failure.
2. Identify infectious endocarditis on the basis of the patient's signs and symptoms.
 - a. SBE has an insidious onset and may mimic other illnesses. Symptoms include the following:
 - (1) Fever, night sweats, fatigue and malaise, weight loss, valvular insufficiency, chills, and arthralgias may be present.
 - (2) There may be a change in a preexisting murmur or a new regurgitant valvular murmur.
 - (3) Tachycardia.
 - (4) Petechiae over the upper trunk, conjunctiva, mucous membranes, and distal extremities.
 - (5) Painful erythematous subcutaneous (SQ) nodules about the tips of the digits (Osler's nodes).
 - (6) Splinter hemorrhages under the nails.
 - (7) With prolonged infection, splenomegaly and clubbing of the fingers may also be present.
 - b. Acute bacterial endocarditis (ABE) has signs and symptoms similar to those of SBE, but the course of the disease is more rapid. ABE can develop on normal valves and is marked by the following:
 - (1) Variable presence of high fever.
 - (2) Toxic appearance of the patient.
 - (3) Rapid valvular destruction.
 - (4) Valve ring abscesses.
 - (5) Septic emboli.
 - (6) An obvious source of infection and septic shock.
3. Identify infectious endocarditis on the basis of lab findings.

Performance Steps

- a. Blood cultures should be done as soon as possible. Identification of the organism and its antimicrobial susceptibility are vital, because bactericidal treatment is required. Other than blood cultures, there are no specific lab findings.
 - b. Two-dimensional echocardiography will detect vegetations in 60 to 80 percent of patients with infectious endocarditis if they have underlying valvular heart disease.
 - c. With established infections, you may see normocytic-normochromic anemia, elevated erythrocyte sedimentation rate (ESR), neutrophilia, increased immunoglobulins, and rheumatoid factor.
4. Provide correct prophylactic measures for patients with valvular disease or other conditions that predispose them to infectious endocarditis.
 - a. For at-risk patients undergoing dental procedures, amoxicillin 3 grams (g) by mouth (PO) is given 1 hour before the procedure and 1.5 g PO 6 hours after the procedure.
 - b. For GI and GU tract procedures, give ampicillin 1 g plus gentamicin 1.5 milligrams per kilogram (mg/kg) (up to 80 mg) parenterally 30 to 60 minutes before the procedure and 2 additional doses every 8 hours (q8h) after the procedure.
 5. Manage infectious endocarditis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. In a patient with normal heart valves, the empirical treatment while awaiting blood cultures or if cultures are not available is: penicillin G 20 million units (mu) every day (q.d.) intravenous (IV) in a continuous drip or divided every 4 hours (q4h) OR ampicillin 12 g q.d. IV in a continuous drip or divided q4h PLUS nafcillin or oxacillin 2 g q4h IV PLUS gentamicin 1 mg/kg every 8 hours (q8h) intramuscularly (IM) or IV.
 - b. If blood cultures are available, follow the drug regimen for the specific microorganism in The Sanford Guide to Antimicrobial Therapy.
 - c. Surgical management of mechanical complications (valve damage) and removal of resistant organisms may be necessary.
 6. Treat complications symptomatically with appropriate supportive care.
 7. Record all treatment in the patient's medical record.
 8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an infectious cardiac disease.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and cause of infectious endocarditis.	—	—
2. Identified infectious endocarditis on the basis of the patient's signs and symptoms.	—	—
3. Identified infectious endocarditis on the basis of lab findings.	—	—
4. Provided correct prophylactic measures for patients with valvular disease or other conditions that predispose them to infectious endocarditis.	—	—
5. Managed infectious endocarditis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	
Required	Related
MERCK MANUAL 17TH ED	EMT-P, BRADY 3RD ED. 1997
SANFORD, 1999	

Manage Pericarditis

081-833-4062

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with (IAW) The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition and causes of pericarditis.
 - a. Acute pericarditis may be fibrinous, serous sanguineous, hemorrhagic, or purulent. The amount and quality of the cellular reaction depends on the cause. The pericardial sac normally contains little fluid, but effusion may develop in disease. The superficial layers of the subepicardial myocardium may be involved.
 - b. Chronic pericarditis may be serous, chylous, fibrous, adhesive, hemorrhagic, purulent, or calcific.
2. Identify pericarditis on the basis of the patient's signs and symptoms.
 - a. Acute pericarditis may present with the following:
 - (1) Chest pain that may be dull or sharp, precordial, or substernal and radiating to the neck, trapezius ridge, or shoulders. It varies from mild to severe and is usually aggravated by cough, respiration, or other thoracic motion.
 - (2) Dyspnea or tachypnea.
 - (3) Fever, chills, and weakness.
 - (4) Pericardial friction rub (task 081-833-4040, Detect Abnormal Cardiac Sounds). This is the characteristic finding of pericarditis, but is not always present.
 - b. Chronic pericarditis is asymptomatic unless constrictive pericarditis is present. If constrictive pericarditis is present, symptoms and signs of peripheral congestion may appear along with an early diastolic sound. The early diastolic sound is often best heard on inspiration (pericardial knock) and at times pulsus paradoxus.
3. Identify pericarditis on the basis of lab findings.
 - a. Acute pericarditis may present with the following:
 - (1) Leukocytosis.
 - (2) Elevated erythrocyte sedimentation rate (ESR).
 - (3) Early in the disease, there may be ST segment elevation on the electrocardiogram (ECG). However, this will usually return to normal, unlike myocardial infarction (MI). The T wave may become inverted after the ST segment has returned to normal. Electrical alternans (the rise and fall of QRS complex amplitude on alternating beats) may be present. Electrical alternans usually occur in the presence of cardiac tamponade.
 - (4) X ray will only show an enlargement of the cardiac silhouette with effusion of 250 milliliters (ml) of fluid or more.
 - b. Chronic pericarditis may present with the following:
 - (1) Nonspecific ECG changes such as low QRS complex voltage and abnormal T waves. Atrial fibrillation or flutter may be present in 25 percent of patients with constrictive pericarditis.
 - (2) X ray will show pericardial calcification, if present. It occurs in about 50 percent of patients with chronic pericarditis.
4. Manage pericarditis.
 - a. Aspirin or other nonsteroidal anti-inflammatory drugs (NSAIDs) by mouth (PO) are indicated for reduction of inflammation and relief of pain.

Performance Steps

- b. Narcotics may also be required for relief of pain.
 - c. Anticoagulants are usually contraindicated in acute pericarditis and their use should be discontinued while the condition persists.
 - d. Pericarditis caused by infection is best managed by treatment of the underlying cause.
 - e. If cardiac tamponade develops, immediate pericardiocentesis may be required. Removal of even a small volume of fluid may be lifesaving.
 - f. Recurrent or persistent symptomatic effusion, with or without tamponade, and constrictive pericarditis usually require evacuation and referral for a pericardiectomy.
5. Treat complications symptomatically with appropriate supportive care.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pericarditis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and causes of pericarditis.	_____	_____
2. Identified pericarditis on the basis of the patient's signs and symptoms.	_____	_____
3. Identified pericarditis on the basis of lab findings.	_____	_____
4. Managed pericarditis.	_____	_____
5. Treated complications symptomatically with appropriate supportive care.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Congestive Heart Failure

081-833-4064

Conditions: Given a cardiac monitor-defibrillator, all current cardiac drugs, and the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Standards: Manage congestive heart failure (CHF) in accordance with (IAW) the AHA textbook Advanced Cardiac Life Support.

Performance Steps

1. Understand the definition and causes of CHF.
 - a. CHF is a clinical syndrome with many different causes that reflect a fundamental abnormality in effective mechanical performance of the heart, resulting in cardiac output that is inadequate to meet the body's demands.
 - b. Physiologically, cardiac function can be described in terms of the ventricular function curve and the Frank-Starling principle. This principle states that the degree of end diastolic fiber stretch within a physiologic range is proportional to the systolic mechanical work expended in the ensuing contraction. As left ventricular filling pressure rises, there is a commensurate increase in cardiac output. A peak is eventually reached above which no further increase in cardiac output occurs, and finally reduction in cardiac output results from extreme elevations of the filling pressure. As the left ventricular filling pressure increases and exceeds the oncotic pressure of the plasma proteins, pulmonary congestion, dyspnea, and eventually pulmonary edema develop. As cardiac output declines, fatigue, peripheral hypotension, and cyanosis may develop. Left ventricular failure will eventually increase pulmonary venous pressure and pulmonary arterial pressure leading to pulmonary hypertension, which will ultimately cause right ventricular failure.
 - c. Heart failure may be caused by valvular, coronary, or myocardial disease.
 - (1) Valvular disease, either by obstruction or regurgitation, increases the myocardial workload and eventually leads to deterioration of the contractile state.
 - (2) Coronary artery disease, through reduced myocardial blood flow, results in ischemia and infarction with eventual loss of contracting myocardium.
 - (3) Myocardial diseases include a variety of conditions that impair myocardial performance.
2. Identify CHF on the basis of the patient's signs and symptoms.
 - a. Left ventricular failure may become apparent with the following:
 - (1) Undue tachycardia, fatigue on exertion, dyspnea with mild exercise, and intolerance to cold.
 - (2) Paroxysmal nocturnal dyspnea (PND) and cough reflect the redistribution of excess fluid in the recumbent position.
 - (3) Bronchospasm and wheezing due to pulmonary venous hypertension and excess pulmonary fluid.
 - (4) Cough, often with pink or brownish sputum.
 - (5) Diffuse and laterally displaced apical impulse, palpable and audible ventricular (S3) and atrial (S4) gallop, accentuated pulmonic S2 sound, and inspiratory basilar rales.
 - (6) Right-sided pleural effusion is common.
 - (7) Acute pulmonary edema is a life-threatening manifestation of acute left ventricular failure secondary to sudden onset of pulmonary venous hypertension. See task 081-833-4190, Manage Pulmonary Edema.
 - b. Right ventricular failure may become apparent with the following:
 - (1) Fatigue.
 - (2) Awareness of fullness in the neck and abdomen with occasional right upper quadrant (RUQ) tenderness. In the latter stages, abdominal swelling caused by ascites will occur.
 - (3) Ankle swelling.
 - (4) Abnormally large "a" or "v" waves in the external jugular pulse.
 - (5) An enlarged and tender liver.

Performance Steps

- (6) A murmur of tricuspid regurgitation along the left sternal border, and right ventricular S3 and S4 sounds.
 - (7) Pitting edema in the lower parts of the body.
- c. Cyanosis may occur with any form of heart failure
- 3. Identify CHF on the basis of lab findings.
 - a. There are no electrocardiogram (ECG) readings specific to CHF. Abnormalities associated with ventricular hypertrophy, myocardial infarction, or bundle branch block may point to the underlying cause of the condition.
 - b. Chest X ray will show signs of pulmonary edema such as increased vascular markings. Careful examination of the cardiac silhouette, evaluation of chamber enlargement, and cardiac calcifications are important clues to the cause of the underlying condition.
 - c. Echocardiography, if available, can also help to determine the exact cause of heart failure.
- 4. Manage CHF. Management is based on improvement of the underlying cause. General management includes the following:
 - a. Rest: Reduction of heart rate and cardiac work by bed rest and sedation. The degree of restriction depends on the severity of CHF. The head of the bed should be elevated and the patient should be encouraged to sit as tolerated.
 - b. Oxygenation sufficient to ensure the prevention of hypoxemia of peripheral tissues should be used.
 - c. Arrhythmias should be evaluated as primary or secondary. Those secondary to the CHF such as frequent premature ventricular contraction (PVC) or premature atrial contractions (PACs), usually improve as the congestion subsides. With atrial fibrillation or atrial flutter, specific treatment should be used (task 081-833-4052, Manage Tachycardia). Keep in mind that persistent "sinus tachycardia" may be atrial flutter with a 2:1 conduction ratio.
 - d. Diuretics and sodium restriction are helpful in the long-term management of CHF.
 - e. Manage pulmonary edema as per task 081-833-4190, Manage Pulmonary Edema.
 - f. Digitalis may be used to increase myocardial contractile force by slowing ventricular response and prolonging A-V conduction, allowing increased ventricular filling and stretch. Digitalis also suppresses ventricular arrhythmias, increases venous tone, and increases renal blood flow.
 - g. Vasodilator therapy with nitrates, hydralazine, or angiotensin-converting enzyme (ACE) inhibitors may decrease preload and thus reduce congestive symptoms. Venodilators will not be effective and may have serious adverse effects on patients with low ventricular filling pressure or with right ventricle (RV) dysfunction or infarction, since further reduction in venous return and preload may produce hypotension and impair the contractile state.
- 5. Record all treatment in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by demonstration of proficiency by using a cardiac mannequin and cardiac monitor-defibrillator. The soldier may verbalize the drugs he would give and the dosages as they become necessary during the progress of the scenario. Give the soldier a scenario in which he must manage CHF.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and causes of CHF.	—	—
2. Identified CHF on the basis of the patient's signs and symptoms.	—	—
3. Identified CHF on the basis of lab findings.	—	—
4. Managed CHF.	—	—
5. Recorded all treatment in the patient's medical record.	—	—

Performance Measures

GO **NO GO**

6. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

ACLS 1997-1999

Related

EMT-P, BRADY 3RD ED. 1997

MERCK MANUAL 17TH ED

Manage a Cerebrovascular Accident

081-833-4066

Conditions: Given a patient in a hospital or clinical setting who has or is suffering from a cerebrovascular accident (CVA).

Standards: Manage a CVA in accordance with (IAW) the American Heart Association (AHA) textbook Advanced Cardiac Life Support.

Performance Steps

1. Understand the definition and causes of CVA.
 - a. The term "cerebrovascular accident" lacks specificity. It is commonly applied to the syndromes that accompany either ischemic or hemorrhagic lesions. These can be caused by the following:
 - (1) Cerebral insufficiency caused by transient disturbances of blood flow.
 - (2) Infarction, caused either by embolism or to thrombosis of the intra or extracranial arteries.
 - (3) Hemorrhage.
 - (4) Arteriovenous malformation.
 - b. The term "stroke" as opposed to CVA is used mainly to refer to ischemic lesions. The term "CVA" will be used throughout this text.
2. Identify an ischemic CVA on the basis of the patient's history. Patients will usually have the following in their history:
 - a. Over 50 years old.
 - b. Hypertensive.
 - c. Signs of atherosclerosis.
 - d. Diabetes mellitus, which will predispose patients to CVA.
 - e. Known cause of emboli, which also predisposes patient to ischemic CVA.
3. Identify an ischemic CVA on the basis of the patient's signs and symptoms.
 - a. An evolving ischemic CVA is an enlarging infarction manifested by neurologic defects that increase over 24 to 48 hours. Its signs and symptoms include unilateral neurologic dysfunction (often beginning in one arm) that increases painlessly and without headache or fever over several hours to 1 to 2 days to involve progressively more of the body ipsilaterally. The progression is usually stepwise, interrupted by periods of stability, but may be continuous.
 - b. An acute completed ischemic CVA is more common. It is an infarct of brain tissue manifested by neurologic deficits of varying severity. Onset is usually abrupt, owing to arteriosclerosis or hypertensive stenosis, thrombosis, or embolism. The symptoms develop rapidly and typically are maximal within a few minutes. The site of manifesting paralysis or disability is based on the artery that is infarcted and the area of the brain that is supplied by that area.
4. Identify ischemic CVA on the basis of lab studies.
 - a. Request lab tests to identify hypertension and rule out anemia, polycythemia, and infection.
 - b. Request computed tomography (CT) scan or magnetic resonance imaging (MRI) to help rule out tumor.
 - c. Examine cerebrospinal fluid (CSF) in ischemic CVA. The result will be normal; however, this will rule out intracerebral hemorrhage.
 - d. Use angiography to identify the exact site of an occlusion.
5. Manage ischemic CVA.
 - a. Provide immediate care. Immediate care includes management of airway and breathing, oxygenation, intravenous (IV) fluids to maintain nutritional and fluid intake and general nursing care to manage bladder and bowel functions and prevent decubitus ulcers.
 - b. Use heparin to stabilize symptoms of evolving CVA; however anticoagulants are useless in acute completed stroke. To be effective, treatments to minimize brain damage and keep the damage from evolving into a CVA have to begin very soon after onset.
 - c. Manage complications symptomatically.

Performance Steps

- d. For rehabilitation and aftercare, educate the patient and family on the nature of the damage and the likelihood of improvement. With occupational and physical therapy, emphasize using affected limbs and achieving proficiency in daily tasks.
6. Identify an intracerebral hemorrhage on the basis of the patient's signs and symptoms.
 - a. Typically begins abruptly with headache and is followed by steadily increasing neurologic deficits.
 - b. Large hemorrhages produce hemiparesis when located in the hemispheres and symptoms of cerebellar or brainstem dysfunction when located in the posterior fossa.
 - c. Loss of consciousness is common.
 - d. Nausea, vomiting, delirium, and focal or generalized seizures also are common.
7. Identify intracerebral hemorrhage on the basis of lab studies.
 - a. Request CT scans which will easily show the area affected by the hemorrhage.
 - b. perform lumbar puncture (LP) for CSF cautiously, if at all. Changes in CSF pressure may precipitate transtentorial or cerebellar herniation. With large hemorrhages, the CSF is almost always bloody and under increased pressure.
8. Manage intracerebral hemorrhage.
 - a. Provide immediate care. Immediate care includes management of airway and breathing, oxygenation, and IV fluids to maintain nutritional and fluid intake and general nursing care to manage bladder and bowel functions and prevent decubitus ulcers.
 - b. Do not give anticoagulants as they are contraindicated.
 - c. To relieve headache, give codeine 60 milligrams (mg) every 4 hours (q4h).
 - d. If nausea and vomiting occur, give prochlorperazine 2.5 to 5 mg IV during the first few days.
 - e. Surgically evacuate large hemorrhages. This surgery may be lifesaving.
9. Identify a subarachnoid hemorrhage on the basis of the patient's signs and symptoms.
 - a. If the hemorrhage is preceded by an aneurysm, the symptoms will manifest themselves on the basis of where the aneurysm is applying pressure. Some possibilities are ocular palsies, diplopia, squint, or facial pain.
 - b. After a hemorrhage, patients may have the following symptoms:
 - (1) Headache, which is usually abrupt and severe and is often accompanied by at least brief syncope.
 - (2) Coma (some patients remain in a coma).
 - (3) Obtunded.
 - (4) Depending on the expansion of the hemorrhage, vomiting, dizziness, and alteration in pulse and respiratory rate.
 - (5) Within 24 hours, moderate to marked stiffness of the neck.
 - (6) Elevated temperature may occur the first 5 to 10 days.
10. Identify subarachnoid hemorrhage on the basis of lab studies.
 - a. Request a CT scan, if available, which will easily show the area of hemorrhage.
 - b. Perform LP for CSF cautiously, if at all. Changes in CSF pressure may precipitate transtentorial or cerebellar herniation. With large hemorrhages, the CSF is almost always bloody and under increased pressure.
 - c. Request X rays, which may show calcification in the wall of an aneurysm before rupture.
11. Manage subarachnoid hemorrhage as follows:
 - a. Treat underlying vascular disease, blood dyscrasia, cardiac disease, or syphilis.
 - b. Instruct patient to avoid exertion by prescribing mandatory bedrest.
 - c. Maintain fluid balance and nutrition (parenterally, if necessary).
 - d. May use diazepam for restlessness; however, ensure that increased restlessness is not the result of increased intracranial pressure.
 - e. May use codeine or meperidine to relieve headache.
 - f. Use LP cautiously to remove amounts of CSF. Use of this procedure depends on the patient's response to diagnostic LP.

Performance Steps

- g. If appropriate neurosurgical support is available, surgically repair an aneurysm before rupture.
- 12. Treat complications symptomatically with appropriate supportive care.
- 13. Record all treatment in the patient's medical record.
- 14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a CVA.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and causes of CVA.	—	—
2. Identified an ischemic CVA on the basis of the patient's history.	—	—
3. Identified an ischemic CVA on the basis of the patient's signs and symptoms.	—	—
4. Identified ischemic CVA on the basis of lab studies.	—	—
5. Managed ischemic CVA.	—	—
6. Identified an intracerebral hemorrhage on the basis of the patient's signs and symptoms.	—	—
7. Identified intracerebral hemorrhage on the basis of lab studies.	—	—
8. Managed intracerebral hemorrhage.	—	—
9. Identified a subarachnoid hemorrhage on the basis of the patient's signs and symptoms.	—	—
10. Identified subarachnoid hemorrhage on the basis of lab studies.	—	—
11. Managed subarachnoid hemorrhage.	—	—
12. Treated complications symptomatically with appropriate supportive care.	—	—
13. Recorded all treatment in the patient's medical record.	—	—
14. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

ACLS 1997-1999

Related

EMT-P, BRADY 3RD ED. 1997
MERCK MANUAL 17TH ED

Subject Area 11: Pulmonary Conditions

Assess Respiratory Diseases

081-833-4164

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the cause of the disease.

Performance Steps

1. Explain the significance of various respiratory conditions.
 - a. Hypoxemia: insufficient oxygenation of the blood.
 - b. Apnea: temporary cessation of breathing.
 - c. Dyspnea: air hunger, resulting in labored or difficult breathing and sometimes accompanying pain.
 - d. Cyanosis: bluish, grayish, slate-like, or dark purple discoloration of skin caused by presence of abnormal amounts of reduced hemoglobin in the blood.
 - e. Sputum: substance expelled by coughing or clearing the throat.
 - f. Phlegm: thick mucus, usually from the respiratory tract.
 - g. Hemoptysis: expectoration of blood arising from the oral cavity, larynx, trachea, bronchi, or lungs.
 - h. Pneumonia: an inflammation of the lung parenchyma produced by microbial infection and characterized by cough, pleuritic chest pain, fever, and signs of consolidation.
2. Explain the significance of various complications of respiratory diseases.
 - a. Lung abscess: pocket of pus within lung tissue. It may be assessed by X ray or needle aspiration. It can develop during an inflammatory lung condition.
 - b. Bronchiectasis: dilation of portions of the bronchial tree through the breakdown of bronchiole walls, resulting in local cavitation.
 - c. Pleuritis: inflammation of pleura.
 - d. Pleural effusion: abnormal accumulation of fluid in air spaces of lungs and pleural cavity.
 - e. Empyema: collection of pus in a body cavity, especially in the pleural cavity.
 - f. Emphysema: destruction by overinflation of interalveolar membranes, resulting in large air spaces with subsequent poor oxygenation of blood.
3. Determine the significance of common symptoms of respiratory diseases.
 - a. Chronic cough in general will be present longer than 3 weeks. It is the fifth most common reason for visits to a doctor. It is a symptom of another problem.
 - (1) History of cough may illicit the following questions:
 - (a) What is the duration, frequency, and severity of the cough?
 - (b) Do you smoke?
 - (c) Do you feel something dripping down your throat that requires you to clear your throat?
 - (d) Do you have allergies (seasonal), nasal discharge (DC), or pain in sinuses?
 - (e) Do you have wheezing, shortness of breath (SOB) that worsens after exercise or exposure to cold air?
 - (f) Do you have heartburn, a sour taste in your throat, or a history (Hx) of reflux?
 - (g) What is the color, consistency, and hemoptysis of your sputum or phlegm?
 - (h) Is your cough worse at night? (Suspect postnasal drip, reflux, or congestive heart failure [CHF].)
 - (i) Does cough disturb your sleep? (If not, consider psychogenic cough.)
 - (j) Are you taking any medications? (If not, consider medicine for cough or an angiotensin-converting enzyme [ACE] inhibitor for CHF.)

Performance Steps

- (k) Have you experience any weight loss or night sweats? (If so, consider cancer or chronic infections.)
- (l) Do you have a Hx of other illnesses, exposure to any toxin or substance on the job that could cause a cough, or change in cough pattern?
- (2) Differential diagnosis of cough should consider the following:
 - (a) Postnasal drip (nonsmokers).
 - (b) Asthma.
 - (c) Chronic bronchitis (smokers).
 - (d) Gastroesophageal reflux.
 - (e) CHF, occupational or environmental exposure to toxins, chronic lung infection, tumor, bronchiectasis, interstitial lung disease, recurrent aspiration, ACE inhibitors, cerumen impaction, psychogenic conditions, and foreign body.
- b. Hemoptysis is the expectoration of blood. When faced with this problem, consider the following:
 - (1) There are three sources: lungs, oropharynx, and gastrointestinal (GI) tract. Bronchial circulation is responsible for most cases of hemoptysis.
 - (a) Consider the patient's history and physical examination.
 - (b) Look at the blood. Pink, frothy sputum is usually from the lungs. Frank bleeding is usually from the oropharynx. Dark, especially "coffee ground" blood, is usually from the GI tract.
 - (c) Consider the quantity. It is hard to measure: scant (blood-tinged sputum), frank (anything more than scant [less than 600 milliliters per 24 hours [ml/24 hours]], and massive (greater than 600 ml/24 hours).
 - (2) Differential description of hemoptysis:
 - (a) Scant or frank: bronchitis, bronchiectasis, cancer, active tuberculosis (TB), chronic necrotizing pneumonia, pulmonary emboli with pulmonary infarction, and CHF.
 - (b) Massive: TB, bronchiectasis, necrotizing pneumonia, lung abscess, fungal lung infections, and bronchogenic carcinoma.
- 4. Determine which lab tests or other tests would be helpful in assessing respiratory diseases.
 - a. X ray.
 - b. Complete blood count (CBC).
 - c. Clotting times.
 - d. Urinalysis (UA).
 - e. Sputum Gram stain, acid fast stain, and cultures.
 - f. Electrocardiogram (ECG).
 - g. Bronchoscopy.
 - h. Purified protein derivative (PPD).
- 5. Record all findings in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess respiratory diseases.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the significance of various respiratory conditions.	—	—
2. Recognized the significance of various complications of respiratory diseases.	—	—
3. Determined the significance of common symptoms of respiratory diseases.	—	—
4. Determined which laboratory tests or other tests would be helpful in assessing respiratory diseases.	—	—

Performance Measures

GO **NO GO**

5. Recorded all findings in the patient's medical record.

6. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

BATES PE, 8TH ED. 2002
SANFORD, 1999

Manage Adult Respiratory Distress Syndrome

081-833-4165

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, pharmacological agents, patient's medical record, oxygen, and oxygen delivery equipment.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Define the phrase "adult respiratory distress syndrome" (ARDS).
 - a. Respiratory failure associated with various acute pulmonary injuries and characterized by noncardiogenic pulmonary edema, respiratory distress, and hypoxemia.
 - b. The pulmonary capillary and alveolar epithelium are injured due to poorly understood pathophysiology. When this occurs, plasma and blood leak into the interstitial and intra-alveolar spaces. Alveolar flooding and atelectasis result, the latter at least in part because of surfactant activity. Within 2 to 3 days, the second stage of lung injury occurs with interstitial in bronchoalveolar inflammation and by proliferation of epithelial and interstitial cells. In the third phase, collagen accumulation may progress rapidly, resulting in severe interstitial fibrosis within 2 to 3 weeks.
2. Understand the causes of ARDS.
 - a. This common medical emergency can be precipitated by a variety of acute processes that directly or indirectly injure the lung, such as primary bacterial or viral pneumonias, aspiration of gastric contents, direct chest trauma, prolonged or profound shock, burns, fat embolism, near-drowning, oxygen toxicity, and others.
 - b. Although termed "adult," this respiratory distress syndrome occurs in children and adults.
3. Identify ARDS on the basis of the patient's signs and symptoms.
 - a. ARDS usually develops within 24 to 48 hours after the initial illness or injury, beginning with dyspnea and rapid, shallow respiration.
 - b. The skin may become cyanotic and mottled and may not improve with oxygen (O₂) administration.
 - c. Auscultation may reveal rales, ronchi, or wheezes.

NOTE: A high index of suspicion should be aroused by the onset of dyspnea in settings known to predispose a patient to ARDS.

4. Identify ARDS by using advanced lab tests, if available.
 - a. Arterial blood gas analysis initially shows respiratory alkalosis with a very low PaO₂ (partial pressure of oxygen in arterial blood), a normal to low PaCO₂ (partial pressure of carbon dioxide in the arterial blood), and an elevated potential of hydrogen (pH).
 - b. Chest X rays usually show diffuse bilateral alveolar infiltrates similar to acute pulmonary edema of cardiac origin, except that the cardiac silhouette is usually normal.

NOTE: X ray changes may lag many hours behind functional changes, and the hypoxemia may seem disproportionately severe compared to the edema observed on the X ray.

5. Differentiate between ARDS and other diseases with similar signs and symptoms. Consider the following:
 - a. Pneumocystis carinii pneumonia may lead to and mimic ARDS; however, the overall progression of the disease will not lead to lung damage.
 - b. Heart failure may be differentiated from ARDS in the clinical setting by measurement of pulmonary artery wedge pressure (PAWP). A PAWP greater than 20 millimeters (mm) mercury (Hg) is characteristic of heart failure.

Performance Steps

6. Focus initial management on ensuring adequate oxygenation and correction of the underlying cause.

CAUTION: ARDS is a medical emergency. If at all possible, patients evacuated should be expedited to the highest level medical facility available.

- a. If needed insert endotracheal tube to deliver enough O₂. Hypoxemia of ARDS is frequently refractory to O₂ by face mask.
- b. If pleural idema is present, give intravenous (IV) fluids to prevent renal failure, especially if underlying sepsis is the etiology, if diuretics were given to combat pulmonary edema before ARDS was suspected, or because of decreased venous return resulting from positive pressure ventilation (PPV). Titrate IV fluids to urine output and not to the severity of pulmonary edema.
- c. If sepsis is present or a superinfection develops in the already damaged lung tissues, give antibiotics. In either of these cases, pending culture results, begin appropriate empiric broad-spectrum antibiotic treatment.
- d. For most patients, intubate and assist ventilation with a volume-controlled mechanical ventilator. If this is not available, try oxygen delivery via bag-valve-mask (BVM) to ensure sufficient organ tissue perfusion. Sedatives or narcotics may improve patient comfort and promote ventilatory synchrony during mechanical ventilation.

CAUTION: High levels of O₂ may be toxic over time and this combined with high-delivery pressures may accentuate the lung injury.

NOTE: If the patient's oxygen demands are met and the underlying causes are corrected, the lung tissue will eventually begin to heal on its own.

- e. As the patient's condition improves, gradually wean him off of oxygen. Be sure to monitor for signs of hypoxemia during this phase, and increase oxygen delivery, as necessary.

7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage ARDS.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined the phrase "adult respiratory distress syndrome" (ARDS).	—	—
2. Understood the causes of ARDS.	—	—
3. Identified ARDS on the basis of the patient's signs and symptoms.	—	—
4. Identified ARDS by using advanced lab tests, if available.	—	—
5. Differentiated between ARDS and other diseases with similar signs and symptoms.	—	—
6. Managed ARDS by focusing on ensuring adequate oxygenation and correcting the underlying cause.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Acute or Chronic Bronchitis

081-833-4166

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify bronchitis on the basis of the patient's history.
 - a. The patient will often relate a history of recent upper respiratory infection (URI).
 - b. Other contributory factors are exposure to air pollution, chilling, fatigue, stress, and malnutrition.
2. Identify bronchitis on the basis of the patient's signs and symptoms.
 - a. May be preceded by coryza, malaise, chills, fever, myalgias, and sore throat.
 - b. Onset of cough usually signals the onset of bronchitis. The cough is initially dry and nonproductive, but small amounts of viscid sputum are raised after a few hours. It may become more abundant; however, purulent sputum suggests an underlying bacterial infection.
 - c. Although the severity of symptoms may subside, the cough may continue for several weeks.
 - d. Persistent high fever suggests a complicating pneumonia.
 - e. With uncomplicated bronchitis, there may be scattered high- or low-pitched ronchi. Wheezing, especially after coughing, is common.
3. Identify bronchitis by using the Special Forces (SF) lab set.
 - a. Perform a gram stain of sputum to determine the causative organism.
 - b. Conduct a white blood cell (WBC) count with differential to determine the relative severity of a bacterial infection.
4. Identify bronchitis by using other lab tests, if available.
 - a. Order X rays to rule out complicating pneumonia.
 - b. Perform sputum culture should be done to identify the causative organism.
5. Differentiate between bronchitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Chronic bronchitis: A condition that is associated with prolonged exposure to nonspecific bronchial irritants and accompanied by mucus hypersecretion and certain structural changes in the bronchi. It is characterized by a chronic productive cough and is usually associated with cigarette smoking.
 - b. Acute irritative bronchitis: A condition that is caused by the inhalation of irritative dust or fumes.
 - c. Cough variant asthma: Asthma in which the degree of bronchoconstriction is not enough to produce overt wheezing.
6. Manage bronchitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - a. Rest until fever subsides.
 - b. Antipyretic and analgesics for fever and myalgia.
 - c. Antitussives for cough.
 - d. Hydration during the febrile phase.
 - e. Because of the high probability of viral etiology, antibiotics are usually not indicated. Purulent sputum alone is not an indication for antibiotics. If complicating pneumonia is present, treat for pneumonia (task 081-833-4169, Manage Pneumonia).

Performance Steps

- 7. Record all treatment in the patient's medical record.
- 8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage bronchitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified bronchitis on the basis of the patient's history.	_____	_____
2. Identified bronchitis on the basis of the patient's signs and symptoms.	_____	_____
3. Identified bronchitis by using the SF lab set.	_____	_____
4. Identified bronchitis by using other lab tests, if available.	_____	_____
5. Differentiated between bronchitis and other diseases with similar signs and symptoms.	_____	_____
6. Managed bronchitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Recorded all treatment in the patient's medical record.	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	
MERCK MANUAL 17TH ED	
SANFORD, 1999	

Manage Pneumonia

081-833-4169

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Define pneumonia. Pneumonia is the inflammation of the lung caused by a reaction to an invading microorganism or noxious substance. It usually results in consolidation. It is the sixth leading medical cause of death in the United States.
2. Understand the causes of pneumonia. When trying to determine the likely causes of pneumonia, you must consider where and how patients acquired it and what other medical problems, if any, they have. These considerations are important because of the different percentages of flora responsible for community-acquired pneumonia versus nosocomial pneumonia and immunocompetent versus immunocompromised patients.
 - a. Bacterial causes are common in older children and young adults. They include *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Mycoplasmal pneumoniae*, *Legionella pneumophila*, *Staphylococcus aureus*, *Klebsiella pneumoniae* and other gram-negative bacteria, and others.
 - b. Viruses are common in infants and young children. They include Influenza A and B, parainfluenza, respiratory syncytial virus, adenovirus, rhinovirus, coronaviruses, measles, and cytomegalovirus.
 - c. Other causes are chlamydial pneumonia, pneumocystis carinii pneumonia, aspiration (chemical), and fungal.
 - d. Community-acquired pneumonias are caused by three major organisms: *Streptococcus pneumoniae* (pneumococcus), *Haemophilus influenzae*, *Mycoplasmal pneumoniae*, and a host of viruses. These cause about 95 percent of all community-acquired pneumonias in otherwise healthy patients.
3. Identify pneumonias on the basis of the patient's history and predisposing factors.
 - a. Viral respiratory infections.
 - b. Smoking.
 - c. Cities, day care centers, subways, and classrooms.
 - d. Heart failure, chronic obstructive pulmonary disease (COPD), and debility.
 - e. Age extremes.
 - f. Immunosuppressive disorder or therapy.
4. Identify pneumonia on the basis of the patient's signs and symptoms.
 - a. Usually preceded by upper respiratory infection (URI).
 - b. Low- or high-grade fever.
 - c. Productive cough.
 - d. Patients often appear acutely ill.
 - e. Malaise and myalgia.
 - f. Possibly dyspnea, cyanosis, and use of accessory muscles.
 - g. Adventitious breath sounds.
 - h. Signs of consolidation:
 - (1) Dullness to percussion.
 - (2) Decreased breath sounds.
 - (3) Decreased tidal volume.

Performance Steps

- (4) Increased whispered pectoriloquy, tactile or vocal fremitus, and egophony ("e-a" sound).
 - (5) Bronchial breath sounds.
5. Identify pneumonia by using the Special Forces (SF) lab set.
 - a. Leukocytosis 15,000 to 30,000 with a left shift if bacterial. (Left shift does not always occur.)
 - b. Positive Gram stain of sputum for bacteria.
 6. Identify pneumonia by using other lab tests, if available.
 - a. Chest X ray usually shows segmented or lobar infiltrates.
 - b. Culture and sensitivity of sputum specimen has to be performed before commencing antibiotic therapy. Avoid nasal or oral catheter aspiration. Ultrasonic nebulization of water can help induce secretions. Not always reliable because of contamination and 30 to 50 percent negative results.
 - c. Blood culture and sensitivity. Obtain two samples--aerobic and anaerobic. A positive blood culture is diagnostic, even if the sputum culture is negative. A positive culture indicates a high risk of complications and death.
 - d. Percutaneous transtracheal aspiration. Obtained through a plastic catheter and needle inserted through the cricothyroid membrane.
 - e. Pleural fluid thoracentesis with culture and sensitivity.
 - f. Fiberoptic bronchoscopy offers a direct view of the affected lung. Allows for removal of copious secretions or mucous plug.
 - g. Direct examination and culture of affected lung tissue. Needle biopsy or small open thoracotomy.
 7. Differentiate between pneumonia and other diseases with similar signs and symptoms. Consider the following diseases.
 - a. URI.
 - b. Congestive heart failure (CHF).
 - c. Pulmonary embolus.
 - d. Atelectasis.
 - e. Pulmonary edema.
 - f. Subdiaphragmatic abscess.
 8. Manage pneumonia according to the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Antipyretics: acetylsalicylic acid (ASA) or acetaminophene (APAP).
 - b. Pulmonary toilet: postural drainage or frapping.
 - c. Expectorant: to help relieve congestion.
 - d. Antitussive or perhaps analgesic: to help sleep at night.
 - e. Bedrest.
 - f. Fluids.
 - g. Oxygen, if needed, with humidification and Beta2-agonists inhaler to help open the lungs.
- CAUTION:** In patients with chronic lung disease, monitor oxygen.
- h. Antibiotic therapy. Try to determine the type of pneumonia, and use the specific drug of choice (DOC) for the type of pneumonia.
 - (1) Pneumococcal pneumonia: Primary is penicillin G (high dose. With resistant strains, use erythromycin, chloramphenicol, or vancomycin; and as alternates, cephalosporins, erythromycin, and clindamycin.
 - (2) Haemophilus influenza: Primary is ampicillin or cephoxatin. Alternates are amoxicillin, septr, cefuroxime, cefaclor, tetracycline, and chloramphenicol.
 - (3) Mycoplasma pneumonia: Primary is erythromycin. Nearly all patients recover with or without treatment (tx). Antibiotic therapy will only serve to lessen the severity of the disease.
 - (4) Chlamydial pneumonia: DOC is oxytetracycline or erythromycin for 10 to 21 days. Very slow response to treatment. Most patients recover, but there is a 5 to 10 percent mortality rate in elderly.

Performance Steps

- (5) Legionnaires' disease: Primary is erythromycin. For severe cases, use erythromycin plus rifampin.
 - (6) Staphylococcal pneumonia: Primary is oxycillin or nafcillin (penicillinase-resistant penicillin). Vancomycin is DOC when methicillin resistance is suspected. Alternate is cephalosporin: cephalothin, cefamandole, or clindamycin.
 - (7) Streptococcal pneumonia: DOC is penicillin G. Alternates are cephalosporins, erythromycin, or clindamycin. Use repeated thoracentesis or closed catheter drainage for large pleural effusions. Use tube thoracotomy for purulent collections and loculated effusion.
 - (8) Klebsiella pneumoniae and other gram-negative bacilli: Primary is intravenous (IV) cephalosporin. Resistant and alternative are gentamycin or tobramycin or amikacin PLUS cephalosporin PLUS broad-spectrum penicillin.
 - (9) If the specific viral agent is known, the appropriate antiviral agent (amantadine, acyclovir) may be useful in lessening the severity of the disease.
 - (10) Aspiration pneumonia:
 - (a) Tracheal suction only if early or to clear solid matter.
 - (b) Respiratory support with oxygen (O₂) or mechanical ventilation is the most important.
 - (c) Corticosteroids.
 - (d) Antibiotics if associated bacterial infection is suspected.
9. Treat complications symptomatically with appropriate supportive care.
 10. Record all treatment in the patient's medical record.
 11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pneumonia.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Defined pneumonia.	—	—
2. Understood the causes of pneumonia.	—	—
3. Identified pneumonia on the basis of patient's history and predisposing factors.	—	—
4. Identified pneumonia on the basis of the patient's signs and symptoms.	—	—
5. Identified pneumonia by using the SF lab set.	—	—
6. Identified pneumonia by using other lab tests, if available.	—	—
7. Differentiated between pneumonia and other diseases with similar signs and symptoms.	—	—
8. Managed pneumonia on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
9. Treated complications symptomatically with appropriate supportive care.	—	—
10. Recorded all treatment in the patient's medical record.	—	—
11. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Pulmonary Atelectasis

081-833-4174

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, pharmacological agents, patient's record, oxygen, and oxygen administration equipment.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the cause of atelectasis.
 - a. The chief cause of atelectasis is intraluminal bronchial obstruction caused by plugs of tenacious bronchial exudate, endobronchial tumors, granulomas, or foreign bodies.
 - b. Atelectasis may also be caused by bronchial distortions; external compressions of a bronchus by enlarged lymph nodes, tumor, or aneurysm; and external pulmonary compression by pleural fluid or gas (due to pleural effusion or pneumothorax).
 - c. Interference with surfactant production or effectiveness also promotes atelectasis.
2. Identify atelectasis on the basis of the patient's history.
 - a. The following are significant events in a patient's history that will contribute to atelectasis.
 - (1) Large doses of opiates or sedatives.
 - (2) High oxygen concentration during anesthesia.
 - (3) Tight or circumferential chest dressings.
 - (4) Abdominal distention.
 - (5) Immobility of the body, or patient's refusal to move and breathe deeply because of pain.
 - b. Atelectasis is often a postoperative complication of upper abdominal or chest surgery.
3. Identify atelectasis on the basis of the patient's signs and symptoms.
 - a. Rapid occlusion with massive collapse causes the following:
 - (1) Pain on the affected side.
 - (2) Sudden onset of dyspnea and cyanosis.
 - (3) A drop in blood pressure (BP).
 - (4) Tachycardia.
 - (5) Elevated temperature.
 - (6) Sometimes shock.
 - (7) Dullness to flatness over the involved area of the chest and diminished or absent breath sounds.
 - (8) Tracheal and cardiac deviation toward the affected side will follow.
 - b. Slowly developing atelectasis may be asymptomatic or cause minor pulmonary symptoms.
 - c. Middle lobe syndrome, a form of chronic atelectasis, will often be asymptomatic, though a severe, hacking, nonproductive cough may result.
4. Identify atelectasis by using other lab tests, if available.
 - a. X ray evidence of diminished lung size and of a solid, airless opacity.
 - b. Fiberoptic bronchoscopy will allow direct visualization of subsegmental divisions of the bronchi and may reveal the cause of non-nosocomial atelectasis.
 - c. Arterial blood gasses (ABGs) or pulse-oximetry should be used to ensure adequate tissue perfusion.
5. Prevent atelectasis by taking the following measures:
 - a. Cease smoking before surgery.
 - b. Avoid the use of long-acting anesthetics and use narcotics sparingly after surgery as they suppress the cough reflex.
 - c. When anesthesia is ended, the lungs should be left filled with some air, not 100 percent oxygen (O₂).

Performance Steps

- d. As soon after surgery as possible, ensure patient turns, coughs, and breathes deeply every hour. Early ambulation is also important.
 - e. Intermittent positive-pressure breathing (IPPB) and incentive spirometry are of disputed value at this time. If they are to be effective, they must be used appropriately with adjunctive measures.
6. Manage atelectasis. If atelectasis develops, management is based on removal of the underlying cause.
- a. Mechanical obstructions should be given a 24-hour trial of vigorous respiratory and physical therapeutic measures.
 - b. If the above fails, fiberoptic bronchoscopy or surgery to relieve the obstruction must be undertaken. The patient should be evacuated to an appropriate medical facility.
 - c. Maintain the turn, cough, and deep breathing routine. Position the patient generally resting with the involved side up to promote drainage.
 - d. If the atelectasis is caused by foreign body aspiration, place the patient on a broad spectrum antibiotic and evacuate for surgical intervention.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pulmonary atelectasis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the cause of atelectasis.	—	—
2. Identified atelectasis on the basis of the patient's history.	—	—
3. Identified atelectasis on the basis of the patient's signs and symptoms.	—	—
4. Identified atelectasis by using other lab tests, if available.	—	—
5. Prevented atelectasis.	—	—
6. If atelectasis develops, management is based on removal of the underlying cause.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Chronic Obstructive Pulmonary Disease

081-833-4176

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, venturi mask, and oxygen administration equipment.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological care in accordance with The Merck Manual.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with emphysema.
 - a. Chronic obstructive pulmonary disease (COPD) may affect as many as 30 million Americans and is the fifth leading medical cause of death in the United States.
 - b. The main feature is chronic, irreversible reduction of airflow from the lungs.
 - c. COPD includes chronic bronchitis and emphysema. Asthma is NOT included in this category; asthma is reversible.
 - d. Etiology of COPD is as follows:
 - (1) Chronically inhaled particulates cause destruction of alveolar walls, which reduces alveolar surface area and lung elasticity because of fibrotic repair of lung damage.
 - (2) Ciliary escalator is also destroyed because of chronic inhalant irritation that results in decreased ability to remove excess (bacterial laden) mucous.
 - (a) Smoking is the most common cause of COPD, even though only 10 to 15 percent of smokers develop COPD.
 - (b) Occupational exposure.
 - (c) Reduced lung function.
 - e. Types of obstruction are as follows:
 - (1) Emphysema: Is characterized by permanent abnormal enlargement of the airspaces distal to the terminal bronchioles with associated destruction of the airspace walls.
 - (a) Etiology: Irritants and pollutants (smoking and tobacco) and pre-existing COPD (bronchitis) destroy interalveolar septa and cause loss of elastic recoil properties, resulting in the coalescence of airspaces to form abnormal overinflated, bullous areas. It also occurs as an inherited deficiency of the ability of the lung linings to produce surfactin.
 - (b) Affects: Loss of elastic recoil is the major mechanism of increased airflow resistance. Decrease in functional surface area results in diminished gas exchange capability.
 - (2) Chronic bronchitis: Characterized by chronic cough and sputum production, this disorder causes inflammatory changes on the mucosal surfaces of the larger cartilaginous airways, resulting in a chronically inflamed bronchus.
 - (a) Etiology: Irritants (smoking, fumes, excessive cold, and allergies) aggravate the condition. This leads to an increase in mucous production with a decrease in mucociliary activity. Reflex bronchoconstriction resulting in airway resistance is common and can be due to smoking irritating the nerve endings.
 - (b) Irritants produce thick, viscous, mucous that moves poorly and can result in mucous plugs.
2. Recognize the following signs and symptoms of emphysema.
 - a. In the early stages, dyspnea upon exertion; later, even walking short distances induces breathlessness.
 - b. Minimal cough is present, and sputum production is minimal.
 - c. Use of accessory muscles during respiration lifts sternum into an anterior-superior direction with each inspiration. This process progresses to muscular hypertrophy, which ultimately produces barrel chest.
 - d. Tachypnea occurs.

Performance Steps

- e. Prolonged expiration through pursed lips, which often begins with a grunting sound.
- f. Breath sounds are diminished over lung fields.
- g. Percussion over lung fields has hyperresonance.
- h. X rays show flattened or concave diaphragm and hyperinflated lungs.
- i. Cyanosis is not present.

3. Recognize significant history, signs, and symptoms for chronic bronchitis.

- a. Patient has a cough (smoker's cough) initially only in winter months. Then the cough becomes constant over the years.
- b. Patient has intractable and relentless productive cough for no less than 2 consecutive months.
- c. Patient has long history of heavy smoking.
- d. Patient has rapid, shallow respirations.
- e. Patient usually complains of shortness of breath.
- f. Patient has generalized cyanosis.
- g. Patient is overweight.
- h. Patient has massive sputum production--usually clear.
- i. Patient has rhonchi.

4. Manage COPD. Management of COPD is aimed at improving airflow when possible and relieving symptoms; this does much to support and comfort the patient. It is best undertaken by a specialist; however, you will encounter these patients and should be familiar with the types of pharmacotherapy involved in their treatment.

- a. Theophylline.
 - (1) Use remains controversial.
 - (2) Narrow margin of safety between therapeutic and toxic dosage.
 - (3) Improves diaphragm muscle activity and decreases vascular and pulmonary bronchiolar resistance.
 - (4) Routine use of this drug as a first-line agent is no longer necessary.
- b. Beta2-selective agonists:
 - (1) Several inhaled Beta2-selective agonists are available, and no evidence clearly favors the use of one over another.
 - (2) The most common difficulty limiting the efficacy of Beta2-agonists is inadequate dosage resulting from improper use by the patient.
 - (3) Proper patient education regarding the proper use of inhalers is essential.
- c. Corticosteroids:
 - (1) Corticosteroids are of tremendous value for short-term treatment of acute exacerbations of COPD. However, significant side effects can occur with long-term usage.
 - (2) Improvements in airflow and pulmonary function are the goals in therapy.
 - (3) Inhaled corticosteroids in COPD patients remains controversial.
- d. Anticholinergic agents:
 - (1) Atropine has long been known to inhibit vagal bronchospasm (the vagal nerves mediate resting tone in the bronchi).
 - (2) In the 1980s, the introduction of inhaled ipratropium renewed interest in anticholinergics.
 - (3) Ipratropium bromide is 3 to 5 times more potent than atropine as a bronchodilator and has proved to be poorly absorbed through the gastrointestinal (GI) tract, which minimizes systemic effects.
- e. Mucolytic agents:
 - (1) Mucolytics work generally by liquefying mucus through hydration or by changing its chemical structure, which leads to improved transport and clearance of secretions by the ciliary network in the bronchial tree.
 - (2) Guaifenesin requires large doses. Mucomyst is effective, but may irritate the airways of many patients.

NOTE: No available therapy can provide a cure for this condition, and in most cases, therapy does not significantly retard the progress of the disease.

- f. Outpatient care of COPD patients:

Performance Steps

- (1) The goals of outpatient management of COPD are:
 - (a) Prevent progression of the disease.
 - (b) Prevent and treat infection.
 - (c) Treat reversible symptoms.
 - (d) Alleviate hypoxemia.
 - (e) Improve quality of life by means of education and rehabilitation.
- (2) The following slows disease progression:
 - (a) Stop smoking, and avoid passive smoke too.
 - (b) Decrease environmental factors such as occupational exposure and air pollution and patients.
 - (c) Avoid temperature extremes and high altitudes that may adversely affect COPD.
- g. A serious respiratory infection may dramatically worsen COPD. The following procedures prevent infection:
 - (1) Immunizations:
 - (a) Annual influenza vaccine. If vaccine is contraindicated, consider coverage with Symmetrel (amantadine hydrochloride).
 - (b) Pneumococcal vaccine.
 - (2) Antibiotic treatment:
 - (a) Antibiotic treatment does not seem to decrease the frequency of infections, but decreases the severity and duration of symptoms.
 - (b) A wide variety of bacterial organisms are found in the sputum of COPD patients.
 - (3) Pulmonary toilet:
 - (a) Postural drainage.
 - (b) Hydration.
 - (c) Frappage.
5. Give the patient information on improving quality of life.
 - a. Education:
 - (1) Patients and families should be given basic facts about the disease process and a list of resources available to them.
 - (2) Should cover practical matters, such as techniques for use of an inhaler, breathing and control techniques, methods to control dyspnea, proper use of oral and inhaled medications, smoking cessation, nutritional guidelines, and exercise guidelines.
 - b. Pulmonary rehabilitation:
 - (1) Designed to make daily living easier and increase work capacity.
 - (2) Exercise programs should involve aerobic activity such as stationary biking or treadmill walking.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage emphysema.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with emphysema.	—	—
2. Recognized the signs and symptoms of emphysema.	—	—
3. Recognized significant history, signs, and symptoms for chronic bronchitis.	—	—
4. Managed COPD by trying to improve airflow when possible and relieve symptoms.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Gave patient information on improving quality of life.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK MANUAL 17TH ED

Manage Pleurisy

081-833-4180

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, pain medications, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Define pleurisy. Pleurisy is inflammation of the pleura, often characterized clinically by pain worsened by respiration and cough.
2. Understand the cause of pleurisy. Pleurisy is caused by the following:
 - a. Injury by an underlying lung process.
 - b. Entry of an infectious agent or irritating substance into the pleural space.
 - c. Transport of an infectious or noxious agent or neoplastic cells to the pleura by the blood stream or lymphatics.
 - d. Pleural trauma, especially rib fracture.
 - e. Asbestos-related pleural disease.
 - f. Pleural effusion resultant from drug ingestion.
3. Understand the pathology of pleurisy and how it progresses.
 - a. Pleura becomes edematous and congested.
 - b. Cellular infiltration occurs.
 - c. Fibrinous exudate develops on pleural surface. This exudate may be reabsorbed or organized into fibrous tissue, resulting in pleural adhesions.
 - d. Specific strains may run their course without significant exudate; however, pleural effusion may develop. When this happens, pleuritic pain often subsides.
4. Identify pleurisy on the basis of the patient's signs and symptoms.
 - a. Virulent onset.
 - b. Pain is the dominant symptom. It varies from vague to intense stabbing sensation and may be aggravated by breathing or coughing. The visceral pleura is insensitive. The pain results from inflammation of the parietal pleura.
 - c. Pain is generally felt over the pleuritic region but may be referred as well. Irritation of the posterior pleuritic regions may cause referred pain in which interabdominal disease process pain may be mimicked. Irritation of the diaphragmatic pleural region may cause referred pain to the posterior neck and shoulder region.
 - d. Respirations are generally rapid and shallow.
 - e. Motion of the affected side may be limited.
 - f. Breath sounds may be diminished.
 - g. A friction rub is the characteristic physical sign. It may be heard only 24 to 48 hours post onset of pain. The rub varies from a few intermittent sounds to a fully developed harsh grating, synchronous with inspiration and expiration.
5. Lab tests are usually not necessary except as a means to rule out other possible diagnoses.
6. Differentiate between pleurisy and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Basilar pleurisy may produce referred pain to the abdomen. This is differentiated from acute abdominal inflammatory disease by X ray and clinical evidence of absence of nausea, vomiting, and disturbed bowel function.

Performance Steps

- b. Myocardial infarction (MI), spontaneous pneumothorax, pericarditis, and chest wall lesions may mimic pleurisy. The friction rub of pericarditis is differentiated from pleurisy by "to and fro" sounds over the left sternal border (LSB), synchronous with the heartbeat.
7. Manage pleurisy. (Management of pleurisy is aimed at controlling pain so that sufficient unaided respiration may take place.)
- a. With severe pleurisy where pleural effusion is suspected, the patient should be referred for a pleural thoracentesis to determine the presence and character of the fluid. This is especially important if sufficient fluid is present to impinge on proper lung expansion.
 - b. Chest pain may be relieved or diminished by wrapping the chest with two or three 6-inch wide nonadhesive elastic bandages. Care should be taken to ensure that the bandages are not so tight that they impair respiratory effort.
 - c. Acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) may be given to relieve pain. If these are insufficient, codeine 30 to 60 milligrams (mg) by mouth (PO) may be given. However, its cough suppressant properties should be considered.
 - d. To prevent complicating pneumonia, adequate bronchial drainage must be provided. Coughing is often facilitated if additional temporary splinting of the chest wall is provided by holding a pillow firmly against the chest wall. If patients are taking narcotics, coughing and deep breathing should take place when pain relief from the drugs is at its peak.
 - e. Antibiotics and aqueous aerosol inhalation with bronchodilators should be considered for treatment of any associated bronchitis.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pleurisy.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Defined pleurisy as inflammation of the pleura, often characterized clinically by pain worsened by respiration and cough.	—	—
2. Understood the cause of pleurisy.	—	—
3. Understood the pathology of pleurisy and how it progresses.	—	—
4. Identified pleurisy on the basis of the patient's signs and symptoms.	—	—
5. Knew lab tests are usually not necessary except as a means to rule out other possible diagnoses.	—	—
6. Differentiated between pleurisy and other diseases with similar signs and symptoms.	—	—
7. Managed pleurisy by trying to control pain so that sufficient unaided respiration may take place.	—	—
8. Recorded all treatment in the patient's medical record.	—	—
9. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Tuberculosis

081-833-4182

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) kit, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understood the progress of a primary infection of tuberculosis (TB).
 - a. Primary infection (Ghon complex) involves local destruction of the lung tissue. Lymph nodes draining the area will contain bacilli.
 - b. Takes 2 to 4 weeks to form tubercle. Onset of signs and symptoms occurs 4 to 6 weeks postexposure.
2. Identify primary TB on the basis of the patient's signs and symptoms.
 - a. May be asymptomatic.
 - b. May develop mild flu-like symptoms.
 - c. PE is essentially negative.
3. Identify primary TB by using the SF lab set.
 - a. Do TB skin test: Mantoux (purified protein derivative [PPD]) is positive after several weeks of infection (4 to 10 weeks to become tuberculin hypersensitive).
 - b. Do Ziehl-Nielsen stain (acid-fast). Sputum is negative for acid-fast bacteria (AFB).
 - c. White blood cells are normal.
4. Manage primary TB on the basis of the treatment modality in the most current edition of The Sanford's Guide to Antimicrobial therapy. The following modalities are acceptable as of this writing:
 - a. Isoniazid (INH) 300 milligrams (mg) by mouth (PO) every day (q.d.) for (x) 1 year plus pyridoxine (B6) 50 mg PO q.d. for 1 year.
 - b. INH causes vitamin B6 deficiency, or peripheral neuritis. Use INH with caution in patients with liver dysfunction (hepatitis).
5. Understand the progress of a latent infection of TB.
 - a. Progress of latent infection of TB involves shrinkage and calcification of the primary lesion with live mycobacteria present in the tubercle.
 - b. Slow or intermittent multiplication occurs and may continue for months to years.
 - c. The patient will usually be asymptomatic with a negative history and PE.
6. Identify latent TB by using the SF lab set.
 - a. TB skin test: Mantoux is positive.
 - b. Sputum is negative for AFB.
 - c. White blood cells are normal.
7. Perform an X ray, if available. The X ray may show a lesion which will be visible when large enough (usually in apical regions of the lungs).
8. Manage latent TB on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. INH 300 mg PO q.d. x 1 year. AND
 - b. Pyridoxine 50 mg PO q.d. x 1 year.
9. Understand the progress of a postprimary infection of TB.

Performance Steps

- a. Begins when some factor allows scar tissue to break down, allowing the tubercle bacilli to escape and spread throughout the lungs.
 - b. More tubercles are then formed, which coalesce to form large cavities filled with pus and blood.
 - c. Precipitating factors are as follows:
 - (1) Steroid therapy, which suppresses the body's immune system.
 - (2) Cancer (especially leukemia and Hodgkin's disease).
 - (3) Cancer therapy.
 - (4) Diabetes mellitus.
 - (5) Acquired immunodeficiency syndrome (AIDS).
10. Identify post-primary TB on the basis of the patient's history.
- a. The patient may relate a history of low-grade fever. TB fever (top-bottom) is intermittent in nature (101 degrees Fahrenheit peak) and may be insensible.
 - b. Night sweats are the classic sign of TB. They are due to periods of defervescence (patients complain of damp bed clothes and linen).
11. Identify postprimary TB on the basis of the patient's signs and symptoms.
- a. The patient may complain of malaise, irritability, anorexia, and headache.
 - b. Productive cough with purulent sputum, which is green, yellowish, and tenacious.
 - c. Hemoptysis with blood-streaked sputum. (Large quantities of blood are not common.)
 - d. Rales and rhonchi over infected area of lung, usually in the apical regions.
 - e. Dullness to percussion over infected area of lung.
12. Identify postprimary TB by using the SF lab set.
- a. TB skin test is positive.
 - b. Sputum is positive for AFB. (Get an early morning specimen.)
 - c. White blood cells are increased and there is lymphocytosis.
13. Perform X ray. (X ray will show numerous unexplained infiltrates.)
14. Manage postprimary TB on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing; however, evacuation and referral for treatment are preferable.
- a. Short-course chemotherapy regimen (9 months):
 - (1) Initial therapy for 1 month is INH 300 mg PO q.d. and rifampin 600 mg PO q.d. This regimen is slightly more hepatotoxic.
 - (2) Continued therapy x 8 months is INH and rifampin at above dose or INH 900 mg and rifampin 600 mg PO twice weekly.
 - b. If patient has drug resistance to either INH or rifampin, replace them with other regimens that use ethambutol, pyrazinamide, and/or streptomycin.
15. Place patient in respiratory isolation for 2 weeks.
16. Understand the progress of a miliary infection of TB.
- a. The tubercle bacilli spread throughout the entire body and may infect any organ (resembles millet on X ray). Up to 15 percent of TB cases will develop into this stage.
 - b. Onset may occur rapidly after postprimary infection.
17. Identify miliary TB on the basis of the patient's history.
- a. Virtually any signs or symptoms are possible, depending on what part of the body has been affected (for example, meningitis, renal, pleural, laryngeal, peritoneal, and osteo or arthro TB).
 - b. The patient may relate a history of weight loss, abdominal pain, weakness, and especially fever that follows a double quotidian curve.
18. Identify miliary TB on the basis of the patient's signs and symptoms.
- a. Abdominal tenderness.
 - b. Stiff neck.
 - c. Dullness in lung bases because of pleural effusion.

Performance Steps

19. Identify miliary TB by using the SF lab set.
 - a. TB skin test: usually PPD positive, but in fulminating infection, it may become negative (anergic response).
 - b. Sputum is positive for AFB.
 - c. White blood cells are increased and lymphocytosis and monocytes are greater than 20 percent.
20. Manage postprimary TB. Management is the same as for postprimary TB. Any delay in management could be fatal. Do not wait for lab results before initiating management. Evacuate and refer the patient for higher echelon hospitalization as soon as possible.
21. Record all treatment in the patient's medical record.
22. Treat complications symptomatically with appropriate supportive care.
23. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage TB.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the progress of a primary infection of TB.	—	—
2. Identified primary TB on the basis of the patient's signs and symptoms.	—	—
3. Identified primary TB by using the SF lab set.	—	—
4. Managed primary TB on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
5. Understood the progress of a latent infection of TB.	—	—
6. Identified latent TB by using the SF lab set.	—	—
7. Managed latent TB on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
8. Understood the progress of a postprimary infection of TB.	—	—
9. Identified postprimary TB on the basis of the patient's history.	—	—
10. Identified postprimary TB on the basis of the patient's signs and symptoms.	—	—
11. Identified postprimary TB by using the SF lab set.	—	—
12. Managed postprimary TB on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
13. Placed patient in respiratory isolation for 2 weeks.	—	—
14. Understood the progress of a miliary infection of TB.	—	—
15. Identified miliary TB on the basis of the patient's history.	—	—
16. Identified miliary TB on the basis of the patient's signs and symptoms.	—	—
17. Identified miliary TB by using the SF lab set.	—	—
18. Managed miliary TB in the same as for postprimary TB.	—	—
19. Recorded all treatment in the patient's medical record.	—	—

Performance Measures

20. Treated complications symptomatically with appropriate supportive care.
21. Sought the advice and assistance of a higher medical authority whenever possible.

GO **NO GO**

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Asthma

081-833-4186

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, and a selection of pharmacological agents for the emergency and chronic treatment of asthma.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understood the pathophysiology of asthma.
 - a. The airway obstruction in asthma is caused by a combination of factors that include the following:
 - (1) Spasm of airway smooth muscle.
 - (2) Edema of airway mucosa.
 - (3) Increased mucus secretion.
 - (4) Cellular--especially eosinophilic--infiltration of the airway walls.
 - (5) Injury to and desquamation of the airway epithelium.
 - b. The trigger of the obstructive elements of asthma is the hyperreactivity or hyperresponsiveness of the airway. This manifests as an exaggerated bronchoconstrictor response to many different stimuli. The degree of hyperresponsiveness is closely linked to the extent of inflammation and the severity of the disease.
 - c. Precipitating factors are as follows:
 - (1) Emotional upsets.
 - (2) Physical exertion.
 - (3) Cold weather.
 - (4) Upper respiratory infection (URI).
 - (5) Specific irritants for each person.
 - d. Drugs that can aggravate bronchospasm include the following:
 - (1) Acetylsalicylic acid (ASA).
 - (2) Antihistamine.
 - (3) Tartrazine yellow dye number 5, which is sometimes found in bronchodilators.
 - (4) Morphine.
 - (5) Dextran.
 - (6) Parasympathomimetics.
2. Identify asthma on the basis of the patient's history.
 - a. A family history of allergy or asthma can be elicited in most asthmatics.
 - b. Any child who presents with a history of chronic nighttime coughing without apparent associated URI should be evaluated for asthma.
3. Identify asthma on the basis of the patient's signs and symptoms.
 - a. Chronic asthma not in the presence of an acute attack will often show the following symptoms:
 - (1) Wheezing, which should raise a high degree of suspicion of asthma. Breath sounds may be normal during quiet respiration, but fine wheezes may be heard during forced expiration or after exercise.
 - (2) Excessive tiredness and unexplained coughing or difficulty breathing after exercise.
 - (3) With long-standing, severe asthma, especially if dating from childhood, there may be evidence of secondary effects of chronic hyperinflation on the chest wall such as "squared off" thorax, anterior bowing of the sternum, and depressed diaphragm.
 - b. An acute attack of asthma will show the following symptoms:
 - (1) Stage 1 (mild): The patient will show the following:
 - (a) Mild dyspnea and diffuse wheezes.
 - (b) Adequate air exchange.

Performance Steps

- (2) Stage 2 (moderate): Patient will show the following:
 - (a) Respiratory distress at rest.
 - (b) Hyperpnea.
 - (c) Marked wheezes.
 - (d) Use of accessory muscles in respiration.
 - (e) Normal or slightly decreased air exchange.
 - (f) Tachypnea and tachycardia also may be present as well as varying degrees of dehydration as a result of sweating and water loss from lungs secondary to tachypnea.
 - (g) The patient prefers to sit upright or lean slightly forward.
 - (h) Late in this stage, the patient may develop difficulty in speaking more than a few words at a time.
- (3) Stage 3 (severe): Patient will show the following:
 - (a) Marked respiratory distress.
 - (b) Cyanosis.
 - (c) Marked wheezes.
 - (d) Possibly, absent breath sounds in totally obstructed areas.
 - (e) Possibly, pulsus paradoxus of 20 to 30 millimeters (mm) mercury (Hg).
 - (f) Extensive use of accessory muscles.
- (4) Stage 4 (respiratory failure): Patient will show the following:
 - (a) Severe respiratory distress.
 - (b) Lethargy.
 - (c) Confusion.
 - (d) Prominent pulsus paradoxus of 30 to 50 mm Hg.
 - (e) Less wheezing may be heard because extensive mucus plugging and patient fatigue result in marked reduction in air exchange.

NOTE: An asthmatic with a quiet sounding chest may actually have a more severe problem than one with audible wheezes.

4. Identify asthma by using the SF lab set.
 - a. White blood cells (WBCs) will reveal eosinophilia, even in asthmatics who have no apparent allergic factors contributing to their disease.
 - b. Macroscopically, the sputum will be tenacious, rubbery, and whitish. Microscopically, many eosinophils will be present, often arranged in sheets. Large numbers of histocytes and polymorphonuclear leukocytes are also present. Elongated dipyramidal Charcot-Leyden crystals originating from the eosinophils are also often found.
5. Identify asthma by using other lab tests, if available.
 - a. X ray findings will vary from normal to hyperinflation. Atelectasis, most often involving the right middle lobe, is common in children and may be recurrent.
 - b. Pulmonary function tests are valuable in the differential diagnosis of a mild acute attack or in determining the level of obstruction in chronic asthma.
 - c. Certain pulmonary function tests and blood gas values are characteristic of and correlate well with certain stages of an acute attack.
 - (1) Stage 1: Forced expiratory volume in 1 second (FEV1) or forced vital capacity (FVC) will be between 50 to 80 percent of normal. Blood potential of hydrogen (pH) will be normal or slightly elevated. Partial pressure of carbon dioxide in the arterial blood (PaCO2) will be normal or slightly decreased. Partial pressure of oxygen in arterial blood (PaO2) on room air will most often be slightly decreased.
 - (2) Stage 2: FEV1 or FVC 50 percent of normal, pH normal or elevated, PaCO2 usually decreased, and PaO2 on room air is increased.
 - (3) Stage 3: FEV1 or FVC 25 percent of normal, pH usually decreased, PaCO2 normal or increased, and PaO2 on room air is quite diminished.
 - (4) Stage 4: FEV1 or FVC 10 percent of normal, pH very decreased, PaCO2 very elevated, and PaO2 on room air is very decreased.

Performance Steps

6. Manage asthma prophylactically. Drugs given are only some of a myriad of possible choices. For complete drug therapy information, consult the current literature at the time of treatment. The listed drugs are acceptable as part of a program of prevention of acute attack as of this writing.
 - a. Eliminate or reduce exposure to environmental factors that are known to trigger attacks such as animal dander, dust mites, airborne molds and pollens, and cigarette smoke.
 - b. Consider the use of disodium cromoglycate (DSCG). This drug is a mast cell stabilizer that may help to reduce airway hyperresponsiveness and mediator release. It is mainly useful in children and some adults for maintenance therapy and is not for treatment of acute attack.
 - c. Consider the use of inhalant topical corticosteroids. These block the late response to inhaled allergens and subsequent hyperresponsiveness. These are used for maintenance therapy. Their usefulness during acute attack is still under investigation. Systemic corticosteroids are reserved for the treatment of difficult episodes because of their potential for adverse side effects.
 - d. Beta adrenergic agents cause bronchial smooth muscle relaxation and modulate inhibition of mediator release. They also protect against challenge with various bronchoconstrictor substances and may inhibit microvascular leakage into the airway. These drugs include epinephrine, isoproterenol, and other selective Beta 2 adrenergics that do not cause as much cardiac response. These are the drugs of choice to relieve acute attacks.
 - e. Theophylline (a methylxanthine) relaxes bronchial smooth muscle and decreases microvascular leakage into the airway mucosa. It is an adjunctive treatment in patients with acute attack who have had a suboptimal response to adrenergic drugs. It may also be used in the management of nocturnal asthma. Blood levels of theophylline must be monitored closely as there is a small variance between its therapeutic and toxic range.

NOTE: Theophylline remains a controversial drug; however, you will find patients who are taking this drug.

- f. Anticholinergic agents such as atropine block the cholinergic pathways that cause airway obstruction. They may provide additional bronchodilator effect in patients who have already received inhaled Beta2 agents for acute asthma.
7. Manage an acute asthma attack.
 - a. Oxygen therapy via mask with humidified oxygen (O₂) is always indicated. PaO₂ should be maintained in the 70 to 90 mm Hg range if possible.
 - b. Patients presenting in stage 1 or 2 may be treated effectively with an aerosolized bronchodilator such as racemic epinephrine. Alternatively, 1:1,000 epinephrine 0.01 milliliters per kilogram (ml/kg) subcutaneously (SQ) to a maximum of 0.2 ml for children or 0.3 ml for adults may be given and repeated once or twice after 20 to 30 minutes.
 - c. Albuterol nebulizer of 2.5 milligrams (mg) mixed with 3 to 5 cubic centimeters (cc) normal saline (NS) x 3 treatments may be used in addition to epinephrine. If following three treatments the patient's airways are not clear, hospitalization may be required.
 - d. If there is not enough response from the Beta2 agents, consider giving theophylline (aminophylline). The use of theophylline in the emergency room is controversial at this time because of its inherent side effects at high blood levels. If it is impossible to monitor blood levels with continuous infusion, an alternative is to give 4 to 6 milligrams per kilogram (mg/kg) intravenously (IV) over 20 minutes every 6 hours (q6h).
 - e. In stage 1 or 2, consider using inhaled topical corticosteroids. Patients in stage 3 or 4 who show no improvement with theophylline, should be given systemic corticosteroids. Consider methylprednisolone 1 to 2 mg/kg IV every 4 to 6 hours (q4/6h) or hydrocortisone sodium succinate 4 mg/kg IV every 2 to 4 hours (q2/4h).
 - f. Ensure fluid and electrolyte balance are maintained in patients with prolonged episodes. The titrate fluid input to urine output should be commensurate to the patient's age and size. Overhydration may result in pulmonary edema, further exacerbating the patient's condition.
 - g. Chest X ray to rule out spontaneous pneumothorax and SQ and mediastinal emphysema as complications of the attack.
 8. Record all treatment in the patient's medical record.

Performance Steps

9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage asthma.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the pathophysiology of asthma.	_____	_____
2. Identified asthma on the basis of the patient's history.	_____	_____
3. Identified asthma on the basis of the patient's signs and symptoms.	_____	_____
4. Identified asthma by using the SF lab set.	_____	_____
5. Identified asthma by using other lab tests, if available.	_____	_____
6. Managed asthma prophylactically.	_____	_____
7. Managed an acute asthma attack.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Pulmonary Edema

081-833-4190

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, patient's medical record, and a selection of pharmacological agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the causes of pulmonary edema.
 - a. Imbalance factors such as increased pulmonary capillary pressure, decreased intravascular pressure, and increased interstitial pressure.
 - b. Altered alveolocapillary membrane permeability as a result of infections, inhaled or circulating toxins such as phosgene gas or snake venom, endogenous substances such as histamine, aspiration of gastric contents, acute radiation pneumonitis, high-altitude pulmonary edema (HAPE), narcotic overdose, anesthesia, and other causes.
 - c. Left ventricular failure, which occurs when the left ventricle fails to function as an effective forward pump. When the left ventricle fails, it creates a back pressure of blood through the right side of the heart and into the pulmonary circulation. It may be caused by a variety of forms of heart disease.
2. Identify pulmonary edema on the basis of the patient's history.
 - a. Patients will often relate a history of being unable to lie down to sleep at night. The severity of their condition can be graded to a certain degree by the number of pillows they use to keep their upper body in an elevated position to sleep.
 - b. Patients will often state that they cough up pink, frothy sputum and have a feeling of anxiety or impending doom.
3. Identify pulmonary edema on the basis of the patient's signs and symptoms.
 - a. Signs: tachycardia, diaphoresis, use of accessory muscles, bilateral crackles that do not clear with coughing, rhonchi, and/or wheezes, jugular vein distention, heart murmur or S-3 gallop, irregular pulse, and fever.
 - b. Symptoms: dyspnea with or without exertion depending on severity, feeling of impending doom, palpitations, cool and clammy extremities, chest pain, and pink, frothy sputum.
4. Manage acute pulmonary edema.

CAUTION: Acute pulmonary edema is a medical emergency.

- a. Physical maneuvers such as sitting upright with legs off the side of bed reduce venous return and improve breathing mechanics.
- b. Medications of definite benefit are as follows:
 - (1) High concentration oxygen (O₂) by mask or nasal cannula if mask is not tolerated. Monitor with pulse oximetry, if available, to maintain an O₂ saturation of at least 90 percent.
 - (2) Morphine sulfate 4 to 6 milligrams (mg) intravenous (IV) can reduce agitation and reduce preload.
 - (3) Nitroglycerin 10 micrograms per minute titrate to effect (reduces preload).
 - (4) Diuretics such as furosemide 40 to 60 mg IV or chlorothiazide 250 to 500 mg IV will decrease circulating blood volume.
 - (5) When pulmonary edema is accompanied by hypotension or shock, all drug doses must be tailored to maintain perfusion of the brain, kidneys, and heart. Consider the use of vasopressors such as dopamine or dobutamine to improve cardiac function.

NOTE: Once management of acute pulmonary edema is accomplished, direct management toward eliminating the underlying cause.

Performance Steps

5. Treat complications symptomatically with appropriate supportive care.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage pulmonary edema.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of pulmonary edema.	—	—
2. Identified pulmonary edema on the basis of the patient's history.	—	—
3. Identified pulmonary edema on the basis of the patient's signs and symptoms.	—	—
4. Managed acute pulmonary edema.	—	—
5. Eliminated the underlying cause.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Viral Upper Respiratory Infection
081-833-4284

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical records, The Merck Manual, and a selection of pharmacological agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care without causing further harm.

Performance Steps

1. Identify a viral upper respiratory infection (URI) on the basis of the patient's signs and symptoms.
 - a. Abrupt onset of nasal or throat discomfort.
 - b. This is followed by sneezing, rhinorrhea, and malaise. There is usually no fever.
 - c. Pharyngitis is usually present early. Laryngitis and tracheitis with substernal tightness and burning vary with the individual and the causative agent.
 - d. Nasal secretions are watery and profuse during the first day or two of symptoms then become more mucoid and purulent. Mucopurulent nasal discharge results from the presence of leukocytes (predominantly granulocytes) and is not necessarily a sign of a bacterial infection.
 - e. Hacking cough with scanty sputum often lasts into the second week.
2. Identify a viral URI by using the SF lab set.
 - a. Microscopic examination of a smear of exudate may help differentiate between viral, bacterial and allergic causes. Eosinophilia in the secretions suggests an allergic cause.
 - b. An elevated white blood cell (WBC) count will help to differentiate a bacterial from a viral infection.
3. Differentiate between a viral URI and other diseases with similar signs and symptoms. Consider the following diseases.
 - a. Bacterial infection: Severe tracheobronchial involvement with purulent sputum suggests primary or secondary bacterial infection. Purulent sinusitis and otitis media are common bacterial complications of viral URI.
 - b. Influenza: Usually manifests itself with fever and more severe symptoms.
4. Management of a viral URI is symptomatic.
 - a. Place the patient in a warm, comfortable environment.
 - b. Give antipyretics and analgesics for malaise and fever if present. Do not use aspirin in children because of the increased risk of Reye's syndrome.
 - c. Ensure sufficient hydration.
 - d. Do not prescribe systemic nasal decongestants for more than 7 days. The use of sympathomimetic nasal decongestants is frequently associated with rebound nasal congestion.
 - e. Prescribe antihistamines if the patient has a known nasal allergy; otherwise, antihistamines are of no value.
 - f. Do not use antibiotics unless there is a known bacterial complication.
5. Treat complications symptomatically with appropriate supportive care.
6. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a viral URI.

Performance Measures	GO	NO GO
1. Identified a viral URI on the basis of the patient's signs and symptoms.	—	—
2. Identified a viral URI by using the SF lab set.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Differentiated between a viral URI and other diseases with similar signs and symptoms.	_____	_____
4. Managed viral URI symptomatically.	_____	_____
5. Treated complications symptomatically with appropriate supportive care.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Influenza

081-833-4287

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify influenza on the basis of the patient's signs and symptoms.
 - a. Sudden onset of chills and fever.
 - b. Prostration and generalized myalgia (most pronounced in the back and legs) appears early.
 - c. Headache, often accompanied by photophobia.
 - d. Respiratory tract symptoms may be mild at first with sore throat, substernal burning, and nonproductive cough. Later the respiratory illness becomes predominant with severe and sometimes productive cough.
 - e. There may be reddening of the nasopharynx without exudate.
 - f. Nausea and vomiting are possible--especially in children.
 - g. Weakness, sweating, and fatigue may persist for several days or occasionally for weeks.
 - h. In severe cases, hemorrhagic bronchitis and pneumonia can develop within hours. The illness may progress from dyspnea with cyanosis and hemoptysis to pulmonary edema and death as soon as 48 hours after onset. This is most likely to occur during a pandemic caused by a new strain or with persons who have other predisposing factors.
2. Lab tests are most beneficial in ruling out bacterial infection. White blood cell (WBC) count with differential and sputum cultures will usually identify a causative bacterial agent. Specific serologic tests are available to identify the exact strain of influenza virus responsible for the disease. However, serologic tests are used mostly for statistical purposes in tracking the epidemic.
3. Differentiate between influenza and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Viral URI will usually not present with high fever and severe constitutional symptoms.
 - b. Hemolytic Streptococcus will produce exudate over the tonsils and pharyngeal wall.
 - c. Mononucleosis or coxsackievirus will produce petechiae or ulcers on the palate.
4. Vaccines are produced each year on the basis of global studies of the predominant viral strains. They should be given to all soldiers each year in the fall when they become available.
5. Management for most patients is symptomatic and includes bed rest for 24 to 48 hours, antipyretics/analgesics (do not give aspirin to children because of the risk of Reye's syndrome), decongestants, and steam inhalation to relieve respiratory symptoms and prevent drying of secretions. Some specific drugs have been shown to be beneficial in certain cases.
 - a. Amantadine has a beneficial effect on fever and respiratory symptoms if given early in uncomplicated influenza A but not in influenza B. It is generally only used in debilitated patients or those with other simultaneous complicating factors.
 - b. Ribavirin administered by small particle aerosol or in large oral doses can shorten the duration of fever and reduce virus shedding in either A or B infection and may favorably reverse the course of primary influenzal pneumonia. Again, it is generally only indicated in special patients.

NOTE: Anti-influenzal chemotherapy should be reserved for patients at the extremes of age, the immunocompromised, or those with other factors that might predispose them to complications. If used, they should be started early in the course of the disease.

Performance Steps

6. Treat complications symptomatically with appropriate supportive care.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage influenza.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified influenza on the basis of the patient's signs and symptoms.	—	—
2. Performed lab tests.	—	—
3. Differentiated between influenza and other diseases with similar signs and symptoms.	—	—
4. Administered vaccines.	—	—
5. Managed influenza symptomatically.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Subject Area 12: Gastrointestinal Conditions

Manage Shigellosis**081-833-4021**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for shigellosis.
 - a. The disease is spread by the fecal-oral route or by flies and occurs most frequently in overcrowded populations in endemic areas. It is particularly common in young children. Adults usually have less severe cases.
 - b. Symptoms are anorexia, nausea, abdominal pain, and urgency to defecate. Children will be irritable and drowsy.
3. Perform a physical examination.
4. Recognize significant objective findings for shigellosis.
 - a. Fever (may be absent in adults), vomiting, diarrhea, and abdominal distention.
 - b. Patients will pass formed stools initially and will gradually progress to marked diarrhea, increasing in frequency and severity. The diarrhea will become mucopurulent and possibly bloody.

NOTE: *Shigella dysenteriae* infection may present with delirium, convulsions, and coma but little or no diarrhea. It may be fatal in 12 to 24 hours.

5. Perform labs with the Special Forces (SF) lab set.
 6. Recognize significant lab findings that are caused by shigellosis.
 - a. White blood cells (WBCs) may be reduced at onset; however, during the course of the disease it will average 13,000
 - b. Smears stained with Wright's stain reveal sheets of leukocytes that distinguish bacillary from amebic dysentery. (Amebas destroy the leukocytes.)
 7. Order lab tests that cannot be performed with the SF lab set (if available).
 8. Recognize significant higher level lab results that are caused by shigellosis.
 - a. Positive culture for shigella ensures the diagnosis.
 - b. Plasma carbon dioxide (CO₂) is usually low, reflecting the diarrhea-induced metabolic acidosis.
 9. Differentiate between shigellosis and other diseases with similar signs and symptoms. (Consider the following diseases.)
- NOTE: Diagnosis is facilitated by a high index of suspicion during outbreaks and in endemic areas.
- a. Invasive *Escherichia coli* (*E. coli*), salmonella, yersinia, and campylobacter.
 - b. Amebiasis.
 - c. Viral diarrheas.
10. Use good sanitation to prevent the spread of shigellosis by contaminated food, water, and flies. Stool isolation should be used with patients and carriers.

Performance Steps

11. Manage shigellosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Fluid therapy to correct isotonic dehydration with metabolic acidosis is the first priority.
 - b. The decision to use antibiotics requires consideration of several factors, including severity of disease, age of the patient, adequacy of sanitation, likelihood of further transmission, and possibility of engendering antibiotic-resistant organisms.
 - (1) Drug of choice (DOC) is cipro 500 milligrams (mg) by mouth (PO) every 12 hours (q12h) for (x) 3 doses.
 - (2) Alternate drug is septra double strength (DS) twice daily (b.i.d.) PO x 3 days or azithromycin 500 mg PO x 1 then 250 mg PO every day (q.d). x 4 days.
12. Treat complications symptomatically with appropriate supportive care.
13. Record all treatment in the patient's medical record.
14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage shigellosis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Recognized significant history and symptoms that cause or are caused by shigella.	_____	_____
3. Performed a physical examination.	_____	_____
4. Recognized significant physical findings (signs) that are caused by shigella.	_____	_____
5. Performed labs with the SF lab set.	_____	_____
6. Recognized significant lab findings that are caused by shigella.	_____	_____
7. Ordered lab tests that cannot be performed with the SF lab set (If available).	_____	_____
8. Recognized significant lab results that are caused by shigella.	_____	_____
9. Differentiated between shigella and other diseases with similar signs and symptoms.	_____	_____
10. Managed shigella on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
11. Treat complications symptomatically with appropriate supportive care.	_____	_____
12. Recorded all treatment in the patient's medical record.	_____	_____
13. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

BATES PE, 8TH ED. 2002

Assess Diseases of the Gastrointestinal Tract

081-833-4082

Conditions: As a special operations medic in a field environment and given the M-5 medical equipment set and patient's medical record.

Standards: Assess diseases of the gastrointestinal (GI) tract so that the underlying cause of the disease is discovered.

Performance Steps

1. Solicit a patient history.
 - a. Sequence of events since onset of current complaint.
 - b. Events immediately preceding complaint (let patient relate in own words, and ask questions from pertinent portions of the review of systems [ROS]).
 - (1) Trauma to GI tract.
 - (2) Change in physical activity.
 - (3) History of alcohol consumption.
 - (4) Last meal (possibly food poisoning).
 - (5) Emotional status.
 - (6) Timing of last meal to onset and/or relief of symptoms (ulcer, infections, and GI disturbances and obstructions).
 - (7) Timing of onset of pain to nausea and vomiting (N&V) (possibly appendix or obstruction).
 - (8) Any associated symptoms listed below (relation to fever, chills, and past history).
 - c. Characterization of pain.
 - (1) Location of pain and of referred pain (radiating or boring from one region to another region).
 - (2) Quality of pain.
 - (a) Colic, comes and goes.
 - (b) Burning, as with excessive acid.
 - (c) Sharp or dull.
 - (3) Severity of pain.
 - (a) Awakens patient from a sound sleep.
 - (b) Worse or occurs when lying down (consider gastroesophageal reflux [GER]).
 - (4) Duration of pain.
 - (a) Since onset.
 - (b) Sudden onset or gradual.
 - (c) Constant or intermittent.
 - d. Aggravating or relieving factors.
 - (1) Medications, antacids, or aspirin.
 - (2) Effect of meals or alcohol.
 - (a) Ulcers (pain about 2 hours after meals). Worse with smoking and/or fasting.
 - (b) Anorexia (with many conditions).
 - (c) Changes of pain with position, movement, or respirations.
 - e. Nature of stools.
 - (1) Color of stools.
 - (a) Dark, tarry stools (any cause of upper GI bleeding such as esophagitis or gastritis and blood-clotting disorders related to liver diseases, hemophilia, and nutritional deficiencies).
 - (b) Bright red blood (intestinal bleeding such as enteritis, diverticulitis, infectious GI diseases, parasitic infestation, cancer, and colon or rectal pathology such as anal fissures, proctitis, and hemorrhoids).
 - (2) Consistency of stools.

Performance Steps

- (a) Loose stools (many causes; for example, functional bowel syndrome, allergies, infections, malnutrition, parasites, toxins, and past obstructions). (No gas passed for 24 to 48 hours might mean bowel obstruction.)
 - (b) Hard stools (usually caused by dehydration or hypothyroidism).
 - (c) Undigested food may be caused by inadequate presence of enzymes, obstruction, or malnutrition.
 - (d) Presence of ova or parasites.
 - f. Associated symptoms.
 - (1) Fever and chills (viral gastroenteritis).
 - (2) Nausea and vomiting (infection).
 - (3) Jaundice (malaria, gallbladder disease, and common bile duct obstruction).
 - g. Past history.
 - (1) Peptic ulcer disease.
 - (2) GER.
 - h. Concurrent medical problems or medications:
 - (1) Diabetes.
 - (2) Malaria.
 - (3) Sickle cell anemia.
 - (4) Exposure to hepatitis.
 - (5) Narcotic abuse.
 - (6) Alcohol abuse.
 - (7) Smoking.
 - (8) Hypertension (HTN).
 - (9) Coronary artery disease (CAD).
2. Perform a differential assessment by location of GI tract pain.
- a. Epigastric pain.
 - (1) Esophagitis (worse when lying down with reflux of stomach contents into esophagus and relieved by antacids).
 - (2) Peptic ulcer (gastric or duodenal).
 - b. Right upper quadrant (RUQ) pain.
 - (1) Gallbladder disease.
 - (2) Retrocecal appendicitis.
 - c. Right lower quadrant (RLQ) pain.
 - (1) Appendicitis.
 - (2) Diverticulitis (especially in eastern cultures).
 - (3) Mesenteric adenitis (inflammation of the lymph nodes in mesentery of bowel).
 - d. Left lower quadrant (LLQ) pain.
 - (1) Proctitis (may see white blood cells [WBCs], mucous, and bright red blood in stools on rectal exam).
 - (2) Diverticulitis (especially in western cultures).
3. Perform a physical examination (task 081-833-4002, Perform a Complete Physical Examination).
- a. Examine chest and diaphragmatic excursion to look for pathology in thorax that can mimic abdominal pathology.
 - b. Inspect for the following:
 - (1) Contour of abdomen:
 - (a) Scaphoid.
 - (b) Flat.
 - (c) Distended (may have too much fluid [ascites] or too much intestinal air as in bowel obstruction).
 - (2) Isolated bulges may indicate the presence of herniations of bowel through the abdominal wall.
 - c. Listen for presence of bowel sounds (auscultation).
 - (1) Hyperactive with rushes (partial obstruction or just diarrhea).

Performance Steps

- (2) Absent of sound (ileus may be caused by pus, bile, gastric contents, and so on. This is a sign of peritonitis).
- d. Palpate the abdomen.
 - (1) Effect of voluntary tightening, ascending with direct palpation.
 - (2) Have patient point to quadrant where pain is located, and examine other quadrants first.
 - (3) Feel for abdominal wall guarding (localized tenderness might mean peritonitis).
 - (4) Feel for rebound tenderness (sign of peritonitis). Over McBurney's point, rebound tenderness is a sign of appendicitis.
4. Perform a rectal examination.
5. Perform a pelvic examination (if female) (task 081-833-4310, Perform a Pelvic Exam).
6. Perform or request appropriate lab examinations.
 - a. Always perform a complete blood count (CBC) with differential, complete urinalysis (UA), stool guaiac, stool ova, and parasite.
 - b. If available, perform abdominal X ray series of flat, upright, chest X ray, serum electrolytes, bilirubin, serum amylase, and liver enzymes.
7. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must assess diseases of the GI tract.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	—	—
2. Performed a differential assessment by location of GI tract pain.	—	—
3. Performed a physical examination.	—	—
4. Performed a rectal examination.	—	—
5. Performed a pelvic examination (if female).	—	—
6. Performed or requested appropriate lab examinations.	—	—
7. Recorded all findings in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

BATES PE, 8TH ED. 2002
 MERCK MANUAL 17TH ED
 SANFORD, 1999

Manage Gastroesophageal Reflux

081-833-4083

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition and causes of gastroesophageal reflux (GER).
 - a. GER is defined as reflux of the gastric contents into the esophagus.
 - b. GER is caused by acidification of the esophagus as a result of temporary or permanent incompetence of the esophageal sphincter. The condition may or may not be associated with a sliding hiatus hernia.
2. Solicit a patient history.
3. Recognize significant subjective findings for GER.
 - a. Heartburn described as a substernal burning pain that rises in the chest and radiates into the neck, throat, or even face is the most common symptom of GER.
 - b. Heartburn occurs after meals.
 - c. Heartburn occurs when the patient is lying down.
 - d. Heartburn may be accompanied by regurgitation of gastric contents into the mouth and subsequent hypersalivation. Patient may complain of regurgitating "bile" or bad taste in the mouth.
4. Perform a PE. The PE of a patient with uncomplicated GER will be unremarkable.
5. Recognize significant lab results that are caused by GER.
 - a. Barium swallow with X ray taken in the Trendelenburg position may show reflux of barium into the esophagus.
 - b. Endoscopy is essential to rule out possible complications.
 - c. Esophageal biopsy with findings of a thinning of the squamous mucosal layer and basilar cell hyperplasia is an accurate indicator of GER.
6. Manage GER.
 - a. Elevate the head of the bed 6 inches.
 - b. Avoid strong stimulants of acid secretion such as coffee and alcohol.
 - c. Avoid certain drugs such as anticholinergics, specific foods such as fats and chocolate, and smoking. All of these reduce lower esophageal sphincter competence.
 - d. Consider using cholinergic agonists such as bethanechol, 25 milligrams (mg) by mouth (PO) three times a day (t.i.d.) or metoclopramide 10 mg PO before meals and at bedtime to increase sphincter pressure.
 - e. Give hydrogen (H₂) antagonists such as cimetidine, and so on to reduce gastric acidity.
 - f. The hydrogen-potassium adenosine triphosphatase (ATPase) inhibitor omeprazole (20 milligrams per day [mg/day] for 4 to 8 weeks) is the most effective agent for rapid healing of peptic esophagitis.
 - g. Refer to gastroenterology if problems persist after conservative management measures.
7. Treat complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage heartburn.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and causes of GER.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for GER.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant lab results that are caused by GER.	_____	_____
6. Managed GER.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage (Non-Surgically) Gastritis**081-833-4084**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition, etiology, and pathophysiology of gastritis.
 - a. Gastritis is defined as inflammation of the gastric mucosa, based on endoscopic appearance, histologic findings, radiography, or clinical presentation.
 - b. Gastritis can be broken down into erosive and nonerosive gastritis.
 - (1) Erosive gastritis can be either of the following:
 - (a) Acute stress gastritis, which is a superficial mucosal lesion of the stomach that occurs rapidly in relation to a variety of stresses. This condition is the most serious. It occurs typically in the setting of acute, severe trauma or illness (often in the intensive care unit [ICU]).
 - (b) Chronic erosive gastritis, defined as the presence of multiple punctate or aphthous stomach ulcers. This occurs as a result of drugs (especially nonsteroidal anti-inflammatory drugs [NSAIDs]), Crohn's disease, or viral infection.
 - (2) Nonerosive gastritis is a general category of idiopathic gastritis including several manifestations based largely on histologic findings. These can be caused by the following:
 - (a) Inflammation, either superficial or deep. This is caused by infection with *Helicobacter pylori*.
 - (b) Atrophy and metaplasia, which tend to occur together. As atrophy of the secretory mucosa progresses, metaplasia of fundic mucosa to antral type is common.
2. Solicit a patient history.
3. Recognize significant subjective findings for gastritis.
 - a. Patients with acute stress gastritis will often have a history of the following:
 - (1) Extensive trauma, especially with added shock, anoxia, sepsis, or organ failure.
 - (2) Burns. (The likelihood of gastritis increases with the severity of the burn.)
 - (3) Head injury.
 - (4) Hemorrhage. (The likelihood of gastritis increases with the severity of the hemorrhage.)
 - b. Patients with chronic erosive gastritis will often have a history of the following:
 - (1) Long-term use of aspirin or other NSAIDs.
 - (2) Crohn's disease.
 - c. Patients with nonerosive gastritis will often present with nonspecific symptoms and history.
4. Perform a PE.
5. Recognize significant objective findings for gastritis.
 - a. Acute stress gastritis will present with the following:
 - (1) The first obvious sign may be blood in the nasogastric aspirate.
 - (2) Other specific physical findings may be caused by the underlying stress.
 - (3) Definitive diagnosis is made endoscopically.
 - b. Chronic erosive gastritis will present with the following:
 - (1) Mild nausea.
 - (2) Epigastric discomfort. (Both may be absent in chronic aspirin users.)
 - (3) Definitive diagnosis is based on endoscopic findings.

Performance Steps

- c. Nonerosive gastritis will not present with any identifiable complex of signs and symptoms. Its diagnosis is based on histologic studies or by enzyme-linked immunosorbent assay (ELISA) studies for specific antibodies of *Helicobacter pylori*.

6. Manage gastritis nonsurgically.

- a. Management of acute stress gastritis may include the following:

- (1) Intravenous (IV) cimetidine or other H₂ blockers.
- (2) Antacids.
- (3) Ice water lavage.
- (4) Prevention of hypovolemia with sufficient fluid or blood replacement; however, transfusion of many units of blood may further impair hemostasis.
- (5) Evacuation of the patient to a surgical unit for definitive management as soon as possible.

NOTE: Once torrential bleeding occurs (about 2 percent of ICU patients), the reported mortality is greater than 60 percent even with surgical intervention. This fact enhances the urgency with which all major trauma patients should be evacuated to definitive care.

- b. Management of chronic erosive gastritis may include the following:

- (1) Avoidance of potentially etiologic drugs, (especially NSAIDs) and foods (especially those with a high acid content).
- (2) Symptomatic management with antacids and/or H₂ blockers.

- c. Manage nonerosive gastritis according to the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

- (1) Bismuth subsalicylate 2 tablets four times a day (q.i.d.) with meals and at bedtime (h.s.) PLUS metronidazol 250 mg q.i.d. with meals and h.s. PLUS tetracycline 500 mg q.i.d. before meals and h.s. PLUS omeprazole 20 mg twice daily (b.i.d.) before meals all for 1 week has a 96 percent cure rate.
- (2) Alternatively, bismuth subsalicylate, metronidazol, and tetracycline in the above doses for 1 week have an 86 to 90 percent cure rate.

7. Treat complications symptomatically with appropriate supportive care.

NOTE: Acute alcoholic gastritis is a separate condition and its symptomology and management are listed below.

8. Solicit a patient history.

9. Recognize significant subjective findings for alcoholic gastritis.

- a. Pain preceded by binge drinking.
- b. Pain is present after cessation of drinking.
- c. Moderate intensity, constantly burning, epigastric pain lasting several hours
- d. Relieved with antacids.
- e. May be associated with loose stools.
- f. Occasionally associated with nausea and vomiting shortly after consumption.
- g. Often have history of recurrent episodes.
- h. Might result in hematemesis.

10. Perform a PE.

11. Recognize significant objective findings for alcoholic gastritis.

- a. Essentially nonspecific.
- b. Palpate for epigastric tenderness.
- c. Stools usually normal color but may see melena. An upper gastrointestinal (GI) bleed of as little as 50 milliliters (ml) will produce this sign. Do a guaiac to test for occult blood.
- d. Look for signs of chronic alcoholism.
 - (1) Spider angiomas.
 - (2) Large liver.
 - (3) Large spleen.
 - (4) Tremors.

Performance Steps

- (5) Hyperactive reflexes.
 - (6) Ascites.
 - (7) Hypoalbuminemia (determine through urinalysis).
12. Manage alcoholic gastritis.
 - a. Supportive care includes hydration, either oral or IV.
 - b. Antacids 30 cubic centimeters (cc) every 4 hours (q4h) if burning pain is severe.
 - c. Referral to counseling at the appropriate "track" level. (Probably level II or III depending on whether the patient is physically dependant on alcohol or not.)
 13. Record all treatment in the patient's medical record.
 14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage gastritis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition, etiology, and pathophysiology of gastritis.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for gastritis.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for gastritis.	_____	_____
6. Managed gastritis nonsurgically.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recognized significant subjective findings for alcoholic gastritis.	_____	_____
9. Recognized significant objective findings for alcoholic gastritis.	_____	_____
10. Managed alcoholic gastritis.	_____	_____
11. Recorded all treatment in the patient's medical record.	_____	_____
12. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage (Non-Surgically) Peptic Ulcer

081-833-4086

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for peptic ulcer.
 - a. Pain is usually the chief complaint. The pain will be described as burning or gnawing. The pain will usually be steady and mild to moderately severe, located in a well circumscribed area, almost always epigastric, and generally relieved by antacids or milk. In patients with duodenal ulcers, the pain pattern tends to be consistent. The pain is absent upon awakening, occurs in mid-morning, and is relieved by food. It recurs 2 to 3 hours after a meal. In patients with gastric ulcers, eating may cause rather than relieve pain.
 - b. The pain episodes may resolve and then recur after several years.
 - c. The patient may have a history of nonsteroidal anti-inflammatory drug (NSAID) use to treat rheumatoid arthritis (RA) or for other conditions. In these patients, discontinuation of the NSAIDs or switching to another, milder NSAID may effect a cure.
 - d. In patients without a history of NSAID use, the causative agent is most often *Helicobacter pylori*.
3. Perform a PE. (With peptic ulcers, the PE will be unremarkable.)
4. Perform labs with the Special Forces (SF) lab set. (With peptic ulcer, lab findings will be unremarkable).
5. Order lab tests that cannot be performed with the SF lab set (if available).
6. Recognize significant lab results that are caused by peptic ulcer.
 - a. Endoscopy can usually establish the diagnosis.
 - b. X ray studies with barium may aid in the diagnosis if endoscopy is inconclusive.
7. Differentiate between peptic ulcer and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Gastric cancer may present with similar signs and symptoms.
 - b. Esophageal ulcer will present with epigastric pain that tends to occur when the patient swallows or lies down.
8. Manage peptic ulcer by using the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Bismuth subsalicylate 2 tablets four times a day (q.i.d.) with meals and at bedtime (h.s.) PLUS metronidazol 250 milligrams (mg) q.i.d. with meals and h.s. PLUS tetracycline 500 mg q.i.d. before meals and h.s. PLUS omeprazole 20 mg twice daily (b.i.d.) before meals all for 1 week. (This regimen has a 96 percent cure rate.)
 - b. Alternatively, bismuth subsalicylate, metronidazol, and tetracycline in the above doses for 1 week have an 86 to 90 percent cure rate.
9. Treat complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.

Performance Steps

11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage peptic ulcer.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Recognized significant subjective findings for peptic ulcer.	_____	_____
3. Performed a PE.	_____	_____
4. Performed labs with the SF lab set.	_____	_____
5. Ordered lab tests that could not be performed with the SF lab set (if available).	_____	_____
6. Recognized significant lab results that were caused by peptic ulcer.	_____	_____
7. Differentiated between peptic ulcer and other diseases with similar signs and symptoms.	_____	_____
8. Managed peptic ulcer by using the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
9. Treated complications symptomatically with appropriate supportive care.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Treat Constipation

081-833-4087

Conditions: Given the M-5 medical kit, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the condition, and administer supportive and pharmacological care in accordance with The Merck Manual.

Performance Steps

1. Understand the possible causes of constipation.
 - a. Acute constipation represents a definite change for that individual, suggesting an organic cause. In patients complaining of constipation for only hours or days, mechanical bowel obstruction must be considered. A second organic cause is adynamic ileus.
 - b. Constipation can be a side effect of drugs.
 - c. Common functional causes of chronic constipation are those that hamper normal bowel movement because the storage, transport, and evacuation mechanism of the colon are deranged by systemic disorders or, more often, by neurologic disorders.
 - d. Psychogenic constipation results from the BELIEF of the patient that insufficient defecation has occurred. This may lead the patient to abuse laxatives, ultimately leading to a real disease state.
2. Solicit a patient history.
3. Recognize significant subjective findings for constipation.
 - a. Patients will complain of difficult or infrequent passage of feces.
 - b. They may also refer to hardness of stool or a feeling of incomplete evacuation.
4. Perform a PE. (The PE will be unremarkable or related to the physiologic cause of the constipation.)
5. Manage constipation.
 - a. First, discover and manage the underlying cause.
 - b. Symptomatic treatment should include dietary changes to increase the intake of dietary fiber to ensure adequate stool bulk.
 - c. Bulking agents are the only laxatives acceptable for long-term use. Proper use involves gradually increasing the dose until satisfactory results are achieved. These are best taken three times a day or four times a day with sufficient liquid.
 - d. Laxatives and cathartics should be used carefully. They may interfere with absorption of various drugs by binding them chemically or physically.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage constipation.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the possible causes of constipation.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for constipation.	—	—
4. Performed a PE.	—	—
5. Managed constipation.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED	

Manage (Non-Surgically) Bowel Obstruction

081-833-4088

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the causes of bowel obstruction.
 - a. Herniations.
 - b. Volvulus (twisting of bowel).
 - c. Intussusception (bowel moving into itself).
 - d. Neoplasm.
 - e. Adhesion.
 - f. Fecal impaction.
2. Solicit a patient history.
3. Recognize significant subjective findings for bowel obstruction.
 - a. Pain precedes vomiting.
 - b. Colicky pain occurs early; constant pain occurs later.
 - c. Abdominal cramps are centered about the umbilicus or in the epigastrium. If pain starting with cramps becomes severe and steady, strangulation probably has occurred.

NOTE: Strangling obstruction occurs in nearly 25 percent of cases of small bowel obstruction and can progress to gangrene in as little as 6 hours.

4. Perform a PE.
5. Recognize significant objective findings for bowel obstruction.
 - a. Vomiting appears early in small bowel obstruction and later with large bowel.
 - b. Obstipation occurs with complete obstruction, but there may be diarrhea if it is partial.
 - c. Abdominal scars from previous surgeries might lead to the suspicion of adhesions.
 - d. Palpation of protrusions through the abdominal wall should lead to suspicion of herniation.
 - e. Without strangulation, the abdomen is not tender.
 - f. With strangulation, distention increases and the abdomen becomes tender.
 - g. Hyperactive, high-pitched rushes that coincide with cramps is common with small bowel obstruction. However, with strangulation, there will be minimal peristalsis or a "silent abdomen."
6. Recognize significant lab findings for bowel obstruction.
 - a. Abdominal X rays, both supine and upright, should be taken.
 - (1) A ladder-like series of small bowel loops is typical of small bowel obstruction.
 - (2) Obstruction of the large bowel by cancerous growth or diverticulitis will show distention of the colon proximal to the obstruction.
 - b. A barium enema may be required to rule out colonic lesions.
 - c. Strangulation can be diagnosed for certain only by laparotomy.

7. Manage bowel obstruction with appropriate supportive care until the patient can be evacuated.
Supportive care includes the following:

NOTE: Every patient with possible bowel obstruction must be evacuated and referred for hospitalization and possible surgery.

- a. Nothing by mouth.

Performance Steps

- b. Nasogastric tube with suction.
 - c. Intravenous Ringer's lactate titrated to urine output.
 - d. Indwelling urinary catheter and monitoring of urine output.
8. Recorded all treatment in the patient's medical record.
9. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage bowel obstruction.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of bowel obstruction.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for bowel obstruction.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for bowel obstruction.	_____	_____
6. Recognized significant lab findings for bowel obstruction.	_____	_____
7. Managed bowel obstruction.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
MERCK MANUAL 17TH ED SANFORD, 1999	

Manage Diarrheal Conditions

081-833-4089

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the causes of diarrhea.
 - a. Osmotic diarrhea occurs when nonabsorbable, water-soluble solutes remain in the bowel where they retain water.
 - b. Secretory diarrhea occurs when the large and small intestines secrete rather than absorb water.
 - c. Malabsorption may produce diarrhea as a result of either of the above causes.
 - d. Exudative diarrhea may be caused by mucosal diseases that cause mucosal inflammation, ulceration, or tumefaction resulting in an outpouring of plasma, serum proteins, blood and mucus, thus increasing fecal bulk and fluidity.
2. Solicit a patient history.
3. Recognize significant subjective findings for diarrhea.
 - a. Consumption of certain foods can result in diarrhea. Some examples are as follows:
 - (1) Lactose in lactose-intolerant individuals.
 - (2) Fructose in quantities surpassing the absorptive capacity of the gut.
 - (3) Sucrose in individuals with sucrase deficiency.
 - (4) Sorbitol, hexitols, and mannitol, which are used as artificial sweeteners in many products.
 - (5) Magnesium-containing antacids.
 - (6) Caffeine.
 - b. History of rapid onset of diarrhea with fever or nausea and vomiting would lead to a suspicion of secretory diarrhea due to bacterial toxins or enteropathogenic viruses.
4. Perform a PE. (Objective findings for diarrhea will be based on the pathophysiology of the underlying cause.)
5. Perform or request lab studies.
6. Recognize significant lab findings that could lead to a determination of the cause of diarrhea.
 - a. Macroscopic examination of feces for fluidity, volume, the presence of blood, pus, mucus, or excess fat should be noted.
 - (1) In diseases of the small bowel, stools are voluminous, watery, or fatty.
 - (2) In colonic disease, stools are frequent, sometimes small in volume, and possibly accompanied by blood, pus, mucus, and abdominal discomfort.
 - b. Microscopic examination may confirm the presence of the following:
 - (1) White blood cells (WBCs), which are indicative of ulceration or bacterial invasion.
 - (2) Parasitic infestation such as amebiasis, giardiasis, or worms.
7. Manage diarrhea.
 - a. The first step is to find and manage the underlying cause. (See the other tasks in the category of gastrointestinal diseases.)
 - b. Symptomatic management includes the following:
 - (1) Correcting fluid loss and potential electrolyte imbalances with oral rehydration solutions (ORSs), if tolerated, or parenterally, if necessary.

Performance Steps

NOTE: If prepared oral rehydration solution is not available, it can be made by combining in 1 liter of water the following: 1 teaspoon (tsp) table salt, 1 tsp baking soda, 4 tsp table sugar, and flavoring, if available.

- (2) Bulking agents in small doses or kaolin-pectin solutions can reduce the fluidity of stools.
- (3) Immodium or loperamide should only be given if the fluid loss is so great that the fluid demand cannot be met by parenteral means or if mission considerations force their use.

- 8. Record all treatment in the patient's medical record.
- 9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage diarrhea.

Performance Measures	GO	NO GO
1. Understood the causes of diarrhea.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for diarrhea.	_____	_____
4. Performed a PE.	_____	_____
5. Performed labs with the SF lab set.	_____	_____
6. Recognized significant lab findings that could lead to a determination of the cause of diarrhea.	_____	_____
7. Managed diarrhea.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	
Required	Related
MERCK MANUAL 17TH ED	
SANFORD, 1999	

Manage Gastrointestinal Tract Conditions

081-833-4091

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the etiology and pathophysiology of irritable bowel syndrome (IBS).
 - a. No anatomic cause can be found. Emotional factors, diet, drugs, or hormones may precipitate or aggravate a heightened sensitivity to gastrointestinal (GI) motility.
 - b. The circular and longitudinal muscles of the small bowel and sigmoid colon are particularly susceptible to motor abnormalities. The proximal small bowel appears to be hyperreactive to ingestion of food and parasympathomimetic drugs.
 - c. IBS may manifest as either the "spastic colon" type or the "painless diarrhea" type.
2. Solicit a patient history.
3. Recognize significant subjective findings for IBS.
 - a. Spastic colon patients will exhibit the following:
 - (1) Variable degrees of abdominal pain over one or more areas of the colon. The pain is either colicky or a continuous dull ache. The pain may be relieved by bowel movement.
 - (2) Constipation or diarrhea.
 - (3) Postprandial distention, flatulence, nausea, headache (HA), fatigue, and depression are also common complaints.
 - b. Painless diarrhea patients will exhibit the following:
 - (1) Urgent precipitous diarrhea that occurs on arising or during or immediately after a meal.
 - (2) Incontinence may also occur.
 - c. With both types of the syndrome, symptoms occur during waking hours and are usually triggered by stress or ingestion of food.
 - d. The syndrome is responsible for about half of all initial GI complaints, and women are three times more likely than men to experience it.
4. Perform a PE.
 - a. Patients with IBS will usually appear healthy.
 - b. Palpation of the abdomen may reveal tenderness, particularly left lower quadrant (LLQ).
5. Perform labs to rule out other physiologic or pathologic causes of the symptoms.
6. Differentiate between IBS and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Lactose intolerance.
 - b. Diverticular disease.
 - c. Duodenal ulcer (with antacid therapy).
 - d. Biliary tract disease.
7. Manage IBS.
 - a. Dietary changes to include elimination of beans, cabbage, and other foods containing fermentable carbohydrates. Attempts to determine food allergies may also be beneficial.
 - b. With spastic colon, a bland bulk-producing agent may prove beneficial.

Performance Steps

- c. Anticholinergics alone or in combination with mild tranquilizers or sedatives may be used in combination with mild bulk-producing agents. They should be used only as a temporary expedient to relieve spastic pain.
- d. Above all, a careful explanation of the condition and demonstration that no underlying disease exists will calm patient fears and hopefully lead to resolution of the problem.

NOTE: Excess gas is a common complaint of patients with abdominal distress.

8. Understand the pathophysiology of excess gas.
 - a. Excess gas can be produced by aerophagia, or subconscious swallowing of air.
 - b. Excess gas can also be produced by bacterial metabolism of ingested fermentable material.
9. Manage excess gas.
 - a. Try to control aerophagia.
 - (1) Aerophagia may be a side effect of stress, and controlling stress can reduce aerophagia.
 - (2) Try to change the patient's habits that cause swallowing air. Excessive gum chewing produces excess salivation, which can lead to swallowing excess air. Clamping a pencil or other object between the teeth may decrease the amount of habit swallowing and eventually break the habit cycle.
 - b. Recommend dietary changes that may cause gas.
 - (1) Avoid foods such as beans and cabbage that contain large amounts of nonabsorbable carbohydrates.
 - (2) Eliminate products containing milk if lactose intolerance is suspected.
 - c. Use simethicone and other drugs, which are of variable benefit, in the treatment of excess gas.
 - d. Reassure the patient that gas is a normal byproduct of digestion.
10. Manage nonbacterial food poisoning.
 - a. Mushroom poisoning should be managed by the following:
 - (1) Immediately inducing vomiting.
 - (2) Try to identify the mushroom species.
 - (3) Give atropine, which acts as an antagonist of parasympathetic over stimulation due to muscarine poisoning.
 - (4) Support pulse and blood pressure (BP), as needed.
 - (5) Evacuate to a hospital.
 - b. Ergotism from eating contaminated rye bread or rye grain should be managed by the following:
 - (1) Administering an anticonvulsant, as necessary.
 - (2) Control arterial spasm with amyl nitrate, 0.3 milliliters (ml) by inhalation or nitroglycerine, 0.4 milligrams (mg) sublingually.
 - (3) Give activated charcoal by mouth (PO).
 - (4) Induce vomiting, or perform gastric lavage.
 - (5) Support pulse and BP, as needed.
 - (6) Evacuate to a hospital.
11. Recognize signs and symptoms that indicate the presence of a foreign body in the rectum.
 - a. Sudden excruciating pain during defecation should arouse suspicion of foreign body usually lodged at the anorectal junction.
 - b. The foreign body may have arrived through the digestive tract after being swallowed or after having been inserted into the rectum.
12. Manage a foreign body in the rectum.
 - a. If the object can be palpated, give local anesthesia by means of subcutaneous and submucosal injections of 0.5 percent lidocaine or bupivacaine containing hyaluronidase 150 units per 15 ml. Dilate the anus with a rectal retractor and grasp, deflect, and remove the foreign body.
 - b. If the object cannot be palpated, evacuate the patient for hospitalization and surgery.
13. Understand the etiology and pathophysiology of hiatus hernia.
 - a. Hiatus hernia is a protrusion of the stomach above the diaphragm.
 - b. The hernia may be sliding or paraesophageal.

Performance Steps

- (1) Sliding hernia: The gastroesophageal junction and a portion of the stomach are above the diaphragm and one side of the stomach is covered by peritoneum.
 - (2) Paraesophageal hernia: The gastroesophageal junction is in the normal location, but a portion of the stomach is adjacent to the esophagus.
14. Recognize the signs and symptoms of hiatus hernia.
- a. The patient may complain of heartburn or other symptoms of gastroesophageal reflux (GER).
 - b. Chest pain without GER may also occur.
 - c. Occult or massive GI hemorrhage may occur with either type of hiatus hernia.
 - d. X ray examination will usually show hiatus hernia.
15. Manage hiatus hernia.
- a. Sliding hiatus hernia requires no specific treatment. However, if symptoms of GER exist, they should be managed as noted in task 081-833-4083, Manage Gastroesophageal Reflux.
 - b. Paraesophageal hiatus hernia should be referred for surgery because of the risk of strangulation.
- NOTE: Occult or massive GI hemorrhage may occur with either type of hiatus hernia.
16. Understand the etiology and pathophysiology of antibiotic-associated colitis (pseudomembranous colitis).
- a. An acute inflammatory bowel disorder associated with antibiotic use that encompasses a spectrum from transient mild diarrhea to a severe colitis marked by exudative mucosal plaques.
 - b. Various antibiotics may alter the balance of normal gut flora and allow overgrowth of certain pathogens. Clostridium difficile (C. difficile) is the most frequently recognized. This organism produces two toxins that can damage the colonic mucosa.
17. Recognize the signs and symptoms of pseudomembranous colitis.
- a. Symptoms usually begin during the course of therapy but may appear 1 to 10 days after treatment has ceased.
 - b. Symptoms range from loose stools to active colitis with bloody diarrhea, abdominal pain, fever, leukocytosis, and protein-losing enteropathy.
 - c. In severe cases, dehydration, hypotension, toxic megacolon, and colonic perforation may supervene.
18. Manage antibiotic-associated pseudomembranous colitis.
- a. If significant diarrhea occurs during antibiotic administration, stop the antibiotic immediately, unless its use is absolutely essential.
 - b. Antiperistaltic drugs should be avoided as they may prolong contact time of the colonic mucosa with the offending agent.
 - c. If mild symptoms persist, the anion exchange agent cholestyramine, 4 grams (g) PO three times a day (t.i.d.) for 10 days may be effective in binding C. difficile toxin and removing it from the body.
 - d. In most cases of frank antibiotic-associated colitis, metronidazole 250 mg PO four times a day (q.i.d.) for 7 to 10 days is the drug of choice against C. difficile. C. difficile is the most common infective agent.
19. Treat complications symptomatically with appropriate supportive care.
20. Record all treatment in the patient's medical record.
21. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a GI disorder.

Performance Measures

1. Understood the etiology and pathophysiology of IBS.

GO **NO GO**

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for IBS.	—	—
4. Performed a PE.	—	—
5. Performed labs to rule out other physiologic and pathologic causes of the symptoms.	—	—
6. Differentiated between IBS and other diseases with similar signs and symptoms.	—	—
7. Managed IBS.	—	—
8. Understood the pathophysiology of excess gas.	—	—
9. Managed excess gas.	—	—
10. Managed nonbacterial food poisoning.	—	—
11. Recognized signs and symptoms that indicate the presence of a foreign body in the rectum.	—	—
12. Managed a foreign body in the rectum.	—	—
13. Understood the etiology and pathophysiology of hiatus hernia.	—	—
14. Recognized the signs and symptoms of hiatus hernia.	—	—
15. Managed hiatus hernia.	—	—
16. Understood the etiology and pathophysiology of antibiotic-associated colitis (pseudomembranous colitis).	—	—
17. Recognized the signs and symptoms of pseudomembranous colitis.	—	—
18. Managed antibiotic-associated pseudomembranous colitis.	—	—
19. Treat complications symptomatically with appropriate supportive care.	—	—
20. Recorded all treatment in the patient's medical record.	—	—
21. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Bacterial Gastroenteritis

081-833-4093

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the causes of bacterial gastroenteritis. There are two general types of bacterial "food poisonings." The first causes an invasive infection of the gut. The second type produces a toxin, either before or after ingestion.
 - a. Diseases caused by bacterial invasive infections are typhoid fever, salmonellosis, and shigellosis.
 - b. Diseases caused by toxin-producing organisms are staphylococcus aureus food poisoning, botulism, clostridium perfringens food poisoning, cholera, and others.

NOTE: Steps 2 through 6 pertain to typhoid fever.

2. Understand the etiology and pathophysiology of typhoid fever.
 - a. Caused most often by the bacterium *Salmonella typhi*, a Gram-negative organism that can be carried in human feces and transmitted through sewage, flies, and shellfish.
 - b. The bacterium invades the gastrointestinal (GI) tract and localizes in the lymph tissue (Peyer's patches) of the intestinal wall. These areas may become thrombosed; then tissue will slough off, leaving ulcers.
 - c. Typhoid fever has three stages, each lasting about 7 to 10 days. They are the prodromal, fastigium, and defervescence stages.
3. Recognize the signs and symptoms of typhoid fever by stages.
 - a. Prodromal:
 - (1) Malaise.
 - (2) Frontal headache.
 - (3) Cough.
 - (4) General body aches possible (myalgia, sore throat, nose bleeding [epistaxis], and abdominal pain).
 - (5) Diarrhea (uncommon).
 - (6) Fever that ascends in a stepladder fashion (generally higher in evening than in morning).
 - b. Fastigium phase:
 - (1) Fever stabilizes (around 104 degrees Fahrenheit).
 - (2) Severe constipation.
 - (3) Occasionally, "pea-soup" diarrhea.
 - (4) In severe cases, patient lies motionless and unresponsive, with their eyes half shut, appearing wasted and exhausted. This is called the "typhoid state." A patient can usually be aroused from this state.
 - (5) "Rose spots" commonly appear in the second week of disease, and they are found sparsely (usually no more than 10) on the trunk. They do not itch or crust, but they do blanch upon pressure. They are 2 to 3 millimeters in size and disappear over a period of 3 to 4 days.
 - (6) Splenomegaly with bradycardia in the presence of fever and dicrotic pulse. A regular irregular pulse also may be present.
 - c. Defervescence phase:
 - (1) If the patient does not develop any complications, fever declines in stepladder fashion to normal in 7 to 10 days, patient becomes more alert, and abdominal symptoms disappear.

Performance Steps

- (2) However, relapse can occur up to 2 weeks after defervescence.
4. Recognize significant lab findings for typhoid fever.
 - a. Stools are positive for the organism after the first week (noted by culture).
 - b. Urine may become positive within first week.
 - c. Moderate anemia and leukopenia.
5. Manage typhoid fever.
 - a. Chloramphenicol given intravenously (IV) or by mouth (PO).
 - b. For chloramphenicol-resistant strains, give ampicillin intramuscularly (IM), IV, or PO (amoxicillin orally).
 - c. Patients allergic to penicillin can be given trimethoprim-sulfamethoxazole (bactrim or septrax) PO.
 - d. In addition to antibiotics, glucocorticoids may be indicated for severely toxic patients.
 - e. Supportive measures include the following:
 - (1) Encourage a diet high in calories with frequent small feedings.
 - (2) Employ methods to decrease fever, but no salicylates.
 - (3) Monitor fluid and electrolytes to prevent an imbalance.
 - (4) Maintain enteric precautions and isolation techniques.
6. Employ prophylactic measures to prevent typhoid.
 - a. Military personnel who anticipate significant exposure in endemic areas should be vaccinated. Typhoid vaccine is given in two 0.5 milliliter (ml) subcutaneous (SQ) doses 1 month apart. A booster is needed every 3 years.
 - b. Educate personnel to avoid eating raw, leafy vegetables and other foods stored or served at room temperature. (Keep foods stored at less than 40 degrees Fahrenheit, and cook and serve food at greater than 140 degrees Fahrenheit).

NOTE: Steps 7 through 10 pertain to salmonellosis.

7. Understand the etiology and pathophysiology of Salmonellosis (acute enterocolitis).
 - a. Many species of salmonella (Gram negative) cause a local GI infection in which organisms usually do not enter the blood stream. Such infections are referred to as salmonellosis or salmonella food poisoning. There are about 2,100 different serotypes of salmonella.
 - b. Organisms are found in inadequately cooked meats, poultry, and eggs and in infected turtles and household pets. Animals may be asymptomatic carriers (20 percent of dogs, 12 percent of cats, and 50 percent of turtles are salmonella carriers).
 - c. Organisms multiply in the intestines, causing gastric upset and infection. Incubation period is 12 to 48 hours after ingestion of contaminated food or liquid, and symptoms usually last 2 to 3 days.
8. Recognize the signs and symptoms of salmonellosis. (These may be mild or severe.)
 - a. Nausea and vomiting.
 - b. Malaise.
 - c. Chills and fever.
 - d. Diarrhea, which may be bloody.
9. Recognize significant lab findings for salmonellosis. (The only diagnostic lab finding is a positive stool culture for salmonella.)
10. Manage salmonellosis symptomatically.
 - a. Bedrest and bland diet.
 - b. Fluid and electrolyte replacement.
 - c. Young, malnourished, or immunocompromised infants, severely ill patients, patients with sickle cell disease, and patients in whom bacteremia is suspected should be treated with the following:
 - (1) Ampicillin 100 milligrams per kilogram (mg/kg) PO or IV. OR
 - (2) Chloramphenicol 50 to 100 mg/kg PO.

Performance Steps

NOTE: Steps 11 through 16 pertain to staphylococcus aureus food poisoning.

11. Understand the etiology and pathophysiology of staphylococcus aureus food poisoning.
 - a. Gram-positive staphylococcus strain that clots plasma (coagulase type) is the most lethal type and causes a variety of infections. Most food poisoning resulting in GI upset occurs as a result of this bacterium.
 - b. Gram-positive staphylococcus strain is found in unrefrigerated foods; for example, creams, mayonnaise, stuffing, meats, pastries, and fish. Bacteria are usually transmitted to food from the hands of food handlers. Incubation period is 1 to 6 hours after ingestion of contaminated food. Symptoms last 24 to 48 hours--self-limiting.
12. Recognize the signs and symptoms of staphylococcus aureus food poisoning.
 - a. Severe nausea and vomiting.
 - b. Malaise.
 - c. Abdominal cramps and pain.
 - d. Diarrhea.
 - e. Subnormal temperature.
13. Manage staphylococcus aureus food poisoning.
 - a. Supply with adequate fluid and electrolytes orally or parenterally.
 - b. Bedrest.
 - c. Offer fluids in small amounts, as tolerated.
14. Understand the etiology and pathophysiology of botulism.
 - a. Clostridium botulinum (C. botulinum) is a large Gram-positive bacillus that is an obligate anaerobe. Its exotoxin, a very powerful neurotoxin, is responsible for botulism.
 - b. The organism's toxin causes the most serious, often fatal, form of food poisoning. Toxins are found in improperly processed foods (mostly canned foods) that have been infected with the anaerobic bacillus C. botulinum. Toxins block neuromuscular transmission in cholinergic nerve fibers by possibly binding with acetylcholine.
 - c. Incubation period is usually 18 to 36 hours after ingestion of contaminated food but may vary from 4 hours to 8 days.
15. Recognize the signs and symptoms of botulism.
 - a. Lassitude and fatigue.
 - b. Diplopia.
 - c. Weakness of muscles in the extremities.
 - d. Dysphasia and dysphagia.
 - e. Diminished visual acuity.
 - f. Loss of pupillary light reflex.
 - g. Diminished gag reflex.
16. Manage botulism.
 - a. Evacuate and refer for hospitalization, if possible.
 - b. Keep the patient in a darkened room.
 - c. IV feedings to prevent aspiration.
 - d. Tracheostomy or cricothyrotomy may be necessary to protect the airway and allow for mechanical ventilation.
 - e. Oxygen (O₂) ventilator assistance may become necessary.
 - f. Cathartics and cleansing enemas to remove toxins from the body.
 - g. Trivalent or polyvalent antitoxins, as necessary.
 - h. Sedatives, as necessary (prn). No respiratory depressants.
 - i. Prevent aspiration pneumonia by proper positioning of the patient. Keep suction equipment available at the bedside.
 - j. Prevent contractures and emboli by the use of range-of-motion exercises.

NOTE: Steps 17 through 19 pertain to Clostridium perfringens (C. perfringens) food poisoning.

Performance Steps

17. Understand the etiology and pathophysiology of *C. perfringens* food poisoning.
 - a. *C. perfringens*, a Gram-positive bacillus, is widely distributed in soil, feces, air, and water. Contaminated meat has caused many serious outbreaks.
 - b. The toxin produced by *C. perfringens* is the producer of gastric upset.
18. Recognize the signs and symptoms of *C. perfringens* food poisoning.
 - a. Mild gastroenteritis is common.
 - b. A potentially fatal syndrome with severe diarrhea, abdominal distention and pain, and collapse may occur.

NOTE: Diagnosis is made by identification of organism from contaminated food.

19. Manage *C. perfringens* food poisoning.
 - a. Bedrest with convenient access to latrine or bedpan.
 - b. Give oral fluids to replenish fluid and electrolytes.
 - c. No oral medications if vomiting is present. If vomiting and dehydration is prominent, administer an IV of dextrose 5 percent in water (D5W) with appropriate electrolyte replacements.
 - d. Help decrease vomiting by using antiemetic, such as dimenhydrinate 50 mg IM every 4 hours (q4h) or chlorpromazine 25 mg to 100 mg IM every 12 hours (q12h).
 - e. Pro banthine 5 mg to 10 mg IM every 6 hours (q6h) may be given for severe abdominal cramps.
 - f. Penicillin given 1 million units IM may help in severe cases.

NOTE: Steps 20 through 23 pertain to the management of cholera.

20. Understand the etiology and pathophysiology of cholera.
 - a. *Vibrio cholerae*, a Gram-negative bacillus, is the pathogenic organism. The organism produces a protein enterotoxin that makes the intestinal mucosa lose water rich in sodium, chloride, potassium, and bicarbonate. Persons living in endemic areas gradually acquire a natural immunity.
 - b. Cholera is spread by ingestion of water, seafoods, and other foods contaminated by the fecal-oral route. Incubation is 1 to 3 days. An uncomplicated, mild case lasts 3 to 6 days.
21. Recognize the signs and symptoms of cholera.
 - a. Intense thirst.
 - b. Muscle cramps.
 - c. Weakness.
 - d. Profuse, effortless, watery diarrhea. "Rice water diarrhea."
 - e. Decreased tissue turgor, or wrinkled skin.
 - f. Sunken eyes.
 - g. Nausea, vomiting, or anorexia.
 - h. Oliguria or anuria.

22. Recognize significant lab findings of cholera. (Most relate to the severity of the disease.)
 - a. Hemoconcentration.
 - b. Serious metabolic acidosis.
 - c. Hypokalemia.
 - d. Diagnosis is achieved by identification of organisms in fresh stool sample.

23. Manage cholera.
 - a. Rapid reinfusion of fluid and electrolytes by IV and then by nasogastric tube.
 - b. Strict monitoring of patient intake and output.
 - c. Drug of choice is ciprofloxacin 500 mg PO q12h for 3 days. Alternate is doxycycline 300 mg PO for 1 day.

NOTE: Cholera vaccine gives partial protection in endemic areas, but booster injections are required every 6 months. It is not generally used by the military.

24. Record all treatment in the patient's medical record.

Performance Steps

25. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage bacterial gastroenteritis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of bacterial gastroenteritis.	—	—
2. Understood the etiology and pathophysiology of typhoid fever.	—	—
3. Recognized the signs and symptoms of typhoid fever by stages.	—	—
4. Recognized significant lab findings for typhoid fever.	—	—
5. Managed typhoid fever.	—	—
6. Employed prophylactic measures to prevent typhoid.	—	—
7. Understood the etiology and pathophysiology of salmonellosis (acute enterocolitis).	—	—
8. Recognized the signs and symptoms of salmonellosis. (These may be mild or severe.)	—	—
9. Recognized significant lab findings for salmonellosis.	—	—
10. Managed salmonellosis symptomatically.	—	—
11. Understood the etiology and pathophysiology of staphylococcus aureus food poisoning.	—	—
12. Recognized the signs and symptoms of staphylococcus aureus food poisoning.	—	—
13. Managed staphylococcus aureus food poisoning.	—	—
14. Understood the etiology and pathophysiology of botulism.	—	—
15. Recognized the signs and symptoms of botulism.	—	—
16. Managed botulism.	—	—
17. Understood the etiology and pathophysiology of C. perfringens food poisoning.	—	—
18. Recognized the signs and symptoms of C. perfringens food poisoning.	—	—
19. Managed C. perfringens food poisoning.	—	—
20. Understood the etiology and pathophysiology of cholera.	—	—
21. Recognized the signs and symptoms of cholera.	—	—
22. Recognized significant lab findings of cholera.	—	—
23. Managed cholera.	—	—
24. Recorded all treatment in the patient's medical record.	—	—
25. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Viral Gastroenteritis

081-833-4095

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care in accordance with The Merck Manual.

Performance Steps

1. Understand the causes of viral gastroenteritis.
 - a. Viruses are responsible for the majority of cases of acute gastroenteritis in the United States. This is not true in the developing (third world) countries where exposure to bacterial, protozoan, and other infectious agents are higher.
 - b. The two main groups of viruses causing gastroenteritis are the Norwalk-type viruses and the rotaviruses. Both types can characteristically produce epidemics.
 - (1) Norwalk-type viruses have an incubation period of 24 to 48 hours with the duration of the illness lasting 24 to 48 hours. Watery diarrhea is the norm.
 - (2) Rotaviruses are the major pathogen in infantile gastroenteritis. They are responsible for about 50 percent of cases of infectious gastroenteritis in children under 2 years of age in temperate climates. They require far less exposure than the Norwalk-type viruses. The disease takes much longer to "peak" with a duration of 5 to 8 days.
2. Solicit a patient history.
3. Recognize significant subjective findings for viral gastroenteritis.
 - a. Anorexia, nausea, and abdominal cramps.
 - b. Myalgia and malaise.
4. Perform a PE.
5. Recognize significant objective findings for viral gastroenteritis.
 - a. Frequent and severe vomiting.
 - b. Frequent and severe diarrhea.
 - c. Low-grade fever.
 - d. Rotaviral infection may also present with the following:
 - (1) Sore throat and redness and swelling of the throat.
 - (2) Nonproductive cough and wheezing.

NOTE: Lab findings for viral gastroenteritis will be unremarkable.

6. Differentiate between viral gastroenteritis and other diseases with similar signs and symptoms. (Consider the following diseases.)
 - a. Bacterial gastroenteritis.
 - b. Toxin-producing bacterial conditions.
 - c. Intestinal parasitemia.
7. Manage viral gastroenteritis.
 - a. Supportive management (or intravenous [IV] rehydration).
 - b. May require hospitalization (infants and elderly).
 - c. Antibiotics are of NO value and may be harmful by creating or reinforcing superinfection.
 - d. Use enteric isolation techniques for infants and young children.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage gastroenteritis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of viral gastroenteritis.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for viral gastroenteritis.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for viral gastroenteritis.	_____	_____
6. Differentiated between viral gastroenteritis and other diseases with similar signs and symptoms.	_____	_____
7. Managed viral gastroenteritis.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	
Required	Related
MERCK MANUAL 17TH ED	SANFORD, 1999

Manage Hemorrhoids

081-833-4098

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and definitive treatment in accordance with The Merck Manual.

Performance Steps

1. Solicit a patient history.
 2. Recognize significant subjective findings for hemorrhoids.
 - a. Pain is the symptom that will usually be reported in association with hemorrhoids. Only ulcerated or thrombosed hemorrhoids are painful. The pain may vary from mild to severe and incapacitating.
 - b. Patients may also complain of a sensation of incomplete evacuation.
- NOTE: Pruritus ani is not a symptom of hemorrhoids.
3. Perform a PE.
 4. Recognize significant objective findings for hemorrhoids.
 - a. Protrusion of external hemorrhoids is a common and easily identifiable sign.
 - b. Inspection of the rectum will usually lead to a diagnosis of external or thrombosed hemorrhoids. Anoscopy is essential in evaluating painless internal hemorrhoids.
 - c. Bleeding is the symptom that will most often cause a patient to seek medical care.
- NOTE: Rectal bleeding should be attributed to hemorrhoids only after other more serious conditions have been ruled out.
5. Manage hemorrhoids.
 - a. Stool softeners or psyllium seed may correct constipation and straining, resulting in spontaneous resolution.
 - b. Painful hemorrhoids caused by thrombosis can be treated with reassurance, warm sitz baths, topical anesthetic cream, or witch hazel compresses.
 - c. Bleeding hemorrhoids can be treated by injection sclerotherapy with 5 percent quinine and urea hydrochloride or 5 percent phenol in vegetable oil.
 - d. Larger internal hemorrhoids or those that fail to respond to injection sclerotherapy are treated by rubber band ligation. A 1/4 inch in diameter elastic band is dilated up to about 3/8 of an inch, the hemorrhoid is grasped in an area that is insensible to pain, the hemorrhoid is drawn through the band, and the band is released to ligate the hemorrhoid, resulting in necrosis and sloughing. One hemorrhoid is ligated every 2 weeks (q2wk). Three to six treatments may be required.
 - e. Painful external hemorrhoids without an internal component may require operative hemorrhoidectomy.
 6. Record all treatment in the patient's medical record.
 7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage hemorrhoids.

Performance Measures

1. Solicited a patient history.

GO NO GO

— —

Performance Measures

	<u>GO</u>	<u>NO GO</u>
2. Recognized significant subjective findings for hemorrhoids.	_____	_____
3. Performed a PE.	_____	_____
4. Recognized significant objective findings for hemorrhoids.	_____	_____
5. Managed hemorrhoids.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Assess Diseases of the Abdomen

081-833-4102

Conditions: As a special operations medic in a field environment and given the M-5 medical equipment and the patient's medical record.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, and determine the cause of the disease without causing further harm.

Performance Steps

1. Solicit a patient history.
 - a. Sequence of events since onset of current complaint.
 - b. Events immediately preceding complaint--listen to patient's own words, and ask questions from pertinent portions of the review of systems (ROS).
 - (1) Trauma to abdomen.
 - (2) Change in physical activity (to rule out simple abdominal muscle strain).
 - (3) History of alcohol consumption (liver disorder or alcohol gastritis).
 - (4) Last meal (possibly food poisoning).
 - (5) History of pulmonary complaint (flu or parasites).
 - (6) Females (last menstrual period [LMP], history of sexual activity, venereal disease [VD], or ectopic pregnancy).
 - (7) Emotional status.
 - (8) Timing of last meal to onset or relief of symptoms (ulcer, infections, or gastrointestinal [GI] disturbances or obstructions).
 - (9) Timing of onset of pain to nausea and vomiting (appendix or obstruction).
 - (10) Any associated symptoms listed below (relation to fever, chills, or past history).
 - c. Characterization of abdominal pain.
 - (1) Location of pain and of referred pain--radiating or boring from one region to another region.
 - (2) Quality.
 - (a) Colic (comes and goes).
 - (b) Burning (as with excessive acid).
 - (c) Boring (through to back as with pancreatitis).
 - (d) Sharp or dull.
 - (3) Severity.
 - (a) Awakens patient from a sound sleep. Consider appendicitis, cholecystitis, duodenal ulcer, or ovarian pain.
 - (b) Causes patient to pass out. Consider ruptured organ or pancreatitis.
 - (4) Duration.
 - (a) Sudden onset or gradual.
 - (b) Since onset.
 - (c) Constant or intermittent.
 - d. Aggravating or relieving factors.
 - (1) Medications, antacids, or aspirin.
 - (2) Effect of meals or alcohol.
 - (a) Ulcers (pain about 2 hours after meals). Worse with smoking and/or fasting.
 - (b) Anorexia (with many conditions).
 - (c) Cholecystitis or cholelithiasis worsens with fatty meals.
 - (d) Changes of pain with position, movement, or respirations.
 - (e) Changes of pain with bowel movement or urination.
 - e. Nature of stools.
 - (1) Color.

Performance Steps

- (a) Dark, tarry stools (any cause of upper GI bleeding such as esophagitis or gastritis). Blood clotting disorders are related to liver diseases, hemophilia, or nutritional deficiencies.
 - (b) Bright red blood (intestinal bleeding such as enteritis, diverticulitis, infectious GI diseases, parasitic infestation, cancer, colon or rectal pathology such as anal fissures, proctitis, or hemorrhoids).
 - (2) Consistency.
 - (a) Loose stools (many causes; for example, functional bowel syndrome, allergies, infections, malnutrition, parasite, toxins, and past obstructions). No gas passed for 24 to 48 hours might mean bowel obstruction.
 - (b) Hard stools (usually caused by dehydration or hypothyroidism).
 - (c) Undigested food may be caused by inadequate presence of enzymes, obstruction, or malnutrition.
 - (d) Presence of ova or parasites.
 - f. Associated symptoms.
 - (1) Fever or chills (viral gastroenteritis, hepatitis, cholecystitis, or pyelonephritis).
 - (2) Nausea and vomiting (infection, malaria, or hepatitis). With appendicitis and bowel obstruction, pain precedes vomiting. Ulcers and cancer will also present with GI bleeding.
 - (3) Jaundice (malaria, gallbladder disease, liver disease from parasites or alcohol, or common bile duct obstruction).
 - g. Past history.
 - (1) Similar episodes (pancreatitis or gallbladder).
 - (2) Peptic ulcer disease.
 - h. Concurrent medical problems or medications.
 - (1) Diabetes.
 - (2) Malaria.
 - (3) Sickle cell anemia.
 - (4) Exposure to hepatitis.
 - (5) Narcotic abuse.
 - (6) Alcohol abuse.
 - (7) Smoking.
 - (8) Hypertension (HTN).
 - (9) Coronary artery disease (CAD).
2. Differentiate between types of abdominal conditions on the basis of the location of abdominal pain.
- a. Epigastric pain.
 - (1) Esophagitis (worse when lying down with reflux of stomach contents into esophagus and relieved by antacids).
 - (2) Peptic ulcer (gastric or duodenal).
 - (3) Gallbladder disease.
 - b. Right upper quadrant (RUQ) pain.
 - (1) Hepatitis (associated symptoms).
 - (2) Gallbladder disease.
 - (3) Pneumonia (right lower lobe).
 - (4) Retrocecal appendicitis.
 - c. Left upper quadrant (LUQ) pain (mononucleosis).
 - d. Right lower quadrant (RLQ) pain.
 - (1) Appendicitis.
 - (2) Ovarian pain (changes with menses). Palpable ovary on pelvic exam.
 - (3) Renal stone (patient will writhe with pain in trying to find comfortable position).
 - (4) Ectopic pregnancy (by history of menses, intercourse, and serum human chorionic gonadotrophin [HCG] tests (if available). If HCG tests unavailable, depending on date of conception, do urine HCG test.
 - (5) Diverticulitis (especially in eastern cultures).
 - (6) Mesenteric adenitis (inflammation of the lymph nodes in mesentery of bowel).

Performance Steps

- e. Left lower quadrant (LLQ) pain.
 - (1) Proctitis (may see white blood cell [WBC], mucous, or bright red blood in stools on rectal examination).
 - (2) Diverticulitis (especially in western cultures).
3. Perform a differential assessment by location of referred pain. Pain is referred to cutaneous distribution of nerve roots supplying the affected organ.
 - a. Back pain may be seen with the following:
 - (1) Gallstones (right side).
 - (2) Pancreatitis (midline).
 - (3) Kidney infection (right or left side).
 - b. Shoulder pain (phrenic nerve supplies diaphragm). Anything causing irritation of diaphragm from above (pneumonia) or below (ruptured viscus or any other damaged organ touching the diaphragm) may be associated with pain in the shoulder.
4. Perform a PE (task 081-833-4002, Perform a Complete Physical Examination).
 - a. Take patient's vital signs.
 - b. Examine chest and diaphragmatic excursion. Look for pathology in thorax that can mimic abdominal pathology.
 - c. Inspect the following:
 - (1) Contour of abdomen.
 - (a) Scaphoid.
 - (b) Flat.
 - (c) Distended. May have too much fluid (ascites) or too much intestinal air (as in bowel obstruction).
 - (2) Isolated bulges may indicate the presence of herniations of bowel through the abdominal wall.
 - d. Check for auscultation (presence of bowel sounds).
 - (1) Hyperactive with rushes may be caused by partial obstruction (or diarrhea).
 - (2) Absent. Ileus may be caused by pus, bile, gastric contents, and so on. This is a sign of peritonitis.
 - e. Palpate abdomen.
 - (1) Effect of voluntary tightening, ascending with direct palpation.
 - (2) Have patient point to quadrant where pain is located, and examine other quadrants first.
 - (3) Feel for abdominal wall guarding. Localized tenderness might mean peritonitis.
 - (4) Feel for rebound tenderness, which is a sign of peritonitis. Rebound tenderness over McBurney's point is a sign of appendicitis.
 - (5) Feel for organomegaly or palpable mass.
 - f. Percuss the abdomen.
 - (1) Organomegaly.
 - (2) Presence of free air or fluid.
 - g. Check for special signs.
 - (1) Iliopsoas. Flex thigh against resistance position. If there is pain in the abdomen, this might indicate inflammation around or near the origin of the psoas muscle. The inflammation might possibly be from retrocecal appendicitis.
 - (2) Murphy's sign. Palpate under liver margin in RUQ during inspiration. If RUQ is tender and there is a feeling of a small mass, this might indicate cholecystitis.
5. Perform a rectal exam.
6. Perform a pelvic exam (task 081-833-4310, Perform a Pelvic Exam).
7. Perform or request lab examinations.
 - a. Always request a complete blood count (CBC) with differential, complete urinalysis (UA), stool guaiac, and stool ova and parasite (if suspect contact).
 - b. If available, request an abdominal X ray series of flat and upright and a chest X ray.

Performance Steps

c. Request serum electrolytes, bilirubin, serum amylase, and liver enzymes.

8. Record all findings in the patient's medical records.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess abdominal conditions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Differentiated between types of abdominal conditions on the basis of the location of abdominal pain.	_____	_____
3. Performed a differential assessment by location of referred pain.	_____	_____
4. Performed a PE.	_____	_____
5. Performed or requested lab examinations.	_____	_____
6. Recorded all findings in the patient's medical records.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

BATES PE, 8TH ED. 2002
 MERCK MANUAL 17TH ED
 SANFORD, 1999

Manage (Nonsurgically) Conditions of the Abdomen

081-833-4103

Conditions: Given stethoscope, sphygmomanometer, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definition and causes of pancreatitis.
 - a. Pancreatitis is defined as inflammation of the pancreas due to any number of causes.
 - b. Possible causes of pancreatitis are as follows:
 - (1) Alcoholism.
 - (2) Gallstones.
 - (3) Peptic ulcer disease (PUD).
 - (4) Mumps.
 - (5) Trauma.
 2. Solicit a patient history.
 3. Recognize significant subjective findings for pancreatitis.
 - a. Often preceded by binge drinking or less often by obstruction of common bile duct.
 - b. Pain is usually acute in onset and followed by nausea and vomiting.
 - c. Severe knife-like epigastric pain, boring through to back or radiating epigastric pain.
 - d. Aggravated by meals and relieved by sitting up and leaning forward.
 - e. Patients often have a history of previous episodes.
 4. Perform a PE.
 5. Recognize significant objective findings for pancreatitis.
 - a. Vomiting.
 - b. Tachycardia.
 - c. Fever.
 - d. Stools may be normal, dark and tarry, or clay-colored (in case of prolonged common bile duct obstruction).
 - e. Orthostatic hypotension with severe bleeding. Occasionally, patients will present with hypovolemic shock.
 - f. Left upper quadrant (LUQ) epigastric tenderness.
 - g. Jaundice.
 6. Recognize significant lab results that are indicative of pancreatitis.
 - a. Leukocytosis.
 - b. Glycosuria presents in 25 percent of the patients.
 7. Manage pancreatitis.
 - a. Evacuate to definitive management facility, if possible.
 - b. Nothing by mouth (NPO) and nasogastric (NG) suction.
 - c. Ringer's lactate intravenous (IV) 1,000 cubic centimeters (cc) over first hour and then adjust to urine output 50 cc per hour.
 - d. Cimetidine 300 milligrams (mg) intravenous (IV) every 6 hours (q6h) for acute phase.
 - e. Antacids 30 cc PO every 4 hours (q4h).
 - f. Demerol 75 mg intramuscularly (IM) q4h for pain.
- NOTE: Steps 8 through 16 pertain to appendicitis.

Performance Steps

8. Understand the etiology and pathophysiology of appendicitis.
 - a. Caused by obstruction in lumen of appendix, causing swelling and eventually decreased blood supply to the wall of the appendix.
 - b. Distention of appendix caused by secretions, bacteria, and/or decreased peristalsis can lead to rupture.
 - c. Most common in 10 to 30 year olds, but can occur at any age.
 9. Solicit a patient history.
 10. Recognize significant subjective findings for appendicitis.
 - a. History before onset of disease (sometimes patient has upper respiratory infection).
 - b. Pain (periumbilical) caused by distention of the appendix followed by right lower quadrant (RLQ) pain caused by local peritonitis.
 - c. Vomiting or nausea (anorexia).
 11. Perform a physical examination.
 12. Recognize significant objective findings for appendicitis.
 - a. Local tenderness at McBurney's point (RLQ) and rectum when the appendix is low in the pelvis. (In right flank when the appendix is retroceal.)
 - b. Rebound tenderness (inconsistent).
 - c. Abdomen distention (inconsistent).
 - d. Possible superficial hyperesthesia.
 - e. Fever (101 degrees Fahrenheit).
 - f. Testicular symptoms (depending on location of appendix).
 13. Recognize significant lab findings that are caused by appendicitis. Leukocytosis is the only reliable lab finding in patients with appendicitis.
 14. Differentiate between appendicitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Acute mesenteric adenitis: Lymphadenopathy is present in mesentery of bowel. Assessment of condition is often made only at time of appendectomy. Mesenteric adenitis mimics appendicitis very closely.
 - b. Acute gastroenteritis: Acute viral condition with profuse, watery diarrhea and nausea and vomiting. Between cramps, the abdomen is completely relaxed. With salmonella, signs include bradycardia, leukopenia, fever, and chills.
- NOTE: If you suspect the patient has appendicitis, immediately evacuate the patient for surgical intervention.
15. Manage appendicitis nonsurgically.
 - a. NPO (initiate intake and output records).
 - b. NG tube, if necessary
 - c. Pain medication. Pain medication is not indicated in a prehospital setting, obscures signs and symptoms, and may delay needed surgical intervention.
 - d. Antibiotics. Use whatever is available to treat gram-negative rods, anaerobes, and streptococcus.
 - e. IV fluids. Correct dehydration before surgery with Ringer's lactate (RL) or normal saline (NS). Do not rehydrate with just dextrose 5 percent water (D5W); it will aggravate electrolyte disturbances.
 16. Recognize complications of an appendiceal rupture.
 - a. Can lead to generalized peritonitis.
 - b. Clinical manifestation:
 - (1) Patient becomes quite ill toxic and prostrate.
 - (2) Temperature increased to 103 to 104 degrees Fahrenheit (white blood cells [WBCs] 20,000 to 30,000).

Performance Steps

- (3) Palpable mass (abscess) appears in patient's RLQ. Avoid forceful palpation in this area.
- (4) Patient's abdomen readily becomes distended.
- (5) Ileus with peritonitis.

NOTE: Steps 17 through 19 pertain to abnormalities of liver function.

17. Understand the definition and etiology of terms and conditions related to liver function.
 - a. Jaundice is not a disease but a sign characterized by yellowness of the skin, the sclera, mucous membranes, body fluids, and the frenulum linguae. Jaundice becomes evident when bilirubin blood level exceeds 2 milligrams (mg) per 100 milliliters (ml). Jaundice is noted primarily in the sclera.
 - b. Bilirubin is the reddish-brown pigment in bile. It is the product of the normal breakdown of hemoglobin from red blood cell lysis.
 - c. Jaundice may result from one or more of the following responsible mechanisms:
 - (1) Prehepatic jaundice is caused by an increased hemolysis or excessive bilirubin production.
 - (2) Hepatic jaundice is caused by an impaired conjugation, intrahepatic cholestasis, or intracellular injury.
 - (3) Posthepatic jaundice is caused by biliary obstruction as a result of cholelithiasis, which is the most common cause, or cancer or fibrosis.
 - d. Etiologies of the different forms of jaundice are variable. Some of the more common ones are as follows:
 - (1) Prehepatic jaundice is generally caused by increased red blood cell (RBC) hemolysis caused by the following:
 - (a) Parasitic infections such as malaria.
 - (b) Transfusion reactions.
 - (c) Vasculitis.
 - (d) Autoimmune deficiency diseases.
 - (e) Drug-induced anemia.
 - (f) Congenital disorders.
 - (g) Sickle cell anemia.
 - (h) Gilbert's syndrome (rare).
 - (i) Crigler-Najjar syndrome (rare).
 - (j) Internal hemorrhage.
 - (2) Hepatic jaundice is usually a result of hepatitis caused by bacterial, chemical, parasitic, or viral factors.
 - (3) Posthepatic jaundice occurs most commonly with cholelithiasis and cholecystitis as a secondary complication. Gallstones can obstruct cystic, common bile, or pancreatic ducts. Fibrous scar tissue that occludes Oddi's sphincter is a rare complication of peptic ulcer disease. Cancer at or adjacent to Oddi's sphincter or strictures may also cause obstruction of the common bile duct.
18. Recognize the signs and symptoms of conditions that can cause jaundice.
 - a. The general signs and symptoms (manifestations) that are concomitant with suspected prehepatic jaundice are as follows:
 - (1) Anemia (hemolytic).
 - (2) Weakness.
 - (3) Flank pain.
 - (4) Abdominal pain.
 - (5) Hepatomegaly.
 - (6) Splenomegaly.
 - (7) Pruritus.
 - (8) Urticaria.
 - (9) Elevated unconjugated bilirubin blood level.
 - (10) Liver enzymes in the normal range.

Performance Steps

- b. The general signs and symptoms that are concomitant with suspected hepatic jaundice are as follows:
 - (1) Malaise.
 - (2) Anorexia.
 - (3) Disorientation and confusion.
 - (4) Weakness.
 - (5) Pruritus.
 - (6) Nausea and vomiting.
 - (7) Dark-colored urine.
 - (8) Light or tarry stools.
 - (9) Elevated conjugated and unconjugated bilirubin blood levels.
 - (10) Elevated liver enzymes.
 - (11) Possibility of right upper quadrant (RUQ) abdominal pain (not absolute).
 - (12) Elevated temperature may develop.
 - (13) Liver will have difficulty metabolizing hormones.
 - (14) Decreased coagulation factor production by liver.
 - (15) Excessive hemorrhage or hematemesis may develop.
 - (16) Prothrombin time is decreased.
- c. The general signs and symptoms (manifestations) that are concomitant with suspected posthepatic jaundice are as follow:
 - (1) Insidious or acute colicky pain in RUQ.
 - (2) Fever.
 - (3) Nausea.
 - (4) Vomiting.
 - (5) White- to clay-colored stool.
 - (6) Ascites.
 - (7) Weight loss.
 - (8) Prostration.
 - (9) Pruritus.
 - (10) Urticaria.
 - (11) Fatty food intolerances.
 - (12) Elevated conjugated bilirubin blood level.
 - (13) Liver enzymes in normal range.
 - (14) Conjugated bilirubin found in the urine. Do urine shake test--standing yellow foam for more than 4 hours is positive test for bilirubinuria (dark).

19. Managed jaundice on the basis of the underlying cause and provide appropriate supportive care.

20. Recorded all treatment in the patient's medical record.

21. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an abdominal condition.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and causes of pancreatitis.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for pancreatitis.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for pancreatitis.	—	—
6. Recognized significant lab results that are indicative of pancreatitis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
7. Managed pancreatitis.	—	—
8. Understood the etiology and pathophysiology of appendicitis.	—	—
9. Solicited a patient history.	—	—
10. Recognized significant subjective findings for appendicitis.	—	—
11. Performed a physical examination.	—	—
12. Recognized significant objective findings for malaria.	—	—
13. Recognized significant lab findings that are caused by malaria.	—	—
14. Differentiated between appendicitis and other diseases with similar signs and symptoms.	—	—
15. Managed appendicitis nonsurgically.	—	—
16. Recognized complications of an appendiceal rupture.	—	—
17. Understood the definition and etiology of terms and conditions related to liver function.	—	—
18. Recognized the signs and symptoms of conditions that can cause jaundice.	—	—
19. Managed jaundice on the basis of the underlying cause and provided appropriate supportive care.	—	—
20. Recorded all treatment in the patient's medical record.	—	—
21. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage (Nonsurgically) Cholecystitis**081-833-4104**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for cholecystitis.
 - a. Patient is typically the six F's (fair, fat, female, forty, fertile, and flatulent), but men and thin people get it too.
 - b. Moderately severe right upper quadrant (RUQ) colicky pain, referred to back or right shoulder (subscapular). The pain lasts hours and is aggravated by meals--especially fatty meals. Patient has a history of repeated episodes of colicky pain after fatty meals.
 - c. Stools are light-colored only when the common bile duct is obstructed.
3. Perform a PE.
4. Recognize significant objective findings for cholecystitis.
 - a. Fever.
 - b. Vomiting.
 - c. Jaundice.
 - d. RUQ inspirational tenderness (positive Murphy's sign).

NOTE: High fever, leukocytosis, and rigors together with findings of rebound tenderness or ileus suggest empyema, gangrene, or perforation. These conditions require urgent referral for surgical management.

5. Recognize significant lab results for cholecystitis.
 - a. Ultrasound findings are among the most accurate tests for diagnosing cholecystitis.
 - b. Isotope scanning techniques are also useful in determining the nature of the problem and ruling out other diseases.
6. Manage cholecystitis nonsurgically.
 - a. Nothing by mouth (NPO) with nasogastric (NG) suction (may omit NG suction if no longer vomiting).
 - b. Intravenous (IV) Ringer's lactate.
 - c. Cimetidine 300 (mg) IV every 6 hours (q6h).
 - d. Demerol 75 mg intramuscularly (IM) every 4 hours (q4h) or as needed (prn). Do not use codeine or morphine.
 - e. If febrile, give kanamycin 1 gram per day for 3 doses or ampicillin 500 mg IV q6h.
 - f. Evacuate for surgery.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage cholecystitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Recognized significant subjective findings for cholecystitis.	_____	_____
3. Performed a PE.	_____	_____
4. Recognized significant objective findings for cholecystitis.	_____	_____
5. Recognized significant lab results for cholecystitis.	_____	_____
6. Managed cholecystitis nonsurgically.	_____	_____
7. Recorded all treatment in the patient's medical record	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Acute and Non-Acute Abdomen

081-833-4105

Conditions: Given stethoscope, sphygmomanometer, M-5 medical kit, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Define the term "acute abdomen."
 - a. An abnormal condition of the abdomen in which there is severe abdominal pain, often of abrupt onset. It requires immediate evaluation and diagnosis as it may indicate a need for immediate surgical intervention.
 - b. It is synonymous with surgical abdomen.
 - c. It is often caused by or associated with peritonitis (inflammation of the abdominal wall).
 2. Recognize the possible causes of an acute abdomen.
 - a. Gastrointestinal causes of an acute abdomen are as follows:
 - (1) Appendicitis.
 - (2) Cholecystitis.
 - (3) Perforated peptic ulcer.
 - (4) Diverticulitis.
 - (5) Pancreatitis.
 - (6) Peritonitis (from any cause).
 - b. Genitourinary and gynecological causes of an acute abdomen.
 - (1) Kidney stones.
 - (2) Cystitis.
 - (3) Pyelonephritis.
 - (4) Pelvic inflammatory disease.
 - (5) Ectopic pregnancy.
 3. Solicit a patient history.
 4. Recognize significant subjective findings of an acute abdomen.
 - a. Local or diffuse pain and/or tenderness.
 - b. Referred (distant) pain. (Task 081-833-4102, Assess Diseases of the Abdomen, provides information on common causes and locations of referred pain.)
 - c. Anorexia and nausea.
 5. Perform a PE.
 6. Recognize significant objective findings for an acute abdomen.
- NOTE: Active peristalsis of normal pitch suggests the possibility of a nonsurgical disease. Severe pain combined with an absolutely silent abdomen indicates the need to immediately evacuate the patient for surgery.
- a. A quiet, rigid patient.
 - b. Rapid, shallow breathing.
 - c. Vomiting.
 - d. Tense, often distended abdomen.
 - e. Rapid pulse.
 - f. Low blood pressure.
 - g. Fever.

Performance Steps

NOTE: Rapid pulse, low blood pressure, and fever are late signs of an acute abdomen.

7. Differentiate between conditions causing an acute abdomen and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Gastroenteritis has similar symptoms. However, the pain never becomes localized, and the disease is self-limiting. This diagnosis is likely if others have recently had similar complaints.
 - b. Inflammatory bowel disease is difficult to differentiate from an acute abdomen.
 - c. Herpes zoster can produce severe pain preceeding the typical rash. A rash with "Christmas tree symmetry" along dermatome lines is pathognomonic.
 - d. Pneumonia can lead to diffuse abdominal pain without localization.
 - e. Patients with psychogenic somatoform disorders often complain of severe abdominal pain. This will not be associated with fever.
8. Manage acute abdomen with appropriate supportive care until the patient can be evacuated. Supportive care includes the following:
 - a. Nothing by mouth (NPO).
 - b. Nasogastric (NG) tube with suction.
 - c. Intravenous (IV) Ringer's lactate titrated to urine output.
 - d. Indwelling urinary catheter and monitoring of urine output.
 - e. Use of broad-spectrum antibiotics for patients who cannot be immediately evacuated. The antibiotics MAY slow progression of the disease until the patient can be delivered for definitive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an acute abdomen.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined the term "acute abdomen."	—	—
2. Recognized the possible causes of an acute abdomen.	—	—
3. Solicited a patient history.	—	—
4. Recognized significant subjective findings of an acute abdomen.	—	—
5. Performed a PE.	—	—
6. Recognized significant objective findings for an acute abdomen.	—	—
7. Differentiated between conditions causing an acute abdomen and other diseases with similar signs and symptoms.	—	—
8. Managed acute abdomen with appropriate supportive care until the patient could be evacuated.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Subject Area 13: Genitourinary Conditions

Assess Diseases and Conditions of the Genitourinary System

081-833-4132

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, and determine the cause of the disease without causing further harm.

Performance Steps

1. Understand the definitions associated with conditions and diseases of the genitourinary (GU) system.
 - a. The GU system consists of organs involved with formation and excretion of urine and reproduction of the species.
 - b. Urinary tract infection (UTI) is an infection of the urinary tract with microorganisms. A significant number of bacteria is present in the urine with or without signs and symptoms of inflammation.
 - c. Pyuria is a condition in which white blood cells (WBCs) are found in the urine.
 - d. Hematuria is a condition in which blood is in the urine (usually refers to red blood cells [RBCs]).
 - e. Urinary triad:
 - (1) Frequency: occurs often, in this instance, many small voidings in a short period of time.
 - (2) Urgency: feeling that the patient cannot hold his urine.
 - (3) Dysuria: pain or discomfort during urination.
 - f. Division of system: Upper tract consists of kidneys and ureters; lower tract, bladder, prostate, and urethra.
2. Understand the general pathology of conditions and diseases of the GU system.
 - a. Infection is generally caused by bacteriuria.
 - b. Obstructive uropathy:
 - (1) Location:
 - (a) Ureteropelvic junction (27 percent).
 - (b) Ureteral (19 percent).
 - (c) Bladder neck (50 percent).
 - (d) Urethra and meatus (4 percent).
 - (2) Causes:
 - (a) Crystallization.
 - (b) Cancer (malignant tumors).
 - (c) Hypertrophy and atrophy (benign tumors).
 - (d) Strictures are usually due to chronic GU infections.
3. Understand the general symptomology of conditions and diseases of the GU system.
 - a. Bacteriuria:
 - (1) With urinary triad, suggests lower UTI.
 - (2) With back pain, chills, and fever, suggests upper UTI.
 - b. Changes in micturition such as the following:
 - (1) Urinary triad.
 - (2) Nocturia (urinating at night [usually wakens patient to void]).
 - (3) Enuresis (bed wetting).
 - (4) Hesitancy (a feeling of having to urinate with no results).
 - (5) Straining (forced urination).
 - (6) Decrease in force (weak stream).
 - (7) Incontinence (inability to control urination).
 - (8) Pneumaturia (gas or air in urine suggests fistula between bladder and bowel).

Performance Steps

- (9) Fever (infection).
- (10) Weight loss possibly associated with cancer.
- (11) Malaise (general feeling of illness and weakness).
- (12) Change in urine output:
 - (a) Polyuria (greater than 2,500 milliliters per day [ml/day]).
 - (b) Oliguria (less than 500 ml/day).
 - (c) Persistent anuria (less than 100 ml/day).
- c. Changes in urine appearance as follows:
 - (1) Clear during water diuresis, which can lead to hypokalemia.
 - (2) Deep yellow suggests urobilinogen.
 - (3) Other than yellow suggests the following:
 - (a) Red or brown (caused by hematuria).
 - (b) Milky (caused by precipitates of phosphate in alkaline urine).
 - (c) Brick dust (caused by precipitates of urates in acid urine).
- d. Characteristics of pain in GU conditions.
 - (1) Renal colic (spastic flank or back pain between 12th rib and iliac crest with an occasional radiation to epigastric region or to testicles suggests renal disease).
 - (2) Bladder pain (pain in the suprapubic region) suggests the following:
 - (a) Cystitis.
 - (b) Acute urinary retention.
 - (3) Other referred pain (pain referred to scapula or back in early stage of passing a stone).
- 4. Perform a PE of the genitalia (task 081-833-4002, Perform a Complete Physical Examination).
- 5. Recognize significant lab findings for diseases and conditions of the GU system.
 - a. Urinalysis:
 - (1) Color:
 - (a) Dark yellow to green (caused by bile or bilirubin).
 - (b) Red to black (erythrocytes, hemoglobin, and myoglobin).
 - (c) Purple to brown (sunlight).
 - (2) Acidity (normal range of potential of hydrogen [pH] is 4.6 to 8.0).
 - (3) Specific gravity (index of weight per unit of volume).
 - (a) Normal range (1.003 to 1.030).
 - (b) Increased specific gravity (caused by dehydration or other causes).
 - (c) Decreased specific gravity (caused by compulsive water drinking).
 - (d) Fixed specific gravity (1.010) is isothermia (caused by severe renal parenchymal damage).
 - (4) Proteinuria (tubular and glomerular disease).
 - (a) Low concentrations (caused by pyelonephritis, fever, and benign orthostatic proteinuria).
 - (b) High concentrations (caused by glomerulonephritis, diabetes mellitus, systemic lupus erythematosus and other causes of nephrotic syndrome).
 - (5) Glucose (caused by hyperglycemia in diabetes mellitus (sugar in urine allows for cultivation of bacteria increasing susceptibility to infection)).
 - (6) Urinary sediment:
 - (a) Erythrocytes (0 to 2 red blood cells per high-power field (RBCs/hpf) is normal on spun sample. Exercise-induced hematuria equals RBCs in urine following exercise.
 - (b) Leukocytes (0 to 10 white blood cells per high-power field (WBC/hpf) is normal on spun sample).
 - (7) Casts may be seen in a spun sample of urine. They can indicate infection, glomerular, or tubular degeneration. The requirements for cast formation are acid urine, high sodium concentrate, reduced urine flow, and/or protein. The types of casts are as follows:
 - (a) RBC casts (indicate acute inflammatory or vascular disorder in the glomerulus, which causes hematuria).
 - (b) WBC casts (indicate inflammation by infectious or noninfectious disease process).

Performance Steps

- (c) Epithelial cell casts (from fused desquamated epithelial cells).
- (d) Granular casts may be "coarse" or "finely granulated" to waxy. Degree of granulation is indicative of degenerative process in kidneys, the more coarse, the greater the degree of degeneration.)
- (e) Hyaline casts (consist of mucoprotein and are present in dehydration).
- (8) Even one bacteria in an unspun sample of a clean catch is significant. If bacteria are found, perform the following:
 - (a) Gram-stain to determine if bacteria is positive or negative.
 - (b) Wet preparation to check for trichomonas.
 - (c) Urine culture to confirm the type of bacteria and its sensitivity to drugs.
- 6. Differentiate between diseases and conditions of the GU system. Consider the following diseases:
 - a. Pyelonephritis will present with the following:
 - (1) Urinary triad.
 - (2) Fever greater than 101 degrees.
 - (3) Costovertebral angle tenderness.
 - (4) Nausea and vomiting.
 - (5) Shaking chills.
 - b. Urethritis will present with the following:
 - (1) Generally no fever.
 - (2) Urinary triad.
 - (3) Erythema of the meatus.
 - (4) The pain may be subclinical, such as itching.
 - (5) Ulceration (possibly caused by chemical irritant of bubble bath).
 - (6) Urethral discharge that appears as follows:
 - (a) Yellow and abundant 3 to 10 days after last sexual contact, which indicates gonorrhea.
 - (b) Clear, sparse, 7 to 14 days after last sexual contact indicates nonspecific urethritis (NSU).
 - c. Glomerulonephritis will present with the following:
 - (1) Hypertension.
 - (2) Edema.
 - (3) Hematuria.
 - d. Neurogenic bladder will present with the following:
 - (1) Urinary retention, either complete or partial.
 - (2) Signs of renal calculi.
 - (3) Continuous overflow dribbling.
 - e. Hydronephrosis will present with the following:
 - (1) Colicky pain.
 - (2) Flank mass, particularly in children.
 - (3) Excruciating pain (Dietl's sign) from overdilatation of renal pelvis.
 - (4) Pyuria.
 - (5) Fever.
 - (6) Unexplained gastrointestinal (GI) symptoms.
 - f. Urolithiasis will present with the following:
 - (1) Ureteral colic.
 - (a) Radiation of pain to back, flank, groin, and testicle (follows the ureter and/or urethral distribution).
 - (b) Movement of pain with movement of stone (starts high and moves down).
 - (c) Character of pain is severe (pain dissipates when passed to bladder), excruciating, colicky, radiates to back, and comes and goes (not uncommon to pass out from this pain).
 - (2) Costovertebral angle tenderness.
 - (3) Gross hematuria.
 - g. Prostatitis will present with the following:

Performance Steps

- (1) Urinary triad.
- (2) Possible nocturia.
- (3) Generally no fever. When fever is present, the degree of fever depends on the severity of the infection.
- (4) Low back pain, rectal pain, or perineal itching.
- (5) Swollen gland observed during rectal exam.
 - (a) With chronic prostatitis, the gland will be nontender.
 - (b) With acute prostatitis, the gland will be exquisitely tender, hot, swollen, and fluctuant or boggy.
- (6) Bowel movement discomfort.
- (7) Urethral discharge, cloudy urine.
- h. Epididymitis will present with the following:
 - (1) Pain (severe) is gradual in onset. Pain begins in scrotum, radiates into groin and abdomen, and follows the distribution of the vas deferens.
 - (2) Testicular swelling, erythema, and calor.
 - (3) Local mass sometimes leading to hydrocele or hematocele.
 - (4) Bloody ejaculate or urethral discharge.
 - (5) Often occurs following physical strain, trauma, or prolonged sexual excitement.
 - (6) Rule out testicular torsion early.
- i. Testicular torsion will present with the following:
 - (1) Exquisite testicular pain caused by twisting of spermatic cord.
 - (2) Testicle elevated and rotated.
 - (3) Pain worse with testicular elevation.
 - (4) Epididymis is anteriorly presented.
- j. Testicular masses will present with the following:
 - (1) Varicocele:
 - (a) History of fullness and possible history of infertility.
 - (b) Visible distention.
 - (c) Palpable "bag of worms" that disappears in supine position.
 - (d) Rarely tender or painful.
 - (2) Hydrocele:
 - (a) Scrotal mass that may be painful.
 - (b) Mass surrounds the testicle and moves with the testicle.
 - (c) Mass transilluminates light. Mass is filled with fluid, which allows light to pass.
 - (3) Hematocele:
 - (a) Painful mass.
 - (b) Mass does not transilluminate light.
 - (4) Spermatocele:
 - (a) Scrotal mass that is rarely painful, but large.
 - (b) Located above and distinct from testicle (like a third testicle).
 - (c) Transilluminates light.
 - (5) Hernia:
 - (a) Scrotal mass.
 - (b) Auscultation may reveal bowel signs if a loop of bowel is positioned in scrotum.
 - (c) If painful, it can progress to a surgical abdomen. Since a bowel loop is strangulated in the inguinal ring, this is a surgical emergency.
 - (6) Testicular cancer:
 - (a) Recent, rapid weight loss.
 - (b) Anorexia.
 - (c) Painless lump on testicles or increase size of testicle.
 - (d) Firm, nontender, hard mass embedded in testicle.
 - (e) Gynecomastia (10 percent of cases will have this because of the mass-secreting chorionic gonadotropin).
 - (f) Metastasis to inguinal, supraclavicular, or axillary lymph nodes. Examine these areas specifically.

Performance Steps

k. Foreskin disorders will present with the following:

- (1) Phimosis:
 - (a) Inability to retract foreskin over the glans.
 - (b) Erythema (edema of foreskin with tenderness).
 - (c) Purulent discharge between glans and foreskin.
- (2) Paraphimosis:
 - (a) Inability to replace foreskin over glans.
 - (b) Increasing edema with increasing pain and tenderness of glans as foreskin functions like constricting band and occludes venous return.
 - (c) If unmanaged, process can go to arterial occlusion and develop gangrene of the glans.

7. Document all findings in the patient's medical record.

8. Seek the advice and assistance of a higher medical authority whenever possible.

NOTE: For further information concerning any of the conditions presented here, refer to the task for the management of the specific condition.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess a patient with a disease or condition of the GU system.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions associated with conditions and diseases of the GU system.	_____	_____
2. Understood the general pathology of conditions and diseases of the GU system.	_____	_____
3. Understood the general symptomology of conditions and diseases of the GU system.	_____	_____
4. Performed a PE of the genitalia.	_____	_____
5. Recognized significant lab findings for diseases and conditions of the GU system.	_____	_____
6. Differentiated between diseases and conditions of the GU system.	_____	_____
7. Documented all findings in the patient's medical record.	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

BATES PE, 8TH ED. 2002
SANFORD, 1999

Manage Urinary Tract Infection

081-833-4134

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Perform a PE.
2. Understand the definition and etiology of urethritis.
 - a. Urethritis is defined as a superficial mucosal infection of urethra.
 - b. The disease is usually caused by an ascending infection caused by one of the following:
 - (1) Bacteria: Gram-negative rods, Gram-positive cocci, or Gram-negative intracellular diplococci (gonococcal [GC]), and other microorganisms (Chlamydia).
 - (2) Viral: herpes (vulvovaginitis).
 - (3) Chemical: bubble bath preparation in young child or susceptible women.
3. Recognize signs and symptoms of urethritis.
 - a. Generally no fever.
 - b. Urinary triad (frequency, urgency, and dysuria).
 - c. Erythema of the meatus.
 - d. Pain can be itching (which is a subclinical form of pain).
 - e. Ulceration possible with chemical irritant of bubble bath.
 - f. Urethral discharge can be as follows:
 - (1) Yellow and abundant 3 to 10 days after last sexual contact is indicative of gonorrhea (GC).
 - (2) Clear, sparse, 7 to 14 days after last sexual contact is indicative of nonspecific urethritis (NSU).
4. Recognize significant lab findings for urethritis.
 - a. Urethral discharge and urine gram stain for GC and other bacteria.
 - b. Wet preparation for trichomonas.
 - c. Cultures for GC, chlamydia, and other bacteria.
5. Manage urethritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Gonorrhea: Drug of choice (DOC) is ceftriaxone 125 milligrams (mg) intramuscularly (IM) once, and concomitant treatment for Chlamydia with doxycycline 100 mg by mouth (PO) twice daily (b.i.d.) for (x) 7 days.

NOTE: Gonorrhea is discussed in task 081-833-4135, Manage Sexually Transmitted Diseases.

 - b. Nonspecific urethritis.
 - (1) Azithromycin 1gram (g) PO once.
 - (2) Doxycycline 100 mg PO b.i.d. x 7 days.
 - (3) Erythromycin 500 mg PO every 6 hours (q6h) x 7 days.

NOTE: Steps 5 through 8 pertain to cystitis.
6. Understand the definition and pathophysiology of cystitis.
 - a. Cystitis is defined as inflammation of the bladder.
 - b. The bladder mucosa is invaded by ascending bacterial or viral infection.

Performance Steps

7. Recognize the signs and symptoms of cystitis.
 - a. Urinary triad--frequency, urgency, and dysuria.
 - b. Temperature less than 101 degrees Fahrenheit (frequently normal).
 - c. Physical examination may be normal.
 8. Recognize significant lab findings for cystitis as follows:
 - a. Bacteria: Perform culture and Gram stain to prove or disprove bacterial infection.
 - b. Hematuria (microscopic).
 - c. Pyuria: number of white blood cell (WBC) casts.
 9. Manage cystitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Urinary analgesic: Pyridium (caution patient about urinary color change).
 - b. Hydration.
 - c. Antibiotics: DOC is trimethoprim-sulfamethoxazole double strength (DS) 1 tablet PO b.i.d. x 3 days.
 - d. Alternate is ciprofloxacin 250 mg PO b.i.d. x 3 days.
- NOTE: Steps 9 through 12 pertain to pyelonephritis.
10. Understand the definition, etiology, and pathophysiology of pyelonephritis.
 - a. Pyelonephritis is defined as an acute, patchy, often bilateral, pyogenic infection of the kidney.
 - b. Kidney is usually enlarged.
 - c. The parenchyma shows extensive destruction of tissue by the acute inflammatory process, particularly in the cortex.
 11. Recognize signs and symptoms of pyelonephritis as follows:
 - a. Urinary triad--frequency, urgency, and dysuria.
 - b. Fever greater than 101 degrees Fahrenheit (maybe 104 to 105 degrees Fahrenheit).
 - c. Costovertebral angle tenderness (CVAT) (part of abdominal exam). Aching pain in lumbar region is elicited by a percussion punch.
 - d. Nausea and vomiting.
 - e. Shaking chills.
 12. Recognize significant lab findings for pyelonephritis.
 - a. Complete blood count (CBC) will show leukocytosis with neutrophilia.
 - b. Urinalysis (UA) will show the following:
 - (1) Bacteria: Perform culture and Gram stain to determine if present.
 - (2) Hematuria: Microscopic (use dipstick chemistries).
 - (3) Proteinuria: Slight to any amount is pathognomonic (when not exercise-related).
 - (4) White cell casts (formed in renal tubules): may not be present, but if present, then pathognomonic.
 13. Manage pyelonephritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Hydration.
 - b. Antibiotics: DOC is cipro 500 mg PO b.i.d. x 14 days or norfloxacin 400 mg PO x 14 days. However, if patient is "septic," treat with intravenous (IV) antibiotics until afebrile and evacuate for higher echelon care if possible.
 - c. Alternate is a combination of amoxicillin and clavulanate 875/125 mg every 12 hours (q12h) PO x 14 days.
- NOTE: Steps 13 through 16 pertain to glomerulonephritis.
14. Understand the definition, etiology, and pathophysiology of glomerulonephritis.
 - a. Cause: reaction to a previous streptococcal infection--especially in children.
 - b. Etiology: Antibodies cross-react with streptococci and kidney tissue so body's own antibodies cause tissue destruction.

Performance Steps

- c. Pathophysiology: Disease is characterized pathologically by diffuse inflammatory changes in the glomeruli and clinically by the abrupt onset of hematuria with red blood cell (RBC) casts, mild proteinuria, and in many cases, hypertension, edema, and azotemia.
- 15. Recognize signs and symptoms of glomerulonephritis.
 - a. Hypertension.
 - b. Edema.
 - c. Hematuria.
- 16. Recognize significant lab findings for glomerulonephritis as follows:
 - a. Blood will show decreased protein.
 - b. Urine will show proteinuria, hematuria (pathognomonic), and RBC casts.
- 17. Manage glomerulonephritis. Management requires hospitalization. If there is any question and the differential diagnosis includes glomerulonephritis, the patient should be evacuated to a higher level of care.
- 18. Record all treatment in the patient's medical record.
- 19. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage urinary tract infection.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Perform a PE.	—	—
2. Understood the definition and etiology of urethritis.	—	—
3. Recognized signs and symptoms of urethritis.	—	—
4. Recognized significant lab findings for urethritis.	—	—
5. Managed urethritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Understood the definition and pathophysiology of cystitis.	—	—
7. Recognized the signs and symptoms of cystitis.	—	—
8. Recognized significant lab findings for cystitis.	—	—
9. Managed cystitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
10. Understood the definition, etiology, and pathophysiology of pyelonephritis.	—	—
11. Recognized signs and symptoms of pyelonephritis.	—	—
12. Recognized significant lab findings for pyelonephritis.	—	—
13. Managed pyelonephritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
14. Understood the definition, etiology, and pathophysiology of glomerulonephritis.	—	—
15. Recognized signs and symptoms of glomerulonephritis.	—	—
16. Recognized significant lab findings for glomerulonephritis.	—	—
17. Managed glomerulonephritis.	—	—

Performance Measures

18. Recorded all treatment in the patient's medical record.

GO **NO GO**

19. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Sexually Transmitted Diseases

081-833-4135

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with sexually transmitted diseases (STDs).
 - a. Gonorrhea: contagious, catarrhal inflammation of the mucous membranes of either sex (usually is a genital mucous membrane). (Gonorrhea is Greek for river of pus).
 - (1) Etiology: *Neisseria gonorrhea* is a Gram-negative intracellular diplococci (GNID) usually pronounced "gonid")
 - (2) Mode of transmission: direct contact with exudates from mucous membranes of infected persons almost always as a result of sexual activity.
 - (3) Incubation period: 1 to 14 days for men (average 2 to 5 days) and within 2 to 10 days for women.
 - b. Nonspecific or nongonococcal infections (nonspecific urethritis [NSU], nongonococcal urethritis [NGU], and nonspecific vaginitis [NSV]):
 - (1) Etiology: usually Chlamydial or ureaplasma infections.
 - (2) Chlamydia trachomatis is responsible for about 50 percent of NGU and NSU cases.
 - (3) Mode of transmission: direct contact with vaginal and urethral discharges during sexual intercourse.
 - (4) Incubation period: for men, 7 to 28 days; for women, hard to tell because of most women being asymptomatic.
 - c. Lymphogranuloma venereum (LGV):
 - (1) Etiology: Chlamydia trachomatis organism Types L 1 through 3.
 - (2) Mode of transmission: direct contact with open lesions or pus from draining lymph nodes.

NOTE: This disease is found mostly in tropical and subtropical areas.

- (3) Incubation period: 3 to 12 days or more.
 - d. Syphilis (lues):
 - (1) Etiology: *Treponema pallidum* (spirochete) is a delicate spiral organism
 - (2) Mode of transmission: direct contact with infectious exudates from obvious or concealed lesions of the skin, mucous membranes, and body fluids or secretions (saliva, semen, blood, and vaginal discharges) of infected persons during sexual contact. May also be transmitted transplacentally from the mother to the fetus after week 16. In rare cases, blood transfusions or needle sharing have spread the disease.
 - (3) Incubation period: 1 to 13 weeks, usually 3 to 4 weeks after initial contact.
 - e. Genital herpes simplex:
 - (1) Etiology: herpes simplex virus (HSV)--Type II and occasionally Type I.
 - (2) Mode of transmission: direct contact with ruptured vesicles during sexual contact.
 - (3) Incubation period: 4 to 7 days after contact.

NOTE: Condition recurs because the virus establishes latent infection and will reappear when immunity is low. If located in the genitals, it may infect the sacral sensory nerve ganglia.

- f. Chancroid:
 - (1) Etiology: *hemophilus ducreyi*--a short, slender bacillus with rounded edges.
 - (2) Mode of transmission: direct contact with discharges from genital ulcers and pus, if inguinal lymphatic nodes.
 - (3) Incubation period: 3 to 7 days.

Performance Steps

- g. Granuloma inguinale (donovanosis): It is one of the most common STDs in some developing countries.
 - (1) Etiology: *Calymmatobacterium granulomatis* is a Gram-negative bacterium.
 - (2) Mode of transmission: requires repeated close contact, usually sexual.
 - (3) Incubation period: 8 to 80 days.
- h. Trichomoniasis:
 - (1) Etiology: *Trichomonas vaginalis*, a flagellate protozoan, which is found in the genitourinary (GU) tract.
 - (2) Mode of transmission: direct contact with vaginal and urethral discharges of infected persons during sexual intercourse.
 - (3) Incubation period: symptoms may develop at any time.
- i. Genital warts:
 - (1) Etiology: caused by human wart viruses (60 different types currently known).
 - (2) Mode of transmission:
 - (a) Usually through sexual intercourse.
 - (b) Possible with autoinoculation by hand.
 - (3) Incubation period: usually several months.
- j. Molluscum contagiosum:
 - (1) Etiology: a pox virus distantly related to smallpox.
 - (2) Mode of transmission:
 - (a) Genital in adults: via sexual intercourse.
 - (b) Nongenital in children: via contact with lesions.
 - (3) Incubation period: an average of 2 to 3 months.

2. Perform a PE.

3. Recognize the signs and symptoms of STDs.

- a. Gonorrhea:
 - (1) Male: usually a triad of signs and symptoms:
 - (a) Anterior urethritis (2 to 4 days).
 - (b) Urethral discharge (yellow nonpurulent).
 - (c) Dysuria: described as "burning."

NOTE: About 10 percent of patients may have no symptoms or complaints.

- (2) Female and homosexual male:
 - (a) Vaginal or rectal discharge.
 - (b) Urethritis.
 - (c) Frequency of urination.
 - (d) Urgency of urination.
 - (e) Mild dysuria.
 - (3) Extragenital:
 - (a) Conjunctivitis, which is usually caused from a baby being born of a mother who is actively infected at time of birth.
 - (b) Pharyngitis may be asymptomatic or exudative.
 - (c) Proctitis may be asymptomatic or include pain and mucopurulent discharge.
- b. Nonspecific or nongonococcal infections (NSU, NGU, and NSV):
 - (1) Men:
 - (a) Mild dysuria and discomfort.
 - (b) Clear to mucopurulent discharge.

NOTE: More marked early in the morning when the lips of the meatus often are stuck together with dried secretions.

- (2) Women:
 - (a) Most asymptomatic. The disease may be picked up at papanicolaou (pap) smear.
 - (b) Vaginal discharge, dysuria, frequent pelvic pain, and dyspareunia.
- c. Lymphogranuloma venereum:
 - (1) Initially:

Performance Steps

- (a) A small, transient, nonindurated vesicular lesion.
- (b) Lesion ulcerates rapidly and heals quickly.
- (c) Lesion may go unnoticed.
- (2) Later:
 - (a) Unilateral, tender enlargement of the inguinal lymphatic node.
 - (b) Disease progresses to form a large, tender, fluctuant mass.
 - (c) Masses adhere to the deep tissues and have overlying red skin.
 - (d) Multiple sinuses develop, discharging purulent or blood-stained material.
 - (e) Fever, malaise, headaches, joint pains, anorexia, and vomiting. Backache is common in females.
 - (f) Rectal discharges (ulcerative proctitis).
- d. Syphilis (lues):
 - (1) Primary syphilis:
 - (a) Primary lesion or chancre appears within 4 weeks (at site of inoculation).
 - (b) Develops as a small, red papule that advances to a painless ulcer, with an indurated base.

NOTE: Lesion does not bleed, but when abraded, exudes a clear serum containing numerous *Treponema pallida* (*T. pallida*).

- (c) Regional lymphatic nodes become painlessly enlarged and rubbery.
- (d) Chancres may be found on lips, tongue, buccal mucosa, tonsils, or fingers.
- (2) Secondary syphilis "The Great Masquerader."
 - (a) Cutaneous rashes usually appear within 6 to 12 weeks after infection.
 - (b) Lesions may be transitory or persist for months. Will resolve, if untreated, but may reappear.
 - (c) Papules developing at the mucocutaneous junctions and in moist areas of the skin become hypertrophic, flattened, and dull pink or gray in color. These papules are called condylomata lata and are extremely infectious).
 - (d) Syphilitic skin rashes may imitate a variety of dermatologic conditions; for example, varicella, pityriasis rosea, tinea versicolor, psoriasis, seborrheic dermatitis, or acne vulgaris).
 - (e) Generalized lymphadenopathy.
 - (f) Mild symptoms of malaise, headache, anorexia, nausea, aching pains in bones, and fatigue.
 - (g) Patchy hair loss (alopecia)

NOTE: Signs and symptoms of secondary syphilis will clear spontaneously.

- (3) Latent syphilis (patient may be asymptomatic).
 - (a) Mucocutaneous relapses may occur during the first year.
 - (b) After 2 years, development of further contagious lesions are rare.
 - (c) May last for a few years or the rest of the patient's life.
- (4) Late or tertiary syphilis affects cardiovascular (CV) system, central nervous system (CNS), skin, and bones.
 - (a) Gummatous lesion formations (granulomatous).
 - (b) Tissues of entire body may be affected.
 - (c) CV syphilis (thoracic aneurysms and aortic insufficiency).
- (5) CNS syphilis:
 - (a) Paresis of the insane causes irritability, personality changes, headaches, insomnia, delusions of grandeur, and seizures.
 - (b) Tabes dorsalis (destroys the posterior columns of spinal cord. The first sign of tabes dorsalis is loss of vibratory sense. Then the following signs occur: decreased deep tendon reflexes, lightning pains (severe stabbing pains), paresthesia, and poor papillary response to light (Argyll Robertson, which can accommodate but cannot constrict to light).
 - (c) Visceral crisis is related to lightning pains. The most common pains are gastric, which can appear like acute abdomen with intense epigastric pain, nausea, and vomiting.

Performance Steps

- (d) Charcot's arthropathy (disorganization of joint), which manifests as unstable, painless, uninfamed, and markedly enlarged joints.
- e. Genital herpes simplex:
 - (1) Lesions on genitals (male and female).
 - (2) Itching and tingling or soreness precede erythema on skin or mucous membrane (prodrome). This may recur with each occurrence.
 - (3) Grouped vesicles on an erythematous base.
 - (4) Inguinal lymphatic nodes, slightly enlarged and tender, especially in primary infection.
 - (5) Circular erosions with a red areola--after vesicles rupture.
 - (6) Erosions become crusted and heal in 10 days; however, acquired immunodeficiency syndrome (AIDS) patients may ulcerate and heal with scars.
 - (7) Dysuria (cause of urethritis).
 - (8) Very contagious while lesion is present and may spread even if no lesion is present (asymptomatic shedding).
 - (9) Recurrences and relapses will occur periodically when the dormant virus becomes active because of a stimuli (for example, emotional and physical stress, trauma, and change in environment or climatic conditions). Most recurrences occur soon after initial infection.
- f. Chancroid:
 - (1) Small papules that rapidly break down to become shallow ulcers with ragged undermined edges.
 - (2) Not indurated.
 - (3) Painful.
 - (4) Ulcers often coalesce (grow together).
 - (5) Inguinal lymphatic nodes become tender, enlarged, and matted together, forming a fluctuant abscess (bubo).
- g. Granuloma inguinale (donovanosis):
 - (1) Primary lesion is an indurated nodule that erodes to a beefy, heaped ulcer. The lesion slowly progresses along with adjacent lesions, coalescing into a large, confluent ulcer.
 - (2) Organism invades monocyte cytoplasm visible on Wright's stain.
- h. Trichomoniasis:

NOTE: Most males are asymptomatic.

 - (1) Women have vaginitis with dysuria and dyspareunia.
 - (2) Women have copious greenish-yellow, frothy, fishy-smelling vaginal discharge associated with irritation and soreness of the vulva, perineum, and thighs.
 - (3) Males may have a transient, frothy, or purulent urethral discharge.
- i. Genital warts are flesh-colored verrucous papules or plaques.
- j. Molluscum contagiosum:
 - (1) Pinpoint papules gradually enlarge to umbilicated, dome-shaped papule.
 - (2) If lesion is scraped, a core of cheesy material is obtained.

4. Recognize significant lab findings for STDs.

a. Gonorrhea:

- (1) Lab smear: Gram stain of mucopurulent discharge.

NOTE: A Gram stain is almost 100 percent accurate in diagnosing gonorrhea in a male, but this is not true in a female.

- (2) Lab culture: material inoculated without delay at room temperature by using calcium alginate swab, Thayer-Martin medium, or Gen-Probe.

NOTES:

1. The material for diagnosis in the female should be obtained from multiple sites including the cervix, vaginal vault, and urethra and by milking of the Bartholin's and Skene's glands. Routinely, rectal and pharyngeal gonococcal cultures should be obtained from women and homosexual men.
2. All patients with suspected gonorrhea should be checked for syphilis by serologic tests for syphilis (STS) such as the Venereal Disease Research Laboratory (VDRL) or rapid plasma reagin (RPR) serum test. Also, check for human immunodeficiency virus (HIV) (AIDS).

b. Nonspecific or nongonococcal infections (NSU, NGU, and NSV):

Performance Steps

- (1) For men, perform a Gram stain to rule out gonorrhea.
- (2) For women, perform a wet preparation (prep) and culture to rule out gonorrhea, herpes, trichomonas, and candidiasis.
- (3) A gram stain of urethral or cervical discharge will show many polymorphonuclear leukocytes without bacteria on the inside (that is why this is called NGU).
- c. Lymphogranuloma venereum:
 - (1) Culture for Chlamydia.
 - (2) Use Chlamydia enzyme-linked immunosorbent assay (ELISA) on ulcer.
 - (3) Get LGV titers.
 - (4) Frei intradermal test, which uses antigen of killed Chlamydia.
- d. Syphilis (lues):
 - (1) Darkfield microscopy.
 - (a) Very useful since serologic evidence may not yet be positive with an early chancre. In fact, the darkfield is the first positive test for syphilis. Some AIDS patients will never have a positive STS nor specific tests. Syphilis is demonstrated with darkfield or by biopsy and special stains.
 - (b) Specimen of clear exudate (from chancre) examined for *T. pallidum*. However, use on an oral lesion will give incorrect results, because almost everyone has nonpathogenic spirochetes in the mouth.
 - (2) Serology:
 - (a) STS.
 - (b) VDRL test.
 - (c) RPR test.

NOTE: Screening tests should be confirmed by specific tests such as the fluorescent treponemal antibody absorption (FTA-ABS) test. Check for AIDS positivity (AIDS is much more easily spread with a concomitant ulcerative STD).

- e. Genital herpes simplex:
 - (1) Tzanck preparation, Wright-Giemsa, or Toluidine Blue stained smears of cells scraped from the bottom of the erosions.
- f. Chancroid:
 - (1) Perform a gram stain by exudating from base of ulcer or aspirating cells from bubo. Identify gram-negative bacillus in chains or groups.
 - (2) Generally will not grow on ordinary culture media. Special media containing fresh defibrinated rabbit's blood or the patient's own serum may be required.
- g. Granuloma inguinale (donovanosis):
 - (1) Wright stain of crushed preparation from the lesion will show mononuclear cytoplasmic inclusions.
 - (2) Cannot be cultured currently.
- h. Trichomoniasis:
 - (1) Microscopic examination of vaginal secretion will show the oval-shaped flagellate organisms.
 - (2) The motility of the organisms is readily observed.
- i. Genital warts are not diagnosed via lab studies.
- j. Molluscum contagiosum:
 - (1) Curettage and crush preparation.
 - (2) Biopsy (rarely required).

5. Manage STDs on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

- a. Gonorrhea:
 - (1) Urethritis, cervicitis, or proctitis.
 - (a) Ceftriaxone at 250 milligrams (mg) intramuscularly (IM) once. This is the drug of choice (DOC).
 - (b) Spectinomycin at 2 grams (g) IM once. (Use if patient is allergic to penicillin.)

Performance Steps

NOTE: Treat concomitantly for chlymidia with doxycycline 100 mg by mouth (PO) twice daily (b.i.d.) for (x) 7 days.

- (2) Pharyngeal:
 - (a) Ceftriaxone at 250 mg IM once.
 - (b) Ciprofloxacin at 500 mg PO once.
- (3) Ophthalmic: ceftriaxone at 1 g IM once, followed by copious irrigation of the eyes.
- (4) Disseminated gonococcal infection:
 - (a) Ceftriaxone at 1 g IM or intravenous (IV) every 24 hours (q24h).
 - (b) If patient is allergic to penicillin, prescribe spectinomycin at 2 g IM every 12 hours (q12h).
 - (c) After symptoms resolve, switch to oral medications of cefuroxime axetil at 500 mg PO b.i.d. x 7 days, amoxicillin at 500 mg with clavulanic acid PO three times a day (t.i.d.) x 7 days, or ciprofloxacin at 500 mg PO b.i.d. x 7 days.
- (5) Meningitis or endocarditis: ceftriaxone 1 to 2 g IV q12h for 10 to 14 days for meningitis and 4 weeks for endocarditis.
- (6) Neonatal and gonorrheal conjunctivitis of children: prescribe same antibiotics as adults, but adjust the strength on the basis of the child's weight.
- (7) Prevention of ophthalmia neonatorum:
 - (a) Erythromycin at 0.5 percent ophthalmic ointment once.
 - (b) Tetracycline at 1percent ophthalmic ointment once.
 - (c) Silver nitrate at 1percent aqueous solution once.
- b. Nonspecific and nongonococcal infections (NSU, NGU, and NSV).
 - (1) Doxycycline 100 mg PO b.i.d. x 7 days (DOC).
 - (2) Erythromycin 500 mg PO q6h x 7 days (in pregnant females).

NOTE: Treat relapses or complications with longer therapy (21 to 28 days).

- c. Lymphogranuloma venereum:
 - (1) Doxycycline at 100 mg PO b.i.d. x 21 days (DOC).
 - (2) Erythromycin at 500 mg PO q.i.d. x 21 days.
 - (3) Sulfisoxazole at 500 mg PO q.i.d. x 21 days.
 - (4) Fluctuant buboes should be aspirated, not incised. Abscesses and fistulas may require surgery.
 - (5) Keep patient under observation for 6 months.
- d. Syphilis (lues):
 - (1) Early (primary, secondary, or latent less than 1 year).
 - (a) Benzathine penicillin G at 2.4 million units IM once (DOC).
 - (b) If patient is allergic to penicillin (if in hospital, consider desensitization in intensive care unit [ICU]), prescribe erythromycin at 500 mg PO q.i.d. x 14 days or doxycycline at 100 mg PO b.i.d. x 14 days.

NOTE: Treatment failures can occur, need to follow titers of STS (usually RPR) at 0, 3, 6, 9, and 12 months. May need more vigorous treatment, if AIDS positive.

- (2) Latent over 1 year and later:
 - (a) Benzathine penicillin G at 2.4 million units IM every week (q/wk) x 3 weeks (DOC).
 - (b) If patient is allergic to penicillin, prescribe doxycycline at 100 mg PO b.i.d. x 4 weeks.
- (3) Neurosyphilis is diagnosed by symptoms and lumbar puncture.
 - (a) Aqueous penicillin G at 2.4 million units IV q4h x 10 to 14 days (DOC).
 - (b) Procaine penicillin G at 2.4 million units IM every day (q.d.) plus probenecid 500 mg PO q.i.d. x 10 to 14 days. Many would also give penicillin G benzathine at 2.4 million units 1/wk x 3 weeks after finishing the above treatment.
- (4) Congenital:
 - (a) Aqueous penicillin G at 50,000 units per kilogram (u/kg) IV q8h x 10 days (DOC).
 - (b) Procaine penicillin G at 50,000 u/kg IM q.d. for 10 to 14 days.
- e. Genital herpes simplex. No cure or vaccine available at this time.
 - (1) Indications for acyclovir:
 - (a) Immunosuppressed as a result of cancer or AIDS.
 - (b) Initial occurrence of herpes simplex, if seen less than 48 hours after blisters occur.

Performance Steps

- (c) If recurrent episodes are followed by erythema multiforms (skin reaction associated with iris or target lesions).
 - (d) If recurrences are very frequent or cause loss of employment.
 - (2) Keep lesions clean to prevent secondary bacterial infections.
 - (3) Use Domebro (aluminum subacetate) tablets as a soak to dry up vesicles (can make paste).
 - (4) Get STS and AIDS tests. With urethritis symptoms, check for gonorrhea and Chlamydia. If ulcer is present, consider chancroid and granuloma inguinal.
 - f. Chancroid:
 - (1) Ceftriaxone at 250 mg IM once.
 - (2) Erythromycin at 500 mg PO q.i.d. x 7 days.
 - (3) STS and AIDS test, to check for other STDs.
 - g. Granuloma inguinale (donovanosis):
 - (1) Most effective is chloramphenicol at 500 mg PO q8h x 3 weeks or gentamicin 1 milligram per kilogram (mg/kg) IM b.i.d. x 3 weeks.
 - (2) Doxycycline: 100 mg PO b.i.d. x 1 to 4 weeks.
 - h. Trichomoniasis:
 - (1) Metronidazole (Flagyl) at 2 g PO once or 500 mg PO b.i.d. x 7 days.
 - (2) According to the Centers for Disease Control (CDC), no alternative is available for a pregnant patient. Do not give metronidazole in the first trimester.
- NOTE: Remember drug interaction between Flagyl and alcohol (antabuse reaction).
- i. Genital warts:
 - (1) 25 percent podophyllum in tincture of Benzoin.
 - (2) Liquid nitrogen.
 - j. Molluscum contagiosum:
 - (1) Curettage, liquid nitrogen, or cantharone.
 - (2) Check for other STDs, if adult has molluscum.
6. Recognize significant complications of STDs:
- a. Gonorrhea:
 - (1) Epididymitis: usually unilateral.
 - (2) Prostatitis.
 - (3) Urethral strictures: occurs with repeated infections.
 - (4) Pelvic inflammatory disease (PID): major cause of infertility.
 - (5) Fallopian tube obstruction: major cause of infertility.
 - (6) Arthritis: monoarticular in sexually active adult with a few necrotic pustules (disseminated gonococcal infection).
 - b. Nonspecific or nongonococcal infections (NSU, NGU, and NSV).
 - (1) Epididymitis (men less than 35 years).
 - (2) Urethral stricture (women).
 - (3) Bartholinitis.
 - (4) Salpingitis (inflammation of fallopian tube) (may cause death).
 - (5) Chlamydial ophthalmia neonatorum.
 - c. Lymphogranuloma venereum:
 - (1) Genital elephantiasis.
 - (2) Rectal strictures.
 - d. Syphilis (lues):
 - (1) Tissue destruction.
 - (2) Periostitis: inflammation of membrane (periosteum) investing (ensheathing) a bone.
 - (3) Osteitis: inflammation of a bone.
 - (4) Cardiovascular involvement.
 - (5) Neural involvement.
 - e. Genital herpes simplex.
 - (1) Women who deliver soon after initial genital herpes simplex will have a high chance of having a child born with neonatal or congenital herpes.

Performance Steps

- (2) Recurrent genital herpes is by far the most common complication.
 - (3) Because herpes simplex is an erosion, AIDS can more easily be transmitted.
 - f. Chancroid:
 - (1) Phimosis (narrowness of preputial or vaginal orifice).
 - (2) Urethral stricture.
 - (3) Urethral fistula.
 - (4) Severe tissue destruction.
 - g. Granuloma inguinale (donovanosis):
 - (1) Fibrosis, vaginal bleeding, phimosis, and depigmentation.
 - (2) Distant sites infected such as head (mouth, lips, throat, and face) liver, thorax, or bones.
 - h. Trichomoniasis:
 - (1) Epididymitis (male).
 - (2) Prostatitis (male).
 - (3) Bartholinitis (female), which is rare.
 - (4) Urethritis.
 - (5) Cystitis.
 - i. Genital warts:
 - (1) Cervical cancer.
 - (2) Squamous cell carcinoma in situ (has not invaded dermis) in men and women.
 - (3) Slow-growing squamous cell carcinoma.
 - j. Molluscum contagiosum complications: If an adult presents with facial molluscum contagiosum, suspect AIDS.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage STDs.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with STDs.	—	—
2. Performed a PE.	—	—
3. Recognized the signs and symptoms of STDs.	—	—
4. Recognized significant lab findings for STDs.	—	—
5. Managed STDs on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Recognized significant complications of STDs.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Epididymitis**081-833-4136**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Solicited a patient history.
 2. Recognized significant subjective findings for epididymitis.
 - a. Severe pain with gradual onset in scrotum. The pain radiates into the groin and abdomen and follows the distribution of the vas deferens.
 - b. Often following physical strain, trauma, or prolonged sexual excitement.
 3. Perform a PE.
 4. Recognize significant objective findings for epididymitis:
 - a. Testicular swelling, erythema, and calor.
 - b. Local mass leading to hydrocele or hematocoele. (This does not always occur.)
 - c. Bloody ejaculate or urethral discharge.
- NOTE:** Rule out testicular torsion early. Refer for early surgical intervention a testicular torsion that cannot be manually resolved.
5. Recognize significant lab findings for epididymitis.
 - a. White blood cells (WBCs) may show leukocytosis.
 - b. Urinalysis may be normal. If positive for bacteria, perform a Gram stain and culture of urethral discharge or urine to isolate the causative organism.
 6. Manage epididymitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Fluoroquinolones antibiotics (ciprofloxacin 500 milligrams [mg] by mouth [PO] twice daily [b.i.d.] for [x] 7 days or norfloxacin 400 mg PO b.i.d. x 7 days).
 - b. Analgesics.
 - c. Scrotal support to raise the testicles.
 - d. Sitz baths.
 - e. Ice.
 - f. Bedrest.
 7. Record all treatment in the patient's medical record.
 8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage epididymitis.

Performance Measures

1. Solicited a patient history.
2. Recognized significant subjective findings for epididymitis.
3. Performed a PE.

GO NO GO

_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Recognized significant objective findings for epididymitis.	_____	_____
5. Recognized significant lab findings for epididymitis.	_____	_____
6. Managed epididymitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Recorded all treatment in the patient's medical record.	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Phimosis/Paraphimosis

081-833-4138

Conditions: Given warm water, gauze sponges, surgical instrument set for minor surgery, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions of phimosis and paraphimosis.
 - a. Phimosis: inability to retract foreskin over the glans.
 - b. Paraphimosis: inability to replace foreskin over glans.
2. Solicit a patient history.
3. Recognize significant subjective findings for phimosis and paraphimosis.
 - a. Patient will relate a history of one of the above definitions.
 - b. History should include sexual partners as both conditions can be caused by sexually transmitted infections.
4. Perform a PE.
5. Recognize significant objective findings for phimosis and paraphimosis.
 - a. Phimosis will have the following:
 - (1) Contracted, narrow foreskin opening.
 - (2) Erythema and edema of foreskin with tenderness.
 - (3) Purulent discharge between glans and foreskin.
 - b. Paraphimosis will have the following:
 - (1) Increasing edema with increasing pain and tenderness of glans. Foreskin functions like a constricting band and occludes venous return.
 - (2) If unmanaged, process can go to arterial occlusion and develop gangrene of the glans.
6. Manage phimosis and paraphimosis.
 - a. Manage phimosis with the following:
 - (1) Heat soaks three times a day (t.i.d.) as long as needed.
 - (2) Dynapen at 250 milligrams (mg) by mouth (PO) four times a day (q.i.d.) for (x) 7 days or Kflex at 250 mg PO q.i.d. x 7 days.
 - (3) If marked infection is present that is uncontrolled by antibiotics, a dorsal slit of the foreskin may be required to restore circulation.
 - (4) Definitive management is to circumcise the patient after the infection is controlled.
 - b. Manage paraphimosis with the following:
 - (1) Manual reduction by squeezing the glans slowly, but firmly, for 5 minutes to reduce its size. Then push the glans back proximally while moving the foreskin forward distally.
 - (2) Dorsal incision of constricting foreskin if manual reduction fails.
 - (3) Definitive management is to circumcise the patient after inflammation and edema have subsided.
7. Treat complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage phimosis and paraphimosis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions of phimosis and paraphimosis.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for phimosis and paraphimosis.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for phimosis and paraphimosis.	_____	_____
6. Managed phimosis and paraphimosis.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Urolithiasis**081-833-4142**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, and pain medications.

Standards: Solicit a patient history, perform a physical examination PE, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pain medication without causing further harm.

Performance Steps

1. Recognize the possible causes of urolithiasis.
 - a. Calcium causes 80 percent of all kidney stones.
 - b. Uric acid stones account for most of the other cases of kidney stones.
2. Solicit a patient history.
3. Recognize significant subjective findings for urolithiasis.
 - a. Ureteral colic will be the dominant symptom.
 - (1) Movement of pain with movement of stone (starts high and moves down).
 - (2) Radiation of pain to back, flank, groin, and testicle (follows the ureter and/or urethral distribution).
 - (3) Pain is severe (pain dissipates when stone is passed to bladder), excruciating, colicky, radiating to back, and comes and goes (not uncommon to pass out from this pain).
 - b. Gastrointestinal (GI) symptoms such as nausea, vomiting, abdominal distention, and the clinical picture of ileus may obscure the urinary origin of the problem.
4. Perform a PE.
5. Recognize significant objective findings for urolithiasis.
 - a. Costovertebral angle tenderness (CVAT).
 - b. Gross hematuria.
 - c. Fever.
6. Recognize significant lab findings for urolithiasis.
 - a. Hematuria.
 - b. Calcium or urate crystals found on microscopic exam of the urine.
 - c. Intravenous pyelogram will show a filling defect at the level of the obstructing stone. X rays will show calcium stones. However, uric acid stones are radiolucent.
7. Differentiate between urolithiasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Ileus.
 - b. Appendicitis. (Only if right ureter is involved.)
 - c. Hernia or testicular torsion if the stone has descended and the patient is complaining of pain in the groin area.
8. Manage urolithiasis.
 - a. Strain all urine for evidence of stones. Stones should be evaluated by crystallography, if available, to determine their type. This information will be used to develop a prophylactic regimen after the acute condition is controlled.
 - b. Prescribe morphine or Demerol for pain.
 - c. Patient's kidney may fail. Appropriate supportive measures should be prepared in the event of a kidney failure.
 - d. Occasionally, surgery or lithotripsy are required to remove large stones or a large number of small stones.

Performance Steps

9. Record all treatment in the patient's medical record.
10. Refer the patient to urology for development of a prophylactic regimen to prevent or limit recurrence.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage urolithiasis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the possible causes of urolithiasis.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for urolithiasis.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for urolithiasis.	_____	_____
6. Recognized significant lab findings for urolithiasis.	_____	_____
7. Differentiated between urolithiasis and other diseases with similar signs and symptoms.	_____	_____
8. Managed urolithiasis.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Referred the patient to urology for development of a prophylactic regimen to prevent or limit recurrence.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Prostatitis

081-833-4144

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for prostatitis.
 - a. Urinary triad (frequency, urgency, and dysuria) with possible nocturia.
 - b. Low back pain, rectal pain, or perineal itching.
 - c. Discomfort during bowel movement.
3. Perform a PE.
4. Recognize significant objective findings for prostatitis.
 - a. Generally no fever, but when present the degree of fever depends on the severity of infection.
 - b. Swollen prostate gland on rectal exam:
 - (1) Chronic prostatitis will present as a nontender prostate.
 - (2) Acute prostatitis will present as an exquisitely tender, hot, swollen, and fluctuant or boggy prostate ("hot potato").
 - c. Urethral discharge and cloudy urine.
5. Recognize significant lab findings for prostatitis.
 - a. Blood findings will be normal in chronic prostatitis, leukocytosis will be present in acute disease.
 - b. Urine will show increased white blood cells especially after prostatic massage (must be performed gently).
6. Manage prostatitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Sitz baths and stool softeners.
 - b. Analgesics.
 - c. Bedrest.
 - d. Avoid ethyl alcohol (ETOH), coffee, tea, and spicy foods that produce rapid bladder expansion and/or further irritate or inflame the prostate.
 - e. Do not use instrumentation (catheterization), thereby avoiding a rupture.
 - f. Follow up in 1 month with postmanagement by using lab tests. These lab tests will prevent the possibility of an inadequately managed case that could develop into chronic prostatitis.
 - g. Antibiotics for a single acute episode are fluoroquinolones (ciprofloxacin 500 milligrams [mg] by mouth [PO] twice daily [b.i.d.] for (x) 14 days or norfloxacin 400 mg PO b.i.d. x 14 days.)
 - h. Management for chronic-intermittent episodes of acute prostatitis is as follows:
 - (1) Ciprofloxacin 500 mg b.i.d. x 6 weeks for an 80 percent cure. Septra double strength (DS), one tablet b.i.d. x 12 weeks for a 33 percent cure.
 - (2) Massage prostate every week (q/wk) x 3 to 4 weeks.
 - (3) Follow-up at 3, 6, 9, 12, 18, and 24 weeks with lab tests. Refer to urologist, if possible.
7. Recognize possible complications of prostatitis.
 - a. Acute prostatitis:

Performance Steps

- (1) Acute urine retention.
- (2) Ruptured abscess--if present.
- (3) Systemic infection.
- b. Chronic prostatitis:
 - (1) Chronic cystitis.
 - (2) Epididymitis and urethral stricture.
 - (3) Fibrosis of prostate gland.

8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage prostatitis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	_____	_____
2. Recognized significant subjective findings for prostatitis.	_____	_____
3. Performed a PE.	_____	_____
4. Recognized significant objective findings for prostatitis.	_____	_____
5. Recognized significant lab findings for prostatitis.	_____	_____
6. Managed prostatitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Recognized possible complications of prostatitis.	_____	_____
8. Treated complications symptomatically with appropriate supportive care.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Testicular Masses

081-833-4146

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions of the various terms associated with testicular masses.
 - a. Varicocele: varicose veins of spermatic cord.
 - b. Hydrocele: accumulation of sterile fluid within the tunica vaginalis.
 - c. Hematocele: accumulation of blood within the tunica vaginalis.
 - d. Spermatocele: spermatic cyst that occurs adjacent to the epididymis and usually contains sperm.
 - e. Inguinal hernia: herniation of a portion of the intestine into the scrotal compartment.
 - f. Testicular tumor: solid malignancy in the testis that arises from a primordial germ cell.
2. Solicit a patient history.
3. Recognize significant subjective findings for testicular masses.
 - a. Varicocele will have the following:
 - (1) Patient history of fullness and possibly of infertility.
 - (2) Testicle rarely tender or painful.
 - b. Hydrocele will have the following:
 - (1) Scrotal mass that may be painful.
 - (2) Possibly caused by a congenital condition.
 - c. Hematocele will have the following:
 - (1) Painful mass.
 - (2) Probable patient history of trauma.
 - d. Spermatocele will have the following:
 - (1) Scrotal mass that is rarely painful, but large.
 - (2) Patient may complain of a "third testical."
 - e. Inguinal hernia will have the following:
 - (1) Scrotal mass.
 - (2) Possibly patient history of straining or lifting.
 - f. Testicular tumor will have the following:
 - (1) History of recent, rapid weight loss.
 - (2) Anorexia.
4. Perform a PE.
5. Recognize significant objective findings for testicular masses.
 - a. Varicocele will have the following:
 - (1) Visible distention.
 - (2) Palpable "bag of worms" that disappears in supine position.
 - b. Hydrocele will have the following:
 - (1) Mass surrounds the testicle and moves with the testicle.
 - (2) Mass transilluminates light. It is filled with fluid that allows light to pass.
 - c. Hematocele will have the following:
 - (1) Mass that surrounds the testicle and moves with the testicle.
 - (2) Mass that does not transilluminate light because it is filled with blood.

Performance Steps

- d. Spermatocoele will have the following:
 - (1) A large mass located above and distinct from the testicle.
 - (2) The mass transilluminates light.
 - e. Inguinal hernia will have the following:
 - (1) Scrotal mass that prevents complete palpation of the spermatic cord into the inguinal ring.
 - (2) Auscultation may reveal bowel signs if a loop of bowel is positioned in scrotum.
 - f. Testicular tumor will have the following:
 - (1) Painless lump on testicles or an increase in size of testicle. Firm, nontender, hard mass that is embedded in the testicle.
 - (2) Gynecomastia (10 percent of cases) caused by a mass secreting chorionic gonadotropin.
 - (3) Metastasis to inguinal, supraclavicular, or axillary lymph nodes is highly probable.

Examine these areas specifically.
6. Manage testicular masses.
- a. Manage varicocele with the following:
 - (1) Scrotal support.
 - (2) Definitive management is varicocelectomy by means of ligating the spermatic vein at the internal ring. Refer patient to urology (only required if patient is symptomatic).
 - b. Manage hydrocele with the following:
 - (1) Scrotal support.
 - (2) Definitive management is hydrocelectomy. Refer patient to urology (only required if patient is symptomatic).
 - c. Manage hematocele with the following:
 - (1) Scrotal support.
 - (2) Definitive management is hematocelectomy. Refer patient to urology (only required if patient is symptomatic).
 - d. Manage spermatocoele with the following:
 - (1) Scrotal support.
 - (2) Definitive management is spermatocelectomy. Refer patient to urology (only required if patient is symptomatic).
 - e. Manage inguinal hernia with the following:
 - (1) Scrotal support.
 - (2) Immediate evacuation for surgery because of the probability of progression and the possibility of incarceration and strangulation of the bowel leading to peritonitis.
 - f. Manage testicular tumor with immediate evacuation for surgery because of the possibility of metastasis.
7. Treat complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a testicular mass.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions of the various terms associated with testicular masses.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for testicular masses.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for testicular masses.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
6. Managed testicular masses	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Testicular Torsion

081-833-4148

Conditions: Given The Merck Manual, patient's medical record, and a selection of pain medications.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pain medications in accordance with The Merck Manual without causing further harm.

Performance Steps

1. Solicit a patient history.
 2. Recognize significant subjective findings for testicular torsion.
 - a. Exquisite testicular pain caused by twisting of spermatic cord.
 - b. Pain worse with testicular elevation.
 - c. Nausea and vomiting.
 3. Perform a PE.
 4. Recognize significant objective findings for testicular torsion.
 - a. Testicle is elevated and rotated.
 - b. Epididymis is anteriorly presented.
 - c. Fever is present.
 5. Manage testicular torsion.
- NOTE: Perform detorsion within 4 to 6 hours. Detorsion is a genitourinary emergency.
- a. Detorsion may be accomplished by rotating the affected testicle one-half turn. Remember, normal testicles will present "like an open book." The affected testicle will normally present with the epididymis toward the front. This is only a temporary solution to buy time until surgical intervention can be obtained.
 - b. Pain management with narcotics is indicated.
 - c. Orchiopexy is required; therefore, refer patient to urology for bilateral definitive surgical management.
6. Record all treatment in the patient's medical record.
 7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage testicular torsion.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	—	—
2. Recognized significant subjective findings for testicular torsion.	—	—
3. Performed a PE.	—	—
4. Recognized significant objective findings for testicular torsion.	—	—
5. Managed testicular torsion.	—	—
6. Recorded all treatment in the patient's medical record.	—	—
7. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Subject Area 14: OBGYN Conditions

Assess Gynecological Infections

081-833-4302

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the cause of the disease without causing further harm.

Performance Steps

1. Determine the possible cause of pelvic pain.
 - a. Dysmenorrhea is menstrual pain. It is the most common cause of pelvic pain in females.
 - b. Premenstrual syndrome (PMS) (premenstrual tension) is a distinct clinical entity. PMS involves a cluster of physical and psychological symptoms preceding menstruation that are limited to a week or 10 days and are relieved by onset of the menses. Known precipitating factors include an increase in antidiuretic hormone and aldosterone secretion and estrogen-progesterone imbalance.
 - c. Pelvic inflammatory disease (PID) is any acute, subacute, recurrent, or chronic infection of the oviducts and ovaries, with adjacent involvement.
 - (1) Cervicitis: inflammation of the cervix.
 - (2) Endometritis: inflammation of the endometrium.
 - (3) Endometriosis: ectopic endometrium located in various sites throughout the pelvis or on the abdominal wall.
 - (4) Salpingitis and oophoritis: infection of the fallopian tubes and ovaries.
 - (5) Ovarian cyst: usually nonneoplastic sacs on an ovary that contain fluid or semisolid material.
 - (6) Bartholin's abscess: acute or chronic infection of the Bartholin's gland (streptococci, staphylococci, Escherichia coli [E. coli], and anaerobes).
2. Leukorrhea is a white to yellowish mucoid discharge from cervical canal or vagina.
 - a. Probably most frequently encountered gynecological symptom.
 - b. Generally associated with simple infection of the cervix and vagina such as the following:
 - (1) Moniliasis or candidiasis: yeast infections.
 - (2) Trichomonas vaginitis: flagellate protozoan.
 - (3) Bacterial vaginitis: Gardnerella vaginitis.
3. Recognize the signs and symptoms of PMS.
 - a. Physical.
 - (1) Painful and swollen breast.
 - (2) Bloating.
 - (3) Abdominal pain.
 - (4) Headache and back pain.
 - b. Psychologically.
 - (1) Depression.
 - (2) Anxiety.
 - (3) Irritability.
 - (4) Behavioral changes.
4. Recognize the signs and symptoms of cervicitis.
 - a. Acute cervicitis.
 - (1) Purulent, foul-smelling vaginal discharge.
 - (2) Itching and/or burning sensation.
 - (3) Red, edematous cervix.

Performance Steps

- (4) Pelvic discomfort.
 - (5) Sexual dysfunction leading to infertility.
- b. Chronic cervicitis.
 - (1) Cervical dystocia: difficult labor.
 - (2) Lacerations or eversion of the cervix.
 - (3) Ulceration or vesicular lesions (when cervicitis results from Herpes simplex).
5. Recognize the signs and symptoms of salpingitis and oophoritis.
 - a. Lower abdominal pain sometimes with signs and symptoms of acute abdomen can be unilateral or bilateral.
 - b. Fever.
 - c. Severe pain with palpation of the cervix, uterus, and adnexa (Chandelier sign).
 - d. Purulent cervical discharge.
 - e. Leukocytosis.
6. Recognize the signs and symptoms of endometritis and endometriosis.
 - a. Low back and low abdominal pain.
 - b. Dysmenorrhea.
 - c. Menorrhagia.
 - d. Pain on defecation and constipation.
 - e. Sterility.
7. Recognize the signs and symptoms of ovarian cyst.
 - a. Ovarian cysts are frequently asymptomatic, but the pressure of an abnormal mass may cause discomfort, aching, or heaviness to the pelvic region and on abdominal organs.
 - b. Sudden or sharp pain may indicate rupture, hemorrhage, or torsion.
 - c. Fever, leukocytosis, or signs and symptoms of shock may be present.
8. Recognize the signs and symptoms of various types of vaginitis.
 - a. Moniliasis or candidiasis.
 - (1) Marked leukorrhea, marked redness of vulva, and extreme pruritus.
 - (2) White, creamy, cheesy, sweet-smelling discharge, and thrush patches.
 - (3) Commonly seen in pregnancy, diabetics, women on birth control pills or antibiotics (ampicillin).
 - b. Trichomonas vaginitis.
 - (1) Leukorrhea, vaginal soreness, burning, pruritus, and dyspareunia (pain during intercourse).
 - (2) Bubbly, yellowish, thick, foul-smelling discharge.
 - (3) Strawberry appearance of cervix.
 - c. Bacterial vaginitis.
 - (1) Leukorrhea, pruritus, and dyspareunia.
 - (2) Turbid, chalky, white to gray or yellowish, malodorous ("fishy") discharge.
9. Recognize the signs and symptoms of Bartholin's abscess.
 - a. Mass in perineum that is hot, tender, and fluctuant.
 - b. Pus draining from Bartholin's duct.
10. Recognize the signs and symptoms of various breast abnormalities.
 - a. Acute mastitis.
 - (1) Pain in the breast.
 - (2) Patient withdraws from palpation.
 - (3) Erythema.
 - (4) Induration.
 - (5) Chalor of the affected area.
 - b. Chronic cystic mastitis (fibrocystic syndrome).
 - (1) Single or multiple cysts.
 - (2) Pain and tenderness.

Performance Steps

- (3) Nodular, well-defined cysts.
- (4) Smooth, firm, and mobile cysts.
- c. Primary malignancy of the breast.
 - (1) Persistent lump or thickening and hard, irregular mass.
 - (2) Fixation: tumor invades surrounding tissue.
 - (3) Dimpling: shortening of Cooper's ligament.
 - (4) Nipple retraction, scaliness, or discharge.
 - (5) Invade skin: satellite nodules or ulcers in the skin.
 - (6) Peau d'orange: invasion of lymphatics causes edema.
 - (7) Hard, matted, fixed axillary or supraclavicular nodes.
 - (8) Bloody nipple discharge.
 - (9) Metastasizes most commonly to bone (bone pain and fracture), lymph nodes, liver, and skin.
 - (10) Pain or tenderness.

NOTE: Task 081-833-4304, Manage Gynecological Infections, contains further information on the above conditions.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess gynecological infections.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined the possible cause of pelvic pain.	_____	_____
2. Recognized leukorrhea.	_____	_____
3. Recognized the signs and symptoms of PMS.	_____	_____
4. Recognized the signs and symptoms of cervicitis.	_____	_____
5. Recognized the signs and symptoms of salpingitis and oophoritis.	_____	_____
6. Recognized the signs and symptoms of endometritis and endometriosis.	_____	_____
7. Recognized the signs and symptoms of ovarian cyst.	_____	_____
8. Recognized the signs and symptoms of various types of vaginitis.	_____	_____
9. Recognized the signs and symptoms of Bartholin's abscess.	_____	_____
10. Recognized the signs and symptoms of various breast abnormalities.	_____	_____
11. Recorded all findings in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

RelatedBATES PE, 8TH ED. 2002
SANFORD, 1999

Manage Gynecological Infections

081-833-4304

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with dysmenorrhea.
NOTE: Steps 1 and 2 pertain to dysmenorrhea.
 - a. Definition: menstrual pain.
 - b. Etiology:
 - (1) Obstruction and anatomical cervical stenosis, fibroids, anteflexion of uterus, and pelvic inflammatory disease (PID).
 - (2) Endocrine: excessive production of prostaglandin F2 and F2a. The excessive F2 and F2a intensify uterine contraction.
 - (3) Possible contributing factors include hormonal imbalances and psychogenic factors (of mental origin).
2. Management of dysmenorrhea is based on the following:
 - a. Nonsteroidal anti-inflammatory drugs (NSAIDs).
 - b. Oral contraceptive.
 - c. Adequate rest and sleep and regular exercise may be beneficial.
 - d. Heating by use of baths, soaks, showers, and heating pad.
 - e. Muscle relaxants, as necessary, for cramping.
 NOTE: Steps 3 to 8 pertain to premenstrual syndrome (PMS) (premenstrual tension).
3. Understand the definitions, etiology, and pathophysiology associated with PMS (premenstrual tension).
 - a. PMS is a distinct clinical entity. PMS is characterized by a cluster of physical and psychological symptoms preceding menstruation that are limited to a week or 10 days and are relieved by onset of menses. Known precipitating factors include an increase in antidiuretic hormone and aldosterone secretion and as estrogen-progesterone imbalance.
 - b. PMS increases with age and body weight.
 - c. PMS is uncommon in women in their teens and twenties.
4. Solicit a patient history.
5. Recognize significant subjective findings for PMS.
 - a. Headache.
 - b. Back pain.
 - c. Depression.
 - d. Anxiety.
 - e. Irritability.
 - f. Behavioral changes.
6. Perform a PE.
7. Recognize significant objective findings for PMS.
 - a. Painful and swollen breast.

Performance Steps

b. Bloating.

8. Management of PMS is based on the following:

- a. No drug therapy unless needed.
- b. Routine of regular sleep and exercise.
- c. Decreased salt intake, which relieves bloating and edema.
- d. Analgesics for pain. For pain, acetylsalicylic acid (ASA) 600 milligrams (mg) by mouth (PO) every 4 to 6 hours (q4/6h) as needed (prn).
- e. Diuretics to reduce fluid retention.
- f. Tranquilizer drugs for mood changes are a last resort. Diazepam 2 to 5 mg three times a day (t.i.d.) by mouth (PO).

NOTE: Step 9 pertains to PID.

9. Understand the definitions, etiology, and pathophysiology associated with PID.

- a. Definition: PID is any acute, subacute, recurrent, or chronic infection of the oviducts and ovaries with adjacent involvement.
- b. Sites: PID includes inflammation of the cervix (cervicitis), uterus (endometritis), fallopian tubes (salpingitis), and ovaries (oophoritis) which can extend to the connective tissue lying between the broad ligaments (parametritis).

NOTE: Steps 10 through 14 pertain to cervicitis.

10. Understand the definitions, etiology, and pathophysiology associated with cervicitis.

- a. Definition: inflammation of the cervix.
- b. Causative organisms: gonococcus, streptococcus, staphylococcus, aerobic and anaerobic organisms, herpes virus, and chlamydia.
- c. Forms of cervicitis: acute and chronic.

11. Solicit a patient history.

- a. Recognize significant subjective findings for acute cervicitis.
 - (1) Itching and/or burning sensation.
 - (2) Pelvic discomfort.
 - (3) Sexual dysfunction leading to infertility.
- b. Recognize significant subjective findings for chronic cervicitis.
 - (1) Dyspareunia.
 - (2) Cervical dystocia (difficult labor).

12. Perform a PE.

- a. Recognize significant objective findings for acute cervicitis.
 - (1) Purulent, foul-smelling vaginal discharge.
 - (2) Red, edematous cervix.
 - (3) Cervical palpation reveals tenderness.
- b. Recognize significant objective findings for chronic cervicitis.
 - (1) Lacerations or eversion of the cervix.
 - (2) Ulceration and vesicular lesions (when cervicitis results from Herpes simplex).

13. Recognize significant lab findings that are caused by cervicitis.

- a. Cultures for *Neisseria gonorrhoeae* (N. gonorrhea) are positive greater than 90 percent of the time with acute cervicitis.
- b. For chronic cervicitis, causative organisms are usually staphylococcus or streptococcus.

14. Manage acute cervicitis on the basis of culture results and identification of the causative organism by using the treatment modalities in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

NOTE: Antimicrobial therapy for the causative organism of chronic cervicitis may be started; however, definitive treatment involves cauterization, cryotherapy, or conization (excision of a cone of tissue). Refer the patient to obstetrics and gynecology (OB-GYN).

Performance Steps

- a. N. gonorrhoeae: ceftriaxone 125 milligrams (mg) intramuscularly (IM) single dose PLUS treatment (tx) for Chlamydial (C.) trachomatis of doxycycline 100 mg PO twice daily (b.i.d.) x 7 days. Since 50 percent of patients have concomitant infection with C. trachomatis, treat for both.
- b. Alternate for N. Gonorrhoeae: cefixime 400 mg PO single dose or cipro 500 mg PO single dose.
- c. Alternate for C. trachomatis: azithromycin 1 gram (g) PO single dose.

NOTE: Steps 15 to 19 pertain to endometritis.

- 15. Understand the definitions, etiology, and pathophysiology associated with endometritis and endometriosis.
 - a. Definition: inflammation of the endometrium.
 - b. Etiology of endometritis: produced by bacterial infection--most commonly staphylococci, colon bacilli, or gonococci--and trauma and septic abortion.
 - c. Etiology of endometriosis: ectopic endometrium located in various sites throughout the pelvis or on the abdominal wall.
 - d. Sites: uterine ligaments (uterosacral, broad, round) and ovaries (extra-uterine locations).
- 16. Solicit a patient history.
- 17. Recognize significant subjective findings for endometritis and endometriosis.
 - a. Low back and low abdominal pain.
 - b. Dysmenorrhea.
 - c. Pain on defecation and constipation.
- 18. Perform a PE.
- 19. Recognize significant objective findings for endometritis and endometriosis.
 - a. Deep palpation solicits abdominal guarding.
 - b. Sterility.
 - c. Possible palpable pelvic mass.
 - d. Pelvic examination may reveal visible lesions on the vulva or cervix.

NOTE: Lab findings will generally be unremarkable. With endometritis, white blood cell (WBC) count may be elevated.

- 20. Manage endometritis and endometriosis.
 - a. Management of endometritis with antibiotic therapy will be based on the treatment modality for the specific organism in the most current edition of The Sanford Guide to Antimicrobial Therapy.
 - b. Management of endometriosis is based on either administration of drugs that suppress ovarian function and arrest the growth of the endometrial cells or surgery to remove extra-uterine tissue or a combination of both. These patients should be referred to OB-GYN.

NOTE: Steps 21 through 28 pertain to salpingitis and oophoritis.

- 21. Understand the definitions, etiology, and pathophysiology associated with salpingitis and oophoritis.
 - a. Definition: infection of the fallopian tubes and ovaries.
 - b. Etiology: occur predominantly in women under the age of 35 who are sexually active and result from microorganisms transmitted most commonly by intercourse.
 - c. Pathophysiology: Infection begins vaginally in most cases and spreads upward. Although symptoms usually predominate on one side, both sides are probably affected.
- 22. Solicit a patient history.
- 23. Recognize significant subjective findings for salpingitis and oophoritis.
 - a. Usually recent sexual intercourse, insertion of an intrauterine device (IUD) or a recent childbirth or abortion.
 - b. Lower abdominal pain.
 - c. Onset shortly after menses.

Performance Steps

24. Perform a PE.

25. Recognize significant objective findings for salpingitis and oophoritis.

- a. Lower abdominal pain sometimes with signs and symptoms of acute abdomen can be unilateral or bilateral.
- b. Fever.
- c. Severe pain with palpation of the cervix, uterus, and adnexa (Chandelier sign).
- d. Purulent cervical discharge.

26. Recognize significant lab findings that are caused by salpingitis and oophoritis.

- a. Leukocytosis.
- b. Culture of discharge may be positive for gonococcal (GC), Chlamydia, or other causative organisms. Chlamydia is now the most common causative organism.
- c. Erythrocyte sedimentation rate (ESR) is usually elevated.

27. Differentiate between salpingitis and oophoritis and other diseases with similar signs and symptoms.

Consider the following diseases:

- a. Appendicitis.
- b. Ectopic pregnancy.

NOTE: Surgical emergencies must be ruled out. If in doubt, evacuate the patient for surgical intervention.

28. Manage salpingitis and oophoritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following are acceptable as of this writing:

- a. N. Gonorrhoeae: ceftriaxone 125 mg IM single dose PLUS tx for C. trachomatis of doxycycline 100 mg PO b.i.d. x 7 days. Since 50 percent of patients have concomitant infection with C. trachomatis, treat for both.
- b. Alternative oral regimen: ofloxacin 400 mg PO b.i.d. x 14 days PLUS metronidazole 500 mg PO b.i.d. x 14 days.
- c. Intravenous (IV) fluids to correct dehydration.
- d. Nasogastric (NG) suction in the presence of abdominal distention or ileus.
- e. Bedrest and restrict oral feedings.

NOTE: Steps 29 through 37 pertain to moniliasis or candidiasis.

29. Recognize the signs and symptoms associated with moniliasis or candidiasis (yeast infection).

- a. Marked leukorrhea, marked redness of vulva, and extreme pruritus.
- b. White, creamy, cheesy, sweet-smelling discharge, and thrush patches.
- c. Commonly seen in pregnancy, diabetics, and women on birth control pills or antibiotics (ampicillin).

30. Perform a potassium hydroxide (KOH) preparation, and examine for characteristic branching hyphae or mycelium fungus nails.

31. Manage yeast infection with nystatin intravaginal adult tablets 0.1 to 0.2 million units daily for 7 to 10 days.

32. Recognize the signs and symptoms associated with trichomonas vaginitis.

- a. Leukorrhea, vaginal soreness, burning, pruritus, and dyspareunia (pain during intercourse).
- b. Bubbly, yellowish, thick, foul-smelling discharge.
- c. Strawberry appearance of cervix.

33. Perform a wet preparation. Microscopic examination will reveal a pear-shaped parasite with long flagella and undulated (wavy outline in appearance) cell membrane.

34. Manage trichomonas vaginitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

Performance Steps

- a. Drug of choice (DOC): metronidazole 2 g PO single dose.
- b. Pregnancy: clotrimazole 100 mg vaginal tablets at bedtime (h.s.) every day (q.d.) x 2 weeks.

NOTE: Treat asymptomatic male sex partners concomitantly.

- 35. Recognize the signs and symptoms associated with bacterial vaginitis (*Gardnerella vaginitis*).
 - a. Leukorrhea, pruritus, and dysparunia.
 - b. Turbid, chalky, white to gray or yellowish, malodorous ("fishy") discharge.
- 36. Perform a Gram stain of vaginal discharge. Microscopic examination will reveal gram-positive nonmotile coccobacillus.
- 37. Manage bacterial vaginitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC: metronidazole (flagyl) 500 mg b.i.d. PO for 7 days.
 - b. Alternate: clindamycin 300 mg PO b.i.d. x 7 days.

NOTE: About 25 percent of the patients have recurrence and require treatment in 2 to 3 months.

- 38. Record all treatment in the patient's medical record.
- 39. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage gynecological conditions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with dysmenorrhea.	—	—
2. Managed dysmenorrhea.	—	—
3. Understood the definitions, etiology, and pathophysiology associated with PMS (premenstrual tension).	—	—
4. Solicited a patient history.	—	—
5. Recognized significant subjective findings for PMS.	—	—
6. Performed a PE.	—	—
7. Recognized significant objective findings for PMS.	—	—
8. Managed PMS.	—	—
9. Understood the definitions, etiology, and pathophysiology associated with PID.	—	—
10. Understood the definitions, etiology, and pathophysiology associated with cervicitis.	—	—
11. Recognized significant subjective findings for acute cervicitis.	—	—
12. Recognized significant subjective findings for chronic cervicitis.	—	—
13. Recognized significant objective findings for acute cervicitis.	—	—
14. Recognized significant objective findings for chronic cervicitis.	—	—
15. Recognized significant lab findings that are caused by cervicitis.	—	—
16. Managed acute cervicitis	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
17. Understood the definitions, etiology, and pathophysiology associated with endometritis and endometriosis.	—	—
18. Recognized significant subjective findings for endometritis and endometriosis.	—	—
19. Recognized significant objective findings for endometritis and endometriosis.	—	—
20. Managed endometritis and endometriosis.	—	—
21. Understood the definitions, etiology, and pathophysiology associated with salpingitis and oophoritis.	—	—
22. Recognized significant subjective findings for salpingitis and oophoritis.	—	—
23. Recognized significant objective findings for salpingitis and oophoritis.	—	—
24. Recognized significant lab findings that are caused by salpingitis and oophoritis.	—	—
25. Differentiated between salpingitis and oophoritis and other diseases with similar signs and symptoms.	—	—
26. Managed salpingitis and oophoritis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
27. Recognized the signs and symptoms associated with moniliasis or candidiasis (yeast infection).	—	—
28. Performed a KOH preparation.	—	—
29. Managed yeast infection.	—	—
30. Recognized the signs and symptoms associated with trichomonas vaginitis.	—	—
31. Performed a wet preparation.	—	—
32. Managed trichomonas vaginitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
33. Recognized the signs and symptoms associated with bacterial vaginitis (Gardnerella vaginitis).	—	—
34. Performed a Gram stain of vaginal discharge.	—	—
35. Managed bacterial vaginitis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
36. Recorded all treatment in the patient's medical record.	—	—
37. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Bartholin's Gland Abscess

081-833-4306

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, minor surgery surgical set, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, perform incision and drainage (I&D) of the abscess, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understood the definitions and etiology associated with a Bartholin's gland abscess.
 - a. It is an acute or chronic infection of the Bartholin's gland.
 - b. The infection may arise from streptococci, staphylococci, Escherichia coli (E. coli), or anaerobes.
2. Solicit a patient history.
3. Recognize significant subjective findings for a Bartholin's gland abscess.
 - a. Recent intercourse.
 - b. Venereal disease.
 - c. Trauma.
 - d. Spontaneous abortion.
 - e. Wiping from rectum toward vagina.
4. Perform a PE.
5. Recognize significant objective findings for a Bartholin's gland abscess.
 - a. Mass in perineum that is hot, tender, and fluctuant.
 - b. Pus draining from Bartholin's duct.
6. Manage a Bartholin's gland abscess.
 - a. Perform an I&D of the abscess (task 081-833-4537, Drain Abscesses).
 - b. Sitz bath.
 - c. Administer broad-spectrum antibiotics that cover Gram-positive organisms and some common vaginal Gram-negative organisms.
7. Manage complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a Bartholin's gland abscess.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Explained the definitions and etiology associated with a Bartholin's gland abscess.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for a Bartholin's gland abscess.	—	—
4. Performed a PE.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Recognized significant objective findings for a Bartholin's gland abscess.	_____	_____
6. Managed a Bartholin's gland abscess as follows:	_____	_____
a. Incised and drained the abscess.		
b. Prescribed sitz baths.		
c. Prescribed broad-spectrum antibiotics.		
7. Managed complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Perform a Pelvic Exam
081-833-4310

Conditions: Given a vaginal speculum, patient's medical record, and specimen-collecting equipment.

Standards: Perform a pelvic examination (exam) so that all disease processes and/or abnormal conditions are discovered without causing further harm.

Performance Steps

1. Perform a complete physical examination (PE) (task 081-833-4002, Perform a Complete Physical Examination).
2. Give the patient an opportunity to empty her bladder before the exam.
NOTE: A routine urinalysis (UA) specimen may be obtained at this time.
3. Explain what is to take place during the exam.
4. With the patient sitting or standing, have her press her hands on her hips to contract the pectoral muscles.
NOTE: This maneuver accentuates any existing tissue retraction.
5. Observe the breasts for the following:
 - a. Breast development.
 - b. Size, symmetry, contour, and appearance of the skin.
NOTE: Variation in breast contour may include the presence of masses, dimpling, or flattening.
 - c. Nipples.
 - (1) Direction of the nipples may provide a clue to masses when there is asymmetry.
 - (2) Discharge may indicate disease or may merely occur with the hormonal fluctuation of the menstrual cycle.
 - (3) Ulcerated areas and other nipple lesions require further exploration.
6. Have the patient lie flat with arm abducted and hand under head.
NOTE: This helps flatten breast tissue evenly over the chest wall.
7. Palpate entire breast and lymph nodes (axillary and infraclavicular).
 - a. Palpation is performed in a rotary motion, using an organized approach.
NOTE: If client complains of a mass or tenderness of one breast, examine the opposite breast first to ensure an objective comparison of normal and abnormal tissue.
 - b. Some examiners start in the upper outer quadrant where tumors develop most frequently.
 - c. Breasts of young females are firm and elastic.
 - d. In older females, the tissue may feel stringy and nodular.
 - e. When palpating large pendulous breasts, use a bimanual technique. The inferior portion of the breast is supported in one hand while the other hand palpates breast tissue against the supporting hand.
 - f. When palpating breasts, palpate the nipples and areola as follows:
 - (1) Entire surface is gently palpated.
 - (2) With thumb and index finger, compress the nipple. Note any discharge.
8. Position the patient in the lithotomy position or semisitting lithotomy position.
NOTE: A patient suffering pain or deformity of the joints may be unable to assume a lithotomy position. It may be necessary to have the client abduct only one leg or have another person help separate the patient's thighs.
 - a. Supine position.
 - b. Thighs flexed and abducted.
 - c. Feet resting in stirrups.
 - d. Buttocks extended slightly beyond edge of exam table.
 - e. Head supported with a pillow.

Performance Steps

- f. Arms should be at her side or folded across her chest.

NOTE: Male examiners should always be attended by female assistants.

9. Drape the patient appropriately (cover extending at least over her knees).
 10. Warm your hands and the speculum before the exam.
 11. Have eye-to-eye contact with the patient during the exam.
 12. Explain in advance each step in the exam, avoiding any sudden or unexpected movements.
 13. Inspect the patient's external genitalia.
 - a. Illuminate the perineal area.
 - b. Glove both hands.
 - c. Perineum is sensitive and tender. Warn the patient by touching the neighboring thigh first before advancing to the perineum.
 - d. Examine the mons pubis, and note quantity and distribution of hair growth.
 - e. Examine the labia. It is usually plump and well-formed in the adult female.
 - f. Examine the perineum. It is slightly darker than the skin of the rest of the body. Mucous membranes appear dark pink and moist.
 - g. Separate the labia and inspect the following:
 - (1) Labia minora.
 - (2) Clitoris.
 - (3) Urethral orifice.
 - (4) Hymen.
 - (5) Vaginal orifice.
 14. Note abnormalities such as the following:
 - a. Discharge.
 - b. Inflammation.
 - c. Edema.
 - d. Ulceration.
 - e. Lesions.
 - f. Bulges and swelling of vulva and vagina.
 - g. Enlarged clitoris.
 - h. Syphilitic chancres.
 - i. Sebaceous cyst.
 15. Insert index finger with palm facing you into the vagina up to the second joint. Apply pressure upward, and milk the Skene's gland by moving your fingers outward.
 16. Do this on both sides, and note color, odor, clarity, and amount (COCA) on any discharge. Obtain specimen for culture.
 17. Change glove if discharge is found.
- NOTE: Discharge indicates an infection and is often gonorrhea.
18. Check Bartholin's glands as follows:
 - a. Insert index finger up to first knuckle.
 - b. With your index finger and thumb, palpate the posterolateral area of the labia majora, noting any of the following:
 - (1) Swelling.
 - (2) Tenderness.
 - (3) Masses.
 - (4) Heat or discharge.

NOTE: A painful abscess is pus-filled and usually staphylococcal or gonococcal in origin. Incise and drain the abscess, and perform culture and sensitivity test (task 081-833-4306, Manage Bartholin's Gland Abscess).

Performance Steps

19. Assess the support of the vaginal outlet as follows:
 - a. With the labia separated by middle and index finger, ask patient to strain down.
 - b. Note any bulging of the vaginal walls (cystocele and rectocele).

20. Inspect the anus at this time, noting presence of lesions and hemorrhoids.

21. Insert a speculum for examination of the internal genitalia.
 - a. Select a speculum of appropriate size as follows:
 - (1) Small--not sexually active female.
 - (2) Medium--sexually active.
 - (3) Large--women who have had children.

NOTE: Medium to large speculum may be used if female has had children.

- b. Lubricate the speculum.

NOTE: Commercially prepared lubricants interfere with papanicolaou (pap) smear studies.

- c. Warm the speculum with warm water.
- d. Hold speculum in right hand.
- e. Place two fingers just inside or at the introitus, and gently press down. This helps guide the speculum into the vagina opening.
- f. Ensure the speculum is closed.
- g. Insert closed speculum obliquely into vagina at a 45 degree angle, rotating 50 degrees counterclockwise.
- h. Avoid trauma to the urethra.

NOTE: Avoid pulling pubic hair or pinching the labia.

- i. Maintaining downward pressure, open blades slowly after full insertion and position the speculum so that the cervix can be visualized.
- j. When the cervix is in full view, the blades are locked in the open position.

22. Inspect the cervix.
 - a. Color should be uniformly pink.
 - b. Erythema around the opening may indicate the following:
 - (1) Ectropion: expressed columnar epithelium.
 - (2) Erosion: term has been used to describe both the exposed columnar epithelium and the erythema seen with cervicitis.
 - (3) Pale color may indicate anemia.
 - (4) Bluish: Chadwick's sign, which is a presumptive sign of pregnancy.
 - c. Note the presence of lesions or cysts as follows:
 - (1) Nabothian cyst: endocervical retention cysts usually secondary to cervical infection and inflammation.
 - (2) Friable, granular, red or white patchy areas. Be suspicious of dysplasia, which needs to be evaluated with colposcopy.
 - (3) Ulcerative lesions: may be herpetic. Do viral culture of lesions, and refer patient for colposcopy.
 - (4) Polyps: soft, friable mass protruding through opening. Mass may bleed if traumatized. Refer for evaluation and removal.
 - d. Note the presence, quantity, and consistency of any discharge.
 - (1) Endocervical versus from vaginal vault.
 - (2) Physiological discharge (odorless and colorless).
 - (3) Culture any discharge.
 - e. Note the appearance of the opening.
 - (1) Nulliparous: small, round, or oval.
 - (2) Parous or multiparous: linear, irregular, or stellate.

23. Obtain specimens.
 - a. Chlamydia culture (most prevalent sexually transmitted disease [STD]).

Performance Steps

- b. Gonococcal (GC) culture: (Gram stain not reliable, done for screening, and confirmed by Thayer-Martin).
- c. Pap smear for cytology. Sites of collection are the following:
 - (1) Endocervical brush (all patients).
 - (2) Endocervical scrape with spatula (all patients).
 - (3) Posterior fornix (all patients).
 - (4) Vaginal cuff and area of former posterior fornix for posthysterectomy patient.
- d. Collect viral cultures of suspected lesions.

24. Inspect the vagina.

- a. Withdraw the speculum slowly while observing the vaginal wall.
- b. Close blades as the speculum emerges from the introitus.
- c. Inspect vaginal mucosa as the speculum is withdrawn.

25. Perform a bimanual exam.

NOTE: Many vaginal orifices will readily admit a single examining finger. The technique can be modified so that the index finger alone is used. Special small speculum or nasal speculum also may make inspection possible. When the orifice is even smaller, a fairly good bimanual examination can be performed with one finger in the rectum.

- a. From a standing position, introduce the index finger and middle finger of your gloved hand into the vagina.
- b. Exert pressure posteriorly.
- c. Your thumb should be abducted with the ring finger and little finger into your palm to avoid touching the clitoris.
- d. Palpate the vaginal walls as you insert your fingers for tenderness, cysts, nodules, masses, or growths.
- e. Identify the cervix, noting the following:
 - (1) Position (anterior or posterior).
 - (2) Shape (pear-shaped).
 - (3) Consistency (firm or soft).
 - (4) Mobility (move from side to side 1 to 2 centimeters [cm] in each direction).
 - (5) Tenderness.
- f. Palpate the fornix around the cervix.
- g. The opening should admit your fingertip 0.5 cm.
- h. Place your free hand on the client's abdomen midway between the umbilicus and symphysis pubis, and press downward toward the pelvic hand.

NOTE: Your pelvic hand should be kept in a straight line with your forearm and inward pressure exerted on the perineum by your flexed fingers. Support and stabilize your arm by resting your elbow either on your hip or on your knee, which is elevated by placing your foot on a stool.

- i. Identify the uterus, noting the following:
 - (1) Size (uterine enlargement suggests pregnancy or benign or malignant tumors). The uterus should be 5.5 to 8.0 cm long.
 - (2) Shape (pear-shaped).
 - (3) Consistency (firm or soft).
 - (4) Mobility (deviation to the left or right is indicative of adhesions, pelvic masses, or pregnancy. Uterus should be mobile in the antero-postero plane).
 - (5) Tenderness (suggests pelvic inflammatory disease [PID] or ruptured tubal pregnancy).
 - (6) Masses.
- j. Identify right ovary and masses in the adnexa.
 - (1) Place your abdominal hand on the right lower quadrant.
 - (2) Place your pelvic hand in the right lateral fornix.
 - (3) Maneuver your abdominal hand downward.
 - (4) Use your pelvic hand for palpation.
 - (5) Felt with the vaginal hand, the ovary has the size and consistency of a shelled oyster.

Performance Steps

- (6) Note the size, shape, consistency, mobility, and tenderness of any palpable organs or masses.

NOTE: The normal ovary is somewhat tender when palpated.

- k. Repeat the procedure on the left side.
- l. Withdraw fingers from vagina, and change gloves.

26. Perform a rectovaginal examination.

NOTE: There is a risk of spreading infection between the vagina and rectum. Gonorrhea may infect the rectum, and the female genitalia. It is recommended that gloves be changed between bimanual and rectovaginal examination to avoid spreading gonococcal infection. To avoid fecal soiling, gloves should always be changed, if for some reason the practitioner examines the vagina after the rectum.

- a. Tell the patient that this may be somewhat uncomfortable, and will make her feel as if she has to move her bowels.
- b. Lubricate dominant gloved hand.
- c. Inspect the perianal area for lesions, discoloration, inflammation, and hemorrhoids.
- d. Palpate the rectal wall.
- e. Instruct the patient to bear down as though she is having a bowel movement, and caution her she will feel as though she must pass a bowel movement.
- f. As the anal sphincter relaxes, insert your fingertip of the second finger gently into the anal canal and the first finger into the vagina.
- g. Insert your middle finger into the rectum just past the sphincter. Palpate the anorectal junction. Tell the patient to bear down. Palpate the anterior rectal wall, and check for sphincter tone. A loose sphincter may be present because of a neurologic deficit or third degree perineal laceration after childbirth.
- h. Insert fingers as far as they will go. Tell the woman to bear down, and that should bring another cm of palpation. Check the rectal walls, rotating your finger and checking for masses, polyps, irregularities, or tenderness.
- i. Palpate the rectovaginal septum for tone and thickness.
- j. If you were previously unable to do your initial bimanual exam, perform a bimanual exam. With your vaginal finger in the posterior, palpate the bottom of the uterus and adnexa completely.
- k. Withdraw your fingers, and evaluate the posterior rectal wall.
- l. Prepare guaiac of rectal finger.
- m. Give the patient a towel or tissues to cleanse herself.

27. Perform a wet mount with normal saline, and examine for the presence of the following:

- a. White blood cells (WBCs): evidence of infection and inflammatory process.
- b. Flagellated trichomonads: indicative of trichomonas.
- c. Granulated epithelial cells: "clue cells" for the presence of Gardnerella.

28. Perform a potassium hydroxide (KOH) preparation. Observation of budding yeast is indicative of candidiasis.

29. Perform other labs, if appropriate.

- a. If pregnancy is suspected, perform Beta human chorionic gonadotrophin (HCG).
- b. If any STDs are suspected, perform rapid plasma reagin (RPR) to rule out syphilis.

30. Record all findings in the patient's medical record.

31. Seek the advice and assistance of a higher medical authority whenever necessary.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must perform a pelvic exam.

Performance Measures

1. Performed a complete PE.

GO **NO GO**

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Gave the patient an opportunity to empty her bladder before the exam.	—	—
3. Explained what would take place during the exam.	—	—
4. With the patient sitting or standing, had her press her hands on her hips to contract the pectoral muscles.	—	—
5. Observed the breasts.	—	—
6. Had the patient lie flat with arm abducted and hand under head.	—	—
7. Palpated entire breast and lymph nodes (axillary and infraclavicular).	—	—
8. Positioned the patient in the lithotomy position or semisitting lithotomy position.	—	—
9. Draped the patient appropriately.	—	—
10. Warmed your hands and the speculum before the exam.	—	—
11. Had eye-to-eye contact with the patient during the exam.	—	—
12. Explained in advance each step in the exam, avoiding any sudden or unexpected movements.	—	—
13. Inspected the patient's external genitalia.	—	—
14. Noted abnormalities with the patient's external genitalia.	—	—
15. Inserted index finger, with palm facing you, into the vagina up to the second joint. Applied pressure upward and milked the Skene's gland.	—	—
16. Obtained specimen for culture, while noting COCA on any discharge.	—	—
17. Changed glove when discharge was found.	—	—
18. Checked Bartholin's glands.	—	—
19. Assessed the support of the vaginal outlet.	—	—
20. Inspected the anus, noting presence of lesions and hemorrhoids.	—	—
21. Inserted a speculum for examining the internal genitalia.	—	—
22. Inspected the cervix.	—	—
23. Obtained specimens.	—	—
24. Inspected the vagina.	—	—
25. Performed a bimanual exam.	—	—
26. Perform a rectovaginal exam.	—	—
27. Performed a wet mount with normal saline and examined the mount.	—	—
28. Performed a KOH preparation.	—	—
29. Performed other labs, if appropriate.	—	—
30. Recorded all findings in the patient's medical record.	—	—
31. Sought the advice and assistance of a higher medical authority whenever necessary.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

BATES PE, 8TH ED. 2002

Assess Normal Intrauterine Pregnancy

081-833-4312

Conditions: Given a scale calibrated in pounds or kilograms, a fetal stethoscope, patient's medical record, and The Merck Manual.

Standards: Assess normal intrauterine pregnancy so that the condition of the mother and fetus are accurately assessed and the stage of pregnancy is determined within 1 month.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for pregnancy.
 - a. Amenorrhea: often the earliest symptom of pregnancy.
 - b. Nausea and vomiting (morning sickness).
 - (1) Experienced by almost half of all pregnant women.
 - (2) Occurs during first 3 months of pregnancy.
 - c. Urinary frequency: enlarging uterus exerts pressure on the bladder.
 - d. Excessive fatigue: may persist throughout the first trimester.
 - e. Change in breasts: engorgement of the breast caused by the hormone-induced growth of the secretory ductal system, causing the following:
 - (1) Tenderness.
 - (2) Tingling of the nipple area.
 - f. Quickening: mother's perception of fetal movement.
 - (1) 18 to 20 weeks after last menstrual period (LMP).
 - (2) 16 weeks in multigravidas.
3. Perform a physical examination (PE).
4. Recognize significant objective findings for pregnancy.
 - a. Changes in the pelvic organs.
 - (1) Goodell's sign.
 - (a) Softening of the cervix caused by increased vascular congestion.
 - (b) Slight uterine enlargement on pelvic examination (exam).
 - (c) Only physical signs detectable within the first 3 months of pregnancy.
 - (2) Chadwick's sign.
 - (a) Deep red to purple or bluish coloration of the mucous membranes.
 - (b) Cervix, vagina, and vulva involved.
 - (c) Result of increased vasocongestion of the pelvic vessels.
 - b. Enlargement of the abdomen and uterus enlargement on pelvic exam.
 - c. Braxton Hicks contractions.
 - (1) Painless contractions that occur at regular intervals throughout pregnancy.
 - (2) Felt more commonly after 28 weeks.
 - (3) Also known as false labor.
 - d. Changes in pigmentation of the skin.
 - (1) Abdominal striae: stretch marks.
 - (2) Facial chloasma: after 16 weeks.
 - (3) Nipples and areola: may darken--especially in primagravidas and dark-haired women.
 - (4) Linea nigra: pigmented line of the abdomen may develop.
 - e. Fetal outline.
 - (1) Identified by palpation in many pregnant women after 24 weeks of gestation.
 - (2) Ballottement:
 - (a) Passive fetal movement elicited by tapping the cervix with two fingers.
 - (b) Tapping pushes the fetal body up, and as it falls back, the examiner feels rebound.

Performance Steps

- f. Positive changes. Positive signs of pregnancy are completely objective. The signs are usually not present until the fourth month of pregnancy.
 - (1) Fetal heartbeat: detected with a fetoscope by about week 17 to 20 of pregnancy.
 - (2) Fetal heart rate: between 120 and 160 beats per minute.
 - (3) Fetal movement: palpable by a trained examiner after about 18 weeks of pregnancy.
 - (a) Faint flutter in early pregnancy.
 - (b) Vigorous movement later in pregnancy.
 - (4) Fetal electrocardiographic evidence: recorded as early as 84 days of pregnancy.
 - (5) Ultrasound: positive diagnosis as early as the sixth week of pregnancy.
5. Recognize significant laboratory (lab) findings for pregnancy.
 - a. Urine test.
 - (1) First urine specimen in morning (midstream) (not necessary, but preferred if tested early).
 - (2) About 95 percent accurate.
 - (3) Can detect pregnancy around time of missed period.
 - b. Blood test.
 - (1) Most accurate pregnancy test.
 - (2) Few days after presumed implantation.
 - (3) Can be used in diagnosis of ectopic pregnancy or trophoblastic disease.
 - c. Over-the-counter pregnancy tests.
 - (1) Performed on urine.
 - (2) False positive rate: about 5 percent.
 - (3) False negative rate: about 10 percent.
 - (4) Must follow instructions carefully.
6. Calculate the estimated due date.
 - a. Gestation: about 9 1/3 calendar months, or 40 weeks plus 2 1/2 weeks from LMP.
 - b. Nagele's rule:
 - (1) Most common method of determining the expected delivery date (EDD).
 - (2) Begin with the first day of the LMP.
 - (3) Subtract 3 months, and add 7 days.
 - (4) Result is the estimated due date.
7. Record all findings in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess normal intrauterine pregnancy.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	—	—
2. Recognized significant subjective findings for pregnancy.	—	—
3. Performed a PE.	—	—
4. Recognized significant objective findings for pregnancy.	—	—
5. Recognized significant lab findings for pregnancy.	—	—
6. Calculated the estimated due date.	—	—
7. Recorded all findings in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

BATES PE, 8TH ED. 2002

Monitor Progress of Normal Pregnancy

081-833-4314

Conditions: Given a scale calibrated in pounds or kilograms, a fetal stethoscope, a vaginal speculum, patient's medical record, and The Merck Manual.

Standards: Monitor the progress of a normal pregnancy so that any complications are identified and the life of the patient and fetus are preserved without causing further harm.

Performance Steps

1. Understand the definitions of terms associated with pregnancy.
 - a. Gravida: number of times patient has been pregnant, including miscarriages and the current occurrence.
 - b. Para: a woman who has borne offspring.
 - c. Primigravida: woman pregnant with first child.
 - d. Multigravida: woman who has been pregnant more than once.
 - e. Multiparous: woman who has had two or more viable deliveries.
 - f. Labor: time interval between onset of coordinated uterine contractions and delivery of the placenta (three stages).
 - g. Contractions: tightening and shortening of the uterine muscles during labor, causing effacement and dilation of the cervix. Contributes to the downward and outward descent of the fetus.
 - h. Viable: capable of developing.
 - i. Lochia: maternal discharge of blood, mucus, and tissue from the uterus, may last for several weeks after birth.
 - j. Lochia rubra: red, blood-tinged vaginal discharge that occurs following delivery and lasts 2 to 4 days.
 - k. Lochia serosa: pink, serous, and blood-tinged vaginal discharge that follows lochia rubra.
 - l. Lochia alba: white vaginal discharge that follows lochia serosa and lasts about 10th to 21st day after delivery.
2. Calculate the estimated date of delivery.
 - a. Average gestation time: 280 days, or 40 weeks (may be plus or minus 2 1/2 weeks).
 - b. Estimation of due date: estimated date of confinement (EDC) (Nagele's rule).
 - (1) Date of first day of last normal period.
 - (2) Count back 3 months.
 - (3) Add 7 days.
3. Understand the physiological changes associated with pregnancy.
 - a. Cardiac output rises 30 to 50 percent, beginning by week 6 of pregnancy and peaking between weeks 16 and 28. Cardiac output (CO) remains elevated until after 30 weeks and then may decrease slightly because the enlarging uterus obstructs the vena cava.
 - b. Blood volume increases proportionally with CO. However, the increase in plasma volume is greater than the red blood cell (RBC) mass, and so hemoglobin (Hb) may be lowered by dilution.
 - c. White blood cell (WBC) count increases to 9,000 to 12,000. Marked leukocytosis of up to 20,000 occurs during labor and the first few days postpartum.
 - d. Iron requirements increase as a result of placental and fetal development and the increase in RBCs. Supplemental iron is indicated, and 30 mg of iron salts per day is recommended, with an increase to 60 to 90 milligrams per day (mg/day) when anemia is present.
 - e. Changes in kidney function parallel those in cardiac function. Glomerular filtration rate (GFR) increases 30 to 50 percent. Kidney function also is responsive to posture during pregnancy. Kidney function decreases in the upright position and increases in the supine position.

Performance Steps

- f. Changes in lung function are partly caused by hormonal stimuli and partly by the encroachment of the enlarging uterus. Tidal and minute volume, respiratory rate, and plasma potential of hydrogen (pH) and oxygen (O₂) consumption increase, while inspiratory and expiratory reserve, residual volume and capacity, and plasma partial pressure of carbon dioxide, in the arterial blood (PaCO₂) decrease. Considerable hyperemia and edema of the respiratory tract occur.
- g. As pregnancy progresses, the enlarging uterus, pressing against the rectum and lower portion of the colon, may cause constipation. Heartburn and belching are common, possibly because of a delay in gastric emptying time and relaxation of the sphincter at the junction of the esophagus and stomach.
- h. Pregnancy alters the function of most endocrine glands, partly because most hormones are circulated in protein-bound forms and protein binding increases in pregnancy.
 - (1) Thyroid function increases and may mimic hyperthyroidism with tachycardia, palpitations, excessive perspiration, emotional instability, and enlarged thyroid gland.
 - (2) Adrenal hormone levels increase, which may contribute to the formation of stretch marks and increased edema.
 - (3) Increased levels of glucocorticoids, estrogens, and progesterone modify glucose metabolism and increase the need for insulin. Patients with prediabetic conditions frequently develop more overt forms of the disease during pregnancy.
 - (4) The trophic hormones manufactured by the placenta include human chorionic gonadotrophin (HCG). HCG functions much like follicle-stimulating hormone and lutenizing hormone from the anterior pituitary in maintaining the corpus luteum, thereby preventing ovulation.
4. Recognize the levels of embryo and fetal development for each lunar month of pregnancy.
 - a. First lunar month: Foundations are formed for the nervous system, genitourinary system, skin, bones, and lungs. Buds of arms and legs begin to form. Rudiments of eyes, ears, and nose appear.
 - b. Second lunar month: The head is disproportionately large because of brain development. Gender differentiation begins. The centers of bones begin to ossify.
 - c. Third lunar month: Fingers and toes are distinct. The placenta is complete. Fetal circulation is complete.
 - d. Fourth lunar month: Gender is differentiated. Rudimentary kidneys secrete urine. Heartbeat is present. Nasal septum and palate close.
 - e. Fifth lunar month: Fetal movements are felt by the mother. Heart sounds are perceptible by fetoscope.
 - f. Sixth lunar month: The skin appears wrinkled. Eyebrows and fingernails develop.
 - g. Seventh lunar month: The skin is red. The pupillary membrane disappears from the eyes. If born, the infant cries and breathes, but frequently dies.
 - h. Eighth lunar month: The fetus is viable if born. The eyelids open. Fingerprints are set. Vigorous fetal movement occurs.
 - i. Ninth lunar month: The face and body have a loose, wrinkled appearance because of subcutaneous fat deposits. Amniotic fluid decreases somewhat.
 - j. Tenth lunar month: Skin is smooth. Eyes are uniformly slate colored. The bones of the skull are ossified and nearly together at sutures.
5. Perform a complete physical examination (PE) to include a pelvic examination (exam) and initial assessment of pregnancy (tasks 081-833-4310, Perform a Pelvic Examination, and 081-833-4312, Assess Normal Intrauterine Pregnancy).
6. Evaluate the size of the uterus.
 - a. The uterine contour is usually irregular between weeks 8 to 10; therefore, early uterine enlargement may not be symmetric and the uterus may be deviated to one side.
 - b. At 12 to 16 weeks, the uterus is above the symphysis pubis.
 - c. At 24 weeks, the uterus is at the level of the umbilicus.
 - d. At term, the uterus is at or near the level of the xyphoid process.

Performance Steps

7. Monitor the progress of the pregnancy at 4-week intervals from the first visit through delivery.

During follow-up exams, note the following:

- a. Patient's weight.
- b. Blood pressure.
- c. Size and shape of the uterus. Measure the uterus to determine whether growth and advancement are normal for gestational age.
 - (1) Weight gain during pregnancy for an average woman should be about 11.2 to 13.5 kilograms (kg) (25 to 30 pounds) total.
 - (2) Average monthly weight gain should be about 0.9 to 1.4 kg (2 to 3 pounds) per month.
 - (3) Weight gain beyond 13.5 to 15.8 kg (30 to 35 pounds) represents excess fat on both the mother and fetus.
- d. Urine. Test urine for albumin and glucose.
- e. Beginning at 18 weeks, fetal heart tones. Use a fetal stethoscope to hear fetal heart tones.
- f. Edema of the ankles, which indicates excess fluid retention.
- g. In each trimester, hematocrit (Hct).
- h. If the patient has a rhesus factor (Rh) of negative, an Rh antibody titer should be repeated at 26 to 27 weeks. If she is Rh negative and the father of the baby is known not to be Rh negative, the patient should be given Rho (D) immune globuline 300 micrograms (ug) at 28 weeks (task 081-833-4328, Manage Complications of Pregnancy).

NOTE: During the pregnancy of a patient, prescribe drugs only when needed to ensure the well-being of the mother and fetus.

8. Assess common NORMAL complaints caused by pregnancy.

- a. Edema of the legs. A common complaint that may be partially relieved by having the patient lie on her left side for 30 to 45 minutes three times a day t.i.d. or four times a day (q.i.d.).
- b. Varicosities of the legs and vulva are common and may give discomfort. Clothing should be nonconstrictive at the waist and legs. Edema and the risk of varicosities may be reduced by wearing elastic support hose and by increased rest with the legs elevated.
- c. Hemorrhoids are common. If symptomatic, they may be treated with stool softeners, topically applied anesthetics, and warm soaks.
- d. Backache is common. Eliminating excessive strain and standing and wearing a lightweight maternity girdle may be helpful.
- e. Pain at the symphysis pubis is common.
- f. Increased vaginal discharge is common and is usually nonpathologic. If vaginal candidiasis or trichomoniasis are found, only provide treatment during pregnancy if the patient is symptomatic.

9. Record all information in the patient's medical record.

10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must monitor the progress of a normal pregnancy.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions of terms associated with pregnancy.	—	—
2. Calculated the estimated date of delivery.	—	—
3. Understood the physiological changes associated with pregnancy.	—	—
4. Recognized the levels of embryo and fetal development for each lunar month of pregnancy.	—	—
5. Performed a complete PE, to include a pelvic exam and initial assessment of pregnancy.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Evaluated the size of the uterus.	_____	_____
7. Monitored the progress of the pregnancy at 4-week intervals from the first visit through delivery.	_____	_____
8. Assessed common, normal complaints caused by pregnancy.	_____	_____
9. Recorded all information in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

BATES PE, 8TH ED. 2002

Assist in Natural Childbirth

081-833-4316

Conditions: Given four 36- x 36-inch sterile drapes, scalpel, 3-0 vicryl suture material, two curved Kelly hemostats, 2-0 silk ligature, patient's medical record, and an infant bulb suction device.

Standards: Assist a natural childbirth so that the life of the mother and child are preserved without causing further harm.

Performance Steps

1. Detect false labor (Braxton Hicks contractions).
 - a. Check the cervix for dilation when you first see the patient.
 - b. If cervix is not at least 2 centimeters (cm) dilated, check the dilation 2 hours later.
 - c. If dilation of cervix has not increased, the patient is most likely experiencing false labor.
 - d. If cervix is more than 2 cm dilated, she is experiencing true labor.
2. Recognize the stages of labor.
 - a. First stage of labor:
 - (1) Definition: begins with onset of coordinated contractions, leading to dilation of the cervical opening and ends with complete dilation (10 cm) of the opening.
 - (2) Duration of phase.
 - (a) Average is 12 hours in primigravida and 7 hours in multiparous. However, the duration may be much shorter.
 - (b) Can be gauged by the rate of dilation of the cervix. Patient on average dilates about 1/2 to 1 cm per hour early (less than 5 cm) but progressively dilates more rapidly as labor progresses.
 - (3) Contractions:
 - (a) Interval (time between contractions) is 10 to 20 minutes early labor and 3 to 5 minutes during later labor.
 - (b) Duration (length of contraction) is 20 seconds early labor and 40 to 80 seconds for later labor.
 - NOTE: Patient feels like she has to defecate. May have nausea and vomiting.
 - (4) Quality (hardness of uterus).
 - (a) Early labor: poor quality (can dent uterus).
 - (b) Later labor: good quality (cannot dent uterus). Uterus becomes harder during contractions as labor progresses.
 - (5) Management measures.
 - (a) Take vital signs only between contractions.
 - (b) Listen to fetal heart tone with the bell of the stethoscope lightly placed over the uterus. Heart rate should be 120 to 160 beats per minute.
 - (c) Instruct mother to relax, lie still, and pant between contractions and breathe deeply and push during contractions.
- b. Second stage of labor.
 - (1) Definition: Second stage of labor begins with complete dilation of the cervix and ends with delivery of the body.
 - (2) Average duration: Primigravida is 50 minutes, and multiparous is 20 minutes.
 - (3) Contractions:
 - (a) Interval: 2 to 3 minutes.
 - (b) Duration: 50 to 100 seconds.
 - (4) Management measures:
 - (a) When mother feels the urge to "push" during contractions, urge her to push "like bowel movement."
 - (b) Don sterile gloves and other personal protective equipment.

Performance Steps

NOTE: An episiotomy, or surgical incision of the perineum, should only be performed on patients in whom the perineum does not stretch readily and is obstructing delivery. In these patients, the procedure substitutes a surgical incision for excessive stretching and possible tearing of the perineal tissues. The incision is easier to repair than a tear and may decrease the chance of deep tears into the anus. Steps (c) through (f) are the procedures for an episiotomy.

- (c) Perform the episiotomy when the infant is "crowning" and its hair is clearly visible in introitus (vaginal opening).
- (d) Put two fingers into the vagina down to the posterior wall.
- (e) Place one blade of the scissors between the fingers inside the vagina. The other blade of the scissors should remain outside the vagina and toward the anus.
- (f) Cut to about 1 inch away from the anus during a contraction.

NOTE: Steps (g) through (j) explain the process for delivery of the head.

- (g) Apply gentle inward pressure with the palm of the hand on the baby's head to control delivery. (Do not allow baby's head to "pop" out.)
- (h) Stop the movement of the baby when the head (down to the chin) is totally exposed.
- (i) Check for the presence of the umbilical cord around the baby's neck with your fingers. If present, slip the cord over the baby's head to unloop. If this cannot be done, tie two ligatures around the cord and cut between them.

NOTE: Do not ligate and cut cord until step (k) has been completed, since the cord supplies the baby's oxygenated blood.

- (j) Suction the baby's mouth and nose to remove fluids.
- (k) Apply gentle, downward pressure to deliver the anterior shoulder first. Delivery of the baby is usually spontaneous once the first (anterior) shoulder is free. (Control delivery with one hand on the baby's head, the other hand under the baby).

CAUTION: Baby is very slippery. Be very careful.

- (l) Clamp, tie, and cut the umbilical cord. Leave 3 to 6 inches of the cord on the baby. Cut the cord with a sterile instrument to avoid tetanus neonatorum.
- (m) Clean umbilical cord stub with 70 percent alcohol solution.
- (n) Check the baby for a clear airway by holding the baby's head down, repeatedly suctioning the mouth and nose. If the baby is not breathing, briskly rub the baby's back.

NOTE: If fetal blood is needed for any reason; that is, culture, typing, or hematocrit, obtain cord blood from the placental stub of the cord, not the baby's stub.

c. Third stage of labor:

- (1) Definition: The third stage begins after the delivery of the baby and ends with delivery of the placenta.
- (2) Average duration: 8 minutes.
- (3) Signs of placental separation are as follows:
 - (a) Change in uterine shape from a flattened structure to the original globular one.
 - (b) Sudden increase in bleeding.
 - (c) Lengthening of the cord.
 - (d) Uterus rises in the abdomen.
- (4) Management measures.
 - (a) Do not pull the cord. You can apply gentle traction.
 - (b) Check the placenta for completeness after it is expelled to ensure no remnants were left behind in the uterus as potential sources of infection. (Inspect cotyledons for completeness.)
 - (c) If the placenta is not complete, search the uterus for missing pieces by using a clamp and sterile 4- x 4-inch sponge.
 - (d) Massage the uterus after the placenta is expelled to maintain muscular contraction and to minimize bleeding.
 - (e) Give oxytocin intravenously (IV) after delivery of the placenta. Oxytocin aids in uterine contraction and slows bleeding.

d. Immediate postdelivery care of baby.

- (1) Recheck the airway, and clear secretions.

Performance Steps

- (2) Keep the baby warm and dry.
 - (3) Instill 1percent silver nitrate. Administer 1drop in each eye, or use Neosporin ophthalmic. Then rinse the eyes with normal saline.
 - (4) Give baby to the mother to provide "bonding" and allow breast-feeding as early as possible.
3. Calculate an Apgar score at 1 minute postdelivery and at 5 minutes postdelivery.
 - a. This system assigns a numerical score of 0 to 10. The more vigorous the infant, the higher the score.
 - b. A number of 0 to 2 is assigned to each assessed area; that is, heart rate, respiratory effort, muscle tone, reflex irritability, and color.
 - (1) Appearance (color).
 - (a) Very few infants are completely pink and receive a score of 2.
 - (b) Most babies score 1 because their hands and feet are blue for awhile following birth. Paleness and blue color over the entire body is rated 0.
 - (2) Pulse.
 - (a) Most important sign.
 - (b) Score 2 if more than 100 beats per minute.
 - (c) Score 1 if rate is below 100 beats per minute.
 - (d) Score 0 if there is no detectable heartbeat.
 - (3) Grimace refers to muscle tone or degree of flexion of the arms and legs and the resistance to straightening them.
 - (a) Score 2 for normal muscle tone.
 - (b) Score 1 for muscle tone that is between normal and limp.
 - (c) An oxygen-starved infant is limp and does not resist straightening of the extremities. Score this condition 0.
 - (4) Activity refers to reflexes. Flick the sole of the infant's foot.
 - (a) Score 2 when the infant cries.
 - (b) Score 1 for a weak cry or slight motion of the head.
 - (c) Score 0 for no response.
 - (5) Respiratory effort is the second most important sign.
 - (a) Score 2 for regular respirations and a vigorous cry.
 - (b) Score 1 for weak cry.
 - (c) Score 0 for no response.
 - (6) Scoring.
 - (a) Score of 7 to 10: provide supportive care.
 - (b) Score of 4 to 6: indicates moderate depression.
 - (c) Score less than 4: requires aggressive resuscitation.
4. Record all treatment in the patient's medical record.
5. Manage complications associated with natural childbirth.
 - a. Premature labor: labor process of uterine contractions leading to cervical dilation and effacement and expulsion of the fetus and placenta.
 - (1) Causes: maternal, fetal, or placental disorders. Occurs in 10 to 15 percent of all pregnancies.
 - (a) Two-thirds: no cause can be attributed.
 - (b) Twenty to thirty percent follow premature rupture of membranes and can be attributed to cervical incompetency, family history of membrane rupture, and other things.
 - (c) Maternal medical problems such as diabetes, Cushing's disease, trauma, and maternal intra-abdominal sepsis (for example, appendicitis).
 - (d) Placental abnormalities such as premature separation, infarction, hematoma, or tumors.
 - (e) Fetal abnormalities such as infection, rubella, and toxoplasmosis (first trimester of pregnancy).

Performance Steps

- (2) Diagnosis: regular contractions occurring every 10 minutes for at least 30 minutes accompanied by continual cervical dilation.
- (3) Management: Follow normal delivery procedures. Prevention is the key.
- (4) Prevention:
 - (a) Occurs most in deprived socioeconomic populations and in those who have poor prenatal care.
 - (b) Make sure you reinforce proper diet; decreased workload; avoidance of alcohol, tobacco, and drugs; and careful management of any maternal medical problems such as anemia, diabetes, eclampsia, and preeclampsia.
- b. Abnormal labor (dystocia).

NOTE: Normal labor is determined by the three "Ps" of labor--passage through the pelvis, passenger (how the baby presents), and powers of uterine contraction.

- (1) Small portals lead to dystocia.
- (2) Pelvic inadequacies determined by pelvic examination (exam).
- (3) Management: usually requires referral and evacuation for surgical delivery (cesarean section).
- c. Assess pelvic adequacy on the basis of one of the four basic pelvic shapes.
 - (1) Gynecoid: easiest for delivery.
 - (2) Platypelloid: wide-hipped female.
 - (3) Android: normal.
 - (4) Anthropoid: prevalent in blacks; difficult delivery.

NOTE: Abnormal fetopelvic relations occur in the following percentages: operative procedure 4.9 percent, breech 2.45 percent, and others 1.2 percent.

- d. Abnormal uterine action.
 - (1) Inadequate myometrium function.
 - (2) Management.
 - (a) Reassure, maintain fluids, empty bladder, enema, reposition the patient. Nipple stimulation.
 - (b) If uterus is atonic, first try to correct by massage. If no improvement, then give oxytocin (pitocin) IV.
- e. Other complications.
 - (1) Cord accidents or prolapsed cord.
 - (a) Assessment is based on recognition during vaginal exam.
 - (b) Management is based on manual repositioning of the fetus to relieve pressure on the cord and allow continued fetal blood flow.

CAUTION: This is a medical emergency. Definitive management is evacuation and referral for cesarean section.

- (2) Multiple pregnancies (1 in 89 deliveries). Normal delivery of one fetus followed by a second delivery occurring no later than 20 minutes afterward.
- (3) Uterine rupture (1 in 1,500 deliveries). The major problem is hemorrhage. The condition is common in patients who have had a previous cesarean section.
 - (a) May occur during or following labor. Complete rupture usually occurs during labor.
 - (b) Factors which predispose are high parity, obstructed labor, intrauterine maneuvers, previous surgery, or motor vehicle accident in which lap seat belt was used.
 - (c) Usually manifested by sudden lower abdominal pain and the appearance of shock.
 - (d) Management consists of managing for shock during and following the delivery and immediate evacuation and referral for emergency surgery to repair the rupture and control the bleeding.
- (4) Vaginal and perineal lacerations.
 - (a) 1st degree: slight laceration with no need for suturing.
 - (b) 2d degree: laceration into the perineum without going into the anal sphincter or rectal mucosa. Manage with simple suture repair (catgut).
 - (c) 3d degree: lacerations into the rectal mucosa and/or anal sphincter. Manage with carefully placed sutures (in layers). The sutures must approximate the edges of the anal sphincter exactly to ensure proper healing. Clean the wound every 4 to 6 hours.

Performance Steps

- (5) Cervical laceration may be repaired with simple sutures to approximate the edges.
 - (6) Uterine inversion or prolapse, demonstrated by profuse bleeding after delivery, abdominal pain, and visualization of the uterus in the vagina. It is usually caused by traction on the cord when the placenta is implanted in the fundus. Manage by doing the following:
 - (a) Manual inversion. Reposition uterus with fist or fingers.
 - (b) Careful monitoring for shock and blood loss and correct with IV therapy, as necessary.
6. Manage problems of fetal presentation.
- a. Occiput posterior presentation: fetal back on the mother's side, either right occipitoposterior (ROP) or left occipitoposterior (LOP).
 - (1) Assessment: vaginal exam with recognition of occiput posterior (OP) position, which occurs 4.9 percent of the time.
 - (2) Management: 70 percent of the time the fetus will rotate into occiput anterior (OA) position without assistance. Next option is to manually rotate the fetus into the OA position.
 - b. Face presentation (OA): 1 in 500 deliveries.
 - (1) Assessment: encountered on vaginal exam.
 - (2) Management: normal delivery and careful monitoring of cord position and fetal respiration.
 - c. Breech presentation: Infant mortality is 5.5 times greater primarily because of cord prolapses. A delivery in which the buttocks and/or feet are presented before the head.
 - (1) Types: frank (buttocks first with flexed hips and extended knees), complete, and incomplete or footling.
 - (2) Assessment is based on vaginal exam and abdominal exam.
 - (3) Management is best accomplished by prevention, if possible. Before labor, try to change the fetal position through external manipulation. If breech labor is inevitable, do the following:
 - (a) Allow the fetus to deliver up to the level of the umbilicus. If the fetus is in a front presentation, gently extract the legs downward after the buttocks are delivered.
 - (b) After the infant's legs are clear, support the baby's body with the palm of the hand and the volar surface of the arm.
 - (c) After the umbilicus is visualized, gently extract a 4- to 6-inch loop of umbilical cord to allow delivery without excessive traction on the cord. Gently rotate the fetus to align the shoulders in an anterior-posterior position. Continue with gentle traction until the axilla is visible.
 - (d) Gently guide the infant upward to allow delivery of the posterior shoulder.
 - (e) Gently guide the infant downward to allow delivery of the anterior shoulder.
 - (f) During breech delivery, avoid having the fetal face or abdomen toward the maternal symphysis pubis.
 - (g) Be aware that after shoulder delivery, the head is often delivered without difficulty. Be careful to avoid excessive head or spine manipulation or traction.
 - (h) If the head does not deliver immediately, take immediate action to prevent suffocation of the infant. Place a hand inside the vagina with the palm facing the baby's face. Form a "V" with the index and middle fingers on either side of the baby's nose, and gently push the vaginal wall away from the baby's face until the head is delivered.
 - d. Shoulder dystocia: occurs when the fetal shoulders impact against the maternal symphysis pubis, thereby blocking shoulder delivery.
 - (1) Assessment: The head will deliver normally, but then pull back against the maternal perineum.
 - (2) Management:
 - (a) Position the mother on her left side in a dorsal, knee-to-chest position to increase the diameter of the pelvis.
 - (b) Try to guide the infant's head downward to allow the anterior shoulder to slip under the symphysis pubis.

Performance Steps

- (c) Gently rotate the fetal shoulder girdle into the wider oblique pelvic diameter. The posterior shoulder usually delivers without resistance. Rotate the posterior shoulder downward and into the left posterior quadrant. The anterior shoulder usually follows.
- (d) After delivery of the shoulders, continue with the rest of the procedure as normal.

7. Record the time of delivery, all treatment, and any complications in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assist a natural childbirth.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Detected false labor (Braxton Hicks contractions).	_____	_____
2. Recognized the stages of labor.	_____	_____
3. Calculated an Apgar score at 1minute postdelivery and at 5 minutes postdelivery.	_____	_____
4. Managed complications associated with natural childbirth.	_____	_____
5. Managed problems of fetal presentation.	_____	_____
6. Recorded the time of delivery, all treatment, and any complications in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

EMT-P, BRADY 3RD ED. 1997
MERCK MANUAL 17TH ED

Manage Spontaneous Abortion

081-833-4322

Conditions: Given pain medications, absorbent pads, intravenous (IV) administration equipment, IV solutions, oxygen and oxygen delivery equipment, oxytocin, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the condition, and administer supportive care and pain medication, as required.

Performance Steps

1. Understand the definitions, incidence, and categories related to spontaneous abortion (miscarriage).
 - a. Categories: threatened, inevitable, incomplete, complete, or missed abortions.
 - b. Abortion: termination of pregnancy before viability.
 - (1) Threatened abortion: any vaginal bleeding in the first 20 weeks of pregnancy. In early months of pregnancy, 20 to 30 percent of pregnant women have some bleeding in early months.
 - (2) Inevitable abortion: intolerable pain or bleeding that threatens the mother's well-being.
 - (3) Incomplete abortion: some products of conception partially passed from uterine cavity.
 - (4) Complete abortion: all products of conception are expelled.
 - (5) Missed abortion: fetus has died but has been retained in utero 4 weeks or longer.
 - c. Incidence: Fifteen percent of all pregnancies abort spontaneously. These abortions seem to be a natural rejection of mal-developing fetus. Eighty-five percent occur in the first trimester and are related to fetal causes.
2. Recognize the signs and symptoms of the categories of abortion.
 - a. Threatened abortion:
 - (1) Vaginal bleeding: varies from brownish to bright red and may occur repeatedly for many days.
 - (2) Mild cramps.
 - (3) Tenderness over the uterus, low back pain, and sense of pelvic pressure.
 - (4) Cervix closed or slightly dilated and no tissue loss.
 - (5) Symptoms subside. If symptoms do not subside, condition becomes an inevitable abortion.
 - b. Inevitable abortion:
 - (1) Bleeding more profuse; threatens mother.
 - (2) Cervix dilated.
 - (3) Membrane rupture.
 - (4) Painful uterine contractions.
 - c. Incomplete abortion: signs and symptoms similar to those of threatened.
 - d. Complete abortion:
 - (1) Same as incomplete except all products of conception are passed.
 - (2) Symptoms of pregnancy no longer exist (cervix closes and uterus contracts to normal size).
 - e. Missed abortion:
 - (1) Uterus fails to grow.
 - (2) Fetal heart sound is not heard at appropriate time with Doppler.
 - (3) Fetal heart sound was present previously and now is absent.
 - (4) Ultrasound no longer shows cardiac activity.
3. Provide appropriate management for the various categories of abortion.
 - a. Threatened abortion:
 - (1) Vaginal examination (exam). Ensure cervix is closed.
 - (2) Pad count to monitor bleeding.

Performance Steps

- (3) Bedrest.
 - b. Inevitable abortion.
 - (1) Embryo delivered.
 - (2) Refer for dilation and curettage (D and C) after delivery.
 - c. Incomplete abortion:
 - (1) Complete the abortion promptly with suction, if possible, or refer and evacuate.
 - (2) Monitor vital signs and amount of bleeding, and treat symptomatically (IVs, blood, and bedrest).
 - (3) Provide psychological assistance to reduce anxiety.
 - (4) Give pain medications, as necessary, and vitamin and iron supplement.
 - (5) Watch for infection.
 - d. Complete abortion.
 - (1) Bedrest for 3 days.
 - (2) Monitor vital signs and bleeding, keep pad count, and replace blood, as necessary.
 - (3) Vitamin and iron supplements.
 - (4) Refer for D and C if bleeding continues.
 - (5) Schedule follow-up visit to ensure return to proper menstruation and no evidence of infection for about 6 weeks.
 - (6) Give pain medications, as necessary.
 - e. Missed abortion.
 - (1) If the fetus is not passed, use oxytocin induction.
 - (2) Use D and C to remove fragments of the placenta.
4. Record all treatment in the patient's medical record.
 5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage spontaneous abortion.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, incidence, and categories related to spontaneous abortion (miscarriage).	—	—
2. Recognized the signs and symptoms of the categories of abortion.	—	—
3. Provided appropriate management for the various categories of abortion.	—	—
4. Recorded all treatment in the patient's medical record.	—	—
5. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Medical Complications of Pregnancy

081-833-4328

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, and a selection of pharmacological agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease or condition, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the definition, incidence, and causes of ectopic pregnancy.
 - a. Definition: implantation of fertilized egg in any site other than the uterine cavity.
 - b. Incidence:
 - (1) One in 150 pregnancies.
 - (2) Incidence is rising and higher in nonwhites.
 - (3) Increases with prior tubal diseases, ectopic pregnancies, and induced abortions.
 - (4) Ninety-five percent occur in fallopian tube (tubal pregnancy) and more than half are on the right side. Ectopic pregnancy may also occur in ovary, abdomen, or cervix.
 - (5) Most common cause of maternal mortality in first trimester.
 - c. Causes: delayed passage of eggs caused by decreased lumen size. Conditions associated with decreased lumen size are as follows:
 - (1) Pelvic inflammatory disease (PID).
 - (2) Congenital deformities in mother.
 - (3) Use of intrauterine device (IUD). Incidence is four times greater in IUD users.
 - (4) Adhesions of the tube.
 - (5) Anything leading to tubal sterilization.
2. Recognize the signs and symptoms of ectopic pregnancy.
 - a. Abdominal and pelvic pain early in pregnancy ("tearing" type of pain). Abdominal pain occurs in 90 percent of women.
 - b. Amenorrhea (spotty or irregular vaginal bleeding) is present in 75 percent of women.
 - c. Positive pregnancy test occurs 50 percent of the time.
 - d. Abdominal tenderness.
 - e. Pelvic examination (exam) may or may not reveal tender adnexal mass.
3. Differentiate between ectopic pregnancy and other conditions with similar signs and symptoms. Consider the following diseases:
 - a. PID.
 - b. Spontaneous abortions.
 - c. Ruptured ovarian cyst.
 - d. Torsion of the ovarian cyst.
 - e. Appendicitis.
 - f. Pyelonephritis.
 - g. Pancreatitis.
4. Manage ectopic pregnancy.

CAUTION: If left untreated, ectopic pregnancy usually results in a catastrophic sequence of events involving tubal rupture, severe internal hemorrhage, shock, and death.

 - a. Perform culdocentesis to confirm diagnosis. Aspirate blood from cul-de-sac. Blood indicates intraperitoneal bleeding.
 - b. Refer patient for surgery for definitive management, even if the patient was diagnosed before rupture.
 - c. Principles guiding management include the following:
 - (1) Preserve maternal life.

Performance Steps

- (2) Terminate the pregnancy with surgery.
 - (3) Provide mother with supportive care (monitor vital signs, provide psychological support, and replace blood and fluid, as necessary).
5. Understand the definition, incidence, and contributing factors for abruptio placentae.
 - a. Definition: premature separation of the normally implanted placenta after 20 weeks gestation.
 - (1) External hemorrhage: retroplacental bleeding occurs and the blood may pass behind the membranes and through the cervix.
 - (2) Internal hemorrhage: placenta separates centrally, and the blood accumulates under the placenta.
 - b. Incidence: occurs in 1 out of 90 pregnancies.
 - c. Contributing factors:
 - (1) Hypertension.
 - (2) Trauma.
 - (3) Alcoholism.
 - (4) Cocaine use.
 - (5) Previous history of the same problem.
6. Recognize the signs and symptoms of abruptio placentae.

NOTE: The signs and symptoms will depend on the degree of separation.

 - a. Concealed hemorrhage.
 - (1) Sharp pain.
 - (2) Change in vital signs.
 - (3) No external bleeding.
 - (4) Tender uterus that can progress to board-like.
 - (5) Evidence of fetal heart rate drop, fetal distress, or death.
 - b. External hemorrhage: same signs and symptoms except external bleeding occurs.
7. Manage abruptio placentae.

CAUTION: Do not perform a vaginal exam if abruptio placentae is even suspected; it may precipitate hemorrhage.

 - a. Intravenous (IV) fluids and oxygen.
 - b. Type and crossmatch blood for possible transfusion.
 - c. Prepare for possible immediate delivery of the fetus.
 - d. Frequent fetal monitoring.
 - e. Psychological support for the mother.
 - f. Evacuate and refer to obstetrics and gynecology (OB-GYN), if possible.
8. Understand the definition, incidence, and mortality associated with placenta previa.
 - a. Definition: implantation of the placenta in the lower uterine segment, covering at least a portion of a fully dilated cervix.
 - b. Incidence:
 - (1) Occurs in 1 out of 200 pregnancies.
 - (2) Multiparous greater than primiparous.
 - (3) More common in patients with abnormalities of uterus (for example, fibroids).
 - (4) Perinatal mortality is 20 percent.
9. Recognize the signs and symptoms associated with placenta previa.
 - a. Sudden, painless vaginal bleeding.
 - b. Lower abdominal cramps are possible.
 - c. Uterus is soft.
 - d. Fetal exam is usually normal. However, this depends on the amount of bleeding when the exam occurs.
 - e. Usually not shocky as in abruptio placenta.
10. Manage placenta previa.

CAUTION: Do not perform a vaginal exam if placenta previa is suspect; it may precipitate hemorrhage.

Performance Steps

- a. IV fluids and oxygen.
 - b. Type and crossmatch blood.
 - c. Bedrest. Monitor maternal and fetal vital signs and amount of bleeding, position patient comfortably, and provide psychological support. When the bleeding stops, the patient can ambulate.
 - d. Prepare for possible delivery of the fetus, dependent upon the fetus size and the amount of bleeding. Once delivery is decided on, if the medical assets are available, a cesarean section is usually preferred.
11. Understand the definition and incidence of preeclampsia.
 - a. Definition: development of hypertension with proteinuria, edema, or both as a result of pregnancy between 20 weeks and first postpartum day.
 - b. Incidence:
 - (1) Five percent of all pregnancies.
 - (2) Increased in primipara.
 - (3) Increased in women with hypertension or other vascular disorders.
 12. Recognize the signs and symptoms of preeclampsia.
 - a. Rise in blood pressure (BP) to over 140/90 or a 30/15 increase during pregnancy.
 - b. Edema of the face, hands, and feet that can cause possible headache or diplopia. It is important to note that edema persists even during bedrest.
 - c. Proteinuria 0.3 grams per liter in a 24-hour sample.
 - d. Weight exceeds normal for patient.
 13. Manage preeclampsia.
 - a. Bedrest, preferably on the left side as this enhances tissue perfusion.
 - b. Frequent weight and BP measurements.
 - c. Monitor urinalysis (UA) for protein.
 - d. Correct dietary deficiencies, and manage underlying medical conditions.
 - e. Ensure proper fluid and electrolyte intake. Encourage fluids, but avoid high-sodium fluids.
 - f. Delivery of baby is the cure.
 14. Understand the definition, incidence, and mortality associated with eclampsia.
 - a. Definition: the occurrence of one or more convulsions not attributed to other cerebral conditions in a patient with preeclampsia.
 - b. Mortality: Perinatal mortality with eclampsia is 15 percent.
 - c. Incidence: If untreated, eclampsia develops in 1 per 200 pre-eclamptic patients.
 15. Recognize the signs and symptoms of eclampsia.
 - a. The signs and symptoms are generally the same as for preeclampsia.
 - b. Seizures are also present.
 16. Manage eclampsia.
 - a. Manage oxygen and airway.
 - b. Monitor BP, pulse, and respirations every 15 minutes. Record urinary output and input hourly. This should stabilize 4 to 6 hours when delivery must be accomplished.
 - c. Use magnesium sulfate to prevent and treat convulsions.
 - d. Monitor fetus constantly.
 - e. Place patient in quiet, dark environment.
 - f. Hydrate with a balanced salt solution IV, usually 3 to 4 liters over 24 hours.
 - g. Deliver baby to obtain cure.
 - h. Closely monitor the patient postdelivery since eclampsia can occur up to a week postpartum.
 17. Record all treatment in the patient's medical record.
 18. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage medical complications of pregnancy.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understand the definition, incidence, and causes of ectopic pregnancy.	—	—
2. Recognized the signs and symptoms of ectopic pregnancy.	—	—
3. Differentiated between ectopic pregnancy and other conditions with similar signs and symptoms.	—	—
4. Managed ectopic pregnancy.	—	—
5. Understood the definition, incidence, and contributing factors for abruptio placentae.	—	—
6. Recognized the signs and symptoms of abruptio placentae.	—	—
7. Managed abruptio placentae.	—	—
8. Understood the definition, incidence, and mortality associated with placenta previa.	—	—
9. Recognized the signs and symptoms associated with placenta previa.	—	—
10. Managed placenta previa.	—	—
11. Understood the definition and incidence of preeclampsia.	—	—
12. Recognized the signs and symptoms of preeclampsia.	—	—
13. Managed preeclampsia.	—	—
14. Understood the definition, incidence, and mortality associated with eclampsia.	—	—
15. Recognized the signs and symptoms of eclampsia.	—	—
16. Managed eclampsia.	—	—
17. Recorded all treatment in the patient's medical record.	—	—
18. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

EMT-P, BRADY 3RD ED. 1997

Subject Area 15: Orthopedic Conditions

Apply a Cast**081-833-4365**

Conditions: Given plaster or fiberglass casting material, patient's medical record, and TM 8-231, Orthopedic Specialist.

Standards: Apply a cast so that the underlying bone, the joint above the injury, and the joint below the injury are immobilized without causing further harm.

Performance Steps

1. Recognize the need for a cast (task 081-833-4374, Assess Common Orthopedic Diseases and Conditions).
 2. Understand the general purpose of and guidelines for applying a cast.
 - a. The purpose of a cast is as follows:
 - (1) Immobilizes.
 - (2) Allows early ambulation.
 - (3) Improves function.
 - (4) Corrects deformities.
 - (5) Prevents deformity.
 - b. Apply casts in a position of function (unless otherwise indicated).
 - c. Extend casts to the joint above and below the fracture.
 - d. Before applying a cast, carefully inspect patient's skin to ensure that there are no sores or breaks in the skin that might become infected while the cast is on.
 3. Know the basic factors in the use of plaster of paris.
 - a. Plaster bandages and splints are made by impregnating crinoline with plaster of paris. When this material is dipped into water, the powdery plaster of paris is transformed into a solid crystalline form of gypsum.
 - b. Casts dry through water evaporation.
 - c. Plaster sizes are as follows:
 - (1) Rolls: 2-, 3-, 4-, and 6-inch widths.
 - (2) Splints: 4 inches by 15 inches and 5 inches by 30 inches.
 - d. Plaster setting time is as follows:
 - (1) Extra fast: 2 to 4 minutes.
 - (2) Fast: 5 to 6 minutes.
 - (3) Slow: 8 to 12 minutes.
 - e. Setting time of plaster may be retarded by the following:
 - (1) Too much water left in the plaster roll.
 - (2) Sugar added to the water.
 - (3) Cold water.
 - f. Setting time of plaster may be accelerated by the following:
 - (1) Water removed from plaster roll.
 - (2) Table salt added to the water.
 - (3) Excessive rubbing the plaster as it is being applied.
 - (4) Hot water.
- NOTE: Plaster takes 24 to 48 hours to harden. This is different from the setting time.
4. Position the patient.
 - a. First get the patient to relax.
 - b. For upper limb, position as follows:
 - (1) Wrist: in a natural position at 15-degrees extension (as if holding a can).
 - (2) Elbow: at a 90-degree angle.

Performance Steps

- c. For lower limb, position as follows:
 - (1) Knee: 5- to 15-degrees flexion.
 - (2) Ankle: 90 degrees.
 - (3) No inversion or eversion of the foot.

NOTE: Specific position for the different types of casts are discussed in TM 8-231.

5. Pad the patient for casting.

- a. Purposes:
 - (1) Provide comfort.
 - (2) Lessen the possibility of pressure sores.
 - (3) Make it easier and safer to remove the cast.
- b. Padding material:
 - (1) Stockinet:
 - (a) Not to be used where there is excessive swelling (new fracture or postoperative surgery).
 - (b) May constrict or impair circulation.
 - (2) Sheet cotton or Webril:
 - (a) Used in acute injuries and postoperative cases.
 - (b) Should be applied smoothly with the turns overlapping about half the width of the previous layer.
 - (c) Used to pad bony prominences (helps prevent pressure sores).

6. Dip and squeeze the casting material.

- a. Place the roll on end (vertical) in tepid (70 to 80 degrees Fahrenheit) water for about 5 seconds (or when the water stops bubbling).

NOTE: The roll should be placed on end to allow air to escape through the core of the roll.

- b. Remove the roll from the water.

NOTE: The longer plaster or fiberglass is soaked, the shorter the working time to apply.

- c. Hold plaster or fiberglass at each end and squeeze; do not wring. Some water should be left in to prevent setting too quickly.

7. Roll the plaster or fiberglass material.

- a. Roll the material with the roll resting on the patient's extremity.
- b. Roll smoothly, keeping the pressure equally distributed through the entire width of the plaster roll.
- c. Overlap the preceding turn by 1/2 to 3/4 of the width.
- d. To guide or change the direction of the roll of plaster, make a tuck by pointing the plaster up or down, making the tuck, and smoothing the tuck until it is flat. Fiberglass should contour; if not, a small cut can be made to change direction.
- e. Use as many rolls as necessary to make a proper cast. Usually four or five rolls of plaster or two rolls of fiberglass are required.
- f. Apply plaster or fiberglass within 1/2 inch of the edge of the Webril, turn the Webril or stockinet back, and incorporate it into the plaster.
- g. Rub smooth the plaster or fiberglass as it is applied, smoothly blending the layers. This causes lamination of layers and removal of air pockets.

8. Add plaster splints, if necessary.

NOTE: Splints are applied over joint areas OR where additional strength is desired.

- a. Dip plaster or fiberglass in water, withdraw the plaster or fiberglass from the water, and fan the plaster or fiberglass while folded to expel water.
- b. Draw each side of the plaster or fiberglass through the index and middle fingers to remove excessive water (laminates plaster).
- c. Place the plaster or fiberglass on a worktable, and smooth the plaster or fiberglass with the palm of the hand.
- d. Apply the plaster or fiberglass splint, and cover it with an elastic bandage.

Performance Steps

9. Mold the cast.
 - a. Rub and mold the plaster or fiberglass over the contour of the body part until the plaster or fiberglass is firmly set.
 - b. Continue molding until the setting point of the plaster or fiberglass is reached.
 - c. Do not cover the cast while it is setting. Leaving the cast uncovered allows the escape of heat (exothermal reaction).

10. Finish the plaster or fiberglass cast.
 - a. Trim the plaster cast edges with a knife or scissors.
 - b. Trim the fiberglass cast edges with a cast saw.
 - c. Support the cast on NONPLASTIC covered pillows to avoid contact with rough surfaces, which may dent the cast.

11. Bivalve the cast, if necessary.

NOTE: Bivalving is superior to simply splitting the cast.

- a. Use bivalving when cast becomes too tight and elevation will not reduce the swelling.
- b. If bivalving becomes necessary, cut all the material down to the skin.
- c. Cut the cast laterally and medially for the entire length of the cast.
- d. Cut lower limb casts posterior to the lateral malleoli and anterior to the medial malleoli.
- e. Secure cast with a loose elastic wrap.

12. Remove the plaster or fiberglass cast.
 - a. Simplest way to remove the plaster cast is to soak the cast and unravel it.
 - b. Hand cutter requires a lot of effort.
 - c. Electric cutter is fastest, easiest, and best method to remove plaster and fiberglass casts.

13. Cut a window in the cast, if necessary.
 - a. To expose wounds (change dressings), cut a window in the cast.
 - b. Replace and rewrap the cut out portion with new plaster or elastic bandage to prevent window edema.

14. Take precautions to prevent improper cast application.
 - a. After the plaster or fiberglass has begun to set, do not try to correct a position.
 - b. Do not allow joint movement, because wrinkles will develop and cause skin slough and pressure sores.
 - c. Do not place circular dressings under the cast.
 - d. When applying the plaster or fiberglass, do not stretch or pull the wet roll. The roll should be unraveled.
 - e. To hold a wet cast, use the palm of the hand, not the tips of the fingers (prevents pressure points).
 - f. Since plaster and fiberglass generate considerable heat (exothermal reaction) while setting (drying), expose the cast to a maximum amount of air.

15. Transfer the patient in a cast.
 - a. Write the following on the cast:
 - (1) Date of injury.
 - (2) Date of operation, if performed.
 - (3) Outline of the fracture, which is drawn over the fracture site.
 - b. Inform receiving facility of type and location of cast.

16. Instruct the patient wearing a cast.
 - a. Care for the cast as follows:
 - (1) Do not walk on a new plaster walking cast for 48 hours. Wait 30 minutes for a fiberglass cast.
 - (2) Keep cast clean and dry.
 - (3) Do not alter cast.

Performance Steps

- (4) Do not remove cast.
 - (5) Do not put foreign objects inside cast.
 - (6) Do not paint cast.
 - (7) Do not scratch down the cast with a coat hanger.
 - b. Keep limb elevated above the heart for 2 days (prevent swelling).
 - c. Report pressure points (feels like a burning sensation).
 - d. If a cast becomes soft, broken, or loose, return for evaluation.
 - e. Start range-of-motion exercises of the adjacent joints not immobilized.
 - f. Report signs or symptoms of circulatory impairment.
- 17. Recognize the complications involved with casting.
 - a. Circulatory impairment caused by improper casting.
 - (1) General signs and symptoms (five Ps):
 - (a) Pain.
 - (b) Pulselessness.
 - (c) Pallor.
 - (d) Paresthesia.
 - (e) Paralysis.
 - (2) Specific signs and symptoms:
 - (a) Peroneal nerve palsy, which presents as pain and inability to actively dorsiflex foot (drop foot).
 - (b) Caused by improper positioning of cast or pads during application.
 - b. Compartment syndromes:
 - (1) Presence of pain, paralysis, and/or pulselessness.
 - (2) Caused by pads or plaster wrapped too tightly.
 - c. Constrictive edema: poor perfusion caused by pressure.
 - (1) Generalized swelling from vascular or neurological compromise.
 - (2) Alteration in circulatory or neurological status.
 - (3) Caused from lack of care in applying padding, plaster, or splint.
- 18. Manage complications of casting by removing the cast and reapplying one properly.
 - a. Bivalve the cast to allow for circulation. OR
 - b. Remove the cast, and reapply one properly.
- 19. Apply a short arm cast with plaster splint.
 - a. Indications:
 - (1) Injury of forearm.
 - (2) Injury to wrist or thumb.
 - b. Material needed:
 - (1) One roll of 3- or 4-inch Webril.
 - (2) Three rolls of 3-inch plaster or two rolls of 4-inch plaster with a thickness of 5 and dimension of 4 inches by 15 inches..
 - c. Method of application:
 - (1) Position wrist at 15-degree extension.
 - (2) Apply Webril from distal palmer crease up to 5 to 6 inches below the elbow. Overlap half the width of each wrap.
 - (3) Apply additional Webril over styloid of the ulna.
 - (4) Apply plaster, overlapping about half the width of each wrap.
 - (5) Mold to form of forearm.
 - (6) Trim around thumb. Patient should have freedom of movement and be able to touch thumb to all fingers.
 - (7) Check neurovascular status.
 - d. Add a finger splint, if necessary.
 - (1) Cut the plaster away from the palm and thumb.
 - (2) Use an aluminum splint that is 1/2- to 1-inch wide and long enough to extend from upper edge of the cast to about 2 inches past the fingertip.

Performance Steps

- (3) Wrap the aluminum splint with moleskin or tape.
- (4) Bend the aluminum splint to the shape of the anterior part of the cast and the finger.
- (5) Incorporate the aluminum splint into the plaster.
- (6) Place the finger in a position of function.
- (7) Place the end of the splint so that it covers and protects the end of the finger.
- (8) Wrap the aluminum splint to the cast with plaster bandage roll.
- (9) Tape finger to the aluminum splint with adhesive strips.

20. Apply a short leg cast.

a. Indications:

- (1) Support for displaced fractures.
- (2) Soft tissue crush injuries.

b. Materials needed:

- (1) Two rolls of 4-inch Webril.
- (2) Three rolls of 6-inch plaster.
- (3) Five full-thickness 5-inch by 30-inch splints.

c. Method of application:

- (1) Have patient in supine position with support of foot in neutral position and ankle at 90-degree angle.
- (2) Apply Webril from tip of toes upward to 3 inches from bend of knee (extra padding around malleoli).
- (3) Apply two plaster rolls.
- (4) Apply splints to posterior aspect of cast.
- (5) Apply third roll of plaster.
- (6) Trim cast to the web of the toes on top and the margin of the toes on the bottom. (If a foot plate is desired, trim cast to tip of toes.)
- (7) Check neurovascular status.

NOTE: The cast may be converted into a walking cast by attaching a rubber walking heel to the sole of the cast. About eight thicknesses of short plaster splint, 4- by 15-inches, folded twice, can be used as a foundation between the plaster and the heel. The foundation is attached to the cast, and the heel is placed on the foundation and tied with the plaster bandage. (Align walker with medial malleolus.)

21. Record all treatment in the patient's medical record.

22. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must apply a cast.

Performance Measures

- 1. Recognized the need for a cast.
- 2. Understood the general guidelines for applying a cast.
- 3. Knew the basic factors in use of plaster of paris.
- 4. Positioned the patient.
- 5. Padded the patient for casting.
- 6. Dipped and squeezed the casting material.
- 7. Rolled the plaster material.
- 8. Added plaster splints, if necessary.
- 9. Molded the cast.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
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_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
10. Finished the plaster or fiberglass cast.	_____	_____
11. Bivalved the cast, if necessary.	_____	_____
12. Removed the plaster or fiberglass cast.	_____	_____
13. Windowed a cast, if necessary.	_____	_____
14. Took precautions to prevent improper cast application.	_____	_____
15. Transferred the patient in a cast.	_____	_____
16. Instructed the patient wearing a cast.	_____	_____
17. Recognized the complications involved with casting.	_____	_____
18. Managed complications of casting.	_____	_____
19. Applied a short arm cast with plaster splint.	_____	_____
20. Applied a short leg cast.	_____	_____
21. Recorded all treatment in the patient's medical record.	_____	_____
22. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

TM 8-231

Related

Assess Common Orthopedic Diseases/Conditions

081-833-4374

Conditions: Given patient's medical record, a goniometer, and reflex hammer.

Standards: Assess common orthopedic diseases and conditions so that they are identified with 100 percent accuracy without causing further harm to the patient.

Performance Steps

1. Solicit a patient history.
2. Recognize significant subjective findings for orthopedic diseases or conditions.
 - a. Most patients will complain of pain of the involved joint or limb.

NOTE: When evaluating pain, remember OPQRST (onset, palliative or provocative, quality, radiation and region, severity, temporal relationship) (task 081-833-4690, Manage Pain).

 - b. Some patients will relate a history of loss of function, which may involve the following:
 - (1) Decreased strength.
 - (2) Decreased range of motion (ROM).
 - (3) Decreased motor control.
 - (4) Locked joint, either temporarily or permanently.
 - (5) Paralysis.
3. Perform a physical examination (PE). As part of a complete PE or a problem-oriented orthopedic examination (exam), examine the areas discussed in steps 4 through 11.
4. Examine the neck (task 081-833-4372, Manage a Cervical Fracture or Dislocation).
5. Examine the shoulder girdle.
 - a. Observation:
 - (1) General contour of the following:
 - (a) Clavicle and acromioclavicular joint.
 - (b) Lateral aspect of the shoulder.
 - (2) Deformity.
 - (3) Atrophy.
 - (4) Rhythm of motion.
 - b. Palpation:
 - (1) Spasm.
 - (2) Tenderness.
 - (3) Defects.
 - (4) Popping, snapping, or crepitus (during ROM testing).
 - (5) Nodes.
 - (6) Masses.
 - c. ROM and muscle strength:

NOTE: The shoulder has the greatest ROM in the body and is therefore easily dislocated.

 - (1) Active range of motion (AROM) (Apley scratch test):
 - (a) External rotation and abduction.
 - (b) Internal rotation and adduction.
 - (2) Passive range of motion (PROM):
 - (a) Abduction: 180 degrees. Two components are deltoid 0 to 45 degrees and supraspinatus 45 to 180 degrees.
 - (b) Abduction: 45 degrees.
 - (c) Flexion: 90 degrees.
 - (d) Extension: 45 degrees.
 - (e) Internal rotation: 55 degrees.
 - (f) External rotation: 40 to 45 degrees.
 - (3) Strength testing:

Performance Steps

- (a) Abduction: deltoid (0 to 45 degrees) and supraspinatus (45 to 180 degrees).
 - (b) Adduction: pectoralis major.
 - (c) Flexion.
 - (d) Extension.
 - (e) Internal rotation.
 - (f) External rotation: infraspinatus, teres minor.
- d. Special maneuvers:
- (1) Drop arm test (Figure 1):
 - (a) Tests for tears in the rotator cuff (especially the supraspinatus).
 - (b) Patient fully abducts arm and slowly lowers the arm.
 - (c) Positive if patient is unable to lower the arm slowly and it drops to his side. Also positive if he is able to hold the arm at 90-degrees abduction, but gentle tapping causes the arm to fall.

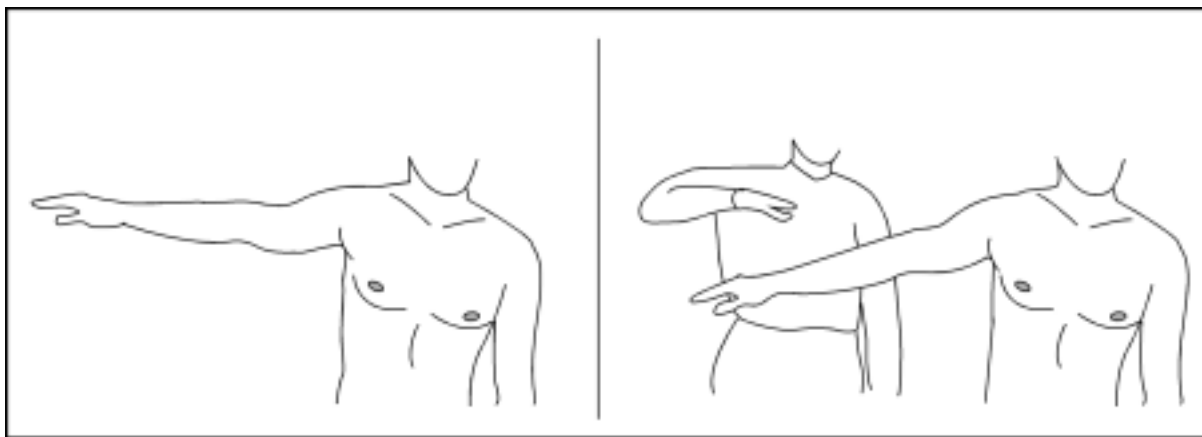


Figure 1. Drop Arm Test

NOTE: If there are tears in the rotator cuff, the arm drops and the patient is unable to lower his arm slowly to his side.

- (2) Scapular winging (Figure 2):
 - (a) Tests for weakness of the serratus anterior muscle.
 - (b) Patient flexes his elbows to 90 degrees in front of him and then leans and pushes against a wall with his hands.
 - (c) Positive if the medial aspect of the scapula protrudes (winging).

Performance Steps

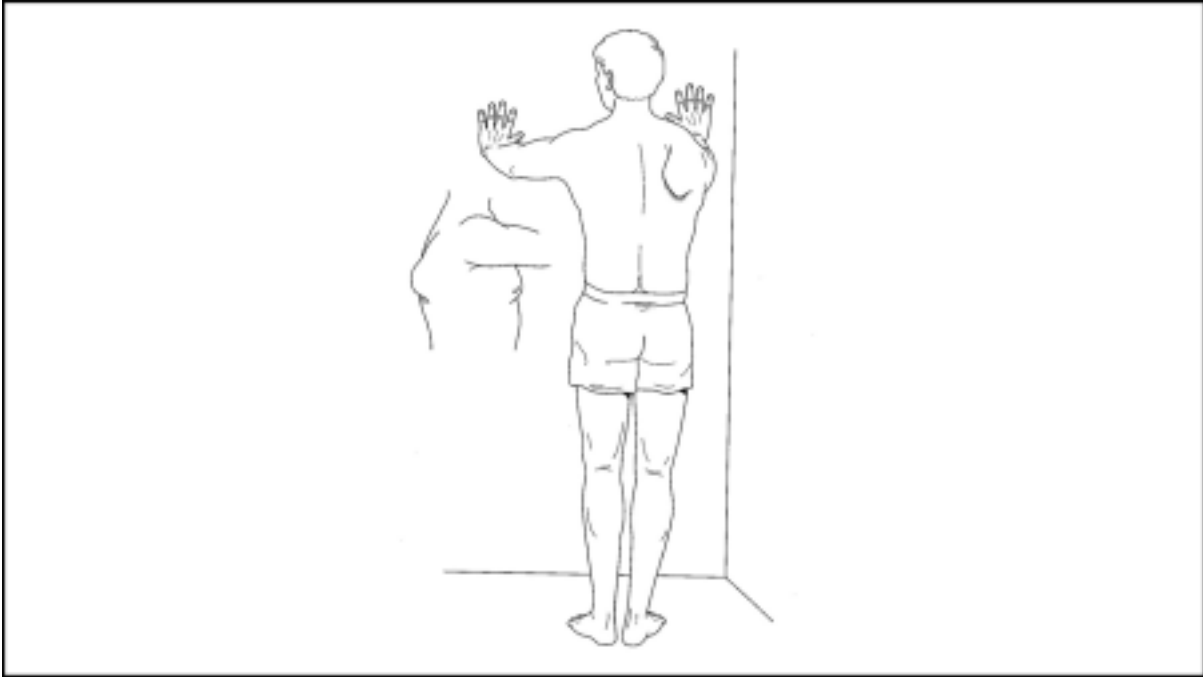


Figure 2. Scapular Winging

- (3) Shoulder shrug:
 - (a) Patient shrugs against resistance. Observe the patient for weakness.
 - (b) Tests the trapezius muscle and levator scapulae.
- (4) Pectoralis major weakness:
 - (a) Patient adducts his arm in front and overhead.
 - (b) Apply resistance outwardly and observe for weakness.
- (5) Yergason test:
 - (a) Tests bicipital tendon stability within the groove.
 - (b) Externally rotate the shoulder with the elbow flexed at 90 degrees against patient resistance, and then pull down on patient's elbow.
 - (c) Positive if the tendon pops out of the groove or if there is associated pain.
- (6) Apprehension test for shoulder dislocation (Figure 3):
 - (a) Tests chronic dislocating shoulder.
 - (b) Abduct and externally rotate the patient's arm to the point of impending dislocation.
 - (c) If the shoulder is ready to dislocate, the patient will have a look of apprehension and will resist further motion. Place your fingers in patient's axilla to help prevent the humeral head from dislocating.

Performance Steps



Figure 3. Apprehension Test

- (7) Tests for acromioclavicular joint (ACJ) instability:
 - (a) Have the patient hold a weight in each hand.
 - (b) Observe and palpate for deformity at the ACJ.

6. Examine the arm and elbow.

a. Observation:

- (1) Swelling, especially of the elbow or olecranon bursa.
- (2) Atrophy.
- (3) Rupture of the biceps.
- (4) Carrying angle:
 - (a) Normal angle for a male is 5 degrees; for female, 10 to 15 degrees.
 - (b) Abnormal is when the cubitus valgus angle is greater than normal and the cubitus varus angle is less than normal (gunstock deformity).

b. Palpation:

NOTE: The radial head is located in the elbow, while the ulnar head is in the wrist.

(1) Triangle of points:

- (a) The epicondyles and the olecranon form an isosceles triangle during flexion.
- (b) The epicondyles and the olecranon form a straight line during extension.

c. ROM and strength:

(1) AROM and PROM:

- (a) Flexion: 150 degrees.
- (b) Extension: 0 degrees.
- (c) Pronation: 90 degrees.
- (d) Supination: 90 degrees.

(2) Strength:

NOTE: The radius rotates around the ulna during supination and pronation.

- (a) Flexion: Tests the brachioradialis and the biceps (when the arm is supinated).
- (b) Extension: Tests the triceps.
- (c) Supination: Tests the biceps and supinator.
- (d) Pronation: Tests pronators.

d. Special maneuvers:

Performance Steps

- (1) Measurement of girth:
 - (a) Measure for atrophy or edema.
 - (b) Use the largest mass area. Measure from the lateral epicondyle to the area being measured, and record the distance. Measure muscle during contraction.
 - (c) Record the results.
 - (d) Use same area for subsequent measurements.
- (2) Test for lateral or medial instability:
 - (a) Flex the elbow slightly.
 - (b) Stress the elbow medially or laterally.
 - (c) Observe and palpate to test instability.
- (3) Tennis elbow test (Figure 4):
 - (a) Patient dorsiflex the wrist under resistance.
 - (b) Positive if the patient experiences pain.

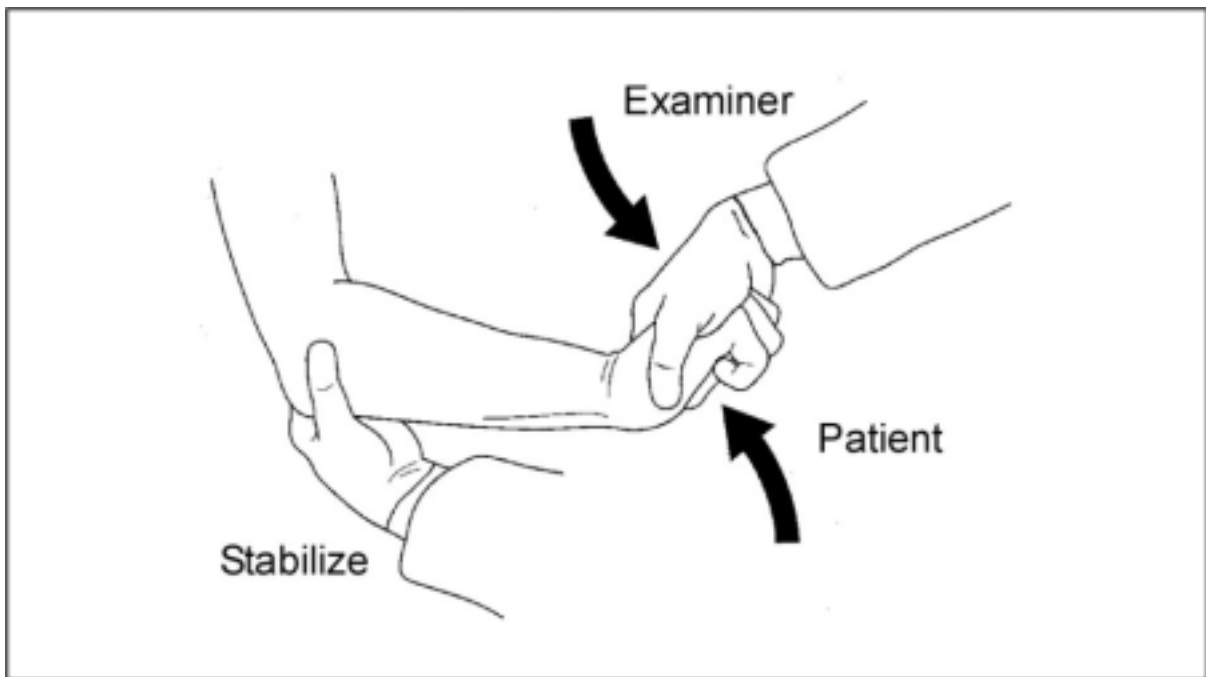


Figure 4. Tennis Elbow Test

- (4) Tinel's sign (Figure 5):

NOTE: Tinel's sign may be used to test several other nerves of the body such as the median nerve in carpal tunnel syndrome.

- (a) Tests for ulna nerve neuropathy.
- (b) Gently tap the area of the ulna groove.
- (c) Patient complains of tingling sensation down the arm to the ulnar distribution of the wrist.

Performance Steps

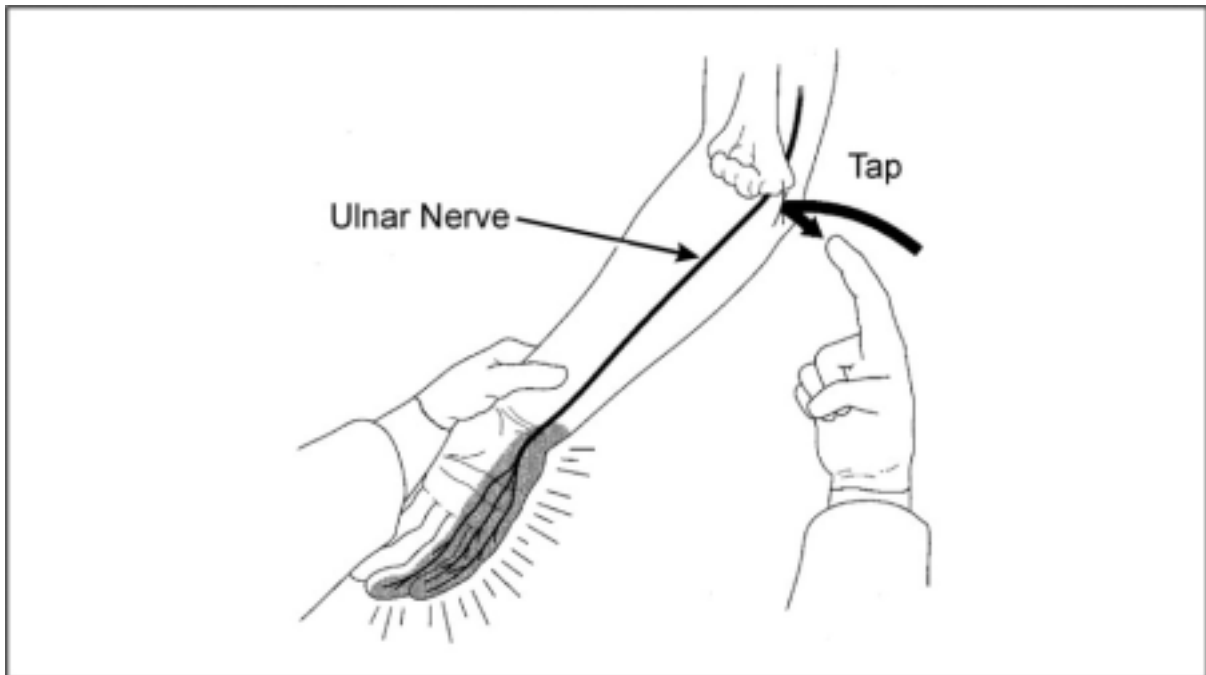


Figure 5. Tinel's Sign

7. Examine the wrist and hand:

a. Observation:

- (1) Interphalangeal joint swelling with rheumatoid arthritis.
- (2) Nodule in the wrist may indicate ganglion cyst.

b. Palpate for general abnormalities.

c. ROM and strength:

(1) AROM:

- (a) Fingers extended and flexed.
- (b) Fist with the thumb across the knuckles.
- (c) Flexion and extension of the middle phalangeal joint (MPJ) and interphalangeal joint (IPJ).
- (d) Flexion and extension of the wrist.
- (e) Radial and ulnar deviation.
- (f) Thumb opposition.
- (g) Finger abduction and adduction.

(2) PROM:

- (a) Ulnar deviation: 30 degrees.
- (b) Radial deviation: 20 degrees.
- (c) Supination: 90 degrees.
- (d) Pronation: 90 degrees.
- (e) Wrist flexion: 80 degrees.
- (f) Wrist extension: 70 degrees.
- (g) Finger flexion: 90 degrees.
- (h) Finger extension: 30 to 45 degrees.
- (i) Proximal interphalangeal joint (PIPJ) flexion: 100 degrees.
- (j) PIPJ extension: 0 degrees.
- (k) Distal interphalangeal joint (DIPJ) flexion: 90 degrees.
- (l) DIPJ extension: 0 to 10 degrees.
- (m) Thumb flexion (MPJ): 50 degrees.

Performance Steps

- (n) Thumb extension (MPJ): 0 degrees (radial abduction).
- (o) Thumb flexion (IPJ): 90 degrees.
- (p) Thumb extension (IPJ): 0 to 20 degrees.
- (q) Palmer abduction (thumb): 70 degrees.
- (3) Strength:
 - (a) Wrist extensions.
 - (b) Wrist flexion: ulnar and radial deviation.
 - (c) Finger extension: flexion.
 - (d) Finger abduction.
 - (e) Finger adduction.
 - (f) Pinch grip.
 - (g) Thumb palmer abduction.
 - (h) Thumb opposition.
- d. Special maneuvers:
 - (1) Test for lateral instability of the phalanges:
 - (a) Finger MPJ: apply lateral pressure during full flexion.
 - (b) Finger and thumb IPJ: apply lateral pressure during mild flexion.
 - (c) Thumb MPJ: apply lateral pressure during palmer abduction.
 - (2) Snuffbox tenderness:
 - (a) Check for navicular fracture (posttraumatic).
 - (b) Positive if the area is tender.
 - (3) Finkelstein's test:
 - (a) Tests for tenosynovitis stenans (De Quervain's tenosynovitis).
 - (b) Patient tucks his thumb inside his fist. The wrist is then deviated to the ulnar side.
 - (c) Positive if the patient experiences a sharp pain over the radial styloid.
 - (4) Tinel's sign for carpal tunnel syndrome:
 - (a) Strike the area of the median nerve in the wrist (palmer area).
 - (b) Positive if the patient experiences paresthesia along the distribution of the median nerve.
 - (5) Phalen's test (Figure 6):
 - (a) Tests for carpal tunnel syndrome.
 - (b) Perform wrist flexion to maximum degree. Hold position for at least 1 minute.
 - (c) Positive if the patient's symptoms are reproduced.

Performance Steps

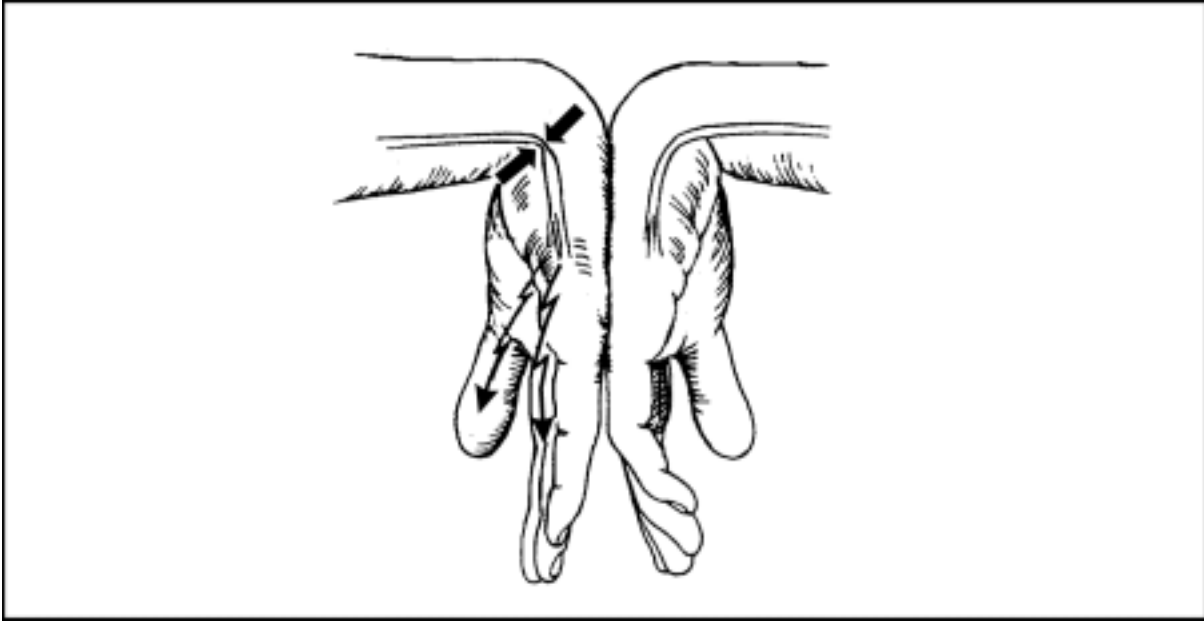


Figure 6. Phalen's Test

8. Examine the lumbosacral area (task 081-833-4420, Manage Musculoskeletal Lower Back Pain).
9. Examine the hip joint and pelvis.
 - a. Observation:
 - (1) Gait:
 - (a) Antalgic: Patient remains on his involved extremity for as short a period of time as is possible.
 - (b) Paralytic: Arm flexed, close to side, and immobile. Leg circles stiffly outward and forward with possible dragging of the toe.
 - (c) Drop foot (steppage gait): Foot lifted high with knee flexed and returned to floor with a slap. The patient looks as if he is walking up stairs. This is an indication of weak dorsiflexors.
 - (d) Gluteus maximus lurch: Patient thrusts thorax posteriorly to maintain hip extension. Associated with gluteus maximus weakness.
 - (e) Trendelenburg gait (gluteus medius lurch or abduction lurch): Patient lurches toward the involved side to place center of gravity over the hip. Associated with weak gluteus medius muscles.
 - (2) Pelvis level:
 - (a) Dimples overlying the posterior superior iliac spine directly above the buttocks should be at same horizontal line.
 - (b) Levels of buttocks creases.
 - b. Palpation:
 - (1) General abnormalities.
 - (2) Crepitation and snapping of the hip joint.
 - c. ROM and strength:
 - (1) AROM:
 - (a) Abduction: Patient stands and spreads legs.
 - (b) Adduction: Patient alternately crosses each leg over the other.
 - (c) Flexion: Patient draws each knee to the chest.
 - (d) Flexion and adduction: Patient sits on chair and crosses thighs.

Performance Steps

- (e) Flexion, abduction, and external rotation: Patient sits in a chair and places the lateral side of the foot on the opposite knee.
- (f) Extension: Patient gets up from chair with his arms crossed.
- (g) Internal and external rotation: Patient is tested during above testing.
- (2) PROM:
 - (a) Flexion: 120 degrees.
 - (b) Extension: 30 degrees.
 - (c) Abduction: 45 to 50 degrees.
 - (d) Adduction: 20 to 30 degrees.
 - (e) Internal rotation: 35 degrees.
 - (f) External rotation: 45 degrees.
- (3) Strength:
 - (a) Flexion: iliopsoas (rectus femoris is secondary flexor).
 - (b) Extension: gluteus maximus.
 - (c) Abduction: gluteus medius.
 - (d) Adduction: adductors.

10. Examine the leg and knee.

a. Observation:

- (1) Leg length discrepancy: may be true or apparent.
 - (a) True leg length discrepancy results from actual bone length difference.
 - (b) Measure from the anterior superior iliac spine to the medial malleolus.
 - (c) If the measurements are unequal, determine where the discrepancy lies.
 - (d) Have the patient lie supine and flex the knees to 90 degrees.
 - (e) If one knee is higher than the other, the tibia of the higher knee is longer.
 - (f) If one knee projects further anteriorly than the other, the femur of the forward knee is longer.
 - (g) If there is no bony inequality, then the discrepancy is in the pelvis or hip joint.
- (2) Genu valgum: "Knock knees."
- (3) Genu varum: "Bowed legs."
- (4) Genu recurvatum: "Back knee."

b. Palpation:

NOTE: The most important point of palpation is to find the exact point of tenderness and identify the structure under it.

- (1) Possible areas of tenderness are as follows:
 - (a) Lateral knee with lateral collateral ligament (LCL) tears, lateral meniscus tears, and tibial plateau stress fractures.
 - (b) Medial knee with medial collateral ligament (MCL) tears, medial meniscus tears, tibial plateau stress fractures, and pes anserinus bursitis.
 - (c) Popliteal fossa with Baker's cysts and hamstring tendon strain.
- (2) Also palpate for general crepitus, popping, or snapping during normal movement of the joint.

c. ROM and strength:

- (1) AROM:
 - (a) Flexion: Patient squats with his hands behind his head. Ensure that both knees flex symmetrically.
 - (b) Extension: Patient stands up from squatting with his hands behind his head. Alternatively, have the patient extend the lower leg while sitting.
 - (c) Rotation: Patient is sitting or supine with the knee flexed to 90 degrees.
- (2) PROM:
 - (a) Flexion: 135 degrees.
 - (b) Extension: 0 degrees.
 - (c) Internal rotation: 10 degrees.
 - (d) External rotation: 10 degrees.

Performance Steps

- (3) Strength: Apply opposing force while instructing patient to maintain flexion and then extension. Normal findings should be bilaterally symmetric with full resistance to opposition.
- d. Special maneuvers:
 - (1) Ballottment:
 - (a) Test for major effusion in the knee joint.
 - (b) Extend the knee, and relax the quadriceps. Compress the patella into the trochlear groove. An audible click may be evident. Quickly release it.
 - (c) Positive sign is rapid patellar rebound, which is caused by fluid lying under the patella being forced to the sides of the joint and flowing back under the patella after it is released.
 - (2) Bulge sign:
 - (a) Test for minor effusion in the knee joint.
 - (b) Milk the fluid from the suprapatellar and lateral areas into the medial side. Tap the fluid gently to the lateral side.
 - (c) Positive sign is a feeling of "fullness" on the medial side when it is tapped.
 - (3) Measure quadriceps girth:
 - (a) Measure each quadriceps 3 inches from the medial tibial plateau.
 - (b) Differences in girth indicate muscle atrophy.
 - (4) LCL (varus) stress test (Figure 7):
 - (a) Test for tears in the LCL.
 - (b) Extend the knee, and relax the quadriceps. Push the knee laterally while pushing the ankle medially.
 - (c) Observe and palpate the knee for gapping and/or popping indicative of ligamental tear or laxity. Compare with the contralateral side.

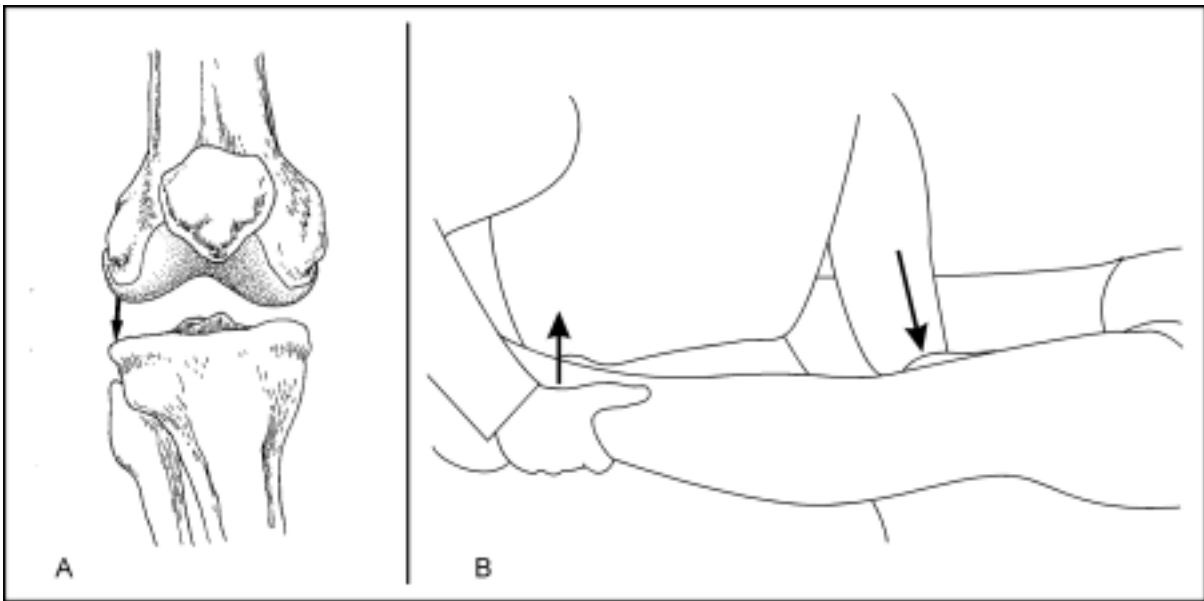


Figure 7. LCL Test

- (5) MCL (valgus) stress test (Figure 8):
 - (a) Test for medial collateral ligament tears.
 - (b) Flex the knee to around 20 degrees, and have the patient relax his quadriceps. Push the knee medially while pushing the ankle laterally.
 - (c) Observe and palpate for gapping and/or popping indicative of ligamental tear or laxity. Compare with the contralateral side.

Performance Steps

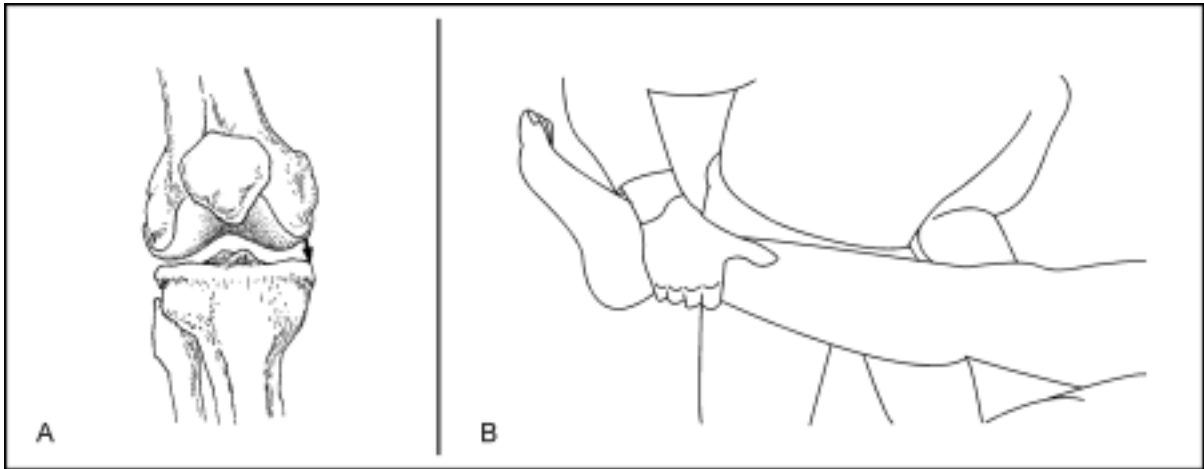


Figure 8. MCL Stress Test

(6) Drawer signs (Figure 9):

- (a) Test for anterior and posterior cruciate ligament instability.
- (b) Anterior drawer sign procedure: Place the patient supine with the knee flexed at 90 degrees and the foot flat on the table. Sit on the foot to stabilize it. Ensure that the patient is relaxed. Draw the tibia toward you and look for forward sliding. Repeat with the foot internally and externally rotated. Compare with the other leg.
- (c) Positive anterior movement indicates a possible rotation of the ACL when the foot is neutral. Possible tear in the ACL, posteromedial portion of the joint capsule and MCL when the foot is externally rotated. Possible tear in the ACL and posterolateral portion of the joint capsule when the foot is internally rotated.
- (d) Posterior drawer sign: Patient is placed as for anterior. Push the tibia posteriorly. If the tibia shifts, this indicates a torn posterior cruciate ligament. Compare to the other side. No need to perform with the foot in rotation.

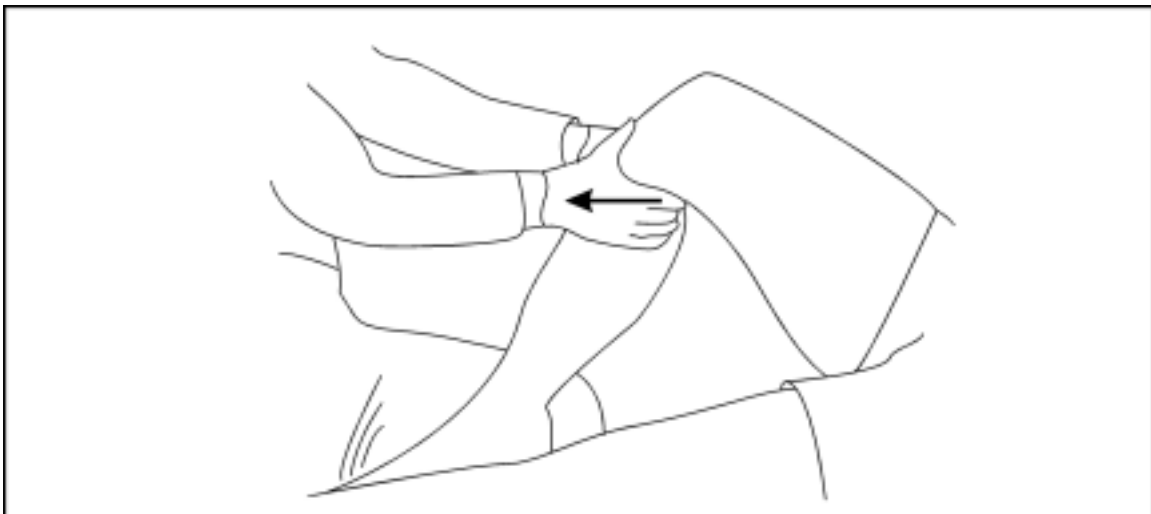


Figure 9. Draw Sign Test

(7) McMurray's test (Figure 10):

- (a) Test for tears in the medial or lateral menisci.

Performance Steps

- (b) Hold the patient's heel, and fully flex the leg. Place the free hand on the joint with the fingers on one joint line and the thumb on the other. Rotate the knee externally and internally to loosen the joint. Apply valgus stress to the knee, and rotate the leg externally (opposite to the direction of the knee). Extend the leg slowly. Repeat with the knee varus and the leg internally rotated.
- (c) Positive if a click is heard or palpated in the joint line of the involved meniscus.

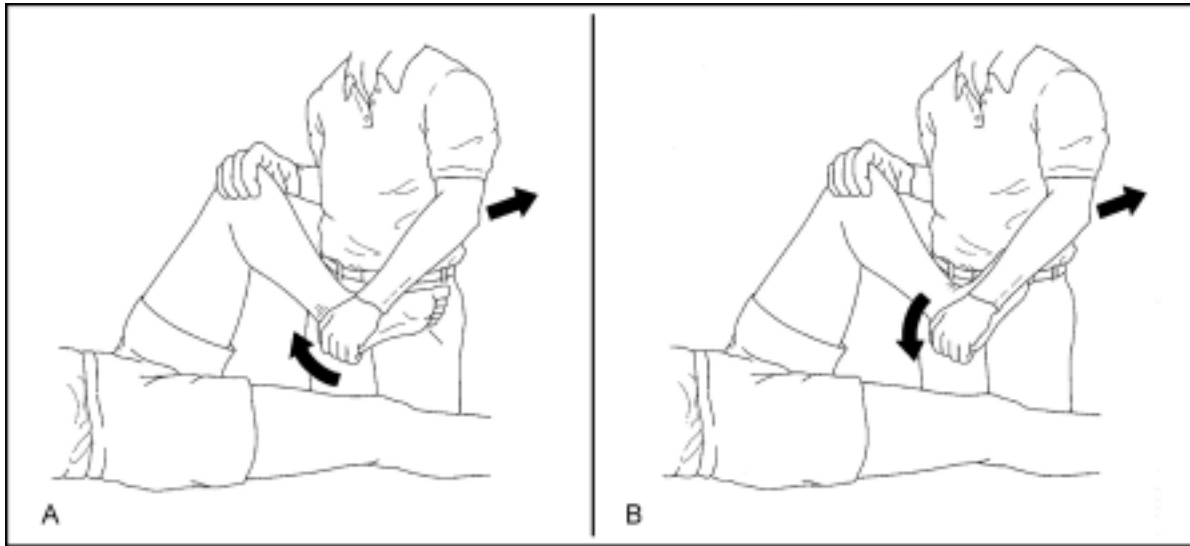


Figure 10. McMurray Test

- (8) Appley's compression (grind) test:
 - (a) Test for torn meniscus.
 - (b) Patient is prone with the knee flexed at 90 degrees. Compress the patient's tibia against the menisci. Rotate the tibia.
 - (c) Positive if the procedure causes pain (medial or lateral).
- 11. Examine the ankle and foot:
 - a. Observation:
 - (1) Calluses.
 - (2) Corns.
 - (3) Pes cavus.
 - (4) Pes planus.
 - (5) Shoe wear: Uneven shoe wear indicates biomechanical abnormality somewhere in the lower extremity, not necessarily the foot.
 - b. Palpation:
 - (1) General deformity.
 - (2) Crepitus or clicks with normal joint movement.
 - c. ROM and strength:
 - (1) AROM:
 - (a) Ankle dorsiflexion: Test with patient walking on heel.
 - (b) Ankle plantar flexion: Test with patient walking on toes.
 - (c) Foot inversion: Patient walks on the lateral borders of his feet.
 - (d) Foot eversion: Patient walks on the medial borders of his feet.
 - (2) PROM:
 - (a) Ankle dorsiflexion: 20 degrees.
 - (b) Ankle plantar flexion: 20 degrees.
 - (c) Foot inversion: 5 degrees.
 - (d) Foot eversion: 5 degrees.

Performance Steps

- (e) Forefoot adduction: 20 degrees.
- (f) Forefoot abduction: 10 degrees.
- (g) First MPJ extension: 45 degrees.
- (h) First MPJ flexion: 70 to 90 degrees.
- (3) Strength:
 - (a) Dorsiflexion tests the tibialis anterior, extensor hallucis longus, and extensor digitorum longus.
 - (b) Plantar flexion tests the peroneus longus and brevis.
 - (c) Gastrocnemius and soleus are tested by having the patient hop up and down on the ball of his foot.
- d. Special maneuvers (Figure 11):
 - (1) Anterior drawer sign of the ankle:
 - (a) Tests for instability of the anterior talofibular ligament.
 - (b) Support the patient's lower tibia. Grip the calcaneus in the other hand. Draw the calcaneus anteriorly while supporting the tibia. Compare contralaterally.
 - (c) Positive if the talus slides forward. May be associated with an audible "clunk."

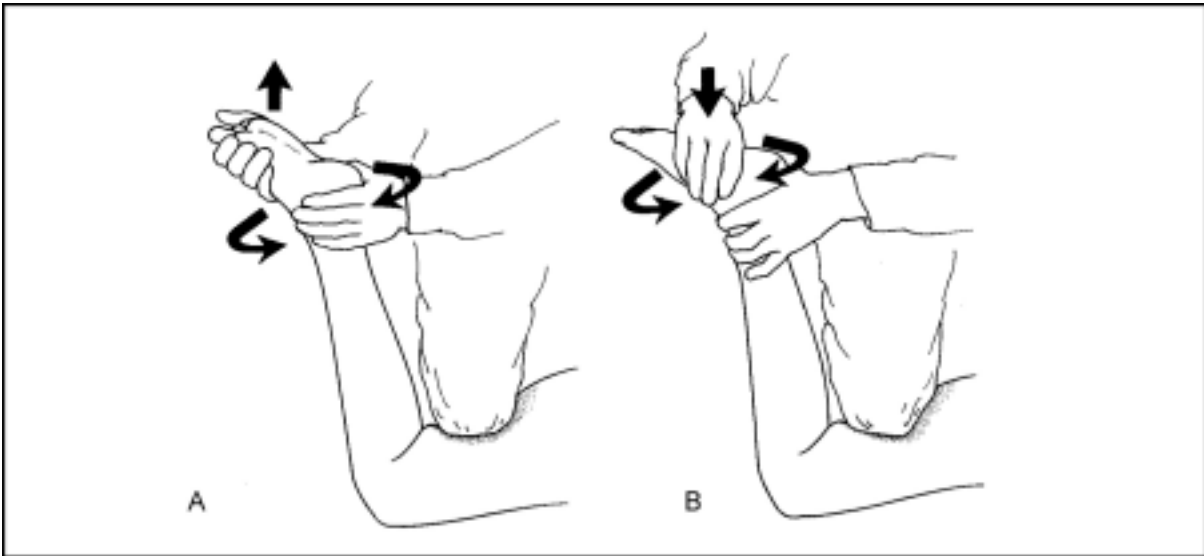


Figure 11. Draw Sign Test

- (2) Test for calcaneofibular and anterior talofibular ligament instability.
 - (a) Invert the patient's calcaneus.
 - (b) Palpate and observe for lateral gapping.
- (3) Test for deltoid ligament instability.
 - (a) Evert the patient's calcaneus.
 - (b) Palpate and observe for gapping.
- (4) Test for ruptured Achilles tendon.
 - (a) Have the patient lie prone on a table with the foot off the table. Squeeze the calf, and look for plantar flexion of the foot.
 - (b) Absence of foot plantar flexion motion indicates a ruptured Achilles tendon.
- (5) Test for Achilles tendon crepitation and tendonitis (Figure 12).
 - (a) Place one hand on the Achilles tendon. Passively and repeatedly perform plantar flexion and dorsiflexion of the foot.
 - (b) Positive if crepitation is felt in the Achilles tendon area.

Performance Steps

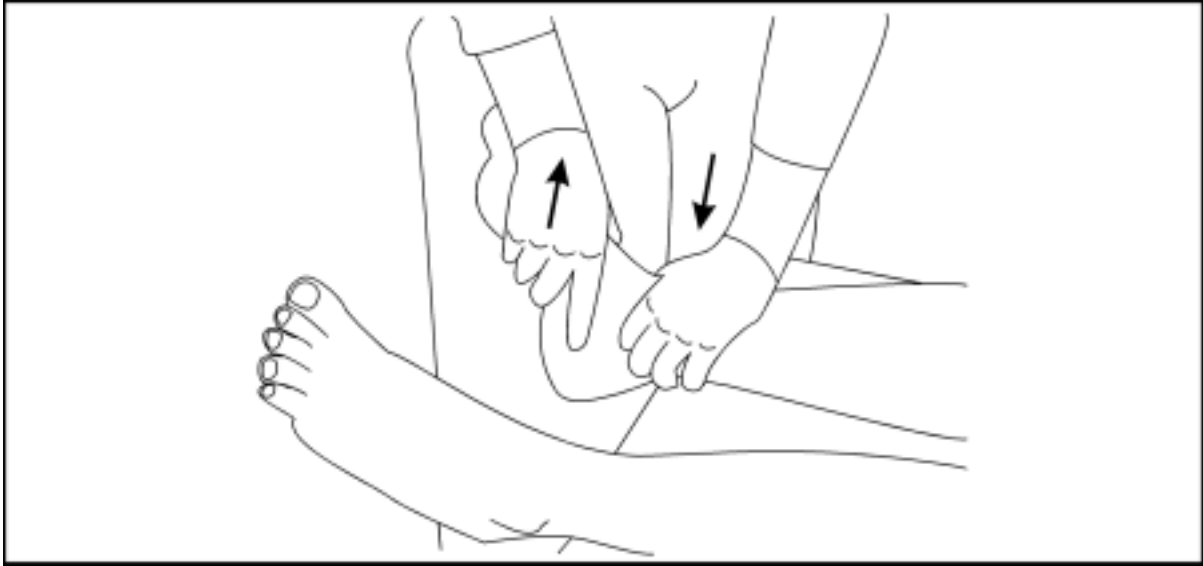


Figure 12. Achilles Tendon Test

12. Record all treatment in the patient's medical record.

13. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must assess common orthopedic diseases and conditions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Solicited a patient history.	—	—
2. Recognized significant subjective findings for orthopedic diseases or conditions.	—	—
3. Performed a PE.	—	—
4. Examined the neck.	—	—
5. Examined the shoulder girdle.	—	—
6. Examined the arm and elbow.	—	—
7. Examined the wrist and hand.	—	—
8. Examined the lumbosacral area.	—	—
9. Examined the hip joint and pelvis.	—	—
10. Examined the leg and knee.	—	—
11. Examined the ankle and foot.	—	—
12. Recorded all treatment in the patient's medical record.	—	—
13. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

BATES PE, 8TH ED. 2002

MERCK MANUAL 17TH ED

Manage Arthritis

081-833-4377

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of nonsteroidal anti-inflammatory drugs (NSAIDs), and other pharmacological agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the general characteristics of rheumatoid arthritis (RA).
 - a. RA is a chronic systemic polyarticular inflammatory disease of the synovium characterized by exacerbations and remissions.
 - b. Etiology is unknown. It is known that autoimmune (immunoglobulin M [IgM]) antibodies are formed against other antibodies within the same patient, leading to what is known as rheumatoid factor (RF).
 - c. RA affects all races and any age. Females are three times more likely than males to be affected. The greatest incidence is during the 3d and 4th decades of life. It generally affects 1 to 2 percent of the population. Susceptibility to RA is genetically determined.
2. Solicit a patient history.
3. Recognize significant subjective findings for RA.
 - a. Slow, insidious onset over a period of weeks to months (seen in the majority of patients with RA (70 percent). Only 15 percent of patients will complain of the acute onset of joint swelling and pain; that is, waking up with warm, swollen joints.
 - b. Prodromal systemic symptoms; for example, malaise fever, weight loss, and morning stiffness.
 - c. Vague periarticular joint pain or stiffness or symmetric joint swelling with associated stiffness, warmth, tenderness, and pain.
 - d. Morning stiffness. The stiffness is prominent in the morning and usually subsides during the day.
4. Perform a physical examination (PE).
5. Recognize significant objective findings for RA.
 - a. Symmetrical joint involvement (usually).
 - b. Small joints are primarily involved (large joints can be involved). The cervical spine may be involved. RA tends to spare the thoracic and lumbar spine. Characteristic joints involved in RA are as follows:
 - (1) Proximal interphalangeal (PIP): 63 percent.
 - (2) Metacarpophalangeal (MCP): 87 percent. Osteoarthritis (OA) usually spares the MCP joint.
 - (3) Wrist: 82 percent. OA usually spares the wrist.
 - (4) Knees: 56 percent.
 - (5) Ankles: 53 percent.
 - (6) Cervical spine: no statistics established.
 - c. Polyarthritis.
 - d. Rheumatoid nodules are involved in only 25 percent of patients. These nodules are subcutaneous, freely moveable, and located primarily on the extensor surfaces of the body (distal to the elbow). The rheumatoid nodules in RA have a characteristic microscopic appearance--granuloma with a central zone of fibrinoid necrosis.
 - e. Peripheral joints tend to be affected more often than proximal joints.
 - f. Synovial cysts (Baker's cysts are associated with RA).
 - g. Hand findings:

Performance Steps

- (1) Ulnar deviation.
 - (2) Swan-neck deformity: only associated with RA. It consists of hyperextension of the PIP with flexion of the distal interphalangeal (DIP) joint of the same finger.
 - (3) Boutonniere deformity: only associated with RA. It is just the opposite of the swan-neck deformity. It consists of flexion of the PIP and hyperextension of the DIP joint.
- h. Systemic findings associated with RA are as follows:
- (1) Pulmonary system:
 - (a) Interstitial fibrosis.
 - (b) Pleurisy.
 - (c) Parenchymal nodules.
 - (2) Eye:
 - (a) Scleritis.
 - (b) Scleromalacia perforans.
 - (3) Heart:
 - (a) Pericarditis.
 - (b) Cardiomyopathy.
 - (c) Valvular incompetence.
 - (4) Blood
 - (a) Splenomegaly.
 - (b) Anemia.
 - (c) Leukopenia.
 - (5) Kidney (amyloidosis).
6. Recognize significant lab findings that are caused by RA.
- a. Radiographic findings:
 - (1) Juxta-articular osteoporosis.
 - (2) Joint erosions.
 - (3) Narrowing of the joint spaces.
 - b. RF: RF is found in 75 percent of patients with RA. Send a blood sample for RF. RF is an IgM antibody directed against other antibodies found in the patient. A positive RF is NOT pathognomonic for RA. RF may also be positive in syphilis, leprosy, sarcoidosis, infective endocarditis, tuberculosis, and so on.
 - c. Joint effusion (Group II inflammatory joint fluid).
 - d. Nonspecific elevated erythrocyte sedimentation rate (ESR).
- NOTE: American Rheumatism Association (ARA) criteria for the diagnosis of RA includes having two of the following five criteria:
1. Arthritis of three or more joint areas involved simultaneously; that is, polyarthritis (must be observed by a health care provider).
 2. Arthritis of the hand joints (wrist and/or MCP).
 3. Symmetric arthritis, which is the simultaneous involvement of the same joint areas on both sides of the body.
 4. Positive serum RF.
 5. Radiographic changes of RA.
7. Differentiate between RA and other diseases with similar signs and symptoms. Consider the following diseases:
- a. Systemic lupus erythematosus (SLE) systemic lupus erythematosus.
 - b. OA. However, OA is not associated with constitutional manifestations and the joint pain is usually relieved with rest. OA spares the wrist and MCP joints.
 - c. Gout. However, usually monoarticular until later years, not polyarticular like RA.
 - d. Septic arthritis. However, septic arthritis is usually associated with fevers and chills, unlike RA. The septic arthritis patients will also have the causative organism in the joint fluid, whereas the joint fluid in RA is sterile (no organisms).
8. Manage RA (reduce inflammation and pain, preserve function, and prevent deformity) as follows:
- a. Rest.

Performance Steps

- b. Physical therapy.
- c. NSAIDs.

NOTE: Take all NSAIDs with food.

- (1) Aspirin. The proper dose is the amount that relieves symptoms but does not cause toxicity (such as tinnitus, or ringing of the ears). The patient may require 4 to 6 grams of aspirin per day. Measure serum acetylsalicylic acid (ASA) (aspirin) levels. Therapeutic level is 20 to 30 milligrams per deciliter (mg/dl). Enteric, coated ASA is preferred.
- (2) Ibuprofen (Motrin).
- (3) Naproxen (Naprosyn).
- (4) Piroxicam (Feldene).

NOTE: If one class of NSAID is not effective, change to a different class of NSAID. Do not mix NSAIDs. Use only one type at a time. Be aware of the NSAID side effects (GI bleeding, renal failure, and so on).

- d. Gold therapy. Gold may stop continued bone erosions. Gold is used for patients who do not respond to conservative measures (rest, physical therapy, ASA, or NSAIDs). If conservative measures fail, refer patient to rheumatology.

NOTE: There are many other drugs which can potentially be used in the patient with RA. If conservative measures fail, refer the patient to rheumatology.

9. Understand the general characteristics of OA (degenerative joint disease).

- a. OA is a slowly progressive disease of the cartilage which can be initiated by metabolic, genetic, systemic, and/or traumatic factors. OA is not associated with systemic manifestations. (Remember RA is associated with systemic manifestations.)
- b. Etiology:
 - (1) OA results from a combination of factors--genetic, metabolic, systemic, and traumatic.
 - (2) OA is not considered "just a normal process of aging" as was commonly believed years ago.
 - (3) OA is caused by any disease process or traumatic event which causes a "change in articular cartilage, such as diabetes, acromegaly, hypothyroidism, obesity, and so on. OA may be idiopathic--the exact etiology is unknown.
- c. Incidence:
 - (1) OA is the most common form of joint disease.
 - (2) OA spares no race, age, or geographic area.
 - (3) By the age of 40, 90 percent of all people will have radiographic features of OA in weight-bearing joints.

10. Solicit a patient history.

11. Recognize significant subjective findings for OA.

- a. Slow, insidious onset (similar to RA).
- b. Initially, the patient may complain of articular stiffness (usually lasting less than 15 minutes). This stiffness progresses to a complaint of joint pain. The joint pain is made worse by exercise or prolonged activity and relieved or improved by rest. (This is completely opposite in the patient with RA.)
- c. Absence of morning stiffness (usually).

12. Perform a PE.

13. Recognize significant objective findings for malaria.

- a. Crepitus may be elicited in the involved joint (especially the knee).
- b. Asymmetrical joint involvement (usually).
- c. Large or small joints, which are the characteristic joints involved in OA.
 - (1) Hands (involved in idiopathic OA):
 - (a) Heberden's nodes: osteoarthritic disfigurements of the DIP joint.
 - (b) Bouchard's nodes: osteoarthritic disfigurements of the PIP joint.
 - (2) Weight-bearing joints.
 - (a) Knee involvement is the most common source of major disability in OA.

Performance Steps

- (b) Spine is commonly involved.
 - d. There are no systemic findings in OA. (RA is associated with systemic findings; that is, other organ systems are involved.)
14. Recognize significant lab results that are caused by OA.
- a. Joint effusion (Group I noninflammatory joint fluid). RA is associated with an inflammatory joint fluid.
 - b. Radiographic findings:
 - (1) Narrowed joint space (also seen in RA).
 - (2) Osteophytes, or bony spur. These are not seen in RA and are the body's attempt to reconstruct the damaged bone.
 - (3) Bony cysts.
 - (4) Increased density of subchondral bone.
 - c. Normal ESR (usually, OA is considered a noninflammatory disease). Remember, RA is usually associated with an increased ESR.
15. Differentiate between OA and other diseases with similar signs and symptoms. Consider the same diseases as with RA.
16. Manage OA (reduce pain, preserve function, and prevent deformity) as follows:
- a. Rest.
 - b. Diet. In obese patients, weight reduction will diminish stress on the osteoarthritic joint.
 - c. Physical therapy.
 - d. NSAIDs help relieve pain.
- NOTE: High doses of ASA are primarily used for the inflammatory arthritides (like RA). OA is a noninflammatory form of arthritis.
- e. Referral to orthopedics for joint replacement for end-stage OA.
17. Understand the general characteristics of gouty arthritis, or gout.
- a. Gout is a metabolic disorder of purine metabolism associated with an increase in the serum levels of uric acid (urate). There are two forms of gout--primary and secondary.
 - (1) Primary gout is caused by an overproduction of purines; that is, either the overproduction is idiopathic or there is a specific enzyme defect (Lesch-Nyhan syndrome). The primary form of gout is the most common form.
 - (2) Secondary gout (secondary hyperuricemia) occurs because of an increased catabolism of purines or a decreased renal clearance of uric acid.
 - b. Incidence of gout:
 - (1) More males than females have gout (just the opposite is true for RA). Ninety percent of patients with gout are male.
 - (2) The typical patient is male over the age of 30.
 - c. Pathogenesis:
 - (1) The excess uric acid in the body tends to accumulate in the joint (primarily the first MTP joint).
 - (2) Crystals form that are referred to as monosodium urate monohydrate crystals. The acute inflammation in the joint is primarily caused by the ingestion of the crystals by the surrounding polymorphonuclear (PMN) cells. When the PMN cells phagocytize the crystals, the PMN cells release substances that cause inflammation.
 - (3) Gout is in the same category as RA--an inflammatory type of arthritis.
18. Solicit a patient history.
19. Recognize significant subjective findings for gout.
- a. Acute onset joint pain (remember RA and OA usually have a slow, insidious onset). Gout is caused by anything that causes a fluctuation in serum uric acid levels in a patient predisposed to gout such as the following:
 - (1) Surgery.
 - (2) Infection.

Performance Steps

- (3) Food excess.
 - (4) Diuretics.
 - (5) Alcohol excess.
 - (6) Uricosuric drugs.
 - b. No morning stiffness (would have stiffness with RA).
 - c. Joint pain is severe.
 - d. Fever is common (may be as high as 39 degrees Celsius).
 - e. Asymptomatic periods (months to years) follow an acute attack of gout. After years, the gout may cause a deforming arthritis.
20. Perform a PE.
21. Recognize significant objective findings for gout.
- a. Asymmetric joint involvement (symmetric in RA and asymmetric in OA).
 - b. Small or large joints are involved (RA involves small joints; OA, small or large).
 - c. Characteristic joints involved in gout are primarily lower extremity joints. (RA usually involves upper extremity; OA, usually lower extremity weight-bearing joints.)
 - (1) Metatarsophalangeal (MTP) joint of the great toe is the most susceptible to gout. When this joint is affected, it is referred to as podagra.
 - (2) Feet.
 - (3) Ankles.
 - (4) Knees.
 - (5) Hips and shoulders are rarely involved.
 - d. Monoarticular. Usually only one joint is involved in a flare of gout. Rarely will gout be polyarticular.
 - e. Involved joint is exquisitely tender, swollen, warm, and red (erythematous).
 - f. Tophi (plural of tophus) tend to be present in patients with chronic gout. Tophi are basically deposits of uric acid crystals. Tophi tend to be found in external ears, hands, feet, olecranon bursa, and prepatellar bursa.
22. Recognize significant lab findings that are caused by gout.
- a. Radiographic findings:
 - (1) Early gout is associated with normal X rays.
 - (2) Chronic gout may be associated with punched-out areas in the bone.
 - b. Serum uric acid is usually elevated (greater than 7.5 mg/dl).
- NOTE: A patient may have a normal uric acid level and still experience an episode of gout.
- c. ESR is usually elevated. (RA is associated with elevated ESR; OA, with normal ESR.)
 - d. White blood cell (WBC) count is usually elevated.
 - e. Aspiration of the joint will demonstrate uric acid crystals. They demonstrate negative birefringence under polarized light. This is pathognomonic of gout.
23. Differentiate between gout and other diseases with similar signs and symptoms. Consider the same diseases as with RA.
24. Manage gout.
- a. Acute attack of gout:
 - (1) Remember, the last thing you want to do is to change the patient's serum uric acid level with a drug during the acute attack. Sudden changes in serum uric acid levels often precipitate an attack of gout.
 - (2) NSAIDs are the drugs of choice. NSAIDs do not change the serum uric acid levels. Most patients will show a dramatic response to NSAIDs.
 - (3) Colchicine does not change the serum uric acid levels either, but it is associated with many side effects and toxicities. Therefore, use NSAIDs.
 - (4) Prescribe bedrest during the acute attack.
 - (5) Physical therapy is probably of little benefit. (Both RA and OA respond to physical therapy.)

Performance Steps

- b. Management of hyperuricemia in a patient with a history of gout.
 - (1) Uric acid tends to accumulate in tissues and organs of the body. A patient with known gout and hyperuricemia that is left untreated may develop renal failure or chronic tophi.
 - (2) Avoid obesity, fasting, and dehydration.
 - (3) Avoid drugs that can cause an increase in the serum levels of uric acid, such as the following:
 - (a) Diuretics (water pills) inhibit renal excretion of uric acid.
 - (b) Low doses of aspirin (ASA) inhibit renal excretion of uric acid.
 - (c) Nicotinic acid (used for elevated cholesterols).
 - (4) Reduce serum uric acid levels. (This measure is indicated in patients with frequent acute arthritis not controlled by prophylaxis, tophaceous deposits, or renal damage). Not all patients need to be on chronic drugs to reduce serum uric acid levels. For example, the patient who is hyperuricemic (elevated uric acid levels) but has never experienced an episode of gout does not require such drugs. Two types of drugs can reduce serum uric acid levels:
 - (a) Uricosuric drugs: These drugs can block the tubular reabsorption of uric acid in the kidney. Therefore, they increase the urine levels of uric acid and decrease the serum levels of uric acid. There are two uricosuric drugs--probenecid and sulfinpyrazone. Avoid uricosuric agents in patients with a history of uric acid stones (uric acid lithiasis).
 - (b) Allopurinol (never use in the treatment of acute gout): It is a xanthine oxidase inhibitor. Best for patients who over produce uric acid (urine excretion of uric acid is greater than 800 mg per day while on a purine-free diet. Used in patients who are unresponsive to the uricosuric drugs. Allopurinol is NOT indicated in asymptomatic hyperuricemic patients. Five percent of patients will have a pruritic rash that may progress to ten (toxic epidermal necrolysis), which is potentially fatal. Dosage starts with 100 mg per day for 1 week. Increase the dose to 200 to 300 mg per day if the serum uric acid levels are still high on 100 mg per day dosage.

25. Understand the general characteristics of septic arthritis.

a. Septic arthritis is basically an infection of the joints.

b. Etiology:

- (1) Otherwise healthy:
 - (a) *Neisseria gonorrhoeae* (N. gonorrhea).
 - (b) *Staphylococcus aureus*.
 - (c) Group A streptococci.
 - (d) Group B streptococci.
- (2) Immunocompromised:
 - (a) *Pseudomonas aeruginosa* (P. aeruginosa).
 - (b) *Escherichia coli* (E. coli).

NOTE: The most common causative organism of septic arthritis in the young adult in the United States is *N. gonorrhea*.

c. Pathogenesis of septic arthritis:

- (1) Hematogenous spread: The organism reaches the joint via the blood, which is the most common way the organism reaches the joint.
- (2) Direct invasion of the joint through the following:
 - (a) Arthrocentesis (joint aspiration). Think staphylococcal infection.
 - (b) Penetrating joint wound.
 - (c) Overlying cellulitis (which decides to penetrate into the joint).
 - (d) Arthroscopy.

26. Solicit a patient history.

27. Recognize significant subjective findings for septic arthritis.

a. Sudden onset (unlike RA and OA). Remember, gout is also associated with an acute onset of joint pain.

Performance Steps

- b. Fevers and chills will usually be present.
 - c. Ask patient for a history of intravenous (IV) drug abuse (these patients are at risk for the gram-negative rods), prosthetic joint surgery, recent arthroscopy, recent arthrocentesis, gout, RA, or OA.
 28. Perform a PE.
 29. Recognize significant objective findings for septic arthritis.
 - a. Asymmetric joint involvement (usually).
 - b. Monoarticular joint involvement (usually, however, can be polyarticular).
 - c. Small or large joint involvement (most often large weight-bearing joints)
 - d. Elevated temperature.
 - e. Warm, edematous, and erythematous joint (usually).
 - f. Pain with joint movement.
 - g. Potentially a vast array of systemic findings may be seen, or there may be none at all.
 30. Recognize significant lab findings that are caused by septic arthritis.
 - a. Radiographic findings:
 - (1) Early in septic arthritis, radiographs are normal.
 - (2) Bony erosions and/or narrowing of the joint space. These changes may be followed by an osteomyelitis (infection of the bone).
 - b. Blood cultures are positive in 50 percent of patients.
 - c. Joint fluid (not absolute diagnostic criteria):
 - (1) Appearance: turbid.
 - (2) WBC count: 150,000 to 250,000.
 - (3) PMN cells: About 90 percent of the total WBC.
 - (4) Glucose: low.
 - (5) Gram stain of the synovial fluid: positive in 75 percent of staphylococcal infections and in 50 percent of gram-negative infections.
 - (6) Joint fluid culture can definitively diagnose the genus and species of the organism causing the joint infection.
 31. Manage septic arthritis.
- NOTE:** This is an orthopedic emergency. Evacuate and refer the patient as soon as possible.
- a. Define the etiology first; that is, which organism is responsible for the joint infection? The blood cultures may demonstrate the organisms (takes several days to grow). The joint aspiration may demonstrate the organisms on gram stain (immediate information regarding the organism), and the joint fluid should be cultured. Most of the time, empiric broad-spectrum antibiotics are started before culture results return.
 - b. Hospitalize the patient.
 - c. Prompt systemic antibiotics. The antibiotic you choose will be based upon which organism(s) is/are suspected.
 - d. Refer patient for orthopedic surgery consult for possible incision and drainage (I&D) of the joint.
32. Manage complications of all types of arthritis symptomatically with appropriate supportive care.
 33. Record all treatment in the patient's medical record.
 34. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage arthritis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of RA.	—	—
2. Solicited a patient history.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Recognized significant subjective findings for RA.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for RA.	—	—
6. Recognized significant lab findings that are caused by RA.	—	—
7. Differentiated between RA and other diseases with similar signs and symptoms.	—	—
8. Managed RA.	—	—
9. Understood the general characteristics of osteoarthritis.	—	—
10. Recognized significant subjective findings for OA.	—	—
11. Recognized significant objective findings for OA.	—	—
12. Recognized significant lab results that are caused by OA.	—	—
13. Differentiated between OA and other diseases with similar signs and symptoms.	—	—
14. Managed OA.	—	—
15. Understood the general characteristics of gouty arthritis.	—	—
16. Recognized significant subjective findings for gout.	—	—
17. Recognized significant objective findings for gout.	—	—
18. Recognized significant lab findings that are caused by gout.	—	—
19. Differentiated between gout and other diseases with similar signs and symptoms.	—	—
20. Managed gout.	—	—
21. Understood the general characteristics of septic arthritis.	—	—
22. Recognized significant subjective findings for septic arthritis.	—	—
23. Recognized significant objective findings for septic arthritis.	—	—
24. Recognized significant lab findings that are caused by septic arthritis.	—	—
25. Managed septic arthritis.	—	—
26. Managed complications of all types of arthritis symptomatically with appropriate supportive care.	—	—
27. Recorded all treatment in the patient's medical record.	—	—
28. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Osteomyelitis

081-833-4386

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify osteomyelitis by patient history.

NOTE: Osteomyelitis has many causative organisms; however, it is more commonly caused by staphylococcal. An open wound may involve gram-negative and anaerobic organisms.

- a. Patient suffered penetrating trauma or open fracture 5 to 7 days previously.
- b. May develop osteomyelitis by one of three routes:
 - (1) Acute hematogenous osteomyelitis secondary to bacteremia.
 - (2) Infection spread to bone from adjacent soft tissue injury.
 - (3) Open fracture or direct contamination of bone.
- c. Possibly immunocompromised or debilitated.

2. Identify osteomyelitis by signs and symptoms.

- a. Malaise and fever, which precede pain by several days.
- b. Bone pain like toothache.
- c. Soft tissue is swollen, warm, tender, and hyperemic.
- d. Limited range of motion.
- e. Fluid in joint if infection nearby.
- f. Draining abscesses.

3. Perform lab tests to confirm or rule out diagnosis of osteomyelitis.

- a. Complete blood count (CBC) with differential.
- b. Gram stain of discharge and wound.
- c. Culture of biopsy.

4. Differentiate between osteomyelitis and other diseases producing similar signs and symptoms.

- a. Bone cancer.
- b. Infection not involving the bone.

5. Manage osteomyelitis.

- a. Begin appropriate antibiotic intravenously (IV) for 3 to 4 weeks. Use penicillinase-resistant drug plus gentamicin, and consider pseudomonas coverage.
- b. Immobilization of extremity.
- c. May require surgery to remove infection.
- d. Evacuation.

6. Consider or manage complications.

- a. Chronic osteomyelitis.
- b. Amputation.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage osteomyelitis.

Performance Measures

GO **NO GO**

1. Identified osteomyelitis by patient history.

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Identified osteomyelitis by signs and symptoms.	_____	_____
3. Performed lab tests to confirm or rule out diagnosis of osteomyelitis.	_____	_____
4. Differentiated between osteomyelitis and other diseases producing similiar signs and symptoms.	_____	_____
5. Managed osteomyelitis.	_____	_____
6. Considered or managed complications.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED SANFORD, 1999	

Manage Bursitis

081-833-4388

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definition and etiology of bursitis.
 - a. Definition: inflammation of a bursal sac located wherever the soft tissue, such as muscle or tendon, moves across a bony prominence.
 - b. Etiology:
 - (1) Repetitive local trauma caused by tissue friction.
 - (2) Direct trauma that leads to a hemobursa.
 - (3) Inflammatory conditions that affect the bursa such as rheumatoid arthritis.
 - (4) Chemical conditions that cause inflammation such as pseudogout.
 - (5) Septic infection may pass into the bursa as follows:
 - (a) Locally through damaged skin, abrasions, or blisters.
 - (b) Systemic via the bloodstream.
 - (c) Nosocomial via aspiration.
2. Recognize the signs and symptoms of frictional bursitis.
 - a. Pain or tenderness over involved bursa.
 - b. Localized swelling and redness.
 - c. Local increase in temperature.
 - d. Pain on attempted movement.
 - e. Fluctuation of fluid may be felt when the bursa is examined.
3. Recognize the signs and symptoms of septic bursitis.
 - a. Pronounced pain and tenderness over involved bursae.
 - b. Marked swelling and redness of the affected area.
 - c. Impaired function.
 - d. Common locations:
 - (1) Subdeltoid.
 - (2) Olecranon.
 - (3) Greater trochanter of the femur.
 - (4) Prepatellar (housemaid's knee).
 - (5) Ischial (weaver's bottom).
4. Request X rays, if available, to rule out bone spur, fracture, and calcific deposits, and to identify any bone changes.
5. Manage frictional bursitis.
 - a. Directed toward prevention of repeated frictional injury.
 - b. Rest until pain resolves completely.
 - c. Local cold and then heat after first 24 hours.
 - d. Analgesics.
 - e. Nonsteroidal anti-inflammatory drugs (NSAIDs).
 - f. Aspiration combined with a compressive pad to prevent the bursa from refilling.
 - g. Rehabilitation once the acute symptoms have subsided.

Performance Steps

- h. Referral for surgical removal of the involved bursae in cases where more conservative measures have failed.
- 6. Manage septic bursitis.
WARNING: This is an orthopedic emergency.
 - a. Aspiration of the contents of the bursa.
 - (1) Gram stain of aspirate.
 - (2) Culture and sensitivity of the aspirate.
 - b. Antibiotics, as indicated by the culture and sensitivity.
 - c. Refer to surgery for incision and drainage.
- 7. Manage complications symptomatically with appropriate supportive care.
- 8. Record all treatment in the patient's medical record.
- 9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage bursitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and etiology of bursitis.	_____	_____
2. Recognized the signs and symptoms of frictional bursitis.	_____	_____
3. Recognized the signs and symptoms of septic bursitis.	_____	_____
4. Requested X rays, if available.	_____	_____
5. Managed frictional bursitis.	_____	_____
6. Managed septic bursitis.	_____	_____
7. Managed complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
MERCK MANUAL 17TH ED SANFORD, 1999	

Remove Fluid From a Joint For Diagnosis

081-833-4394

Conditions: Given betadine and alcohol swabs, needle, and syringe.

Standards: Perform arthrocentesis so that joint fluid is aspirated for diagnosis or treatment without causing further harm.

Performance Steps

1. Recognize the indications for arthrocentesis.
 - a. Diagnosis: for diagnosis of new onset arthritis and to rule out infection of the joint.
 - b. Therapeutic: to instill steroids and maintain drainage of septic arthritis.
 2. Explain the procedure to the patient.
 3. Determine the optimal site for aspiration, and mark it with indelible ink.
 4. Clean the area with providone-iodine, allow area to dry, and wipe area with alcohol. Allow the alcohol to dry before beginning the procedure.
 5. Prefill a syringe with the desired corticosteroid if corticosteroid injection is to be performed in conjunction with aspiration.
 - a. Use 40 milligrams (mg) methylprednisolone or equivalent in large joints, such as the knee.
 - b. Use 20 mg methylprednisolone or equivalent in small joints, such as the ankle or wrist.
- WARNING:** Never inject steroids when there is any possibility of an infected joint.
6. Establish a sterile field (task 081-833-0007, Establish a Sterile Field).
 7. Anesthetize the area with lidocaine (task 081-833-4550, Administer Local Anesthesia). Take care not to inject into the joint space. Alternatively, spray the area with ethyl chloride just before needle aspiration.
 8. Insert the aspirating needle, applying a small amount of vacuum to the syringe. Remove as much fluid as possible, repositioning the syringe, as necessary.
 - a. Knee:
 - (1) The knee should be fully extended with the patient supine.
 - (2) Wait until the patient has a relaxed quadriceps muscle, since its contraction plants the patella against the femur, making aspiration painful.
 - (3) Insert the needle posterior to the MEDIAL portion of the patella and into the patellar-femoral groove.
 - (4) Direct the advancing needle slightly posteriorly and inferiorly (Figure 1).

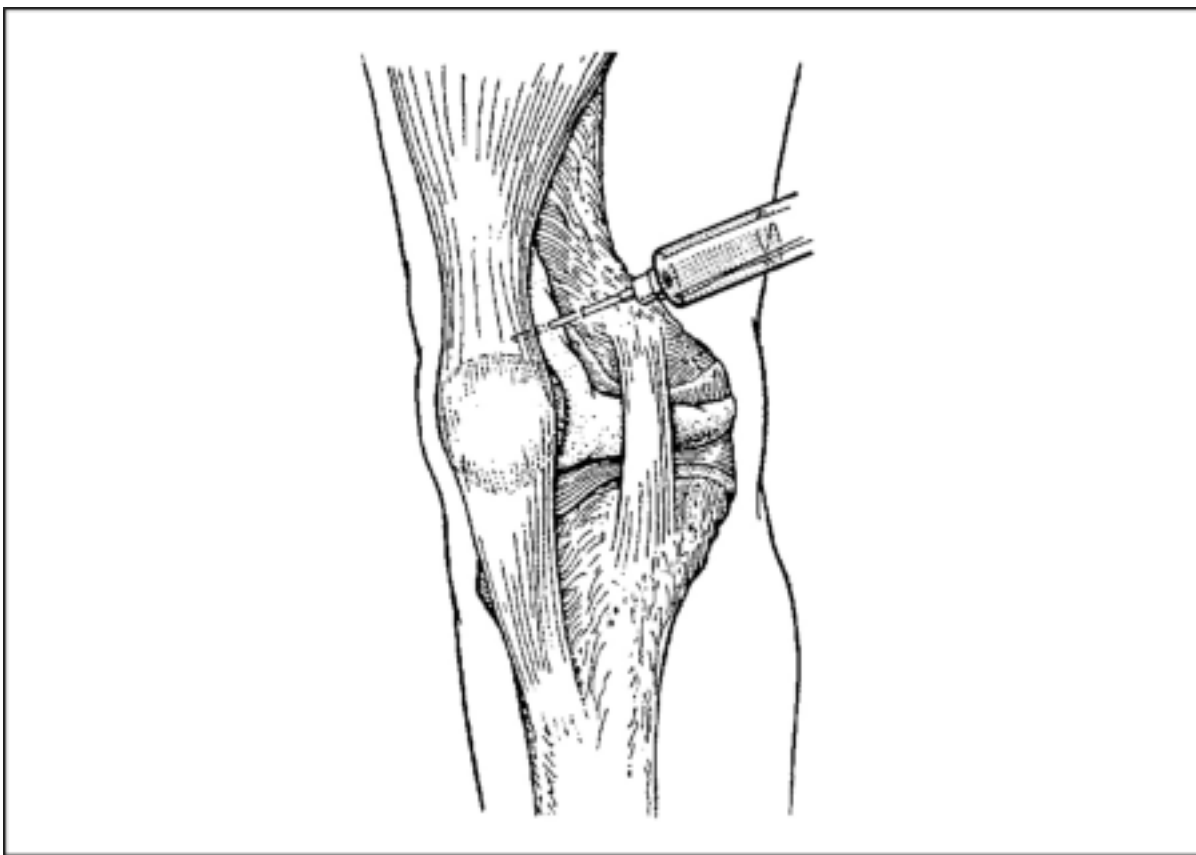
Performance Steps

Figure 1. Knee

b. Wrist:

- (1) The easiest site for aspiration is between the navicular bone and the radius on the dorsal wrist.
- (2) Locate the distal radius between the tendons of the extensor pollicis longus and the extensor carpi radialis longus to the second finger. This site is just ulnar to the "anatomic snuffbox."
- (3) The needle is directed perpendicular to the mark (Figure 2).

Performance Steps

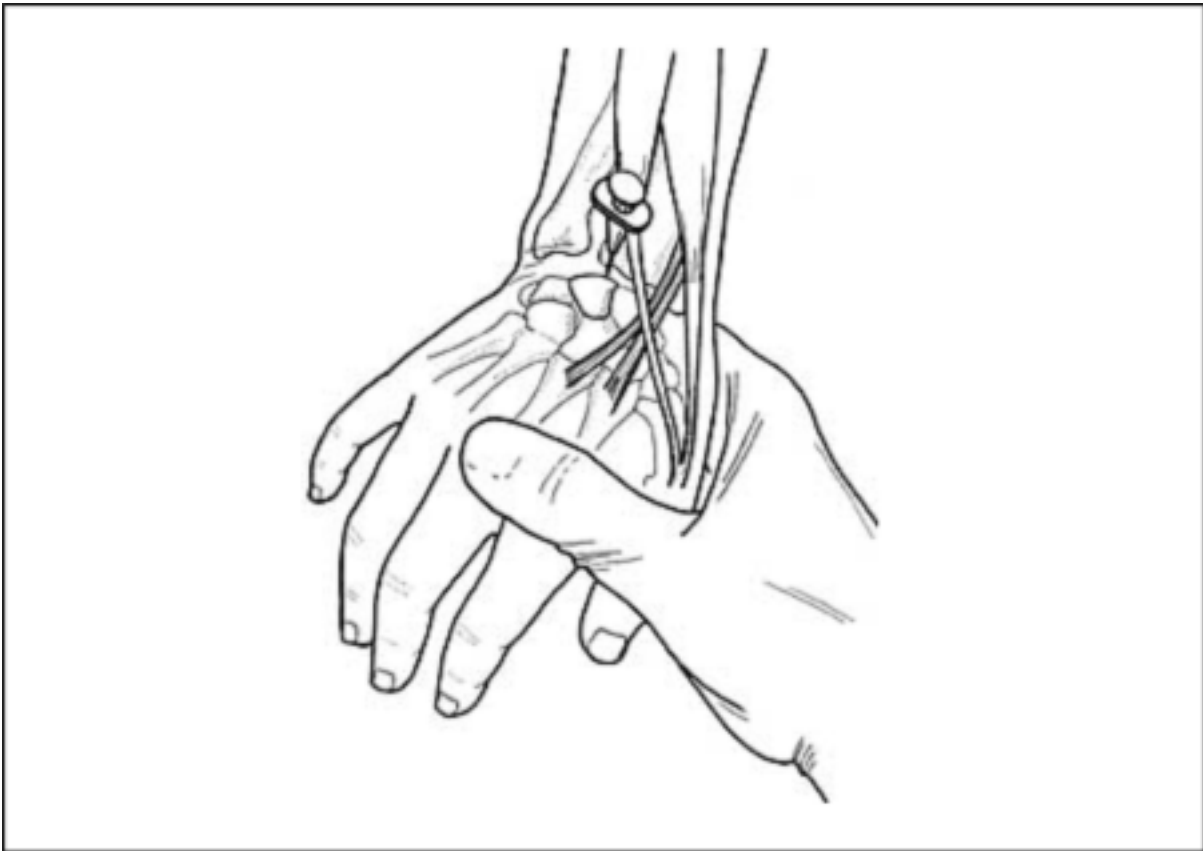


Figure 2. Wrist

c. Ankle:

- (1) The most accessible site is between the tibia and the talus.
- (2) Position the foot and leg at 90 degrees to each other.
- (3) Place a mark lateral and anterior to the medial malleolus and medial and posterior to the tibialis anterior tendon.
- (4) Direct the advancing needle posteriorly toward the heel (Figure 3).

Performance Steps

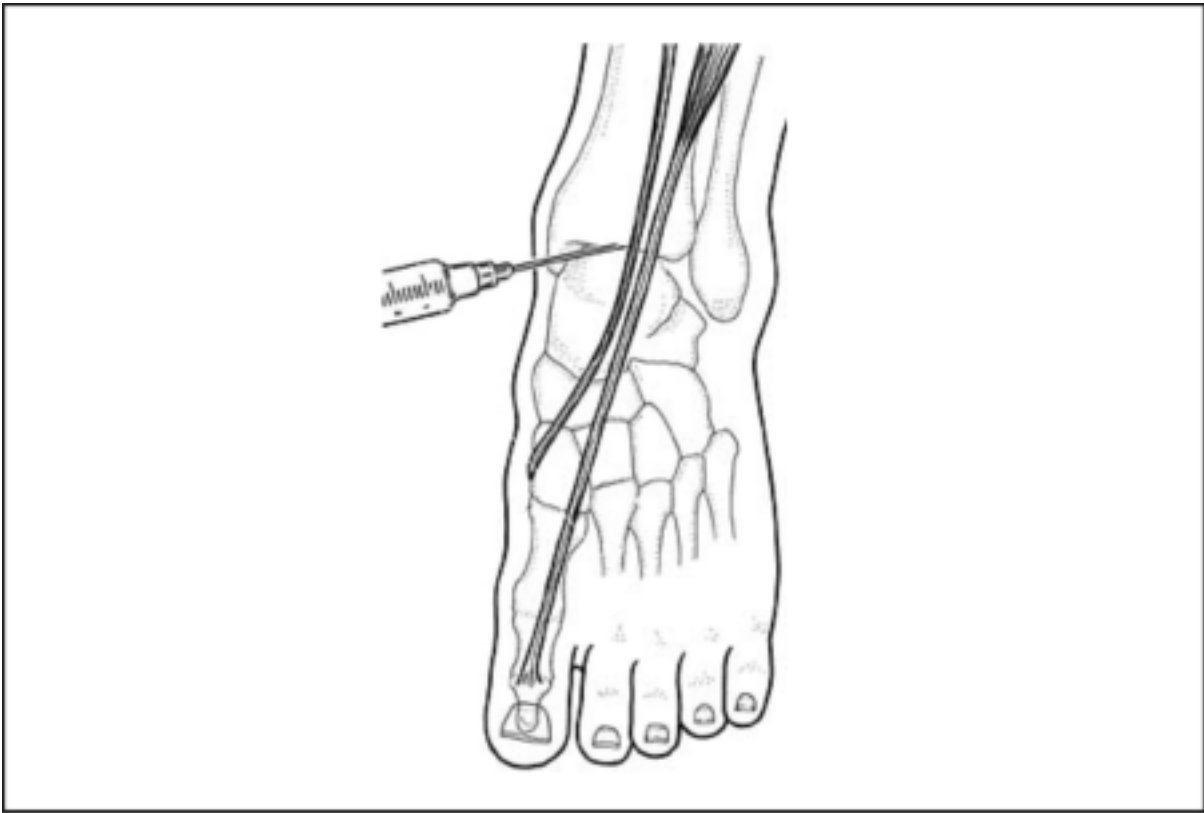


Figure 3. Ankle

WARNING: The subtalar ankle joint does not communicate with the ankle joint and is difficult to aspirate, even by an expert. Ankle pain may originate in the subtalar joint rather than in the ankle.

- 9. If corticosteroids are to be injected, do the following:
 - a. Remove the aspirating syringe from the needle while the needle is still in the joint space.
 - b. Attach the syringe containing corticosteroids.
 - c. Aspirate slightly to ensure that you are not in a vein.
 - d. Inject the contents.
 - e. Remove the needle, and apply pressure to the injection site.
- 10. Examine the joint fluid for bacteria or fungi, as indicated. (Cell count, Gram stain, culture, and so on.)
- 11. Manage complications symptomatically with appropriate supportive care.
- 12. Record all treatment in the patient's medical record.
- 13. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by simulation of the steps. Give the soldier a simulated patient and a scenario in which he must perform arthrocentesis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the indications for arthrocentesis.	—	—
2. Explained the procedure to the patient.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Determined the optimal site for aspiration and marked it with indelible ink.	—	—
4. Cleaned the area with providone-iodine, dried the area, and wiped the area with alcohol. Allowed the alcohol to dry before beginning the procedure.	—	—
5. Prefilled a syringe with the desired corticosteroid when a corticosteroid injection is to be performed in conjunction with aspiration.	—	—
6. Established a sterile field.	—	—
7. Anesthetized the area with lidocaine.	—	—
8. Inserted the aspirating needle.	—	—
9. Injected corticosteroids, if needed.	—	—
10. Examined the joint fluid for bacteria or fungi, as indicated.	—	—
11. Managed complications symptomatically with appropriate supportive care.	—	—
12. Recorded all treatment in the patient's medical record.	—	—
13. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Common Foot Disorders

081-833-4397

Conditions: You are in a field environment. Given an SF Tactical Medical Equipment Set and an SF Individual Combat Laboratory Set.

Standards: Identify and manage the foot disorder without causing further injury to the patient.

Performance Steps

1. Assess common foot disorders.
 - a. Review the patient's medical record.
 - b. Perform a physical examination.
 - (1) Inspect the problem area.
 - (2) Determine the range of motion.
 - (3) Palpate the problem area.
 - c. Take x-rays of problem area, if possible.
 - d. Perform necessary laboratory work.
 - e. Obtain a differential diagnosis.
 - f. Examine completed laboratory work and x-rays.
 - g. Determine the type of foot disorder.
2. Manage pressure injuries to the foot.
 - a. Manage pes cavus, if applicable.
 - (1) Issue a sponge rubber bar or leather bar for padding.
 - (2) Recommend surgery in severe cases.
 - b. Manage halluxvalgus (bunion):
 - (1) Eliminate all pressure on the affected area.
 - (2) Advise the patient to avoid high-heeled, narrow-toed shoes.
 - (3) Recommend surgery if condition persists.
 - c. Manage claw toes, if applicable.
 - (1) Advise the patient to wear well-fitting shoes.
 - (2) Advise the patient to perform toe stretching exercises.
 - (3) Recommend surgery in severe cases.
 - d. Manage metatarsal stress fracture, if applicable.
 - (1) Remove the stress fracture, if applicable.
 - (2) Provide adhesive strapping for the affected area.
 - (3) Recommend gradual physical therapy progression after one month.
 - e. Manage painful heel, if applicable.
 - (1) Provide sponge rubber pads to relieve pressure.
 - (2) Advise weight reduction.
 - (3) Advise the patient to wear well-fitting shoes.
 - (4) Advise warm soaks and massage for affected areas.
 - f. Manage plantar fasciitis, if applicable.
 - (1) Provide the patient with arch supports.
 - (2) Provide the patient with antiinflammatory drugs.
 - (3) Advise the patient to stretch the area by placing the hands flat against a wall, standing on the balls of the feet pressing the heel to the ground, and repeat religiously.
3. Manage plantar warts, if applicable.
 - a. Pare the wart until bleeding or pain occurs.
 - b. Apply a 40 percent salicylic acid plaster.
 - c. Advise the patient to repeat the treatment after 1 week.
 - d. Apply 50 percent trichloroacetic before the acid treatment.
4. Manage pes planus (flatfoot), if applicable.

Performance Steps

- a. Give sponge rubber, metal, or plastic arch supports for use while walking.
- b. Give warm footbaths to lessen discomfort, if necessary.
- c. Give aspirin, if necessary.

5. Record all treatment given.

6. Recommend evaluation by a surgeon, if possible.

Performance Measures

1. Assess the foot disorder.

2. Manage the disorder.

3. Record the assessment and treatment.

4. Recommend evaluation by a surgeon.

GO **NO GO**

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED

Manage Ingrown Toenail**081-833-4404**

Conditions: You are in a field environment. Given a chemical hot pack or hot towels, topical antiseptic, 1 percent xylocaine anesthetic, clean dressings, silver nitrate solution, a scalpel with blade, and a straight clamp.

Standards: Identify and manage the ingrown toenail to its definitive cure.

Performance Steps

1. Inspect the problem area.
 - a. Determine the range of motion.
 - b. Palpate the problem area.
2. Prepare a hot pack to be applied every 3 hours.
3. Prepare an application of topical antiseptic.
4. Apply clean dressings between soaks.
5. Apply silver nitrate every other day if affected area is exuberant. Continue until the infection subsides.
6. Remove the corner of the nail that has grown deeply into the side of the toe to temporarily remove the local irritative factor.
7. Prepare the patient for a partial onychectomy after the infection has subsided.
8. Perform the operative procedure under local infiltration of 1percent xylocaine anesthesia injected at the base of the toe (Figure 1).
9. Perform the operative procedure. Begin with a skin incision 0.5 centimeter (cm) proximal to the lunular edge of the nail and extending distally through the nail, through the anterior pulp of the toe, to the plantar surface.
10. Remove nail and matrix as a block to expose the underlying edge of the phalanx.

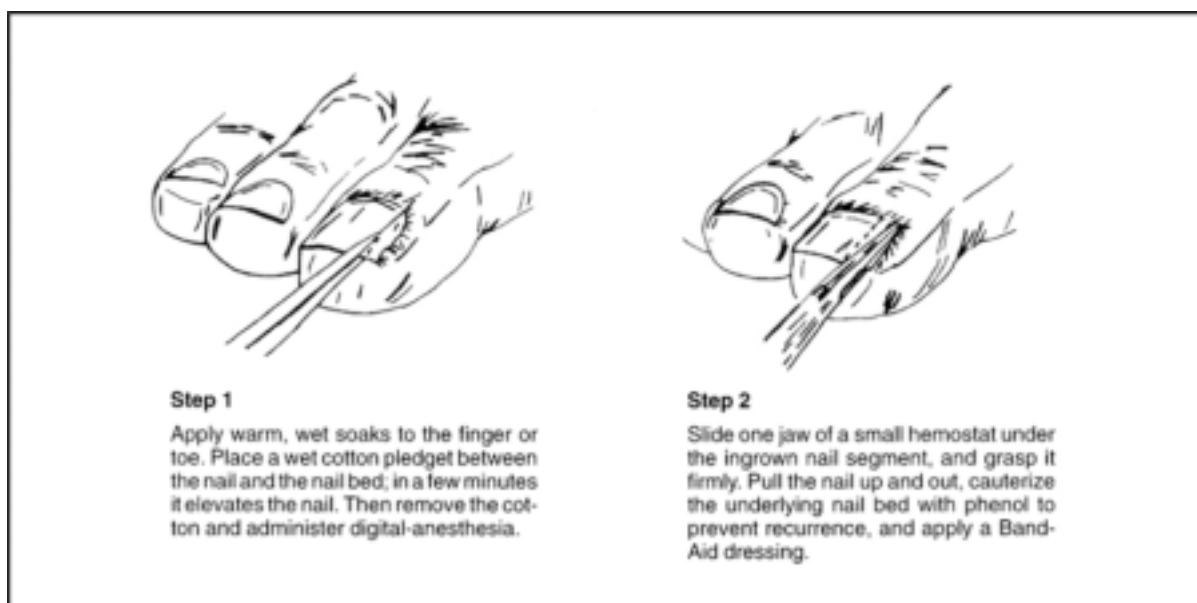
Performance Steps

Figure 1. Procedure for Nail Removal

NOTE: It is important to ensure all of the matrix under the proximal end of the nail and to the nail edge is removed.

11. Apply a small amount of antibiotic ointment in the defect. The skin flap is closed proximally and distally.
12. Apply dressing snugly to help produce hemostasis, since bleeding tends to be rather profuse.
13. Change the dressing on the fourth day to a less voluminous one.
14. Maintain a treatment record, and record the procedure.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an ingrown toenail.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Inspected the problem area.	—	—
2. Prepared a hot pack to be applied every 3 hours.	—	—
3. Prepared an application of topical antiseptic.	—	—
4. Applied clean dressings between soaks.	—	—
5. Applied silver nitrate every other day, if needed. Continued until the infection subsided.	—	—
6. Removed the corner of the nail that had grown deeply into the side of the toe.	—	—
7. Prepared the patient for a partial onychectomy after the infection had subsided.	—	—
8. Injected 1 percent xylocaine at the base of the toe.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
9. Incised 0.5 cm of skin proximal to the lunular edge of the nail and extending distally through the nail, through the anterior pulp of the toe, and to the plantar surface.	—	—
10. Removed nail and matrix as a block to expose the underlying edge of the phalanx.	—	—
11. Applied a small amount of antibiotic ointment in the defect.	—	—
12. Closed the skin flap proximally and distally.	—	—
13. Applied dressing snugly.	—	—
14. Changed the dressing on the fourth day to a less voluminous one.	—	—
15. Maintained a treatment record and recorded the procedure.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED

Manage Musculoskeletal Low Back Pain

081-833-4420

Conditions: Given The Merck Manual and a selection of pharmacological agents.

Standards: Manage musculoskeletal lower back pain so that the quality of life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the pathomechanics of musculoskeletal lower back pain.
 - a. The lumbar spine is too small to bear the weight required in normal life activities and therefore, much of the weight must be borne through the abdominal cavity, which acts as though it were a hydrostatic column of water.
 - b. For the abdomen to carry its share of the weight, the abdominal musculature must be strong.
 - c. When the abdominal muscles are weak or when the abdomen is obese, excess weight is borne through the spinal column, and frequently patients increase their lumbar lordosis and bear weight through the facet joints posteriorly.
 - d. When these joints go into hyperextension and become weight-bearing, they themselves can be the cause of low back pain just as any joint will be painful if held in hyperextension.
 - e. The intervertebral disk allows motion but is a relatively avascular structure and requires motion to maintain a healthy state.
 - f. Individuals who limit normal movement of the lumbar spine through a sedentary life predispose disks to early degeneration and rupture.
2. Recognize the possible etiologies of mechanical low back pain.
 - a. Trauma.
 - b. Intervertebral disk syndromes.
 - (1) Disk herniation.
 - (2) Degenerative disk disease.
 - c. Congenital abnormalities.
 - (1) Spondylolysis: a defect in the pars interarticularis (probably a nonunion of a stress fracture).
 - (2) Spondylolisthesis: a slippage of one vertebra forward on the vertebra below it.
 - (3) Hemisacralization of fifth lumbar vertebrae (L5) or of the first sacral vertebrae (S1), which initiates early disk degeneration.
 - (4) Postural strain.
 - (5) Tension strain.
3. Solicit a patient history.
4. Recognize significant subjective findings for musculoskeletal lower back pain.
 - a. The patient usually complains of a dull, deep low back pain that can occasionally radiate into the buttocks or posterior thigh.
 - b. The pain is exacerbated by activity and usually relieved by rest.
 - c. If the pain has a radicular element, the following applies:
 - (1) The patient may complain of an aching or sharp pain in the posterior thigh that extends below the knee into the leg or foot.
 - (2) Typically, S1 root pain will be felt in the posterior calf and heel.
 - (3) L5 root pain will be felt in the lateral calf and foot.
 - (4) Root pain in the fourth lumbar vertebrae will be felt in the lateral calf and the dorsum of the foot.
 - (5) The pain is exacerbated by activity and by valsalva maneuvers and usually is relieved by rest.
 - (6) Bowel or bladder dysfunction can be present, which should increase the index of suspicion for a neoplastic process as well as a larger prolapsed disk.

Performance Steps

NOTE: Patient with back pain and new onset of bowel or bladder dysfunction should be immediately sent to neurology.

5. Perform a physical examination (PE).
6. Recognize significant objective findings for musculoskeletal lower back pain.
 - a. With mechanical low back pain, the following applies:
 - (1) The lumbar spine has decreased flexion because of palpable paraspinal muscle spasm.
 - (2) Neurologic examination (exam) should show no neurologic involvement.
 - (3) Pain is not aggravated by Valsalva maneuvers.
 - (4) The straight leg-raising (SLR) test should not produce sharp or radicular type leg pain (task 081-833-4374, Assess Common Orthopedic Diseases and Conditions).
 - b. With radicular pain:
 - (1) Decreased flexion of the lumbar spine and paraspinal muscle spasm.
 - (2) The radicular pain is often exacerbated by lateral bending to one side and not to the other.
 - (3) If the patient has right leg pain that is worsened by right lateral bending, the prolapsed disk probably is lateral to the nerve rootlets.
 - (4) If the patient has right leg pain that is worsened by bending to the left, the prolapsed disk is probably in the axilla of the nerve rootlets.
 - (5) Neurologic exam usually shows varying degrees of reflex, sensory, and motor function involvement.
 - (6) The changes found should fit the distribution of the spinal nerve involved and allow the examiner to establish the level of the lesion.
 - (7) An exam of the extremities reveals that SLR between 15 and 80 degrees on the affected side reproduces the patient's radicular pain, and this pain is made worse by dorsiflexion of the ankle, by popliteal compression of the sciatic nerve, and by cervical spine flexion.
 - (8) Tenderness in the sciatic notch also may be present.
 - (9) The patient might have a weakened rectal sphincter, which should raise the index of suspicion for a tumor.
7. Recognize significant lab results that are caused by musculoskeletal lower back pain.
 - a. X rays can be normal or show a varying degree of degenerative disk disease. Narrowing of the intervertebral disk space is the result of disk degeneration, but its mere presence cannot be taken as the cause of the low back pain.
 - b. Flexion and extension films to show abnormal motion at one intervertebral disk space are helpful in establishing the site of symptoms.
 - c. X rays are essential in ruling out the other acute spinal conditions listed in the differential diagnosis.
 - d. Magnetic resonance imaging (MRI) or computer tomography (CT) scanning is most useful in evaluating the patient for spinal stenosis and other spinal impingement syndromes.
8. Differentiate between musculoskeletal lower back pain and other diseases with similar signs and symptoms.
 - a. Consider the following diseases:
 - (1) Dissecting aortic aneurysm.
 - (2) Duodenal ulcer.
 - (3) Kidney disease.
 - (4) Pancreatitis or pancreatic tumor.
 - b. The conditions in paragraph 8a can be differentiated from other types of back pain.
 - (1) The pain is not related to movement. Many individuals thrash in bed or move about the room trying to get relief from pain.
 - (2) On PE, there is no muscle spasm and hence no splinting of the back.
 - (3) If the individual is elderly and has disk disease, he or she may not have a free and full range of motion. However, there is no increase in symptoms with movement.
9. Manage musculoskeletal lower back pain.

Performance Steps

- a. Treatment consists of reversing the excessive lumbar lordosis and placing the back at rest.
- b. The most effective treatment is bedrest on a hard mattress or with a bed board placed under the conventional mattress.
- c. The best position is supine, and the patient should have pillows under the knees to maintain the flexed position.
- d. Pelvic traction is beneficial only to keep the patient at bed rest with the appropriate lumbar flexion.
- e. Usually, 1 to 2 days bedrest is enough. However, you might continue conservative treatment with bedrest 10 to 14 days before abandoning this mode of therapy.
- f. Analgesics are recommended.
- g. An effective muscle relaxant is diazepam (Valium) 2.5 to 10 milligrams (mg) three times a day (t.i.d.) or four times a day (q.i.d.).
- h. If bedrest succeeds, start gentle Williams flexion exercises as the pain resolves.
- i. The temporary use (6 to 12 weeks) of a long lumbosacral corset or brace is helpful in mobilizing the patient.
- j. If bedrest fails to relieve the pain or if progression of the neurologic signs occur, consider a CT scan or myelogram.
- k. If the study confirms an extradural deficit, the patient is a candidate for referral for chemonucleolysis or a laminotomy and disectomy.
- l. Long-term goals for patient rehabilitation include the following:
 - (1) Performing daily Williams flexion exercises.
 - (2) Avoiding heavy lifting and bending at the waist.
 - (3) Maintaining optimum body weight.
 - (4) Possibly modifying occupation and avocation.

10. Record all treatment in the patient's medical record.

11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage musculoskeletal lower back pain.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the pathomechanics of musculoskeletal lower back pain.	—	—
2. Recognized the possible etiologies of mechanical low back pain.	—	—
3. Solicited a patient history.	—	—
4. Recognized significant subjective findings for musculoskeletal lower back pain.	—	—
5. Performed a PE.	—	—
6. Recognized significant objective findings for musculoskeletal lower back pain.	—	—
7. Recognized significant lab results that are caused by musculoskeletal lower back pain.	—	—
8. Differentiated between musculoskeletal lower back pain and other diseases with similar signs and symptoms.	—	—
9. Managed musculoskeletal lower back pain.	—	—
10. Recorded all treatment in the patient's medical record.	—	—
11. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Subject Area 16: Endocrine Conditions

Assess Endocrine Diseases

081-833-4238

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the cause of the disease.

Performance Steps

1. Understand the definitions of specific terms associated with the endocrine system.
 - a. Endocrine gland: A gland that secretes its products directly into the blood (they have no ducts).
 - b. Exocrine gland: A gland that secretes its products into ducts that lead to the lumen of an organ, body surface, or body cavity.
 - c. Hormone: A substance secreted by an endocrine gland that is transmitted into the blood or body fluids. It is a chemical messenger.
 - d. Target: A specific site on a cell, tissue, organ, or organ system upon which a hormone binds.
 - e. Action: The response(s) or effect(s) of a hormone upon the target of the hormone.
 - f. Hypersecretion: The release of a hormone from an endocrine gland in greater than normal amounts, resulting in dysfunction.
 - g. Hyposecretion: The release of a hormone in less than normal amounts, resulting in dysfunction.
 - h. Prostaglandins: Local or tissue hormones that act upon cells within that tissue (the immediate area in which they are produced).
2. Understand the anatomy associated with the endocrine system. The endocrine glands do not have anatomic continuity, but do form a complete system and function accordingly.
 - a. Hypothalamus: Is located posterior to the frontal lobe and coordinates central nervous system (CNS) input with hormone release by direct regulation of the anterior pituitary gland.
 - b. Pituitary gland: The anterior lobe secretes the trophic hormones, which regulate the activity of other endocrine glands. The posterior lobe secretes antidiuretic hormone (ADH), which regulates vasoconstriction, and oxytocin, which functions in the labor and delivery process.
 - c. Thyroid gland: Is located in the neck. It secretes thyroxine and calcitonin, which regulate metabolic rate and calcium storage, respectively.
 - d. Parathyroid gland: Is located on the thyroid. It secretes parathyroid hormone (PTH), which stimulates serum calcium release.
 - e. Pancreas: Is located in the epigastric region. It secretes insulin and glucagon, which stimulate cellular uptake of glucose and the release of glucose from stored reserves (lipids).
 - f. Adrenal gland: Is located on top of the kidneys (suprarenal). The adrenal cortex secretes cortisol and aldosterone, which inhibit glucose uptake and mineral excretion, respectively. The medulla secretes epinephrine and norepinephrine, which regulate the heart rate and blood pressure.
 - g. Gonads: Secrete androgen, estrogen, and progesterone, which regulate the secondary sex traits, gametogenesis, and normal gestation.
3. Understand the functions of the endocrine system.
 - a. Helps to control the internal environment of the body by regulating its chemical composition and volume.
 - b. Responds to marked changes in environmental conditions to help the body cope with emergency demands, such as infection, trauma, emotional stress, dehydration, starvation, hemorrhage, and temperature changes.
 - c. Assumes a role in the smooth, sequential integration of growth and development.

Performance Steps

- d. Contributes to the basic processes of reproduction, including gamete production, fertilization, nourishment, and subsequent delivery of the newborn.
- e. Regulates metabolism, growth, and development to maintain homeostasis, fluid and electrolyte distribution, and acid-base balance.
- f. Helps to regulate metabolism and energy balance.

4. Understand the operation of the negative and positive feedback system.

- a. Feedback: The return of some of the output of a system as input so as to exert some control in the process. When things go wrong, more or less than normal amounts of hormones are secreted into the blood, thus interrupting homeostasis.

NOTE: All cells have receptors for specific hormones (making them target cells for those hormones), but not all cells respond to a particular hormone. Normally, the amount of hormone released by a gland is proportional to the body's need for that hormone at any given time.

- b. Negative feedback: Effects regarding the level of hormone secreted, or its effects, are fed back to the secreting gland to stop its production. For example, elevated blood sugar levels stimulates the beta cells in the Islets of Langerhans of the pancreas to secrete insulin to lower blood sugar levels. When this level reaches normal (or slightly below normal), a signal is sent back to the beta cells to stop insulin production.
- c. Positive feedback: Mechanisms that amplify changes rather than reverse them. For example, oxytocin induces labor to help expel the baby during childbirth.

5. Understand the functions of the pituitary gland.

- a. Divided into two lobes--anterior and posterior.
 - (1) Many endocrine glands respond to stimulation from the pituitary.
 - (2) It regulates the increase or decrease of endocrine gland production by using a counter-regulatory mechanism.
 - (3) An increase in production of thyroid hormone results in a decrease in the amount of thyroid-stimulating hormone (TSH) (thyrotropin), which is produced by the pituitary.
- b. Hormones secreted by the anterior pituitary are as follows:
 - (1) Somatotrophic hormone (STH) stimulates the growth of bones, muscles, and other organs (also known as "growth hormone").
 - (2) Follicle-stimulating hormone (FSH) stimulates the development of eggs in the ovaries and sperm in the testicles.
 - (3) Luteinizing hormone (LH) causes ovulation in the female and the secretion of sex hormones in both sexes.
 - (4) Lactogenic hormone (prolactin) stimulates breast development and the formation of milk during pregnancy.
 - (5) Adrenocorticotrophic hormone (ACTH) controls growth, development, and function of the cortex of the adrenal glands.
 - (6) TSH controls production of the thyroid hormones.
- c. Hormones secreted by the posterior pituitary are as follows:
 - (1) Oxytocin causes contraction of the uterus at term and ejection of milk from the breasts.
 - (2) ADH controls the excretion of waste by the kidneys.

6. Assess diseases associated with the pituitary gland.

- a. Acromegaly (giantism).
 - (1) Definition: Acromegaly is the hypersecretion of growth hormone (somatotropin) during adulthood. (Giantism occurs before adulthood.)
 - (2) Cause: Hyperplasia or tumors of the anterior pituitary cause an overproduction of growth hormone.
 - (3) Signs and symptoms are as follows:
 - (a) A grossly enlarged lower jaw (result of exaggerated skeletal growth).
 - (b) Coarsening of facial features (thick lips, bulging forehead, and bulbous nose).
 - (c) Hands and feet are large.
 - (d) Headaches are common when overgrowth is caused by a tumor.
 - (e) Enlarged joints, which may become stiff and painful.

Performance Steps

- (f) Muscle weakness is common.
 - (g) Men often become impotent.
 - (h) Women may have amenorrhea (absence of menses, increased facial hair, and deepened voice).
 - b. Dwarfism insipidus.
 - (1) Definition: Dwarfism insipidus is the hyposecretion of growth hormone during childhood.
 - (2) Cause or etiology is as follows:
 - (a) Developmental defects (destructive lesions such as tumors, trauma, vascular abnormalities, or surgery).
 - (b) Hereditary (functional disorders such as anorexia nervosa or psychosocial dwarfism).
 - (c) In more than half of children with hypopituitarism, no lesion is evident and the cause is unknown.
 - (3) Signs and symptoms are as follows:
 - (a) Short stature (usually normal growth in the first year, and height may be retarded more than weight).
 - (b) Body proportions are fairly normal (growth measurements below 5th percentile).
 - (c) Less apt to participate in aggressive sporting.
 - (d) Sexual development usually delayed but normal.
 - c. Diabetes insipidus.
 - (1) Definition: Diabetes insipidus is the reduction of ADH, leading to an outpouring of water through the kidneys.
 - (2) Cause and etiology are as follows:
 - (a) Primary is idiopathic and familial.
 - (b) Secondary involves head trauma, brain neoplasm, neurosurgery, and infections.
 - (3) Signs and symptoms are as follows:
 - (a) Marked polyuria (daily output of 15 to 20 liters of dilute urine and specific gravity of 1.002 or less).
 - (b) Cannot sleep an entire night
 - (c) Polydipsia (intense thirst; patient craves water).
 - (d) Weakness.
 - (e) Weight loss.
 - (f) Anorexia.
 - (g) Decreased serum ADH level.
 - d. Syndrome of inappropriate antidiuretic hormone (SIADH).
 - (1) Definition: SIADH is a condition caused by excessive release of antidiuretic hormone (vasopressin).
 - (2) Cause or etiology: lung tumors, CNS disorders, and some drugs.
 - (3) Signs and symptoms are as follows:
 - (a) Water retention.
 - (b) Weight gain.
 - (c) Severe hyponatremia (leading to increased temperature, tachycardia, convulsions, or coma) may be seen
 - (d) Nausea, vomiting, and anorexia.
 - (e) Decreased urine output.
 - (f) Increased urine specific gravity.
7. Understand the functions of the thyroid gland.
- a. The thyroid is the largest of the endocrine glands. It lies in the anterior midline of the neck, just below the larynx, with a wing (lobe) on either side of the trachea.
 - b. The thyroid gland secretes three hormones as follows:
 - (1) Thyroxine (T4) and triiodothyronine (T3):
 - (a) Regulate body metabolism, controlling the rate at which cells do their work.
 - (b) Thyroid gland requires iodine to produce these hormones.

Performance Steps

- (2) Calcitonin (thyrocalcitonin) maintains calcium levels within the body. When serum calcium levels are too high (hypercalcemia), calcitonin is secreted. This allows osteoblasts (bone cells) to take on more calcium, thus decreasing serum calcium levels.
8. Assess diseases associated with the thyroid gland.
 - a. Hyperthyroidism (also known as Graves' disease and/or thyrotoxicosis).
 - (1) Definition: Hyperthyroidism is a condition in which the metabolic rate is increased by overproduction of thyroxine.
 - (2) Etiology: Cause is unknown but may be a result of the following:
 - (a) Physical or emotional strain.
 - (b) Infection.
 - (c) Pregnancy changes.
 - (d) Adolescence changes.
 - (e) Autoimmune origin.
 - (3) Signs and symptoms are as follows:
 - (a) Nervousness, anxiety, and constantly agitated.
 - (b) Tachycardia (systolic blood pressure [BP] elevated).
 - (c) Exophthalmos (bulging eyes).
 - (d) Swollen neck.
 - (e) Increased appetite.
 - (f) Flushed, warm, moist skin.
 - (g) Irregular or scant menses.
 - (h) Weight loss.
 - (i) Tremors and/or clumsiness.
 - (j) Insomnia.
 - (k) Heart palpitations and/or arrhythmias.
 - (l) Diarrhea.
 - b. Hypothyroidism (advanced adult form called myxedema and congenital form called cretinism).
 - (1) Definition: Hypothyroidism is a disorder that occurs when the thyroid gland is hypoactive and fails to secrete adequate thyroid hormones; as a result, there is a "slowing down" of all metabolic processes.
 - (2) Etiology:
 - (a) May originate in the thyroid (primary hypothyroidism).
 - (b) May originate in the pituitary, where insufficient TSH is produced.
 - (c) Thyroid gland has been removed
 - (d) Occurs in females more than males.
 - (e) Physical and mental activity is slowed.
 - (3) Signs and symptoms are as follows:
 - (a) Lethargy, sleeplessness, and chronic headaches.
 - (b) Intolerance to cold.
 - (c) Low temperature.
 - (d) Bradycardia (moderate hypotension).
 - (e) Pale, cool skin.
 - (f) Face puffy with mask-like, unemotional response.
 - (g) Hair coarse and sparse, tending to fall out.
 - (h) Nails thick and hard.
 - (i) Heavy menses (may not be able to conceive or loss of fetus possible).
 - (j) Low sperm count.
 - (k) Increased tendency toward atherosclerosis.
 - (l) Weight gain, despite anorexia.
 - (m) Chronic constipation.
 - (n) Voice low-pitched, slow, or hoarse.
 - (o) Hearing impaired.
 - (p) Numbness and tingling in arms and legs, unrelieved by changing position.
 - (q) Long-term hypothyroidism may result in myxedema coma.

Performance Steps

NOTE: Task 081-833-4240, Manage Simple Goiter, contains information for assessing a goiter.

9. Understand the functions of the parathyroid gland.
 - a. Parathyroid gland has four small structures embedded in the superior and inferior poles of thyroid tissue (normally two on each lobe).
 - b. Types of cells found in the parathyroid gland:
 - (1) Chief cells, in response to a decrease in the level of calcium ions in plasma, secrete parathyroid hormone to elevate plasma calcium level.
 - (2) Oxyphil cells are believed to be aged chief cells that no longer secrete hormone. (Function of oxyphil cells in the body is uncertain.)
 - c. PTH:
 - (1) Participates in the regulation of blood calcium.
 - (2) Causes an increase in blood calcium and a decrease in blood phosphate concentrations.
 - (3) Acts upon the kidneys, small intestines, and bone to increase blood calcium levels.
 - (a) Stimulates bone tissue reabsorption (release of calcium).
 - (b) Causes kidneys to conserve calcium and excrete phosphate.
 - (c) Increases calcium absorption in the small intestine by enhancing the effects of vitamin D on the intestinal mucosa.
10. Assess diseases associated with the parathyroid gland.
 - a. Hyperparathyroidism:
 - (1) Pathophysiological changes:
 - (a) Overproduction of parathyroid hormone (parathormone) results in increased urinary excretion of phosphorus and loss of calcium from the bones.
 - (b) Bones become demineralized as calcium leaves and enters the bloodstream.
 - (c) Large amounts of calcium and phosphorus passing through the kidneys may lead to stones, pyelonephritis, and uremia. Therefore, renal disease may be a serious outcome.
 - (2) Etiology:
 - (a) An overgrowth of the parathyroid glands.
 - (b) Benign tumor of one of the glands.
 - (3) Signs and symptoms are as follows:
 - (a) Muscle weakness and fatigue (excessive blood calcium level depresses the responsiveness of the peripheral nerves).
 - (b) Apathy.
 - (c) Cardiac arrhythmias.
 - (d) Skeletal tenderness and pain with weight bearing.
 - (e) Bones may break with little or no trauma (pathological fractures).
 - b. Hypoparathyroidism:
 - (1) Pathophysiological changes consist of underproduction or absence of parathyroid hormone. Underproduction or absence of parathyroid hormone results in a decrease of calcium and an increase of phosphorus in the blood and a decrease of both in the urine.
 - (2) Etiology:
 - (a) Trauma to the glands (most common cause).
 - (b) Malignancy or metastasis from a cancer to the parathyroid glands.
 - (c) Resistance to parathormone action.
 - (d) Inadvertent removal of these structures during thyroidectomy.
 - (3) Diagnostic evaluation is made on the basis of low serum calcium and elevated serum phosphorus levels in the absence of other causes of hypocalcemia.
 - (4) Signs and symptoms are as follows:
 - (a) Increased blood phosphorus level.
 - (b) Decreased blood calcium level.

Performance Steps

- (c) Tetany consisting of numbness; tingling in the fingers, toes, or around the lips; general muscle hypertonia (voluntary movement may be followed by an involuntary, jerking spasm or tremor) that is tonic on traction or flexion of an arm or finger; Chvostek's sign (patient's mouth twitches and jaw tightens when facial nerve immediately in front of the ear is tapped), and possibly muscle weakness.
- (d) Laryngeal spasm, causing dyspnea with long, crowing respirations that may become cyanotic and in danger of asphyxia.
- (e) Generalized convulsions.

11. Understand the functions of the adrenal gland.

- a. Adrenal glands are located on top of the kidneys.
- b. Consist of two parts--the cortex and the medulla.
- c. Hormones secreted by the adrenal cortex (corticosteroids) are as follows:
 - (1) Aldosterone (a mineralocorticoid) helps regulate blood plasma salts (sodium and potassium), blood pressure, and blood volume.
 - (2) Glucocorticoids are adrenocortical steroid hormones that increase gluconeogenesis, exert an anti-inflammatory effect, affect body metabolism, and help the body withstand stress.
 - (a) Cortisone helps regulate metabolism of fats, carbohydrates, sodium, potassium, and proteins. Cortisone also is used as an anti-inflammatory agent. Cortisone is inactive until converted to cortisol.
 - (b) Cortisol-hydrocortisone is the chief steroid secreted by the cells of the middle part of the adrenal cortex. The best known action of cortisol-hydrocortisone is to increase blood glucose supply for tissues (mainly brain and heart). It is considered essential for life because of its importance in the body's defense against noxious and traumatic stresses. It is the most important glucocorticoid.
 - (c) Corticosterone influences carbohydrate, potassium, and sodium metabolism. It is essential for the normal absorption of glucose, the formation of glycogen in the liver and tissues, and normal use of carbohydrates by the tissues. Corticosterone is less active than cortisol.
 - (3) Sex hormones:
 - (a) Androgens are masculinizing hormones. The function of androgens in adult males is probably unimportant because of the presence of testosterone (testes). Androgens are the main source of the male sex steroid in females. Adrenal androgens are much less potent than testicular androgens.
 - (b) Estrogen is a female hormone. Estrogen is responsible for development of secondary sex characteristics. Secretion of estrogen from the adrenal cortex is small in amount, but some of adrenal androgen is converted into estrogen in blood or peripheral tissues, which accounts for estrogen in male blood.
 - (4) Hormones secreted by the adrenal medulla (catecholamines):
 - (a) Epinephrine (adrenaline) increases heart rate and contractility, blood pressure, and metabolism. Epinephrine prepares the body for "fight-or-flight" stress response.
 - (b) Norepinephrine is similar in chemical and pharmacological properties to epinephrine, but is chiefly a vasoconstrictor, having less of an effect on metabolism and little effect on cardiac output.

12. Assess diseases associated with the adrenal gland.

- a. Addison's disease (primary adrenal cortical insufficiency).
 - (1) Definition: Addison's disease is a life-threatening condition caused by partial or complete failure of adrenocortical function.
 - (2) Pathophysiological changes.
 - (a) Decrease in blood corticosteroid levels.
 - (b) Below normal level of blood sodium.
 - (c) Blood potassium levels are increased.
 - (d) Increased pigmentation of skin and mucous membranes.
 - (3) Etiology:

Performance Steps

- (a) Autoimmune disorders.
- (b) Infection (especially tubercular or fungal).
- (c) Neoplasm (cancer).
- (d) Hemorrhage within the glands.
- (4) Signs and symptoms are as follows:
 - (a) Weakness and fatigue.
 - (b) Weight loss.
 - (c) Anorexia.
 - (d) Abnormal darkening of the skin and mucous membranes.
 - (e) Impaired mental ability (depression or anxiety).
 - (f) Addison's crisis, which is a drop in extracellular fluid volume and hyperkalemia.

WARNING: Addison's crisis is an acute, life-threatening state.

- (g) Hypotension and postural hypotension.
- (h) Hypothermia.
- b. Cushing's disease.
 - (1) Definition: Cushing's disease is an overproduction of adrenocortical hormones.
 - (2) Incidence: Cushing's disease occurs 10 times more frequently in females than males.
 - (3) Pathophysiological changes:
 - (a) Elevated plasma cortisol levels.
 - (b) Increased blood sugar level.
 - (c) Decreased blood potassium level.
 - (d) Increased blood sodium level.
 - (4) Etiology:
 - (a) Prolonged administration of high doses of corticosteroid preparations.
 - (b) Tumors of the adrenal cortex (benign or malignant).
 - (c) Hyperplasia of the glands as a result of overstimulation of the adrenal cortex by the pituitary gland.
 - (d) Tumors elsewhere in the body producing excess ACTH.
 - (5) Signs and symptoms are as follows:
 - (a) Weakness with muscle wasting caused by extensive protein depletion.
 - (b) Fat accumulation in the face ("moon face"), neck, trunk, and on back of neck ("buffalo hump").
 - (c) Hemorrhagic tendencies.
 - (d) Changes in secondary sex characteristics in women (masculinization, hirsutism, and amenorrhea).
 - (e) Hypertension.
 - (f) Truncal obesity (except in legs and arms).
 - (g) Peripheral edema.
 - (h) Hyperglycemia (pruritus and glycosuria).
 - (i) Irritability (mood swings, depression, and occasionally psychosis).
 - (j) Osteoporosis is common (some pathological fractures occur).
- c. Pheochromocytoma.
 - (1) Definition: Pheochromocytoma is a tumor of the adrenal medulla or sympathetic paraganglia (generally small and benign). This tumor is associated with hyperactivity of the adrenal medulla, which leads to hypersecretion of catecholamines (epinephrine and norepinephrine).
 - (2) Incidence: Pheochromocytoma occurs more commonly in early to mid adult life. It is uncommon in individuals over the age of 65.
 - (3) Pathophysiological changes:
 - (a) Increased metabolism.
 - (b) Cardiac arrhythmias.
 - (c) Heart failure.
 - (d) Hyperglycemia.
 - (4) Diagnostic evaluation:
 - (a) Increase in urine vanillylmandelic acid (VMA) level.

Performance Steps

- (b) Evidence of palpable tumor.
- (c) Radiological studies that demonstrate presence of a tumor (magnetic resonance imaging [MRI], computed tomography [CT], ultrasound, and so on).
- (5) Signs and symptoms are as follows:
 - (a) Hypertension (intermittent or persistent).
 - (b) Headaches.
 - (c) Sweating.
 - (d) Palpitations.
 - (e) Nervousness with tremor.
 - (f) Hyperglycemia (polyuria).
 - (g) Weight loss.
 - (h) Vertigo or syncope.

13. Record all findings in the patient's medical record.

14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess endocrine diseases.

Performance Measures**GO** **NO GO**

1. Understood the definitions of specific terms associated with the endocrine system.	_____	_____
2. Understood the anatomy associated with the endocrine system.	_____	_____
3. Understood the functions of the endocrine system.	_____	_____
4. Understood the operation of the negative and positive feedback system.	_____	_____
5. Understood the functions of the pituitary gland.	_____	_____
6. Assessed diseases associated with the pituitary gland.	_____	_____
7. Understood the functions of the thyroid gland.	_____	_____
8. Assessed diseases associated with the thyroid gland.	_____	_____
9. Understood the functions of the parathyroid gland.	_____	_____
10. Assessed diseases associated with the parathyroid gland.	_____	_____
11. Understood the functions of the adrenal gland.	_____	_____
12. Assessed diseases associated with the adrenal gland.	_____	_____
13. Recorded all treatment in the patient's medical record.	_____	_____
14. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

BATES PE, 8TH ED. 2002

Manage Simple Goiter

081-833-4240

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, patient's medical record, and a selection of pharmacologic agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacologic therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the definition and etiology of simple goiter.
 - a. Simple goiter (also called colloid goiter or endemic goiter): enlargement of the thyroid (without symptoms of thyroxine deficiency).
 - b. Etiology:
 - (1) Deficiency of iodine in the diet.
 - (2) Inability of the thyroid to use iodine.
 - (3) A relative iodine deficiency caused by increased body demands for thyroid hormones.
 - (4) Goitrogens are substances that may cause a goiter.
 - (a) Foods (for example, turnips, carrots, seafood, and soybeans).
 - (b) Drugs (for example, iodine, propylthiouracil, salicylates, and sulfonamides).
 - (5) Infection.
 - (6) Pregnancy.
 - (7) Adolescence.
2. Recognize significant signs and symptoms of simple goiter.
 - a. Sense of fullness in the throat as thyroid gland enlarges.
 - b. Enlargement can cause difficulty in swallowing and breathing.
3. Manage simple goiter.
 - a. If diet has been deficient in iodine, recommend foods high in iodine.
 - b. Order potassium iodide to supplement iodine intake.
 - c. If cause is goitrogenic substances, tell patient to avoid goitrogenic foods and drugs.
4. Treat complications symptomatically with appropriate supportive care.
5. Record all treatment in the patient's medical record.
6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage simple goiter.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and etiology of simple goiter.	—	—
2. Recognized significant signs and symptoms of simple goiter.	—	—
3. Managed simple goiter.	—	—
4. Treated complications symptomatically with appropriate supportive care.	—	—
5. Recorded all treatment in the patient's medical record.	—	—
6. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Diabetic Emergencies

081-833-4241

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, glucose dip sticks, intravenous (IV) insulin, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and insulin in accordance with The Merck Manual.

Performance Steps

1. Understand the etiology of diabetic ketoacidosis (DKA).
NOTE: Task 081-833-4244, Manage Hypoglycemia, discusses hypoglycemia.
 - a. Etiology: severe hyperglycemia and glycosuria, resulting in increased lipolysis and oxidation of fatty acids.
 - b. Increased lipolysis and oxidation produces ketone bodies (acetoacetic acid, betahydroxybutyric acid, and acetone).
 - (1) Metabolic acidosis from ketones.
 - (2) Dehydration caused by increased osmotic diuresis.
 - (3) Loss of fluids and electrolytes, which leads to hypotension.
 - (4) Decreased cerebral oxygenation leading to coma and death.
2. Solicit a patient history.
3. Recognize significant subjective findings for DKA.
 - a. History: DKA usually occurs in known diabetics. DKA has a slow onset of signs and symptoms.
 - b. Early symptoms:
 - (1) Weakness.
 - (2) Thirst.
 - (3) Anorexia.
 - (4) Drowsiness.
 - (5) Abdominal pain.
 - (6) Flushed cheeks.
 - (7) Dry mouth.
4. Perform a PE.
5. Recognize significant objective findings for DKA.
 - a. Kussmaul respirations.
 - b. Acetone or fruity odor on breath.
 - c. Hypotension.
 - d. Tachycardia.
 - e. Restlessness.
 - f. Convulsions.
 - g. Stupor.
 - h. Coma.
 - i. Urine dipstick is positive at 4+ glucose and shows presence of ketones.
6. Manage DKA.
 - a. Reduce blood glucose levels by administration of IV insulin.
NOTE: May give as much as 300 to 500 units in a 24-hour period.
 - b. Correct electrolyte imbalance (especially potassium).
 - c. Clear urine of glucose and ketones.
7. Treat complications symptomatically with appropriate supportive care.

Performance Steps

- 8. Record all treatment in the patient's medical record.
- 9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage diabetic emergencies.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the etiology of DKA.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for DKA.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for DKA.	_____	_____
6. Managed DKA.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
MERCK MANUAL 17TH ED	EMT-P, BRADY 3RD ED. 1997

Manage Diabetes Mellitus

081-833-4242

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, glucose dip sticks, oral and parenteral hypoglycemic agents, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and appropriate hypoglycemic agents in accordance with The Merck Manual.

Performance Steps

1. Understand the definition, physiology, and etiology associated with diabetes mellitus (DM).
 - a. Definition: DM is a chronic disorder of carbohydrate metabolism that is characterized by hyperglycemia and glycosuria and results from the inadequate production or use of insulin.
 - b. Review of pancreatic function.
 - (1) Types of pancreatic cells (pancreatic islets) are as follows:
 - (a) Alpha cells: secrete glycogen, which raises blood sugar level.
 - (b) Beta cells: secrete insulin, which lowers blood sugar level.
 - (c) Delta cells: secrete growth hormone inhibiting hormone (GHIH) (somatostatin), which inhibits secretion of insulin and glucagon.
 - (d) F-cells: secrete polypeptide, which regulates release of pancreatic digestive enzymes.
 - (2) Types of enzymes are as follows:
 - (a) Glucagon is a hormone whose principal physiological activity is to increase glucose level when it falls below normal. The main target tissue of glucagon is the liver. Glucagon is responsible for glycogenolysis, which accelerates the conversion of glycogen into glucose. Gluconeogenesis promotes formation of glucose from lactic acid and certain amino acids. It also enhances release of glucose into the blood by the liver.
 - (b) Insulin is a hormone whose chief physiological activity is to decrease the glucose level when it rises above normal. It accelerates the transport of glucose from the blood into the cells (especially skeletal muscle). It is also responsible for glycogenesis, the conversion of glucose to glycogen. It also increases uptake of amino acids by cells and increases protein synthesis, decreases glycogenolysis, and slows gluconeogenesis.
 - c. Negative feedback system, which is controlled by blood glucose level.
 - (1) Normal blood glucose level.
 - (a) Fasting: 70 to 100 milligrams per deciliter (mg/dl).
 - (b) After the glucose tolerance test (GTT): greater than or equal to 140 mg/dl after 2 hours.
 - (2) When blood sugar level falls below normal, alpha cells secrete more glycogen.
 - (3) When blood sugar rises above normal, beta cells secrete more insulin.
- NOTE: If insulin is not secreted or is inadequate (weak), then glucose will back up in the blood and spill into the urine.
- d. Etiology of DM: The basic cause of DM is unknown. The following factors have been implicated as possible causes:
 - (1) Genetically determined abnormality in beta cell function or number.
 - (2) Autoimmune response (antibodies against islet cells).
 - (3) Exposure to mumps or Coxsackie B viruses.
 - (4) Obesity.
 - (5) Diet.
 - (6) Drugs.
 - (7) Pregnancy.
- e. Classifications of DM.

Performance Steps

- (1) Type I: insulin-dependent diabetes mellitus (IDDM).
- (2) Type II: noninsulin-dependent diabetes mellitus (NIDDM).
- (3) Impaired glucose tolerance (IGT).
- (4) Gestational DM.

2. Solicit a patient history.

3. Recognize significant subjective findings for DM. The classic patient will present a history of the following:

- a. Polyuria: increased urinary output.
- b. Polydipsia: excessive thirst (insatiable).
- c. Polyphagia: excessive hunger (the result of negative caloric balance and weight loss).

4. Perform a PE.

5. Recognize significant objective findings for DM.

- a. Glycosuria is the glucose level above renal threshold after carbohydrate ingestion, which leads to osmotic diuresis.
- b. Fasting blood sugar level is greater than or equal to 126 mg/dl.
- c. GTT is less than or equal to 200 mg/dl after 2 hours.

6. Manage DM.

- a. Diet control the number of calories and carbohydrates ingested daily.

NOTE: Diet is the most important factor for controlling DM.

- (1) Prescribed diets should be followed exactly.
- (2) Prescribed diets are specific with substitutions and exchanges.
- b. Exercise aimed at improving cardiovascular status and weight reduction.
 - (1) Helps metabolize carbohydrates, decreasing insulin requirements.
 - (2) Lowers cholesterol and triglyceride levels.
 - (3) Should be performed daily to prevent wide fluctuations in glucose levels.
- c. Hypoglycemic agents are as follows:
 - (1) Oral hypoglycemics (Orinase, Diabinase, Glucotrol, Glipizide, and so on).
 - (a) Stimulate beta cells to produce insulin.
 - (b) Cannot be used on patients with little or no pancreatic activity.
 - (c) Hyperinsulinemia may result from their use.
 - (2) Parenteral insulin:
 - (a) May be short-, medium-, or long-acting according to the time required for glucose-lowering effect.
 - (b) Must be injected to be effective.
 - (c) Hypoglycemia results.

NOTE: The control of DM is very patient-specific. The combination of diet, exercise, and hypoglycemic agents must be tailored to the patient's individual needs to control blood sugar levels. DM patients should be referred to a physician for expert management.

7. Understand the relationships of diet, exercise, and hypoglycemic agents.

- a. Causes of elevated glucose levels:
 - (1) Food intake without exercise.
 - (2) Food intake without hypoglycemic agent.
- b. Causes of decreased glucose levels:
 - (1) Hypoglycemic agents without food intake.
 - (2) Exercise without food intake.
 - (3) Food intake but excessive exercise.
 - (4) Food intake but too much hypoglycemic agent.

8. Understand the complications of DM.

- a. Long-term complications:

Performance Steps

- (1) Micro or macro angiopathy, which is a specific lesion that affects arterioles and capillaries of the following:
 - (a) Retina: Diabetic retinopathy is a leading cause of blindness.
 - (b) Renal glomeruli: Diabetic nephropathy is a leading cause of renal failure.
- (2) Diabetic neuropathy is cause of pain (causalgia), paresthesia, and decreased proprioception.
- (3) Hypertension is usually associated with renal insufficiency and arteriosclerosis or atherosclerosis.
- (4) Decreased peripheral circulation leads to peripheral vascular occlusion.
- b. Short-term complications (usually medical emergencies).
 - (1) Diabetic coma or diabetic ketoacidosis (DKA).
 - (2) Insulin shock (hyperinsulinism and hypoglycemia) (task 081-833-4241, Manage Diabetic Emergencies).
9. Treat complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage diabetes mellitus.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definition, physiology, and etiology associated with DM.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for DM.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for DM.	—	—
6. Managed DM.	—	—
7. Understood the relationships of diet, exercise, and hypoglycemic agents.	—	—
8. Understood the complications of DM.	—	—
9. Treated complications symptomatically with appropriate supportive care.	—	—
10. Recorded all treatment in the patient's medical record.	—	—
11. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

EMT-P, BRADY 3RD ED. 1997

Manage Hyperglycemia

081-833-4243

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, glucose dip sticks, oral and parenteral hypoglycemic agents, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and appropriate hypoglycemic agents in accordance with the Merck Manual.

Performance Steps

1. Understand the causes of hyperglycemia.
 - a. Diabetes mellitus (DM) (task 081-833-4242, Manage Diabetes Mellitus).
 - b. Diabetic ketoacidosis (DKA) (task 081-833-4241, Manage Diabetic Emergencies).
 - c. Nonketotic hyperglycemic-hyperosmolar coma (NKHHC). NKHHC is a syndrome characterized by impaired consciousness, sometimes accompanied by seizures, extreme dehydration, and extreme hyperglycemia that is not accompanied by ketoacidosis. It is a complication of noninsulin-dependant diabetes mellitus (NIDDM) and has a mortality rate of greater than 50 percent.
 - (1) Etiologies of NKHHC are as follows:
 - (a) It is most commonly a complication of previously undiagnosed or medically neglected NIDDM. It usually develops after a period of symptomatic hyperglycemia in which fluid intake is inadequate to prevent extreme dehydration from the hyperglycemia-induced osmotic diuresis.
 - (b) It may be the result of a coexisting acute infection.
 - (c) It can result from giving drugs, such as glucocorticoids, phenytoin, or diuretics, that impair glucose tolerance or increase fluid loss to a patient with undiagnosed or neglected NIDDM.
2. Recognize the signs and symptoms of NKHHC.
 - a. Central nervous system (CNS) alterations, to include the following:
 - (1) Mental cloudiness.
 - (2) Coma.
 - (3) Seizures.
 - (4) Transient hemiplegia.
 - (5) Dehydration and hyperosmolarity.
3. Recognize significant lab findings for NKHHC.
 - a. Extreme hyperglycemia: The plasma glucose is usually in the range of 1,000 milligrams per deciliter (mg/dl) (much higher than in most cases of diabetic ketoacidosis [DKA]).
 - b. Mild metabolic acidosis without marked hyperketonemia.
 - c. Prerenal azotemia.
4. Manage NKHHC.
 - a. The immediate aims of treatment are to rapidly expand the contracted intravascular volume to stabilize the blood pressure (BP), improve the circulation, and improve the rate of urine production.
 - (1) Start with 2 to 3 liters (L) of 0.9 percent sodium chloride over 1 to 2 hours. If this suffices to stabilize the BP and circulation and restore good urine flow, the intravenous (IV) fluid can be changed to 0.45 percent sodium chloride (NaCl) to provide some free water.
 - (2) The aim of this phase of IV fluid therapy is not to rapidly correct the total fluid deficit. The aim is to maintain stable circulation and renal function and gradually replenish water and sodium at rates that do not threaten acute fluid overload.
 - b. Potassium (K) replacement is usually started by adding 20 millimoles (mmol) per liter of K as a phosphate salt to the initial liter of IV-infused 0.45 percent NaCl.

Performance Steps

c. Insulin treatment is started by giving IV regular insulin. This treatment may be the same as for DKA or at a lower dose of 10 to 30 units of IV regular insulin every 2 to 3 hours. Following recovery from the acute episode, patients are usually switched to adjusted doses of subcutaneous regular insulin at 4- to 6-hour intervals.

5. Treat complications symptomatically with appropriate supportive care.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage hyperglycemia.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the causes of hyperglycemia.	_____	_____
2. Recognized the signs and symptoms of NKHHC.	_____	_____
3. Recognized significant lab findings for NKHHC.	_____	_____
4. Managed NKHHC.	_____	_____
5. Treated complications symptomatically with appropriate supportive care.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

EMT-P, BRADY 3RD ED. 1997

Manage Hypoglycemia

081-833-4244

Conditions: Given the M-5 medical kit, patient's record, and oral or intravenous (IV) glucose.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the condition, and administer supportive care and oral or IV glucose in accordance with The Merck Manual.

Performance Steps

1. Understand the etiology of hypoglycemia (insulin shock and hyperinsulinism).
 - a. Overdose of insulin or oral hypoglycemics.
 - b. Omitting meals or eating less than required in relation to the amount of insulin administered.
 - c. Increased physical activity.
 - d. Fluid imbalance.
 - e. Rarely, insulin-secreting pancreatic tumor.
2. Solicit a patient history.
3. Recognize significant subjective findings for hypoglycemia.
 - a. Rapid onset of signs and symptoms.
 - b. Confusion.
 - c. Headache.
 - d. Nervousness.
 - e. Drowsiness.
 - f. Weakness and lethargy.
 - g. Diplopia.
 - h. Vertigo.
4. Perform a PE.
5. Recognize significant objective findings for hypoglycemia.

NOTE: Most of these symptoms will appear late in the course of the illness.

 - a. Dipstick shows normal glucose levels.
 - b. Aphasia (inability to communicate through speech, writing, or signs, as a result of dysfunction of brain centers).
 - c. Delirium.
 - d. Convulsions.
 - e. Unconsciousness.
 - f. Coma, leading to death.
6. Manage hypoglycemia.

NOTE: If a known diabetic is found unconscious, place sugar sublingually. If the patient is in diabetic coma, there will be no response. If the patient is in insulin shock, you could save his life.

 - a. Rapidly recognize signs and symptoms.
 - b. Restore blood glucose levels as rapidly as possible.
 - (1) Conscious: Give candy, sugar, orange juice, or cola orally.
 - (2) Unconscious: Administer 50 percent glucose IV.
7. Treat complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage hypoglycemia.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the etiology of hypoglycemia (insulin shock and hyperinsulinism).	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for hypoglycemia.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for hypoglycemia.	_____	_____
6. Managed hypoglycemia.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

EMT-P, BRADY 3RD ED. 1997

Subject Area 17: Neurologic Conditions

Assess Nervous System Disorders**081-833-4150**

Conditions: Given stethoscope, sphygmomanometer, patient's medical record, otoscope-ophthalmoscope set, reflex hammer, and a paper clip.

Standards: Assess nervous system disorders so that the cause of the disorder is discovered without causing further harm.

Performance Steps

1. Know the major divisions of the neurological examination (exam).
 - a. Chief complaint.
 - b. Mental status exam.
 - c. Cranial nerves.
 - d. Motor exam.
 - e. Sensory exam.
 - f. Reflexes.
 - g. Cerebellar exam.
2. Solicit a patient history.
 - a. Request from the patient, in his own words, his chief complaint.
 - b. If you are able to attain a history from the patient, family members, or from bystanders, the history should include, at a minimum, the mechanism of injury (this is basically how the patient came about having his current problem). When was the onset of this problem and any associated illness with this problem.

NOTE: Task 081-833-4002, Perform a Complete Physical Examination, provides more information concerning general patient history and physical exam.

3. Perform a mental status exam, which begins when you first visualize your patient. This is a simple means of gathering a great deal of information about the neurological system of your patient. Look at the patient, can the patient walk, talk, see, and hear? Notice the general appearance, manner, and emotion of the patient.

NOTE: Remember the key word "AMSIT" (appearance, mood, sensorium, intellectual function, and thought).

- a. Appearance and speech: Physical appearance includes age, manner, dress, and any obvious physical abnormalities or distress. Also note the manner in which the patient is relating his problems to the examiner. Observe the patient as you question him for. Are his emotions appropriate for the situation? Is he able to conduct a conversation, or does he have any speech disorders? What is the attention span of the patient? Is he easily distracted?
- b. Mood and affect: This describes how the patient feels. Affect is immediately observable, with a tone expressed through voice, facial expressions, or demeanor. Mood is a sustained emotion that may color a person's view of the world. If you suspect depression, you must assess depth and any associated risk of destructive activity; for example, suicide or homicide. Historically, at least 25 percent of all patients seen by a provider have a psyche component to their chief complaint. Many providers feel uneasy about exploring these thoughts with their patients. However, most patients will be able to discuss this freely with you, with considerable relief. By initiating these discussions, you demonstrate your concern and interest for what may be the patient's reason for seeing you in the first place.
- c. Sensorium: Level of consciousness and memory.
 - (1) Test for level of consciousness (in order of increasing severity). Use the acronym "AVPU" (alertness, responsiveness to vocal stimuli, responsiveness to painful stimuli, and unresponsiveness).
 - (a) Alert and oriented times 3 (person, place, and time).

Performance Steps

- (b) Responds to vocal stimuli but is disoriented.
- (c) Responds to painful stimuli but cannot maintain alertness and attention.
- (d) Unresponsive to all stimuli.
- (2) There are two types of memory that can be tested on an alert patient--recent and remote.
 - (a) To test recent memory, ask questions that can be easily checked against other sources (relatives). This is easily assessed during the history.
 - (b) To test remote memory, have the patient recall events from his own personal history (birthdays and medical events). If you suspect a problem with memory, check this as part of the interview. ("When was your last clinic visit?" "What year were you diagnosed with migraines?") Ask any other pertinent questions particular to this patient.
- (3) To test intellectual function, estimate the current level of function (vocabulary, complexity of concepts, and general fund of information).
- (4) To test thought, assess the logic, relevance, organization, and coherence of the patient's complaint as he reveals them in words and speech throughout the interview. Does speech progress logically toward a goal? Also the patient's recent and remote memory, which are also acquired in the interview. Follow appropriate leads as they occur instead of using stereotyped lists of specific questions. Any false perceptions, delusions, preoccupations, and illusions or hallucinations? Can patient follow simple commands?
- (5) Use the Glasgow Coma Scale (GCS), which is a useful method for grading level of consciousness. The GCS is the sum of the scores for three areas of assessment--eye opening, motor response, and verbal response. A GCS less than 8 is indicative of a severe head injury, a GCS of 9 to 12 indicates moderate head injury, and a GCS of 13 to 14 is associated with minor head injury. A GCS of 15 is a perfect score.
 - (a) Eye opening: No opening = 1, opening to pain = 2, opening to speech = 3, and spontaneous opening = 4.
 - (b) Motor response: No movement = 1, decerebrate, extension = 2, decorticate, flexion = 3, withdrawal from pain = 4, localizes pain = 5, and obeys commands = 6.
 - (c) Verbal response: None = 1, incomprehensible sounds = 2, inappropriate words = 3, confused = 4, and oriented = 5.
- (6) Mini-Mental State Examination (MMSE): Perhaps the most useful gauge in quickly assessing cortical function is the MMSE. It is widely used by neurologists, psychiatrists, and other health care providers. The advantage of using the MMSE is that once a baseline is established, improvement or diminution in mental status can be objectively recorded by using the 30-point scale.
 - (a) What is the year, season, day, date, and month? (Perfect on all = 5.) Tests orientation (frontal).
 - (b) What is the state, county, town, hospital, and floor? (Perfect on all = 5.) Tests orientation (frontal).
 - (c) Repeat three items. (Perfect = 3.) Tests registration (frontal).
 - (d) Serial subtraction of 7s, or spell "word" backwards. (Perfect = 5.) Tests concentration (frontal).
 - (e) Name wristwatch and pen. (Perfect = 2.) Tests naming (dominant temporoparietal).
 - (f) Say "No ifs, ands, or buts." (Perfect = 1.) Tests expressive speech (dominant frontal).
 - (g) Take this paper in your right hand, fold it in half, and put it on the table. (Perfect = 3.) Tests ability to follow a three-part command (frontal).
 - (h) Read the words "close your eyes," and do it. (Perfect = 1.) Tests reading (dominant temporoparietal).
 - (i) Remember the three items from part 3. (Perfect = 3.) Tests short-term memory (dominant hippocampal).
 - (j) Write a sentence. (Perfect = 1.) Tests writing (dominant temporoparietal).
 - (k) Copy intersecting pentagons. (Perfect = 1.) Tests construction (nondominant parietal).

Performance Steps

4. Describe altered levels of consciousness:
 - a. Lethargic: Sluggish, slow to respond.
 - b. Stuporous: Must be aroused or strongly stimulated to respond. However, responses are appropriate; for example, follows commands and answers questions.
 - c. Semicomatose: Will not respond except to pain or other strong stimuli in primitive fashion.
 - d. Coma: No response to pain or strong stimuli.
5. Describe cortical exam abnormalities:
 - a. Agnosia: Inability to recognize object by sight, sound, and touch (naming wristwatch and pen).
 - b. Apraxia: Inability to carry out a skilled act upon command ("Take this paper in your right hand, fold it in half, and put it on the table.")
 - c. Aphasia: Inability to understand or communicate by using language or writing (following written instructions).
6. Test the 12 cranial nerves.

NOTE: A systemic evaluation of the cranial nerves is essential to obtaining a complete exam. Grouping the cranial nerves by function, rather than testing each one separately, is the most efficient means of evaluating them.

- a. Cranial nerve I: olfactory nerve (sensory).
 - (1) Check sense of smell in each nostril.
 - (2) Assess patency of each nostril before testing smell.
- b. Cranial nerve II: optic nerve (sensory).
 - (1) Check visual acuity (VA) in each eye. If an eye chart is not available, use a newspaper, magazine, or the lettering on an intravenous (IV) bag to assess VA.
 - (2) Check visual fields by confrontation (fingers at sides).
 - (3) Perform a fundoscopic exam of the retina and optic discs.
- c. Cranial nerve III: oculomotor nerve (motor).
 - (1) Pupilloconstriction (check direct and consensual light response).
 - (2) Check accommodation (constriction of the pupil when converging eyes on near focus).
 - (3) Check elevation of eyelid (deficit may give ptosis).
 - (4) Responses with muscle groups controlled.
 - (a) Medial rectus adducts eye.
 - (b) Superior rectus elevates eye.
 - (c) Inferior rectus depresses eye.
 - (d) Inferior oblique elevates the abducted eye.
- d. Cranial nerve IV trochlear: test as a unit (motor)
 - (1) Superior oblique depresses adducted eye.
 - (2) Superior oblique also rotates the eye inward.
- e. Cranial nerve V: trigeminal (motor and sensory). Is the major sensory nerve of the face and has three divisions.
 - (1) Ophthalmic division: forehead, eyes, and nose down to the maxillary division.
 - (2) Maxillary division: cheeks and upper lip.
 - (3) Mandibular division: lower cheeks and chin (not the jaw angle).
 - (4) Test by using a pin over the three divisions to assess sharp or dull pain. Test for light touching by using a cotton swab over the three areas.
 - (5) Motor supply to the masseter and temporal muscles. Test by having patient clench teeth.
- f. Cranial nerve VI: abducens (motor).
 - (1) Lateral rectus abducts eye.
 - (2) Test these muscles as a unit by making an "H" in the air while your patient follows your finger.
 - (3) If you find a motor deficit, remember that the lateral rectus is controlled by the 6th cranial nerve. The superior oblique is controlled by the 4th cranial nerve. All other oculomotor functions are controlled by the 3d cranial nerve.
- g. Cranial nerve VII: facial (motor and sensory).
 - (1) Major motor nerve of the face.

Performance Steps

- (2) Test by asking patient to frown, pucker lips, smile, raise eyebrows, and puff out cheeks.
 - (3) Sensory function involves the taste function for anterior two-thirds of tongue.
 - (4) Corneal reflex. The sensory side of this reflex is tested by asking the patient to look away from you and lightly touching the cornea with a cotton wisp.
 - h. Cranial nerve VIII: acoustic (sensory).
 - (1) Assess hearing. Test gross auditory acuity by using a ticking watch or whispered words.
 - (2) Weber test. Tests for lateralization.
 - (3) Rinne test. Air versus bone conduction.
 - i. Cranial nerve IX: glossopharyngeal (motor and sensory).
 - (1) Test for posterior two-thirds of the tongue.
 - (2) Watch patient say "ahh," and test gag reflex for motor function.
 - j. Cranial nerve X: vagus (motor and sensory).
 - (1) Gag reflex also tests cranial nerve X.
 - (2) Can be tested as a unit with cranial nerve IX.
 - k. Cranial nerve XI: spinal accessory (motor).
 - (1) Innervation to sternocleidomastoid and trapezius muscles.
 - (2) Have patient shrug shoulders and turn head against resistance.
 - l. Cranial nerve XII: hypoglossal (motor).
 - (1) Innervates muscles of the tongue. Tongue will deviate to side of lesion on testing.
 - (2) Test by inspecting the tongue. Note any weakness or fasciculation. Have patient stick out his tongue.
7. Conduct a motor exam.
- a. Much of the motor exam is performed in the cerebella exam; for example, gait, heel-to-toe walking, and coordination.
 - b. Inspect the muscles of the limbs and trunk for atrophy, symmetry, fasciculations, involuntary movements, or abnormalities of posture.
 - c. Test muscle strength.
 - (1) Individuals vary widely in strength, so your standards of "normal" should allow for age, sex, and muscular training.
 - (2) A patient's dominant side is usually slightly stronger than the other. Test muscle strength by asking your patient to move actively against your resistance. Watch for muscle contraction and feel the strength exerted. If muscles are too weak, test against gravity alone or with gravity eliminated. If the muscles cannot tolerate this, look for a weak muscular contraction even if it fails to move a body part.
 - (3) Grade muscle strength. Strength in the following areas ensures at least partial nerve continuity to the spinal level indicated.
 - (a) Deltoids (5th and 6th cervical vertebrae).
 - (b) Triceps (7th cervical vertebra).
 - (c) Biceps (5th and 6th cervical vertebrae).
 - (d) Brachioradialis (6th cervical vertebrae).
 - (e) Grip (6th and 7th cervical vertebrae).
 - (f) Interossei (6th cervical to 1st thoracic vertebrae).
 - (g) Quadriceps (2d to 4th lumbar vertebrae).
 - (h) Biceps femoris (5th lumbar to 1st sacral vertebrae).
 - (i) Dorsiflexion (4th and 5th lumbar vertebrae).
 - (j) Plantarflexion (5th lumbar to 1st sacral).
 - (4) The following scale should be used to quantify muscle strength:
 - (a) 0 = No response.
 - (b) 1 = Minimal contraction.
 - (c) 2 = Movement without gravity.
 - (d) 3 = Movement against gravity.
 - (e) 4 = Movement against partial resistance.
 - (f) 5 = Normal strength.

Performance Steps

- (5) When formally testing muscle strength, each joint should be tested in each primary motion and graded bilaterally. If the patient complains of weakness on a side, ALWAYS test the "good" side first.
- (6) Lower extremity testing:
 - (a) Hip: flexion, extension, adduction, abduction, internal rotation, and external rotation.
 - (b) Knee: flexion and extension.
 - (c) Ankle: inversion, eversion, dorsiflexion, and plantarflexion.
 - (d) Great toe: flexion and extension.
- (7) Upper extremity testing:
 - (a) Shoulders: abduction, adduction, internal rotation, external rotation, flexion, and extension.
 - (b) Elbows: flexion, extension, pronation, and supination.
 - (c) Wrists: flexion, extension, pronation, and supination.
 - (d) Hands: patient makes a fist; medic tries to spread fingers and extend the thumb.
- (8) Grade your findings as __/5. For example, normal strength would be charted as 5+/5 (grade of 5 out of a maximum score of 5).

8. Conduct a sensory exam.

- a. Palpation of the ventral and dorsal surfaces of the patient's arms, hands, trunk, legs, and feet should be systemic and involve all dermatomes. Areas of paresthesia or anesthesia could be outlined in pen and examined in detail.
 - (1) Light touch (anterior spinothalamic tract): Touch the patient lightly with fingertips or wisps of cotton.
 - (2) Pain and temperature (lateral spinothalamic tract): Use something sharp, but do not pierce the skin.
 - (3) Stereognosis (identifying common objects by touch):
 - (a) Graphesthesia (identifying numbers and letters written on palm without looking).
 - (b) Two-point discrimination: proprioception (position sense).
 - (c) Vibration: Though these are all carried by the dorsal columns, the most sensitive indicators of injury are stereognosis and graphesthesia.
 - (4) Sensory exam readily fatigues the patient, thereby producing unreliable results. Perform this part of the neurological exam as quickly as possible.
 - (5) Compare sensation in symmetrical areas on the two sides of the body.
 - (6) When testing pain, temperature, and light touch, compare distal and proximal areas of the extremities. When testing the vibration and position, test fingers and toes first. If these are normal, you may assume that the more proximal areas also will be normal.
 - (a) Scatter the stimuli so that you cover most of the dermatomes and peripheral nerves.
 - (b) When you detect an area of sensory loss, map out its boundaries in detail.
- b. Ask the patient to close his eyes. Test sensation on the arms, trunk, and legs by using the following stimuli:
 - (1) Pain: Using a broken swab as a stimulus, substituting the sharp end with the dull end.
 - (2) Temperature: This may be omitted if pain sensation is normal. Use two test tubes--one filled with hot water and one filled with cold water. Touch the skin, and have the patient identify hot versus cold.
 - (3) Light touch: With a fine wisp of cotton, touch the skin lightly, and ask your patient to respond whenever you touch his skin.
 - (4) Vibration: Using a tuning fork, tap it on the heel of your hand and place it firmly over a bony prominence distally. If vibration is impaired, proceed to a more proximal bony prominence.

NOTE: Vibratory sense is often the first sensation to be lost in a peripheral neuropathy.

- (5) Position: Grasp the patient's big toe, move it, and ask the patient to identify whether it is up or down. Perform the same test with the fingers.

9. Examine the patient's reflexes.

Performance Steps

NOTE: To elicit a tendon stretch reflex, persuade the patient to relax, position the limb properly, and strike the limb briskly.

- a. Deep tendon reflexes (DTRs): Reflexes in the body part tested will indicate spinal competency to the level indicated.
 - (1) Triceps (6th to 7th cervical vertebrae).
 - (2) Biceps (5th to 6th cervical vertebrae).
 - (3) Brachioradialis (5th to 6th cervical vertebrae).
 - (4) Knee jerk (2d to 3d to 4th lumbar vertebrae).
 - (5) Ankle jerk (5th lumbar to 1st sacral to 2d sacral).
 - (6) Plantar (4th lumbar to 5th lumbar to 1st sacral to 2d sacral vertebrae).
- b. DTR grading uses the following scale:
 - (1) 0 = Absent.
 - (2) 1+ = Hypoactive.
 - (3) 2+ = Normal.
 - (4) 3+ = Greater than normal.
 - (5) 4+ = Hyperactive +/- myoclonus.
- c. If reflexes are found to be hyperactive, test for ankle clonus. Sharply dorsiflex the foot, and maintain it in dorsiflexion. Look and feel for rhythmic oscillations between dorsi and plantarflexion.
- d. Superficial reflexes are tested by lightly scratching the skin--abdominal (8th to 12th thoracic vertebrae) and cremasteric (1st to 2d lumbar vertebrae).
- e. The anal wink is tested by lightly touching the perirectal area with a pin and noting contraction of the anus.

10. Examine the patient's cerebellar functioning.

- a. Gait: Observe the patient's gait as he walks to your office. Observe his posture, balance, swing of his arms, and leg movement. Observe for ataxia.
- b. Tandem (heel-to-toe) gait: Ask the patient to walk heel-to-toe in a straight line. Then ask him to walk on his heels and then on his toes, which tests for plantar and dorsiflexion of the ankles and balance. Observe for ataxia.
- c. Finger to nose: Observe for dysmetria or past pointing.
- d. Heel-to-shin test:
- e. Rapid alternating movements (RAM): Testing each hand separately, ask the patient to do the following:
 - (1) Pat his leg as fast as he can with his hand.
 - (2) Turn his hand over and back as rapidly as he can.
 - (3) Touch each of his fingers with his thumb in rapid sequence.
- f. Romberg test: Ask the patient to stand with his feet together and without support from his arms. Note his ability to maintain an upright posture first with his eyes open and then with his eyes closed.

11. Perform special maneuvers to detect abnormal conditions of the nervous system.

- a. Meningeal signs:

NOTE: These maneuvers are not part of a routine neurological exam, but are done when inflammation of the meninges is suspected.

- (1) Brudzinski's sign: With the patient recumbent, place your hands behind the patient's head and flex the neck forward. Note resistance or pain. Watch for flexion of the patient's hips or knees in reaction to your maneuver.
- (2) Kernig's signs: Flex the patient's legs at the hip and knee, and then straighten the knee. Note any resistance or pain.

NOTE: Steps 12 and 13 relate to assessing coma.

12. Understand the definitions, etiology, and pathophysiology associated with coma.

- a. Definition: An abnormally deep state of unconsciousness from which the patient cannot be aroused by external stimuli.
- b. In general terms, only two mechanisms produce coma:

Performance Steps

- (1) Structural lesions that depress consciousness by destroying or encroaching on the ascending reticular activating system of the brain stem.
- (2) Toxic metabolic states that involve the presence of circulating toxins or metabolites or the lack of metabolic substrate (for example, oxygen or glucose).

NOTE: Either mechanism may cause diffuse depression of both cerebral hemispheres, with or without depression of the ascending reticular activating system.

- c. Coma may also be mimicked by certain psychiatric conditions (for example, "hysterical coma") in which the unconscious state has no organic origin. Patients who are experiencing a voluntary or involuntary psychiatric episode often vigorously blink and move the eyes and generally respond to noxious physical or verbal stimuli. However, patients with organic sources of coma are unresponsive.

13. Differentiate between structural and toxic metabolic causes of coma:

- a. Two major factors distinguish structural and toxic metabolic causes of coma:
 - (1) In patients with structural causes, there is a common association of focal (asymmetrical) neurological deficits.
 - (2) In patients with coma of toxic metabolic origin, the neurological findings are often symmetrical.
- b. Coma of toxic metabolic origin is often slow in onset, whereas structural lesions occur acutely.
- c. Pupillary responses are perhaps the most important physical finding in helping to distinguish between structural and metabolic causes of coma.
 - (1) Preserved pupillary responses suggest toxic metabolic causes.
 - (2) Unresponsive or asymmetrical pupillary responses point to a structural cause.
- d. Metabolic coma:
 - (1) The cerebral cortex is more sensitive to toxic metabolic disturbances than are other parts of the central nervous system (CNS).
 - (2) If associated with fever, bacterial meningitis should be suspected.
 - (3) Consider heat stroke during the summer months.
 - (4) Cocaine, seizures (status or prolonged), and phenothiazines can also produce coma and fever.
- e. Structural coma:
 - (1) Follows a progressive pattern of deterioration caused by focal pressure or compression.
 - (2) Cerebral aneurysms that rupture have a sudden onset of symptoms and occur often when the patient is straining, such as during intercourse or a bowel movement.
 - (3) Syndrome is often sudden in onset with an asymmetrical secondary exam (for example, hemiparesis).
 - (4) As a rule, structural lesions affect the ascending reticular activating system by virtue of increased intracranial pressure (ICP) and herniation and require rapid surgical intervention.

NOTE: The following steps relate to the assessment of seizures.

14. Understand the definitions, etiology, and pathophysiology associated with seizures.

CAUTION: All seizures are pathological.

- a. A seizure is a temporary alteration in behavior or consciousness caused by an abnormal electrical activity of one or more groups of neurons in the brain.
- b. Seizures are generally believed to result from alterations in neuronal membrane permeability secondary to structural lesion or metabolic derangement. The increased membrane permeability to sodium and potassium ions enhances the ability of the neurons to depolarize and emit an electrical charge, sometimes resulting in seizure activity.
- c. Seizures may be caused by multiple factors, including the following:
 - (1) Stroke.
 - (2) Head trauma.
 - (3) Toxins, including alcohol or other drug withdrawal.
 - (4) Hypoxia.
 - (5) Hypoglycemia.

Performance Steps

- (6) Infection.
- (7) Metabolic abnormalities.
- (8) Brain tumor.
- (9) Vascular disorders.
- (10) Eclampsia.
- (11) Drug overdose.

NOTE: In the prehospital setting, determining the cause of seizure activity is less important than managing the complications and recognizing whether the seizure is reversible with therapy (for example, hypoglycemia).

15. Recognize the types of seizures.

- a. Generalized seizures do not have a definable origin (focus) in the brain, although focal seizures may progress to generalized seizures.

- (1) Petit mal seizures (absence seizures). Often, there is no motor activity, although some children have eye blinking, lip smacking, or isolated clonic activity.

- (a) Often occur in children between ages 4 and 12.
- (b) Characterized by a brief lapse of consciousness without loss of posture.
- (c) Usually last less than 15 seconds, during which time the patient is unaware of his surroundings, followed by immediate return to normal environmental contact.
- (d) Most patients have remission by age 20, but may subsequently develop grand mal seizures.

- (2) Grand mal seizures:

- (a) Are common and are associated with significant morbidity and mortality.
- (b) May be preceded by an aura which is often recognized by the patient as a warning of the impending convulsion.
- (c) Seizure is characterized by a sudden loss of consciousness associated with loss of organized muscle tone and a tonic phase in which there is a sequence of extensor muscle tone activity (sometimes flexion) and apnea.
- (d) During the tonic phase, there is a massive autonomic discharge that results in hyperventilation, salivation, and tachycardia.
- (e) During tonic phase, tongue biting and bladder or bowel incontinence may occur.
- (f) After the tonic phase (which lasts only seconds), the patient experiences a bilateral clonic phase (rigidity alternating with relaxation), which usually lasts 1 to 3 minutes.
- (g) After the seizure, the patient is usually drowsy or unconscious, resolving over minutes to hours.
- (h) On regaining consciousness, the patient is often confused and fatigued and may have a transient neurological deficit.

NOTE: Step (h) is the postictal phase of the seizure.

- (i) Grand mal seizures may be prolonged or recur before the patient regains consciousness (status epilepticus).

- b. Status epilepticus:

CAUTION: Status epilepticus is a true emergency. Without immediate treatment, it can result in permanent neurological damage, respiratory failure, and death.

- (1) Status epilepticus is a continuous seizure lasting 30 minutes or longer or a recurrent seizure without an intervening period of consciousness.

- (2) Associated complications include the following:

- (a) Aspiration.
- (b) Brain damage.
- (c) Fracture of long bones and the spine.
- (d) Necrosis of heart muscle.
- (e) Severe dehydration.

- c. Partial seizures arise from identifiable cortical lesions and may be classified as simple or complex.

Performance Steps

- (1) Simple partial seizures result mainly from seizure activity in the motor or sensory cortex. These seizures usually manifest in clonic activity limited to one specific body area (one hand, one arm, or one side of the face).
 - (a) These patients do not generally lose consciousness. They maintain a relatively normal mental status.
 - (b) Simple partial seizures result in symptoms such as tingling or numbness of a body part or abnormal visual, auditory, olfactory, or taste symptoms.
- (2) Complex partial seizures arise from focal seizures in the temporal lobe (psychomotor) and manifest primarily as changes in behavior.
 - (a) The classic complex partial seizure is preceded by an aura, followed by abnormal repetitive behavior (automatisms) such as lip smacking, chewing, or swallowing, during which time the patient is amnesic.
 - (b) Like simple partial seizures, complex partial seizures may also progress to generalized tonic-clonic seizure.
 - (c) Complex partial seizures typically last less than 1 minute, and the patient usually regains normal mental status quickly.
- d. Hysterical seizures can mimic true seizures, but stem from psychological causes and have no organic origin.
 - (1) Hysterical seizures are also known as pseudoseizures.
 - (2) Do not respond to normal treatment modalities.
 - (3) Can usually be terminated by sharp commands or painful stimuli (for example, a sternal rub).

NOTE: Steps 16 and 17 relate to cerebrovascular accidents.

16. Understand the definitions, etiology, and pathophysiology associated with cerebrovascular accidents (CVAs).

- a. A CVA (stroke) is a sudden interruption in blood flow to the brain that results in neurological deficit.

NOTE: CVA affects more than 500,000 Americans each year and disassociated with a 30-day mortality rate of about 10 to 15 percent.

- b. Patients more likely to suffer a CVA include those with the following risk factors:

- (1) Hypertension.
- (2) Diabetes mellitus.
- (3) Atherosclerosis.
- (4) Hyperlipidemia.
- (5) Polycythemia.
- (6) Cardiac disease.

- c. Pathophysiology:

- (1) Blood reaches the brain through four major vessels: two carotid arteries (providing about 80 percent of cerebral blood flow) and two vertebral arteries, which combine to form the single basilar artery (supplying the remaining 20 percent of cerebral blood flow).
- (2) These two systems are interconnected at various levels, the principal one being the circle of Willis.
- (3) There are also individual variations of extensive collateral blood flow supplied through facial anastomoses between scalp vessels and vessels of the dura and arachnoid.
- (4) Normally, cerebral blood flow is maintained through autoregulation of cerebral vessels that constrict or dilate to preserve perfusion pressure even with systemic hypotension.
 - (a) Cerebral perfusion is also regulated at the arteriolar level by the level of oxygen and glucose supplied.

NOTE: Ischemia and acidosis are profound vasodilators.

- (b) The sudden cessation of circulation to a portion of the brain that results from vessel occlusion or hemorrhage cannot be readily corrected by these autoregulatory mechanisms.
- (5) The onset and symptoms of the stroke depend on the area of the brain involved.

Performance Steps

- (6) Most patients are hospitalized for close observation, evaluation, and treatment of vascular disease.

17. Recognize the types of CVA.

NOTE: Determining the origin of a CVA is often difficult and unnecessary in the prehospital setting. However, understanding the various signs and symptoms of each type will allow you to be better prepared to anticipate the course of patient care in the clinical setting.

a. Cerebral thrombosis:

- (1) Accounts for half of all strokes.
- (2) Occurs as a result of atherosclerotic plaques or extrinsic pressure from a mass within the brain itself.
- (3) Usually associated with a long history of vessel disease.
 - (a) Angina pectoris.
 - (b) Claudication.
 - (c) Previous stroke.
- (4) Signs and symptoms are usually slower to develop than in other types and include the following:
 - (a) Hemiparesis or hemiplegia on the side of the body opposite the lesion.
 - (b) Numbness (or decreased sensation) on the side of the body opposite the lesion.

NOTE: Aphasia can be expressive; that is, inability or difficulty in speaking or receptive (patient does not understand what you are telling them). Both are very frightening and frustrating to the patient.

- (c) Aphasia.
- (d) Confusion.
- (e) Coma.
- (f) Convulsions.
- (g) Incontinence.
- (h) Double vision.
- (i) Numbness of the face.
- (j) Dysarthria (slurred speech).
- (k) Headache.
- (l) Dizziness or vertigo.

b. Cerebral embolus:

- (1) Results from an occlusion of an intracranial vessel by a fragment of a foreign substance arising outside the CNS.
- (2) Common sources include atherosclerotic plaques originating from large vessels of the head, neck, and heart.
- (3) Thrombi that develop on the valves or in the chambers of the heart are common in patients with valvular heart disease and atrial fibrillation.
- (4) Other rare causes include air embolism after thoracic injury and fat embolism after long bone injury.

NOTE: Bacterial and fungal endocarditis are also capable of causing stroke from embolization.

- (5) Signs and symptoms of cerebral embolus are similar to those of thrombotic stroke, but usually develop more quickly and are often associated with an identifiable cause.

NOTE: Amniotic fluid emboli can also cause CVA at the time of delivery.

- (a) Atrial fibrillation.
- (b) Valvular heart disease.

c. Cerebral hemorrhage:

NOTE: Accounts for 10 percent of all strokes.

- (1) May occur anywhere within the cranial vault, including the epidural, subdural, subarachnoid, intraparenchymal, and intraventricular spaces.
- (2) The most common causes are cerebral aneurysms, arteriovenous malformations, and hypertension.

NOTE: Unlike thrombotic and embolic strokes, which have a relatively high survival rate, cerebral hemorrhages are fatal in 50 to 80 percent of the cases.

Performance Steps

- (a) Cerebral aneurysms and arteriovenous malformations are congenital anomalies that can be familial and are often asymptomatic until rupture.
- (b) Commonly occur during stress or exertion.
- (3) Cocaine and other sympathomimetic amines may also contribute to intracranial hemorrhage by drug-induced rapid elevation of blood pressure.
- (4) Presentation is abrupt and often begins with a headache accompanied by nausea, vomiting, and progressive deterioration in mental status from alert to lethargic.

NOTE: The headache is sometimes described as the worst headache of the patient's life.

- (5) The uncorrected ischemia that results within a short period of time leads to neuronal dysfunction and tissue death.
- (6) Often, the patient loses consciousness or experiences a seizure at the time of the hemorrhage.
- (7) As the hemorrhage expands and ICP increases, the patient becomes comatose with increasing hypertension and bradycardia (Cushing's reflex).

d. Transient ischemic attacks (TIAs):

NOTE: TIAs are also known as "little strokes."

- (1) TIAs are episodes of focal cerebral dysfunction that last from minutes to several hours from which the patient returns to normal within 24 hours without apparent neurological deficit.
- (2) A TIA is thought to be the most important indication of impending stroke and is often followed by cerebral infarct within 2 years.
- (3) Signs and symptoms are the same as those for stroke--all correspond to vascular occlusion of a specific cerebral artery.
- (4) Women taking oral contraceptive and patients with sickle cell disease are also at increased risk.

18. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess nervous system disorders.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Knew the major divisions of the neurological exam.	_____	_____
2. Solicited a patient history.	_____	_____
3. Performed a mental status exam.	_____	_____
4. Recognized terms used to describe altered levels of consciousness:	_____	_____
5. Recognized terms used to describe cortical exam abnormalities:	_____	_____
6. Tested the 12 cranial nerves.	_____	_____
7. Conducted a motor exam.	_____	_____
8. Conducted a sensory examination.	_____	_____
9. Examined the patient's reflexes.	_____	_____
10. Examined the patient's cerebellar functioning.	_____	_____
11. Performed special maneuvers to detect abnormal conditions of the nervous system.	_____	_____
12. Understood the definitions, etiology, and pathophysiology associated with coma.	_____	_____
13. Differentiated between structural and toxic metabolic causes of coma.	_____	_____

Performance Measures**GO** **NO GO**

14. Understood the definitions, etiology, and pathophysiology associated with seizures.	_____	_____
15. Recognized the types of seizures.	_____	_____
16. Understood the definitions, etiology, and pathophysiology associated with cerebrovascular accidents.	_____	_____
17. Recognized the types of CVA.	_____	_____
18. Recorded all findings in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

BATES PE, 8TH ED. 2002
MERCK MANUAL 17TH ED

Manage Loss of Consciousness

081-833-4152

Conditions: Given M-5 medical equipment set and patient's medical record.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the condition, and administer emergency care and supportive care in accordance with The Merck Manual.

Performance Steps

1. Understand the definitions, etiologies, and pathophysiologies associated with loss of consciousness.
 - a. The reticular activating system is a functional unit of the brain. This system is located in the upper brain stem, which is generally believed to be responsible for maintaining consciousness.
 - b. Syncope is a sudden, brief loss of consciousness. (Most commonly the result of temporarily reduced cerebral blood flow from a variety of causes.)
 - (1) Cardiovascular causes:
 - (a) Exertional syncope is usually caused by cardiac outflow obstruction caused by aortic stenosis.
 - (b) Postural (orthostatic) hypotension syncope is caused by blood not reaching the brain after a rapid rise from a recumbent position.
 - (c) Vasovagal syncope is brought on by unpleasant experiences or pain.
 - (d) Hyperventilation syncope is caused by respiratory alkalosis.
 - (e) Weight lifters syncope, not to be confused with exertional syncope, is of benign origin. It is usually caused by hyperventilation before a lift, which causes cerebral vasoconstriction and peripheral vasodilation. The Valsalva maneuver of lifting decreases venous return. Therefore, cardiac output is decreased, resulting in a syncopal episode.
 - c. Noncardiovascular causes:
 - (1) Syncope caused by seizures.
 - (2) Syncope caused by pulmonary embolism.
 - (3) Syncope of gradual onset (metabolic syncope).
 - d. Coma is an abnormally deep state of unconsciousness from which the patient cannot be aroused by external stimuli.
 - (1) In general terms, only the following two mechanisms produce coma:
 - (a) Structural lesions that depress consciousness by destroying or encroaching on the ascending reticular activating system of the brain stem.
 - (b) Toxic metabolic states that involve the presence of circulating toxins or metabolites or the lack of metabolic substrate (for example, oxygen or glucose).
 - (2) Either mechanism may cause diffuse depression of both cerebral hemispheres, with or without depression of the ascending reticular activating system.
 - (3) Coma also may be mimicked by certain psychiatric conditions (for example, "hysterical coma") in which the unconscious state has no organic origin. Patients who are experiencing a voluntary or involuntary psychiatric episode often vigorously blink and move the eyes and generally respond to noxious physical or verbal stimuli. However, patients with organic sources of coma are unresponsive.
 - e. Trauma can cause loss of consciousness (task 081-833-4153, Manage a Casualty With a Closed Head Injury).
2. Solicit a patient history.
3. Recognize significant subjective findings for loss of consciousness.
 - a. Exertional syncope often occurs immediately following exercise as venous return, left atrial pressure, and ventricular filling all decrease.

Performance Steps

- b. Postural hypotension syncope is usually caused by underlying hypovolemia or venous pooling. It is usually seen after prolonged bedrest in elderly patients with varicose veins or in those taking certain medications.
- c. Vasovagal syncope is typically precipitated by unpleasant physical or emotional stimuli such as pain, fright, or the sight of blood. It usually occurs in the upright position.
- d. Patients with syncope caused by seizures may have a prior history of seizures. If this is the first episode, they will relate a history of abrupt onset associated with muscle jerking or convulsions, possibly incontinence, and tongue biting.
- e. Patients with syncope caused by pulmonary embolism will often relate a history of chest discomfort.
- f. Syncope of gradual onset may relate a history of chest discomfort or paresthesias.
- g. Subjective findings for coma will depend on the underlying cause, either metabolic or structural.
 - (1) Coma of toxic metabolic origin is often slow in onset, whereas structural lesions occur acutely.
 - (2) Patients who present in a comatose state should be searched for identifying tags or cards that may indicate the underlying cause of the problem. If family members are present, they should be questioned to solicit significant history concerning the possible cause.
 - (3) With metabolic coma, consider a possible history of heat stroke, especially during the summer months.
 - (4) Structural causes of coma are as follows:
 - (a) Follow a progressive pattern of deterioration caused by focal pressure or compression.
 - (b) Cerebral aneurysms that rupture have a sudden onset of symptoms and occur often when the patient is straining, such as during intercourse or a bowel movement.

4. Perform a PE.

5. Recognize significant objective findings for loss of consciousness.

- a. Patients with exertional syncope may show arrhythmias on cardiac monitoring.
- b. Patients with postural hypotension will usually show positive tilts for hypovolemia.
- c. Patients with vasovagal, hyperventilation, or weight lifter's syncope will have an unremarkable PE.
- d. Syncope caused by seizures will usually not have significant objective findings after the seizure episode is over, unless there are traumatic injuries as a result of the seizure.
- e. Patients with syncope secondary to pulmonary embolism will have dyspnea, tachypnea, cyanosis, and hypotension.
- f. Subjective findings of patients with coma will be related to the underlying cause.
 - (1) The following two major factors distinguish structural and toxic metabolic causes of coma:
 - (a) In patients with structural causes, there is a common association of focal (asymmetrical) neurological deficits.
 - (b) In patients with coma of toxic metabolic origin, the neurological findings are often symmetrical.
 - (2) Pupillary responses are perhaps the most important physical finding in helping to distinguish between structural and metabolic causes of coma. Preserved pupillary responses suggest toxic metabolic causes. Unresponsive or asymmetrical pupillary responses point to a structural cause.
 - (3) The following applies to metabolic coma:
 - (a) If associated with fever, bacterial meningitis should be suspected.
 - (b) Consider heat stroke during the summer months.
 - (c) Cocaine, seizures (status or prolonged), and phenothiazines can also produce coma and fever.
 - (4) The following applies to structural coma:
 - (a) Syndrome is often sudden in onset with an asymmetrical secondary examination (for example, hemiparesis).

Performance Steps

- (b) As a rule, structural lesions affect the ascending reticular activating system by virtue of increased intracranial pressure (ICP) and herniation and require rapid evacuation and referral for surgical intervention.

6. Manage loss of consciousness.

- a. Patients with syncope may not require any special management. However, if it is not possible to determine the cause, evaluate the patient further to rule out more serious conditions.
- b. Regardless of cause, prehospital care is directed at the following:
 - (1) Support of the patient's vital functions.
 - (2) Prevention of further deterioration of the patient's condition.
 - (3) Administration of medications, intravenous (IV) fluid, or both, to treat potentially reversible causes of loss of consciousness.
- c. If patient respirations are slow or shallow or if cerebral edema is suspected, hyperventilate the patient's lungs at 24 to 30 breaths per minute, and intubate unconscious patients who do not have a gag reflex.

NOTE: Excessive hyperventilation can cause too much vasoconstriction and decrease cerebral perfusion.

- d. After securing the airway, management of an unconscious patient of unknown origin includes the following:
 - (1) Establish an intravenous line of dextrose 5 percent in water (D5W) to keep the vein open (TKO) (or lactated Ringer's or normal saline if hypotension is present). If you are drawing the blood from the IV site, draw the red top before connecting the IV fluid.
 - (2) Monitor cardiac rhythm.
 - (3) Administer 100 milligrams (mg) thiamin (slow IV), followed by 50 grams (g) of dextrose 50 percent .

NOTE: If alcohol is suspected as the cause of coma, you should consider administering thiamin since chronic alcoholism interferes with the intake, absorption, and use of thiamin and may result in the development of serious neurologic disorders. Thiamin may prevent dextrose from precipitating Wernicke's syndrome or Korsakoff's psychosis in alcoholic patients who have depleted thiamin stores.

- (4) If there is no response to glucose administration, administer 2 mg of naloxone in a slow IV push to rule out or reverse narcotic depression.

NOTE: Be prepared to restrain a narcotic-dependent patient who may become violent as the naloxone reverses narcotic effects.

- (5) If the patient remains in a comatose state, the patient's eyes should be protected from corneal drying by gently closing them and covering the lids with moist gauze pads.

7. Record all treatment in the patient's medical record.

8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage loss of consciousness.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiologies, and pathophysiologies associated with loss of consciousness.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for loss of consciousness.	—	—
4. Performed a physical exam.	—	—
5. Recognized significant objective findings for loss of consciousness.	—	—
6. Managed loss of consciousness.	—	—

Performance Measures

7. Recorded all treatment in the patient's medical record.

GO **NO GO**

8. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

Manage Vertigo

081-833-4154

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and pharmacological agents.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the definition and etiology of vertigo.
 - a. Vertigo is defined as a disturbance in which the individual has a subjective impression of movement in space (subjective vertigo) or of objects moving around him (objective vertigo), usually with a loss of equilibrium.
 - b. Vertigo results from a disturbance somewhere in the equilibratory apparatus--vestibule, semicircular canals, 8th nerve, vestibular nuclei in the brainstem and their temporal lobe connections, or eyes. These structures may be affected by a wide variety of disorders such as the following:
 - (1) Otogenic conditions: Meniere's syndrome, myringitis, otitis media, and others.
 - (2) Toxic conditions: alcohol, streptomycin, and opiates.
 - (3) Psychogenic conditions: hysteria.
 - (4) Environmental conditions: motion sickness.
 - (5) Ocular conditions: diplopia.
 - (6) Circulatory conditions: transient vertebrobasilar ischemic attacks.
 - (7) Neurologic conditions: multiple sclerosis, skull fracture, temporal lobe seizures, and so on.
2. Solicit a patient history.
3. Recognize significant subjective findings for vertigo.
 - a. Patients with a history of sudden episodic attacks of vertigo, tinnitus, and progressive deafness accompanied by nausea and vomiting and persisting for minutes or hours are characteristic of Meniere's disease.
 - b. Vertigo persisting for days or weeks may be caused by vestibular neuronitis.
 - c. Patients with a history of postural or positional vertigo are more likely to be affected by labyrinthine disturbances.
 - d. Patients with a history of vertigo that occurs with sudden turning or strong extending of the head may have vertebral artery insufficiency or tumors of the floor of the fourth ventricle.
4. Perform a PE.
5. Recognize significant objective findings for vertigo.
 - a. Nystagmus.
 - b. Past-pointing.
 - c. Inability to walk a straight line.
 - d. Persistent deviation to one side when walking.
 - e. Unilateral deafness and tinnitus. These indicate cochlear involvement and are reliable indicators of peripheral nerve lesion.
6. Recognize significant lab findings for vertigo.
 - a. Audiograms will differentiate between cochlear and neural hearing loss.
 - b. Skull X rays or computed tomography (CT) scans may show tumors or other lesions that are impinging on the 8th nerve.
 - c. Cerebrospinal fluid (CSF) examination and electroencephalograms (EEGs) may help rule out pathologic central nervous system (CNS) changes.

Performance Steps

7. Manage vertigo.
 - a. Definitive management is based on managing the underlying cause.
 - b. Symptomatic relief may be achieved by bedrest and medications such as the following:
 - (1) Dimenhydrinate 50 to 100 mg by mouth (PO) every 4 to 6 hours (q4/6h).
 - (2) Perphenazine 4 to 8 mg PO or 5 mg intramuscularly (IM) three times a day (t.i.d.).
 - (3) Meclazine 25 mg PO t.i.d.
 - (4) Transdermal scopolamine 0.5 mg over 3 days.
8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage vertigo.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definition and etiology of vertigo.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for vertigo.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for vertigo.	_____	_____
6. Recognized significant lab findings for vertigo.	_____	_____
7. Managed vertigo.	_____	_____
8. Treated complications symptomatically with appropriate supportive care.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED

Manage Headache

081-833-4156

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and a selection of pharmacological agents.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the types and general description of headache (HA).
 - a. Tension HA is the most common type of HA by far.
 - b. Cluster, or histamine HAs, are caused by unilateral vasodilation.
 - c. Migraine HA is caused by vasoconstriction.
 - d. HAs are caused by meningeal irritation or increased intracranial pressure (task 081-833-4292, Manage Bacterial Meningitis and Encephalitis, and task 081-833-4157, Manage Increased Intracranial Pressure).
2. Solicit a patient history.
3. Recognize significant subjective findings for HA.
 - a. History of a HA should include quality, location, duration, time of onset, and conditions known to produce, exacerbate, or relieve HA. Use OPQRST (onset, palliative or provocative, quality, radiation or region, severity, and temporal relationship) when you question the patient.
 - b. Structures sensitive to pain are as follow:
 - (1) Skin.
 - (2) Muscles.
 - (3) Blood vessels.
 - (4) Periosteum.
 - (5) Ear.
 - (6) Eye.
 - (7) Nasal cavity.
 - (8) Cranial nerve coverings.
 - c. Tension HA will have a history of the following:
 - (1) Variable in location, often beginning at the back of the neck and progressively involving the entire head.
 - (2) Pain is dull, throbbing, or aching.
 - (3) Precipitated by overwork and/or emotional stress that subconsciously tightens up back and forehead muscles.
 - (4) Persists for minutes to hours.
 - d. Cluster, or histamine, HAs will have a history of the following:
 - (1) Pain lasting a few minutes that subsides abruptly but may recur several times daily.
 - (2) Characterized by sudden onset of severe unilateral pain.
 - (3) Involves orbital area, often retroocular, and frequently radiates to the temple, nose, jaw, and neck.
 - (4) Attacks occur most frequently during sleep.
 - (5) More commonly affects the aggressive and overly ambitious.
 - e. Migraine HA will have a history of the following:
 - (1) A biphasic syndrome. The first phase is often a prodrome of psychological or visual disturbances (scintillating scotomas or auras) followed by unilateral retroorbital pain associated with nausea and vomiting. Blurred vision or "spots before the eyes" are common. The first phase is sometimes followed by drowsiness.
 - (2) Onset usually occurs during adolescence.
 - (3) Migraines may persist for days, but not usually.

Performance Steps

- (4) Migraines are separated by periods of complete freedom from pain.
- (5) Patients will often have a family history of migraines.

4. Perform a PE.

5. Recognize significant objective findings for HA.

- a. Tension HA will have an unremarkable physical exam.
- b. Cluster HA will have signs of vasodilation on same side as pain.
 - (1) Edema below the eye.
 - (2) Rhinorrhea.
 - (3) Lacrimation.
- c. Migraine will have signs of the following:
 - (1) Vomiting.
 - (2) Occasionally, transient neurologic deficit during the attack.

6. Manage HA.

- a. Tension HA:
 - (1) Rest and relaxation.
 - (2) If possible, remove patient from source of stress.
 - (3) Apply mild heat to back of neck--heating pad, hot towels, or warm bath.
 - (4) Massage neck muscles.
 - (5) Mild nonsteroidal anti-inflammatory drugs (NSAIDs), aspirin, or acetaminophen.
 - (6) Some sources recommend administration of tricyclic antidepressants (see below) in addition to analgesics in the treatment of severe, chronic, nonvascular HA.

WARNING: Do NOT give antidepressants with alcohol since barbiturates and alcohol together may synergistically cause fatal respiratory arrest.

b. Cluster, or histamine, HAs.

- (1) General management of cluster HAs follows the same treatment modality as migraine HA. (See below).
- (2) Indomethacin (a common NSAID) is uniquely effective in the treatment of cluster HA. Prescribe 25 milligrams (mg) twice daily (b.i.d.) or three times a day (t.i.d.) initially, not to exceed 200 mg per day.
- (3) Alternatively, patients may receive relief from an antihistamine and aspirin.

c. Migraine HA:

- (1) Treatment depends on the frequency of attacks and the presence of comorbid illness. In general, treatment can be classified as prophylactic, abortive, or analgesic.
- (2) If a person has more than one migraine a week, long-term prophylaxis should be considered. The choice is imperic, but guided by the presence of comorbid illness.
 - (a) If hypertension coexists, beta blockers or calcium channel blockers would be most efficient. Commonly used drugs are: propranolol 60 to 320 mg by mouth (PO) per day or verapamil 120 to 480 mg PO per day.
 - (b) If depression or sleep dysfunction coexist, tricyclic antidepressants should be tried first. Commonly used drug is amitriptyline 4 to 25 mg t.i.d. or four times a day (q.i.d.).
 - (c) Other drugs that have been used in the prophylaxis of migraine are methysergide (an ergot alkaloid derivative) 2 mg PO t.i.d. or q.i.d. (a "drug holiday" is required after 6 months of administration), and valproic acid, (an anticonvulsant) 250 mg b.i.d., t.i.d. or q.i.d. (patient dependent).
- (3) There are several drugs on the market now that can be carried by the migraine sufferer that are used when the prodrome is recognized. If taken early, they will generally stop the migraine before it starts. These are called abortive drugs. Some commonly used abortive drugs are as follows:
 - (a) Sumatriptan (a 1 beta and 1 delta adrenergic [1B/1D] agonist) 6 mg subcutaneously (SQ), 20-mg nasal spray, or 25, 50 or 100 mg PO. Use with caution in men over 55 as it may cause coronary artery constriction.

Performance Steps

- (b) Dihydroergotamine (DHE) 45 0.5 to 1 mg intramuscularly (IM) or intravenously (IV).
Contraindicated in coronary artery disease, hypertension, impaired kidney or liver function, sepsis, and pregnancy.
- (c) Prochlorperazine (a dopamine antagonist) 10 mg IV or IM or 25 mg suppository.
This drug may be effective in patients even when vomiting is not present.
- (4) Analgesics should be used sparingly because of the incidence of rebound HA and dose escalation.
 - (a) If migraine is in progress for at least 24 hours before evaluation, manage with prochlorperazine 10 mg IV or IM or 25 mg suppository, followed by demerol 75 mg IM and oxygen instead of other drugs.
 - (b) Other analgesics, including acetaminophen, aspirin, and NSAIDs also have a place in the treatment of mild to moderate migraine.
- 7. Record all treatment in the patient's medical record.
- 8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage headache.

Performance Measures	GO	NO GO
1. Understood the types and general description of HA.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized significant subjective findings for HA.	_____	_____
4. Performed a PE.	_____	_____
5. Recognized significant objective findings for HA.	_____	_____
6. Managed HA.	_____	_____
7. Recorded all treatment in the patient's medical record.	_____	_____
8. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED	

Manage a Seizure

081-833-4158

Conditions: Given patient's medical record and M-5 medical kit.

Standards: Solicit a patient history, perform a physical examination (PE), determine the cause of the seizure, and administer emergency and supportive care in accordance with The Merck Manual.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with seizures.
 - a. All seizures are pathologic.
 - b. Seizures are a temporary alteration in behavior or consciousness caused by an abnormal electrical activity of one or more groups of neurons in the brain.
 - c. Seizures are generally believed to result from alterations in neuronal membrane permeability secondary to structural lesion or metabolic derangement. The increased membrane permeability to sodium and potassium ions enhances the ability of the neurons to depolarize and emit an electrical charge, sometimes resulting in seizure activity.
 - d. Seizures may be caused by multiple factors, including the following:
 - (1) Stroke.
 - (2) Head trauma.
 - (3) Toxins, including alcohol or other drug withdrawal.
 - (4) Hypoxia.
 - (5) Hypoglycemia.
 - (6) Infection.
 - (7) Metabolic abnormalities.
 - (8) Brain tumor.
 - (9) Vascular disorders.
 - (10) Eclampsia.
 - (11) Drug overdose.

NOTE: In the prehospital setting, determining the cause of seizure activity is less important than managing the complications and recognizing whether the seizure is reversible with therapy (for example, hypoglycemia).

2. Understand the types of seizures.
 - a. Generalized seizures do not have a definable origin (focus) in the brain, although focal seizures may progress to generalized seizures.
 - (1) Petit mal seizures (absence seizures). Often, there is no motor activity, although some children have eye blinking, lip smacking, or isolated clonic activity.
 - (a) Often occur in children between ages 4 and 12.
 - (b) Characterized by a brief lapse of consciousness without loss of posture.
 - (c) Usually last less than 15 seconds, during which time the patient is unaware of his surroundings, followed by immediate return to normal environmental contact.
 - (d) Most patients have remission by age 20, but may subsequently develop grand mal seizures.
 - (2) Grand mal seizures are common and are associated with significant morbidity and mortality.
 - (a) May be preceded by an aura that is often recognized by the patient as a warning of the impending convulsion.

Performance Steps

- (b) Seizure is characterized by a sudden loss of consciousness associated with loss of organized muscle tone and a tonic phase in which there is a sequence of extensor muscle tone activity (sometimes flexion) and apnea. During the tonic phase, there is a massive autonomic discharge that results in hyperventilation, salivation, and tachycardia. During tonic phase, tongue biting and bladder or bowel incontinence may occur. After the tonic phase (which lasts only seconds), the patient experiences a bilateral clonic phase (rigidity alternating with relaxation), which usually lasts 1 to 3 minutes.
- (c) After the seizure, the patient is usually drowsy or unconscious, resolving over minutes to hours.
- (d) On regaining consciousness, the patient is often confused and fatigued and may have a transient neurological deficit. This is the postictal phase of the seizure.
- (e) Grand mal seizures may be prolonged or recur before the patient regains consciousness (status epilepticus).
- b. Partial seizures arise from identifiable cortical lesions and may be classified as simple or complex.
 - (1) Simple partial seizures result mainly from seizure activity in the motor or sensory cortex, and usually manifest in clonic activity limited to one specific body area (one hand, one arm, or one side of the face).
 - (a) These patients do not generally lose consciousness; they maintain a relatively normal mental status.
 - (b) Simple partial seizures result in symptoms such as tingling or numbness of a body part, or abnormal visual, auditory, olfactory, or taste symptoms.
 - (2) Complex partial seizures arise from focal seizures in the temporal lobe (psychomotor) and manifest primarily as changes in behavior.
 - (a) The classic complex partial seizure is preceded by an aura, followed by abnormal repetitive behavior (automatisms) such as lip smacking, chewing, or swallowing, during which time the patient is amnesic.
 - (b) Like simple partial seizures, complex partial seizures may also progress to generalized tonic-clonic seizures.
 - (c) Complex partial seizures typically last less than 1 minute, and the patient usually regains normal mental status quickly.
- c. Hysterical seizures can mimic true seizures, but stem from psychological causes and have no organic origin.
 - (1) Hysterical seizures are also known as pseudoseizures.
 - (2) Do not respond to normal treatment modalities.
 - (3) Can usually be terminated by sharp commands or painful stimuli (for example, a sternal rub).
- d. Status epilepticus:
 - (1) A continuous seizure lasting 30 minutes or longer, or a recurrent seizure without an intervening period of consciousness.

NOTE: Status epilepticus is a true emergency. Without immediate treatment, it can result in permanent neurological damage, respiratory failure, and death.

- (2) Associated complications include the following:
 - (a) Aspiration.
 - (b) Brain damage.
 - (c) Fracture of long bones and the spine.
 - (d) Necrosis of heart muscle.
 - (e) Severe dehydration.
3. Solicit a patient history.
4. Recognize significant subjective findings for seizures.
- a. History of seizures, including frequency and medication compliance.

Performance Steps

- b. Description of seizure activity, including duration of seizure, whether generalized or focal, typical or atypical pattern of seizure for patient, and presence or absence of aura, incontinence, or tongue biting.
- c. Recent or past history of head trauma.
- d. Recent history of fever, headache, or nuchal rigidity (suggesting meningeal irritation).
- e. Past significant medical history of diabetes, heart disease, or stroke.

5. Perform a PE.

6. Recognize significant objective findings for a seizure.

- a. Be alert to signs of trauma that may have occurred before or during seizure activity; for example, head and neck trauma, tongue injury, or oral lacerations.
- b. Inspect the patient's gums for gingival hypertrophy (a sign of chronic phenytoin therapy).
- c. Assess the patient's level of consciousness, including presence or absence of amnesia.
- d. Evaluate cranial nerves, particularly pupillary findings.
- e. Perform a motor and sensory evaluation, including coordination. Abnormalities may be caused by metabolic disturbances, meningitis, intracranial hemorrhage, and drug use.
- f. Observe patient for presence of urine or feces, automatisms, or cardiac dysrhythmias.

7. Manage seizure.

- a. The first step is to prevent patient injury by removing obstacles in the immediate area and, if necessary, moving the patient to a safe environment such as a carpeted or soft, grassy area.

NOTE: At no time should a patient with seizure activity be restrained, nor should objects be forced between the patient's teeth to maintain an airway.

- b. Most patients in the postictal phase can be appropriately managed by being placed in a lateral recumbent position to allow drainage of oral secretions and to facilitate suctioning (if needed).
- c. Administer supplemental oxygen via a nonrebreather mask.
- d. Move the patient to a quiet environment away from onlookers.
 - (1) Patients are commonly embarrassed or self-conscious after a seizure, particularly if incontinence has occurred.
 - (2) Be sensitive to the physical and emotional needs of the patient.

NOTE: Continually reorient patients as they recover.

- e. Two common medications for control of seizures are phenytoin (Dilantin) and phenobarbital (Luminal).

8. Manage status epilepticus.

- a. Secure the airway with oral or nasal adjuncts (or intubate the patient's trachea during the flaccid period between seizures).
- b. Administer high-concentration oxygen.

NOTE: Prevention of severe hypoxia is critical.

- c. Support ventilation's with a bag-valve device.
- d. Establish an IV with normal saline to keep open (TKO), and secure it well with tape and roller bandage.
- e. Draw blood sample for lab analysis.
- f. Medications may include the following:
 - (1) Dextrose 50 percent 25 grams (g) slow IV (controversial unless hypoglycemia is suspected) to replace blood glucose lost during seizure activity or to correct hypoglycemia that caused the seizure.
 - (2) Lorazepam (Ativan) 1 mg IV or diazepam (Valium) 2- to 5-mg increments IV (maximum 10-mg total dose) to stop the spread of seizure focus.

NOTE: Lorazepam and diazepam can be given by the rectal route if an IV cannot be established.

- (3) During drug administration, closely monitor patient's blood pressure and respiratory status and be prepared for aggressive airway control and ventilatory assistance.

NOTE: Stop drug therapy if the patient's blood pressure begins to fall or if the respiratory rate or effort decreases.

Performance Steps

- 9. Record all treatment in the patient's medical record.
- 10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a seizure.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with seizures.	_____	_____
2. Understood the types of seizures.	_____	_____
3. Solicited a patient history.	_____	_____
4. Recognized significant subjective findings for seizures.	_____	_____
5. Performed a PE.	_____	_____
6. Recognized significant objective findings for a seizure.	_____	_____
7. Managed seizure.	_____	_____
8. Managed status epilepticus.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED	

Manage Aseptic Meningitis/Encephalitis

081-833-4288

Conditions: Given a Special Forces (SF) tactical medical equipment set, SF individual combat laboratory (lab) set, various fluids, electrolyte solutions, penicillin, and tetracycline.

Standards: Identify and manage aseptic meningitis or encephalitis in accordance with The Merck Manual.

Performance Steps

1. Define viral encephalitis and aseptic meningitis.
 - a. Encephalitis is an acute inflammatory disease of the brain caused by direct viral invasion or hypersensitivity initiated by a virus or other foreign protein.

NOTE: Encephalomyelitis is the same disorder affecting spinal cord structures and the brain.

- b. Aseptic meningitis is a febrile meningeal inflammation characterized by cerebrospinal fluid (CSF) pleocytosis, normal glucose, and an absence of bacteria on examination (exam) and culture.
2. Explain the etiology of viral encephalitis and aseptic meningitis.
 - a. Virus infection can cause encephalitis as a primary manifestations or as a secondary complication.
 - b. Primary encephalitis can be caused by epidemic viruses (arbovirus, poliovirus, echovirus, and coxsackievirus) or sporadic viruses (herpes simplex or herpes zoster).
 - c. Secondary encephalitis occurs as a complication of viral infection such as measles, chickenpox, rubella, smallpox vaccinations, vaccinia, and other viral infections.
 - d. Aseptic meningitis may be caused by viral infections and other organisms and noninfectious causes such as vaccination reactions, lead poisoning, cerebrovascular accident (CVA), tumors, abscesses, otitis, and chronic sinusitis.
3. Elicit a complete patient's history with emphasis on the following:
 - a. Previous viral illnesses.
 - b. Contact with any sick people.
 - c. Any localization of symptoms.
 - d. Recent vaccinations.
4. Perform a PE.
 - a. Aseptic meningitis typically presents with the following findings:
 - (1) Fever and headache.
 - (2) Malaise.
 - (3) Vomiting.
 - (4) Stiff neck and back.
 - b. Encephalitis typically presents with the following findings:
 - (1) Cerebral dysfunction such as confusion, alteration in consciousness, changes in personality, seizures, and paresis.
 - (2) Cranial nerve abnormalities.
 - c. Asymptomatic may present with no symptoms or fever and malaise with no meningeal manifestations.
5. Perform lab tests to diagnose or rule out possible causes.
 - a. White blood cell (WBC) count with differential.
 - (1) WBC counts are normal or slightly elevated in most cases but may reach 50,000 in severely ill, icteric patients.
 - (2) Leukocytosis of greater than 15,000 suggests liver involvement.
 - (3) Neutrophils of greater than 70 percent per finding may help to differentiate leptospirosis from viral illnesses.

Performance Steps

NOTE: As is typical of most infectious conditions, adequate diagnostic (as opposed to "characterization" tests such as blood smears, WBC count, and gram stain) tests cannot be done in the field. Your responsibility is to obtain a complete history, conduct a physical, do the characterization tests that can be done, and assess the stability of the patient.

- b. If the facilities are available, examine the CSF for normal glucose levels and inability to culture bacteria.

6. Determine a differential diagnosis on the basis of the history, exam, and lab results.

NOTE: The distinction between aseptic meningitis and encephalitis is based on the extent and severity of cerebral dysfunction, independent of signs of meningeal inflammation.

- a. If encephalitis is diagnosed, consider whether it is primary or secondary encephalitis.
- b. Aseptic meningitis is a diagnosis of exclusion. No organism can be documented by routine test.

NOTE: Aseptic meningitis is like nonspecific urethritis in that no organism can be documented by routine test. Aseptic meningitis may be the result of a partially treated bacterial meningitis, a malignancy (such as carcinomatous meningitis), or viral, chemical, and other origins.

- c. Consider other possible causes; for example, bacterial meningitis or encephalitis, other neurological causes, and infectious diseases.

7. Rule out other possible causes by additional history, exams, and lab tests.

8. Provide supportive therapy with fluids and electrolyte solution.

CAUTION: Maintain the patient to ensure that overhydration does not occur.

9. Manage the underlying infection as required.

10. Provide antibiotic therapy if unable to rule out bacterial meningitis. (See task 081-833-4292, Manage Bacterial Meningitis/Encephalitis.)

11. Record all treatment.

12. Evacuate as soon as possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage aseptic meningitis or encephalitis.

Performance Measures**GO** **NO GO**

1. Defined viral encephalitis and aseptic meningitis.	_____	_____
2. Explained the etiology of viral encephalitis and aseptic meningitis.	_____	_____
3. Elicited a complete patient's history.	_____	_____
4. Performed a PE.	_____	_____
5. Performed lab tests to diagnose or rule out possible causes.	_____	_____
a. WBC count with differential.		
b. Checked CSF for glucose level.		
c. Tried to culture bacteria from CSF.		
6. Determined a differential diagnosis.	_____	_____
7. Ruled out other possible causes by additional history, exams, and lab tests.	_____	_____
8. Provided supportive therapy with fluids and electrolyte solution.	_____	_____
9. Managed the underlying infection as required.	_____	_____
10. Provided antibiotic therapy if unable to rule out bacterial meningitis.	_____	_____

Performance Measures

GO **NO GO**

11. Recorded all treatment.

12. Evacuated as soon as possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Bacterial Meningitis and Encephalitis

081-833-4292

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, patient's medical record, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with central nervous system (CNS) infections.
 - a. Definitions:
 - (1) Meningitis: inflammation of the meninges of the brain or spinal cord.
 - (2) Cerebritis: bacterial invasion of the brain.
 - (3) Encephalitis: viral invasion of the brain.
 - b. Etiologies:
 - (1) Bacterial meningitis: Three species of bacteria account for about 80 percent of all cases-- *Neisseria meningitidis*, *Hemophilus influenza* type B, and *streptococcus pneumoniae*.
 - (2) Viral encephalitis and aseptic meningitis:
 - (a) Primary encephalitis may be epidemic, which is caused by arbovirus, poliovirus, echovirus, and coxsackievirus, or sporadic, which is caused by herpes simplex, varicella zoster, or mumps. Mosquito-borne arboviral encephalitides are discussed in task 081-833-4248, Manage Vector-Borne Diseases.
 - (b) Secondary encephalitis is usually a complication of a viral infection such as measles, chickenpox, rubella, smallpox vaccination, and others.
 - (3) Subacute and chronic meningitis may occur with fungal infections (most commonly *cryptococcus*), tuberculosis (TB), sarcoid, Lyme disease, acquired immunodeficiency syndrome (AIDS), syphilis, and neoplasms.
 - c. Pathophysiologies:
 - (1) Bacterial meningitis: Bacteria reach the meninges by hematogenous spread, by extension from nearby infected structures (such as sinuses or epidural abscesses), and by communication of the cerebrospinal fluid (CSF) with the exterior.
 - (2) Viral encephalitis and aseptic meningitis: The pathways of infection are similar to those of bacterial meningitis. Direct viral invasion of the brain is likely to be associated with neuron necrosis, and frequently with visible inclusion bodies.
 - (3) Subacute and chronic meningitis: These infections have become much more prevalent with the expansion of the AIDS epidemic and with the increased use of immunosuppressive therapy in cancer treatment.
2. Solicit a patient history.
3. Recognize significant subjective findings for CNS infection.
 - a. Bacterial meningitis:
 - (1) Patient may relate a history of a prodromal respiratory illness or sore throat.
 - (2) Headache.
 - (3) Stiff neck.
 - (4) Changes in consciousness that progress through irritability, confusion, drowsiness, stupor, and coma.
 - b. Viral encephalitis and aseptic meningitis (may take three forms):

Performance Steps

- (1) Asymptomatic: Fever and malaise may be present without meningeal signs.
 - (2) Meningitis: Headache, malaise, and stiff neck and back.
 - (3) Encephalitis: Is associated with cerebral disfunction, alteration in consciousness, and personality changes. The distinction between aseptic meningitis and encephalitis is based on the extent and severity of cerebral dysfunction.
 - c. Subacute and chronic meningitis: The manifestations are similar to those in acute meningitis, but the illness evolves more slowly and over weeks rather than days.
4. Perform a PE.
5. Recognize significant objective findings for CNS infection.
- a. Bacterial meningitis:
 - (1) Fever.
 - (2) Vomiting.
 - (3) Positive Brudzinski's sign. (Abrupt neck flexion in the supine patient results in involuntary flexion of the hips and knees.)
 - (4) Positive Kernig's sign. (Attempts to extend the knee from the flexed thigh position are met with strong resistance.)
 - (5) Unilateral or bilateral Babinski's sign may be present.
 - (6) Cranial nerve abnormalities such as oculomotor or facial nerve palsies and occasionally deafness may be seen.
 - b. Viral encephalitis and aseptic meningitis:
 - (1) Meningitis may have the same objective findings as bacterial meningitis.
 - (2) Encephalitis may be associated with seizures, paresis, and cranial nerve abnormalities.
 - c. Subacute and chronic meningitis: The manifestations are similar to those in acute meningitis, but the illness evolves more slowly, over weeks rather than days.

NOTE: Acute bacterial meningitis, especially meningococcal, can be lethal in hours. When bacterial meningitis is seriously suspected, administration of broad-spectrum antibiotics should not await the results of diagnostic tests.

6. Recognize significant lab findings that are caused by CNS infection.
- a. The patient should be referred for immediate lumbar puncture and CSF culture.
 - b. The presence of bacteria proves bacterial meningitis, however, it does not rule out a bacterial cause since partially treated bacterial meningitis may persist with negative CSF cultures.
 - c. Computed tomography (CT) scans and magnetic resonance imaging (MRI) may show changes associated with infection.
 - d. In the absence of trauma, the presence of red blood cells (RBCs) in the CSF strongly suggests herpes simplex infection.
7. Differentiate between CNS infection and other diseases with similar signs and symptoms. Consider the following diseases:
- a. Brain abscess.
 - b. Subdural empyema.
 - c. Tumor.
 - d. Saggital sinus thrombosis.
8. Manage CNS infection on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
- NOTE: With any form of bacterial meningitis, immediate referral or evacuation is recommended if possible.
- a. With streptococcus pneumonia, meningococci, and Haemophilus influenza, give cefotaxime 2.0 grams (g) intravenously (IV) every 4 to 6 hours (q4/6h) (may substitute ceftriaxone 2 g IV every 12 hours [q12h]) PLUS dexamethasone PLUS vancomycin 15 milligrams per kilogram (mg/kg) every 6 hours (q6h).
 - b. Alternative is meropenem 1 g IV every 8 hours (q8h) PLUS dexamethasone PLUS vancomycin 15 mg/kg q6h.

Performance Steps

- c. With cryptococcal meningitis, prescribe amphotericin B 0.7 milligrams per kilogram per day (mg/kg/day) for (x) 2 weeks, then fluconazole 800 mg per day by mouth (PO) x 2 days, then 400 mg/day PO x 8 weeks, and then 200 mg/day indefinitely.

NOTE: Amphotericin B is an extremely dangerous drug, which may be lethal in and of itself. Treatment with this drug requires hospitalization and management beyond the scope of the special operations medic.

9. Treat complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage bacterial meningitis or encephalitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with CNS infections.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for CNS infection.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for CNS infection.	—	—
6. Recognized significant lab findings that are caused by CNS infection.	—	—
7. Differentiated between CNS infection and other diseases with similar signs and symptoms.	—	—
8. Managed CNS infection on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
9. Treated complications symptomatically with appropriate supportive care.	—	—
10. Recorded all treatment in the patient's medical record.	—	—
11. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Subject Area 18: Psychiatric Conditions

Manage Behavioral Disorders

081-833-4429

Conditions: You are in a field environment. Given a patient's history, physical restraints, and medical antianxiety drugs.

Standards: Manage a patient assessed as having a behavioral disorder without causing further injury to the patient.

Performance Steps

1. Review the patient's history from medical records to determine any history of behavioral disorders.

2. Manage depression, as required.

- a. Observe the patient.
- b. Talk to the patient about the problem; do NOT interrogate.
- c. Talk to close contacts of the patient to gather history of the patient's problem.
- d. Sedate the patient only if absolutely necessary.
- e. Remain alert for a suicide attempt.

NOTE: Your role in dealing with personality or behavioral disorders will largely be limited to counseling.

3. Manage nonspecific psychoses by the following methods, as required.

- a. Pharmacologic--sedation if necessary.
- b. Psychologic--attempt to define the problem.
- c. Behavioral--openly discuss the problem with the patient.
- d. Social--keep soldier in a military environment.

NOTE: Talking with the patient and assessing his "grip on reality" will assist you in determining if the behavioral problem is of a transient nature that will resolve with time and talking, or if it is of a complexity and such long-standing, deep-seated duration as to require expert care.

4. Manage an aggressive patient, as required.

- a. Approach the patient in a direct, nonthreatening manner.
- b. State definite expectations of behavior to the patient.
 - (1) Tell the patient that "acting out" (aggressive behavior), verbally or physically, is unacceptable.
 - (2) Tell the patient that self-control is necessary.
- c. Determine the cause of the patient's agitation and reflect on the problem.
 - (1) Tell the patient that you want to help.
 - (2) Encourage the patient to talk about his problems, feelings, and the reason(s) for those feelings.
 - (3) Listen carefully to the patient.
 - (4) Discuss the problem with the patient.

NOTE: For those who are likely to be able to work through the problem, provide an environment of listening and emotional support. Do not use medications, do not attempt counseling, and do NOT become emotionally involved or offer your own life experiences, lest the roles reverse and you become the patient. Diversions such as work or other activities, firmness, and encouraging self-control may assist in recovery.

d. Terminate the conversation when the patient appears calm.

- (1) Ask the patient if he is OK now.
 - (a) The patient states that he is OK.
 - (b) The patient states it is not necessary to continue the conversation.
- (2) Encourage the patient to seek help before acting out in the future.

Performance Steps

NOTE: For more complex patients, arrange evacuation. Protect them from themselves and caregivers. Air evacuation of uncontrollable patients is contraindicated without physical restraints (but ensure they do not become entangled and strangle).

- 5. Manage stress and fatigue, as required.
 - a. Isolate the causes of stress and fatigue.
 - b. Remove the causes of stress and fatigue, if possible.
 - c. Attempt to manage the stress using one of the following methods.
 - (1) Medical antianxiety drugs.
 - (2) Psychology.
 - (a) Let the patient talk about his problem.
 - (b) Be supportive but allow him to work out his own problems.
 - d. Manage fatigue in the following manner:
 - (1) Maintain treatment of stress.
 - (2) Improve nutritional intake.
 - (3) Provide rest.
- 6. Record all treatment given.
- 7. Medevac or remove the patient from current surroundings, if necessary.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Reviewed the patient's medical history.	_____	_____
2. Assessed the condition.	_____	_____
3. Managed the condition.	_____	_____
4. Recorded all treatment.	_____	_____
5. Medically evacuated or removed the patient from current surroundings, if necessary.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
	FM 4-25.11
	MERCK MANUAL 17TH ED

Manage Mood Disorders

081-833-4437

Conditions: Given The Merck Manual, patient's medical record, and a selection of pharmacological agents.

Standards: Determine the probable cause of the disorder, reassure the patient, and provide pharmacological support or sedation until the patient can be referred to a psychiatrist.

Performance Steps

1. Recognize the classifications of bipolar disorders.
 - a. Bipolar I disorder:
 - (1) Full-fledged manic and major depressive episodes alternate.
 - (2) It commonly begins with depression and is characterized by at least one manic episode during its course.
 - b. Bipolar II disorder:
 - (1) Depressive episodes alternate with hypomanias (relatively mild, nonpsychotic periods of usually less than 1 week).
 - (2) During the hypomanic period, the mood brightens, the need for sleep decreases, and psychomotor activity accelerates beyond the patient's usual level.
2. Recognize the signs and symptoms of bipolar disorders.
 - a. Symptoms of the depressive phase are similar to those of unipolar depression (task 081-833-4429, Manage Behavioral Disorders) except that psychomotor retardation, hypersomnia, and in extreme cases, stupor are more characteristic.
 - b. In full-blown manic psychosis, the mood is usually elation, but irritability and frank hostility are not uncommon.
 - c. Typically, manic patients are exuberant and flamboyantly or colorfully dressed.
 - d. Manic patients have an authoritative manner with a rapid, unstoppable flow of speech. This flow of speech may appear as flights of ideas and be difficult to distinguish from the loose associations of the schizophrenic.
3. Manage bipolar disorders.
 - a. Management of bipolar disorders in the field setting will depend on the severity of the patient's depression or euphoria.
 - b. If the patient is United States military, he should be evacuated for psychiatric evaluation and treatment with mood-altering drugs such as lithium.
 - c. If the patient is host nation military or guerrilla, he should be assessed as functional or nonfunctional.
 - d. If the patient is determined to be functional, he may be allowed to remain with the unit under supervision.
 - e. If the patient is determined to be nonfunctional, he must be removed from the unit and referred for psychiatric treatment, if available or possible.

NOTE: The drug of choice for the treatment of bipolar disorder is lithium. The drug has a very narrow therapeutic range and is toxic at high blood levels. It requires close blood level monitoring, which is beyond the scope of the special operations medic.

4. Record all findings and treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage mood disorders.

Performance Measures

1. Recognized the classifications of bipolar disorders.

GO NO GO

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Recognized the signs and symptoms of bipolar disorders.	_____	_____
3. Managed bipolar disorders.	_____	_____
4. Recorded all findings and treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK MANUAL 17TH ED

Manage a Suicidal Patient 081-833-4439

Conditions: As a special operations medical sergeant in a field environment and given patient's medical record.

Standards: Recognize the risk factors and clinical features of potentially suicidal patients, and take measures to prevent successful suicide.

Performance Steps

1. Recognize the personal and social risk factors for suicide.
 - a. Male.
 - b. Age over 55.
 - c. Previous suicide attempt.
 - d. Making detailed suicide plans.
 - e. Personally significant anniversaries.
 - f. Family history of suicide or of affective disorders.
 - g. Unemployment or financial difficulties.
 - h. Recent separation, divorce, or widowhood.
2. Recognize the clinical features of the potentially suicidal patient.
 - a. Depressive illness--especially at the onset or near the end of the illness.
 - b. Marked motor agitation, restlessness, or anxiety.
 - c. Marked feelings of guilt, inadequacy, or hopelessness.
 - d. Severe hypochondriacal preoccupations.
 - e. Impulsive, hostile personality.
 - f. Alcohol or drug abuse.
 - g. A chronic, painful, or disabling physical disorder--especially in formerly healthy people.
3. Take steps to prevent suicide.
 Any suicidal act or threat must be taken seriously. Although some attempted or completed suicides are a surprise, clear warnings are usually given.
 - a. Provide support and honest reassurance about the patient's well-being, if possible.
 - b. Establish protective limits and measures to prevent the patient from injuring himself or others.
 - c. Listen to the person, even if his talk seems bizarre, inappropriate, or unrealistic. Do not feel that you must answer every statement or give advice or opinions.
 - d. Explain alternatives to suicide that the patient may not have considered.
 - e. Enlist the support of the patient's significant others to try to calm him and direct him toward more appropriate behavior.
 - f. Encourage the patient to discuss feelings, and reassure the patient that he can be helped through the crisis.
 - g. Evacuate and refer the patient for psychiatric help.
4. Record all findings and treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a suicidal patient.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the personal and social risk factors for suicide.	_____	_____
2. Recognized the clinical features of the potentially suicidal patient.	_____	_____
3. Took steps to prevent suicide.	_____	_____
4. Recorded all findings and treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

EMT-P, BRADY 3RD ED. 1997

MERCK MANUAL 17TH ED

Manage an Intoxicated or Overdosed Patient

081-833-4440

Conditions: You are in a field environment. Given an airway device, a nasogastric (NG) tube, activated charcoal, a cathartic, an intravenous (IV) set, and fluids.

Standards: Manage an intoxicated patient or a patient who has overdosed on medication without causing further injury to the patient.

Performance Steps

1. Assess life-threatening conditions in a lethargic patient--especially airway obstruction from the tongue and aspiration of vomitus.
 2. Consult family or friends for information about known drug abuse.
 3. Consult the patient's medical history, if available.
 4. Conduct a physical examination (PE) (task 081-833-4002, Perform a Complete Physical Examination).
 5. Continually assess the level of consciousness.
 6. Determine a differential diagnosis.
 7. Prevent further absorption of the substance by placing an NG tube and lavaging the stomach until clear.
 8. Administer 200 to 300 milliliters (ml) of activated charcoal slurry every 3 or 4 hours.
 9. Administer a cathartic to speed transit and minimize reabsorption of the toxin.
- NOTE: Few toxins have specific antidotes, and supportive care is the key to survival.
10. Increase urine output with IV fluids.
- WARNING: Monitor the patient carefully so that fluid overload does not occur.
11. Record all treatment given.
 12. Evacuate the patient, if necessary.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage an intoxicated or overdosed patient.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed life-threatening conditions.	—	—
2. Consulted family or friends for information about known drug abuse.	—	—
3. Consulted the patient's medical history.	—	—
4. Conducted a PE.	—	—
5. Continually assessed the level of consciousness.	—	—
6. Determined the differential diagnosis.	—	—
7. Prevented further absorption of the substance by placing an NG tube and lavaging the stomach until clear.	—	—
8. Administered 200 to 300 ml of activated charcoal slurry every 3 or 4 hours.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
9. Administered a cathartic.	_____	_____
10. Increased urine output with IV fluids.	_____	_____
11. Recorded all treatment given.	_____	_____
12. Evacuated the patient, if necessary.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
ACLS 1997-1999
EMT-P, BRADY 3RD ED. 1997
MERCK MANUAL 17TH ED

Manage Substance Withdrawal

081-833-4441

Conditions: Given thiamine, vitamin B12, intravenous (IV) solutions and administration equipment, benzodiazepines, disulfirame, methadone, and The Merck Manual.

Standards: Manage substance withdrawal so that the life of the patient is preserved and the patient is no longer physically addicted to the substance, and without causing further harm.

Performance Steps

1. Understand significant terminology that relates to substance withdrawal.
 - a. Psychologic dependence:
 - (1) Feelings of satisfaction and a desire to repeat the drug experience or to avoid the discontent of not having it. This may be the only factor associated with intense craving and apparent compulsive use.
 - (2) Drugs that cause chiefly psychologic dependence include cocaine, marijuana, amphetamine, and hallucinogens
 - b. Addiction: refers to a lifestyle characterized by compulsive use and overwhelming involvement with a drug. It may occur with or without physical dependence.
2. Understand the factors leading to drug dependence.
 - a. The drug:
 - (1) Certain drugs because of their chemical makeup and their interaction with the body are more addictive than others.
 - (2) The following drugs are considered highly physically addictive: opioids, synthetic opioids, methaqualone, barbiturates, and alcohol.
 - b. The user:
 - (1) An addictive personality has been described by behavioral scientists, but there is little medical evidence to support findings of characteristic predisposing personality traits.
 - (2) The following drugs are considered highly psychologically addictive: opioids, synthetic opioids, methaqualone, barbiturates, alcohol, alprazolam, diazepam, amphetamines, and cocaine.
 - c. The setting:
 - (1) Peer or group pressure may lead individuals with weak personalities to experiment with drugs.
 - (2) Emotionally stressful situations may lead the individual to seek escape in drugs.
3. Manage alcohol withdrawal.
 - a. Perform a complete physical examination to detect intercurrent illness that might complicate withdrawal and to rule out central nervous system (CNS) injury that might mimic or be masked by the withdrawal syndrome.
 - b. Give thiamine 100 milligrams (mg) intramuscularly (IM) followed by 50 mg by mouth (PO) daily PLUS B12 and folate both at a dose of 1mg per day PO to prevent Wernicke-Korsakoff syndrome.
 - c. Ensure the patient remains well hydrated with IV fluids, if necessary.
 - d. Patients suffering from delirium should not be restrained unless absolutely necessary. They are extremely suggestible and respond well to reassurance and a calm, nonthreatening environment.
 - e. Some patients may require CNS depressant drugs such as benzodiazepines during the delirious portion of their detoxification.
 - f. Detoxification:
 - (1) First, withdraw alcohol.
 - (2) Correct nutritional deficiencies.
 - (3) Refer the patient for group therapy, if possible. Support groups such as Alcoholics Anonymous have aided many alcoholics in remaining sober.

Performance Steps

- (4) Consider the use of disulfirame. This drug interferes with the metabolism of acetaldehyde so that it accumulates, producing toxic symptoms and great discomfort. The initial dose is 500 mg PO every day (q.d.) for 1 to 3 weeks. Maintenance is then adjusted individually.
4. Manage opioid withdrawal.
 - a. To legally use an opioid drug in treating an addict, a physician must establish the existence of physical opioid dependence.
 - b. The withdrawal syndrome is self-limited and, although severely discomforting, is not life-threatening.
 - c. Tell the patient that he will experience unpleasant symptoms, that they will not be allowed to progress to an intolerable level, and that drugs to relieve them will be given on the basis of the physical signs of withdrawal.
 - d. Methadone substitution is the preferred method of opioid withdrawal because of its long half life and less profound sedation. It is given orally in the smallest dose (usually 30 mg per day) that will prevent severe withdrawal signs.
 - e. Eventually, the patient will also have to be withdrawn from methadone to become completely drug-free.
 5. Manage complications symptomatically with appropriate supportive care.
- NOTE: For information regarding the emergency management of alcohol poisoning or overdose, see tasks 081-833-4022, Perform Emergency Measures for Poisonous Ingestion, and 081-833-4152, Manage Loss of Consciousness.
6. Record all treatment in the patient's medical record.
 7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage substance withdrawal.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood significant terminology that related to substance withdrawal.	—	—
2. Understood the factors leading to drug dependence.	—	—
3. Managed alcohol withdrawal.	—	—
4. Managed opioid withdrawal.	—	—
5. Managed complications symptomatically with appropriate supportive care.	—	—
6. Recorded all treatment in the patient's medical record.	—	—
7. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

EMT-P, BRADY 3RD ED. 1997

Manage Combat Stress Behavior

081-833-4445

Conditions: Given the patient's history and a Special Forces (SF) tactical medical equipment set.

Standards: Manage combat stress without causing further injury to the patient.

Performance Steps

1. For severe reaction to combat stress, review the patient's history.
2. Identified the signs and symptoms of combat stress.
 - a. Normal reactions to combat stress are as follows:
 - (1) Anxiety.
 - (2) Depression with low energy level, social withdrawal, and grief.
 - (3) Muscular tension, headaches, inability to relax, and cramps.
 - (4) Shaking and tremor.
 - (5) Increased perspiration.
 - (6) Startled reactions.
 - (7) Irritability.
 - (8) Nausea, vomiting, and diarrhea.
 - (9) Elevated blood pressure, increased pulse rate, and hyperventilation.
 - b. Severe reactions to combat stress are as follows:
 - (1) Disabling depression.
 - (2) Severe anxiety and uncontrollable shaking.
 - (3) Disabling fatigue.
 - (4) Panic running.
 - (5) Freezing (the inability to move in a given situation).
 - (6) Incoherent language or babbling.
 - (7) Psychological amnesia.
 - (8) Alcohol and drug abuse.
3. Remove the patient from the cause of stress, if possible.
4. Reassure the patient.
 - a. Tell the patient that it is a temporary condition.
 - b. Tell the patient it is not a weakness and that others have had similar reactions.
 - c. Provide the patient an opportunity to express feelings.
5. Maintain the patient in a military environment.
 - a. Keep the soldier in uniform.
 - b. Maintain military courtesy.
 - c. Keep the soldier together with men from the same unit.
6. Manage the combat-stressed soldier by providing the following:
 - a. A minimum of 6 to 8 hours of sleep.
 - b. Hot food and plenty of liquids.
 - c. Antianxiety drugs only if absolutely necessary.
7. Record all treatment given.
8. Medically evacuate or remove the patient from current surroundings, if absolutely necessary.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a suicidal patient.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Reviewed the patient's history.	_____	_____
2. Identified the patient's signs and symptoms as normal or severe reactions to combat stress.	_____	_____
3. Removed the patient from the cause of stress, if possible.	_____	_____
4. Reassured the patient.	_____	_____
5. Maintained the patient in a military environment.	_____	_____
6. Managed the combat-stressed soldier by providing rest, food, liquids, and antianxiety drugs as a last resort.	_____	_____
7. Recorded all treatment given.	_____	_____
8. Medically evacuated or removed the patient from current surroundings, if absolutely necessary.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK MANUAL 17TH ED

Subject Area 19: Communicable Diseases

Manage Uncomplicated Viral Hepatitis

081-833-4106

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the general characteristics of viral hepatitis A.
 - a. Etiology: Hepatitis A virus (HAV) is a ribonucleic acid (RNA) virus with the characteristics of an enterovirus.
 - b. Occurrence:
 - (1) Worldwide, sporadic, and epidemic, with a history of cyclic recurrences. Hepatitis A accounts for 40 percent of reported cases of viral hepatitis.
 - (2) Outbreaks commonly occur in institutions, day-care centers, low-cost housing projects, rural areas, and military forces (particularly during wars).
 - (3) Where environmental sanitation is poor, infection is common. Occurs at an early age. Thus, in developing countries, adults are usually immune and epidemics of HAV are rare.
 - (4) In developed countries, epidemics often evolve slowly, involve wide geographic areas, and last many months. However, epidemics from a common source may evolve explosively.
 - c. Reservoir is man, and rarely primates.
 - d. Mode of transmission:
 - (1) Fecal-oral route: The infectious agent is found in feces, reaching peak levels a week or two before the onset of symptoms appear, which is concurrent with the appearance of antibodies.
 - (2) Common vehicles: Outbreaks have been related to contaminated water and food, including milk, sliced meats, salads, and raw or undercooked mollusks.
 - (3) Blood and contaminated body fluid: Although rare, instances of transmission by transfusion of blood from a donor in the incubation period have been reported.
 - e. Incubation period:
 - (1) From 15 to 50 days, depending on exposure.
 - (2) Average 28 to 30 days.
 - f. Periods of communicability: Studies of transmission in humans and epidemiological evidence indicate maximum infectivity during the latter half of the incubation period, continuing for a few days after onset of jaundice. During the first week of jaundice, most cases are probably noninfectious.
 - g. Susceptibility and resistance: Susceptibility is general. Low incidence of this disease in infants and preschool children suggests that milk and anicteric infections are common. Homologous immunity after attack probably lasts a lifetime.
2. Recognize the signs and symptoms of HAV infection.
 - a. Onset is usually abrupt.
 - b. Fever.
 - c. Malaise.
 - d. Nausea.
 - e. Abdominal discomfort.
 - f. If cholestasis occurs, the patient will develop the following:

Performance Steps

- (1) Jaundice.
- (2) Pruritus.
- (3) Clay-colored stools.
- g. HAV varies from a mild illness lasting 1 to 2 weeks, to a severely disabling disease lasting several months, which occurs rarely.
- h. Convalescence is usually prolonged.
- i. Generally, severity increases with age but complete recovery without sequelae or recurrences is the rule.
- j. Many infections are asymptomatic, many are mild and without jaundice--especially in children--and are recognized only by liver function tests.
- k. The case fatality rate is less than 0.1 percent.

3. Perform a PE.

4. Recognize significant lab findings that are caused by HAV.

- a. Diagnosis usually established by the demonstration of immunoglobulin M (IgM) antibodies against HAV in the serum of acutely or recently ill patients.
- b. IgM may remain detectable for 6 weeks to 4 to 6 months after onset.
- c. In research facilities, diagnosis also may be made by four-fold or greater rise in specific antibodies in paired sera.

NOTE: Assay kits for the detection of IgM and total antibodies to the virus are available commercially.

5. Employ preventive measures to stop the spread of HAV.

- a. Educate the public about sanitation and personal hygiene, with special emphasis on sanitary disposal of feces and careful hand washing.
- b. To manage day-care centers and schools, stress measures to minimize the possibility of fecal-oral transmission, including thorough hand washing after each diaper change and before eating. If one or more HAV cases are associated with a center, immunoglobulin (IG) should be administered to the children who are age 2 or younger.
- c. Give travelers to highly endemic areas hepatitis vaccine for active immunity. It is currently available for adults and children. They are two separate vaccines; you cannot use the child dose with the adult vaccine. The dosage is 1cubic centimeter (cc) intramuscularly (IM) with a recommended repeat dosage in 6 to 12 months. Titer studies indicate that the vaccine may be good for lifetime immunity.
- d. Properly sterilize needles, syringes, and other equipment used for parenteral injections, or use disposable units. The virus is rarely transmitted by this route; however, sterilization is good practice.
- e. Manage patients, contacts, and the immediate environment:
 - (1) Report to local health authority.
 - (a) Obligatory in the United States and Canada.
 - (b) Not required in many countries.
 - (2) Isolation: For proven HAV, take enteric precautions during the first 2 weeks of illness but no more than 1 week past the onset of jaundice. Until a specific diagnosis of HAV is made, adhere to blood and body fluid precautions.
 - (3) Concurrent disinfection: sanitary disposal of feces, blood, and body fluids.
 - (4) Immunization of contacts:
 - (a) Give passive immunization with IG 0.02 to .04 milliliters per kilogram (ml/kg) of body weight. Give immunization deep IM as soon as possible after exposure but within 2 weeks to all household and sexual contacts.
 - (b) In a day-care center, give IG to all classroom contacts. If the center admits children in diapers, give IG to all children and staff in the center.

NOTE: In the event of an outbreak, it may be prudent to give IG to contacts who have not previously been vaccinated for HAV.

6. Take steps to limit the impact of an epidemic.

Performance Steps

- a. Determine the mode of transmission, whether from person to person or by common vehicle. Identify the population exposed to increased risk of infection.
- b. Eliminate any common source of infection.
- c. If hepatitis occurs in a food handler, IG should be given to other food handlers in the establishment.

NOTE: IG is not usually offered to patrons, but may be considered if the food handlers were involved in the preparation of foods that were not heated, deficiencies in personal hygiene were noted, and the IG can be given within 2 weeks after exposure.

- d. Make special efforts to improve sanitary conditions and hygiene practices to eliminate fecal contamination of food and water.
- e. If focal outbreaks in institutions occur consider use of prophylaxis with IG.

7. Manage HAV with general supportive measures.

- a. Restrict patient's activity to avoid fatigue. Bedrest in more severe cases may prevent complications.
- b. Ensure patient has an adequate caloric intake. A high-calorie, low-fat diet is recommended.
- c. Increase patient's fluid intake.
- d. Reduce patient drug therapy to a minimum. Avoid prescribing drugs toxic to the liver.

NOTE: The following steps relate to hepatitis B virus (HBV).

8. Understand the general characteristics of HBV.

- a. Etiology: The HBV is a double-stranded deoxyribonucleic acid (DNA) virus containing three antigens.
 - (1) Hepatitis B core antigen (HBcAg).
 - (2) Hepatitis B surface antigen (HBsAg).
 - (3) Hepatitis B e antigen (HBeAg).
- b. Occurrence:
 - (1) Worldwide, the human reservoir is estimated to be greater than 300 million; endemic with little seasonal variation. Accounts for 35 percent of reported cases of viral hepatitis.
 - (2) In areas of Africa and Asia, widespread infection may occur in infants and children. Up to 90 percent of these children become chronic carriers and up to 50 percent develop chronic hepatitis.
 - (3) In North America, infection is most common in young adults. Estimated at 1million cases with 300,000 new cases annually.
 - (4) Overall, 5 percent of the adult United States population has the hepatitis B antigen. In some areas of Asia, antigen carrier rates may be 10 to 15 percent.
 - (5) In developed countries, HBV infection is common in certain high-risk groups, to include the following:
 - (a) Intravenous (IV) drug abusers.
 - (b) Homosexual men.
 - (c) Clients and staff in institutions for mentally handicapped.
 - (d) Patients and staff in hemodialysis centers.
 - (e) Health care staff who have frequent exposure to blood or body fluids.

NOTE: In the past, recipients of blood products were at high risk. In countries where screening of blood for HBsAG is required, risk of transmitting HBV has been virtually eliminated except for recipients of pooled blood-clotting factors (especially antihemophilic factor).

- (f) Occasionally, clients of tattoo parlors and acupuncturists.

c. Mode of transmission:

- (1) HBsAg has been found in virtually all body fluids. However, only blood, saliva, semen, and vaginal fluids have been shown to be infectious. The presence of antigen greatly enhances the infectivity of these fluids.
- (2) Transmission occurs by percutaneous or permucosal exposure to infective body fluids.
 - (a) Blood and blood products may transmit HBV if they are not screened for HBsAg.
 - (b) IG, heat-treated plasma protein fraction, albumin, and fibrinolysin are generally considered safe.

Performance Steps

- (c) Contaminated needles and syringes are important vehicles of spread--especially among IV drug abusers.
 - (d) The infection may be spread through contamination of wounds or lacerations or by exposure of mucous membranes to infected blood.
 - (e) Perinatal, transmission is common in hyperendemic areas of southeast Asia and the Far East--especially when HBsAg carrier mothers are also HBsAg positive.
 - (f) Infection may be spread through close personal contact--especially between sex partners and more frequently, between male homosexuals.
 - (g) Accidental percutaneous inoculations by communally used razors and toothbrushes have been implicated as occasional transmitters of HBV.
 - (h) Fecal-oral transmission has not been demonstrated.
 - d. Incubation period: This period usually lasts 45 to 180 days. On average, incubation is 60 to 90 days. However, greater variations can occur as a result of the amount of virus in the inoculum, the mode of transmission, and cost factors.
 - e. Period of communicability:
 - (1) Blood from experimentally inoculated volunteers has been shown to be infective many weeks before the onset of symptoms and remains infective through the acute clinical course of the disease and during the chronic carrier state, which may persist for many years.
 - (2) Most, if not all carriers, have demonstrated HBsAg and hepatitis B core antibodies (HBcAb).
 - (3) Chronic antigenemia may follow asymptomatic infections and is common in individuals infected in infancy and in those with immunodeficiency, such as patients with Down's syndrome or lympho-proliferative disease and patients on hemodialysis.
 - (4) The infectivity of chronically infected individuals varies from highly infectious (HBeAg positive) to sparingly infectious (hepatitis Be antibodies[HBeAb]). The former may progress to the latter but rarely does the reverse occur.
 - f. Susceptibility and resistance: Susceptibility is general. Usually the disease is milder in children; in infants, it is predominately asymptomatic. Immunity follows infection if the antibody to HBsAg (hepatitis B surface antibody [HBsAb]) develops and HBsAg is negative.
9. Recognize the signs and symptoms of HBV.
- a. Onset is usually insidious.
 - b. Anorexia.
 - c. Vague abdominal discomfort.
 - d. Nausea and vomiting.
 - e. Arthralgias.
 - f. Occasional rash.
 - g. If cholestasis occurs, the patient will develop the following:
 - (1) Jaundice.
 - (2) Pruritus.
 - (3) Clay-colored stools.
 - h. Fever may be absent or mild.
 - i. Severity ranges from detectable only through liver function tests to fulminating fatal cases of acute hepatic necrosis.
 - j. HBV carriers may or may not have a history of clinical hepatitis. Biopsy findings range from normal to chronic active hepatitis with or without cirrhosis. The prognosis of the liver disease in such individuals is variable.
 - k. HBV is the cause of 80 percent of all cases of hepatocellular carcinoma worldwide, second only to tobacco among carcinogens.
 - l. Perinatal infection has a high likelihood of chronic antigenemia culminating in chronic hepatitis, cirrhosis, or primary hepatocellular carcinoma.
10. Recognize significant lab findings that are caused by HBV. The following are serology tests used with liver function tests (alanine aminotransferase [ALT] and aspartate aminotransferase [AST]):

Performance Steps

- a. HBsAg (antigen test): active disease or carrier state (infectivity).
- b. HBsAb (antibody test): immune from disease or immunization.
- c. HBcAb (antibody test): evidence of infection, past or present.
- d. IgM HBcAb (antibody test): acute infection, active disease.
- e. HBeAg (antigen test): acute disease and sign of increased infectivity in carrier.
- f. HBeAb (antibody test): indicates resolving infection.

11. Take measures to control the spread of HBV.

- a. Administer vaccine.
 - (1) The vaccine available in the United States should be given in three (at time of diagnosis, 1 month, and 6 months) intramuscular (IM) doses.
 - (2) Vaccines licensed in different parts of the world may have varying dosages and schedules.

NOTE: Studies have shown that hepatitis B vaccines are safe and highly effective against all subtypes of HBV. In hyperendemic areas of the world, only widescale immunization of infants and children can be expected to produce significant disease control. Strategies for control differ from those in areas of low endemicity. Currently, the high cost of hepatitis B vaccine precludes its widespread use, but many countries are exploring the feasibility of local production of vaccine at a lower cost. Newer technologies may significantly reduce the future cost of vaccines.

- b. Enforce strict discipline in blood banks. All donated blood should be tested for HBsAg with sensitive tests. Reject all donors who have a history of viral hepatitis, show evidence of drug abuse, or have received a blood transfusion or tattoo within the preceding six months. Use paid donors only in emergencies.
 - (1) Limit administration of unscreened blood or blood products to those patients in clear and immediate need of such therapeutic measures.
 - (2) Maintain a register of all persons who donated blood for each case. Notify blood banks of potential carriers. Maintain surveillance for post-transfusion hepatitis.
- c. Adequately sterilize all reusable needles and syringes. Use disposable supplies whenever possible. Ensure only sterile equipment is used for parenteral procedures. Discourage tattoos.
- d. Instruct persons with antigen they should exert great care to avoid opportunities for transmission--especially medical and dental personnel who perform invasive procedures, sexually active persons, and children in day-care centers.
- e. Manage patients, patient contacts, and the immediate environment:
 - (1) Report cases to the local health authority (not required in all countries).
 - (2) Isolate patient, and implement blood and body fluid precautions.
 - (3) Disinfect equipment contaminated with body fluids.
 - (4) Immunize contacts. Hepatitis B immunoglobulin (HBIG) has high titers of anti-HB and is preferable when specific immuno-prophylaxis is indicated. After exposure, a single dose of HBIG should be given within 24 hours, and the HBV vaccine series should be started.

NOTE: HBIG is not given for needle-stick exposure to blood that is not suspected to be positive for HBsAg, since the risk of infection in these instances is small. If HBIG is unavailable, IG may be given.

- f. Screen all pregnant women belonging to high-risk groups for hepatitis B. If positive for HBsAg, their infants also should be managed.

NOTE: Studies of various regimens to prevent or modify mother-to-infant transmission of HBV show that three doses of HBIG or hepatitis B vaccine are 75 percent effective and the two combined are 90 percent effective.

- g. For heterosexual exposure, HBIG is recommended. Among homosexuals, the vaccine series should be started at the time HBIG is given.
- h. Implement epidemic measures when two or more cases occur in association with some common exposure. Conduct a search for additional cases. If blood products are involved, withdraw all lots and trace all recipients.
- i. In disasters, be aware the relaxation of sterilization procedures and emergency use of unscreened blood for transfusion may result in an increased number of cases of hepatitis B.

12. Manage HBV.

Performance Steps

- a. Restrict patient activity to avoid fatigue. Bedrest in more severe cases may prevent complications.
- b. Ensure patient has an adequate caloric intake. A high-calorie, low-fat diet is recommended.
- c. Increase patient's fluid intake.
- d. Reduce patient's drug therapy to a minimum. Avoid prescribing drugs toxic to the liver.

NOTE: Steps 12 through 15, pertain to hepatitis C.

13. Understand the general characteristics of viral hepatitis C.
 - a. Etiology: Hepatitis C is an ribonucleic acid (RNA) virus responsible for 80 to 90 percent of transfusion-related hepatitis.
 - b. Occurrence: Occurs worldwide. Recipients of blood transfusions and IV drug abusers are at highest risk. Accounts for 20 percent of reported viral hepatitis.
 - c. Reservoir: Reservoir is man.
 - d. Mode of transmission: Percutaneous transmission via contaminated blood and blood products or contaminated needles and syringes. No evidence of fecal-oral transmission.
 - e. Incubation period: Ranges from 2 weeks to 6 months; however, it usually lasts 6 to 9 weeks.
 - f. Period of communicability: This period is 1 or more weeks before onset of symptoms through the acute clinical course of the disease and indefinitely in the chronic carrier state.
 - g. Susceptibility: Susceptibility is general.
14. Recognize the signs and symptoms of a hepatitis C virus (HCV) infection.
 - a. Symptoms are similar to those of HBV.
 - b. Progresses to jaundice less frequently than HBV.
 - c. Severity ranges from inapparent to fulminating, fatal cases, which rarely occur.
15. Take steps to control the spread of HCV.
 - a. Control measures against HBV apply.
 - b. The value of IG is not clear.
 - c. Currently, there is no vaccine.
16. Manage HCV symptomatically, following the same recommendations as for HBV.
17. Recognize significant facts concerning other types of viral hepatitis.
 - a. Hepatitis D virus (HDV):
 - (1) HDV is a single-strand DNA virus. It is defective and requires confection with HBV for synthesis.
 - (2) Occurrence is worldwide.
 - (3) Mode of transmission is the same as HBV.
 - (4) HDV may be severe and is always associated with HBV.
 - (5) HDV may be self-limiting, or it may progress to chronic hepatitis.
 - (6) In several studies in Europe and the United States, 25 to 29 percent of fulminant hepatitis thought to be caused by hepatitis B was associated with a concurrent infection with HDV.
 - b. Hepatitis E virus (HEV):
 - (1) HEV is caused by an RNA virus that is endemic to Asia. Only a few cases have been reported in the United States.
 - (2) HEV resembles other forms of hepatitis and is spread by the fecal-oral route.
 - (3) Affected children and pregnant women have a high mortality rate.
 - (4) Chronic disease does not occur.
 - (5) Currently, there is not a commercially available diagnostic marker for the detection of HEV.
18. Record all treatment in the patient's medical record.
19. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage uncomplicated viral hepatitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of HAV.	—	—
2. Recognized the signs and symptoms of HAV infection.	—	—
3. Performed a PE.	—	—
4. Recognized significant lab findings that are caused by HAV.	—	—
5. Employed preventive measures to stop the spread of HAV.	—	—
6. Took steps to limit the impact of an epidemic.	—	—
7. Managed HAV with general supportive measures.	—	—
8. Understood the general characteristics of HBV.	—	—
9. Recognized the signs and symptoms of HBV.	—	—
10. Recognized significant lab findings that are caused by HBV.	—	—
11. Took measures to control the spread of HBV.	—	—
12. Managed HBV.	—	—
13. Understood the general characteristics of HCV.	—	—
14. Recognized the signs and symptoms of HCV infection.	—	—
15. Took steps to control the spread of HCV.	—	—
16. Managed HCV symptomatically, following the same recommendations as for HBV.	—	—
17. Recognized significant facts concerning other types of viral hepatitis.	—	—
18. Recorded all treatment in the patient's medical record.	—	—
19. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Cryptosporidiosis

081-833-4265

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, Special Forces (SF) laboratory (lab) set, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify cryptosporidiosis on the basis of the patient's history.
 - a. The cryptosporidium genus of protozoa are endemic worldwide.
 - b. The organism may be transmitted from zoonotic spread, person-to-person contact, or water-borne transmission.
 2. Perform a PE.
 3. Identify cryptosporidiosis on the basis of the patient's signs and symptoms.
 - a. Explosive onset of profuse, watery diarrhea and abdominal cramping. Symptoms usually persist for 5 to 11 days and rapidly abate.
 - b. In the immunocompromised host and malnourished children, the onset is more gradual and the diarrhea more severe. Daily fluid losses of 15 to 20 liters (L) are possible.
 4. Identify cryptosporidiosis by using formalin-ethyl acetate sedimentation to recover the acid-fast oocysts for the stool. The presence of acid-fast oocysts confirms the diagnosis.
 5. Identify cryptosporidiosis by using other lab tests, if available.
- NOTE: Fluorescein-labeled monoclonal antibody test kits provide excellent detection of oocysts.
6. Differentiate between cryptosporidiosis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Viral gastroenteritis.
 - b. Giardiasis.
 - c. Cholera.
 7. Manage cryptosporidiosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - a. In patients with normal immune systems, the disease is usually self-limiting.
 - b. In immunocompromised patients, give paromomycin 500 to 750 milligrams (mg) three times a day (t.i.d.) or four times a day (q.i.d.). Alternatively, give azithromycin 1,200 mg by mouth (PO) b.i.d. for (x) 1 day, then 1,200 mg per day x 27 days, and then 600 mg per day for suppression.
 - c. Treat diarrhea with Immodium, diphenoxylate, or tincture of opium.
 8. Treat complications symptomatically with appropriate supportive care.
 9. Record all treatment in the patient's medical record.
 10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage cryptosporidiosis.

Performance Measures

1. Identified cryptosporidiosis on the basis of the patient's history.

GO **NO GO**

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Perform a PE.	—	—
3. Identified cryptosporidiosis on the basis of the patient's signs and symptoms.	—	—
4. Identified cryptosporidiosis by using the SF lab set.	—	—
5. Identified cryptosporidiosis by using other lab tests, if available.	—	—
6. Differentiated between cryptosporidiosis and other diseases with similar signs and symptoms.	—	—
7. Managed cryptosporidiosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
8. Treated complications symptomatically with appropriate supportive care.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Toxoplasmosis

081-833-4267

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, Special Forces (SF) laboratory (lab) set and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify toxoplasmosis on the basis of the patient's history.
 - a. *Toxoplasma gondii*, the causative agent of toxoplasmosis, is prevalent worldwide. Studies show that the microorganism affects 7 to 80 percent of populations in endemic areas.
 - b. The disease is usually asymptomatic in all but the very young and immunocompromised.
 - c. Disease can originate with patient's exposure to cat feces and uncooked or poorly cooked meats.
2. Perform a PE.
3. Identify toxoplasmosis on the basis of the patient's signs and symptoms.
 - a. If the disease is transmitted transplacentally, the fetus may abort or be stillborn or be born with systemic toxoplasmosis, which may be severe or asymptomatic.
 - b. Acquired toxoplasmosis may present in one of four ways:
 - (1) The mild lymphatic form may resemble infectious mononucleosis. It is characterized by cervical and axillary lymphadenopathy, malaise, myalgia, and irregular low fever, which can last for weeks or months but is usually self-limiting.
 - (2) Chronic toxoplasmosis causes retinochoroiditis (posterior uveitis). Other symptoms are vague and indefinite, making diagnosis difficult.
 - (3) An acute fulminating disseminated infection, often with rash, high fever, chills, and prostration, occurs primarily in immunocompromised patients. Some patients may develop meningoencephalitis, hepatitis, pneumonitis, or myocarditis.
 - (4) In patients with acquired immunodeficiency syndrome (AIDS), the disease most often manifests as encephalitis. Manifestations may be focal (such as hemiparesis, sensory loss, or tremor) or generalized (such as headache, confusion, or coma).
4. Identify toxoplasmosis by using the SF lab set.
 - a. Patients with the mild lymphatic form may develop anemia.
 - b. A complete blood count (CBC) with differential will show leukopenia and lymphocytosis.
5. Identify toxoplasmosis by using other lab tests, if available.
 - a. Immunoglobulin M (IgM) antibodies detected by the indirect fluorescent antibody procedure appear in the first 2 weeks of illness, peak within 4 to 8 weeks, and revert to normal within several months.
 - b. Immunoglobulin G (IgG) antibodies, also detectable with indirect fluorescent antibody are more stable and persist in the blood for months to years.
 - c. With central nervous system disease, computed tomography scans or magnetic resonance imaging will show multiple dense, rounded lesions that form "ring-enhancing" lesions when contrast is used.
6. Differentiate between toxoplasmosis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. With chronic disease, consider retinal tear.
 - b. With acute disease, consider mononucleosis, typhus, and malaria.

Performance Steps

7. Manage toxoplasmosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. With active chorioretinitis, give pyrimethamine 50 to 100 milligrams (mg) by mouth (PO) b.i.d. on day 1 and then 25 mg every day (q.d.) PLUS sulfadiazine 1 to 1.5 grams (g) PO q.i.d. PLUS leucovorin 10 mg per day all for 2 weeks after resolution of signs and symptoms. Give leucovorin for 1 week after stopping pyrimethamine.
 - b. During pregnancy, give spiramycin 1 g PO every 8 hours (q8h). (Spiramycin is only available from the United States Food and Drug Administration.)
 - c. For cerebral toxoplasmosis, give pyrimethamine 200 mg PO for (x) 1 then 75 to 100 mg per day PO PLUS sulfadiazine 1 to 1.5 g PO every 6 hours (q6h) PLUS leucovorin 10 to 15 mg per day PO all for 3 to 6 weeks. Then prescribe suppressive therapy of sulfadiazine 500 to 1,000 mg PO q.i.d. plus pyrimethamine 25 to 50 mg PO q.d. plus leucovorin 10 to 25 mg PO q.d.
8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.
11. Report case immediately to the local preventive medicine officer.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage toxoplasmosis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified toxoplasmosis on the basis of the patient's history.	_____	_____
2. Performed a PE.	_____	_____
3. Identified toxoplasmosis on the basis of the patient's signs and symptoms.	_____	_____
4. Identified toxoplasmosis by using the SF lab set.	_____	_____
5. Identified toxoplasmosis by using other lab tests, if available.	_____	_____
6. Differentiated between toxoplasmosis and other diseases with similar signs and symptoms.	_____	_____
7. Managed toxoplasmosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
8. Treated complications symptomatically with appropriate supportive care.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____
11. Reported case immediately to the local preventive medicine officer.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Anthrax
081-833-4269

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, Special Forces (SF) laboratory (lab) set, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify anthrax on the basis of the patient's history.
 - a. Most patients in developed countries work in an area that causes them to come into contact with animal products from infected sheep, goats, cattle, or horses.
 - b. Patients from developing countries may contract the disease through consumption of infected meat or dairy products.
2. Perform a PE.
3. Identify anthrax on the basis of the patient's signs and symptoms.
 - a. The cutaneous form will display the following signs and symptoms.
 - (1) The lesion begins as a red-brown papule that enlarges, with considerable peripheral erythema, vesiculation, and induration.
 - (2) This is followed by central ulceration with serosanguineous exudation and formation of a black eschar.
 - (3) The patient may have local lymphadenopathy and occasionally malaise, myalgia, headache, fever, nausea, and vomiting.
 - b. The pulmonary form will display the following signs and symptoms:
 - (1) Initial symptoms are insidious and resemble influenza.
 - (2) After a few days, severe respiratory distress develops, followed by cyanosis, shock, and coma.
 - (3) Hemorrhagic meningoencephalitis may develop.
 - c. The gastrointestinal form will lead to hemorrhagic necrosis of the intestinal wall, extending to the draining mesenteric lymph nodes. Septicemia with lethal toxicity ensues.
4. Identify anthrax by using the SF lab set.
 - a. The organism may be demonstrated in gram-stained smears from cutaneous lesions or from throat swabs and sputum of pulmonary patients. *Bacillus anthracis* is a large, gram-positive, facultatively anaerobic, encapsulated rod.
 - b. White blood cell (WBC) count will be elevated with a left shift.
5. Identify anthrax by using other lab tests, if available.
 - a. The organism may be cultured from smears taken from cutaneous lesions or from throat swabs and sputum in pulmonary patients.
 - b. In pulmonary patients, lung X ray may show diffuse patchy infiltration. The mediastinum will appear widened because of the enlarged hemorrhagic lymph nodes.
6. Differentiate between anthrax and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Influenza.
 - b. Aortic aneurysm.
 - c. Spider bite (in the cutaneous form).

Performance Steps

7. Manage anthrax on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Ciprofloxacin 500 milligrams (mg) by mouth (PO) twice daily (b.i.d.) or 400 mg intravenously (IV) b.i.d. for (x) 10 to 14 days or doxycycline 100 mg PO b.i.d. x 10 to 14 days.
 - b. Alternates are erythromycin 250 mg PO qid x 14 days or chloramphenicol 500 mg PO four times a day (q.i.d.) X 10 to 14 days.
8. Ensure soldiers are vaccinated as soon as the vaccine becomes available.
9. Treat complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage anthrax.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified anthrax on the basis of the patient's history.	_____	_____
2. Performed a PE.	_____	_____
3. Identified anthrax on the basis of the patient's signs and symptoms.	_____	_____
4. Identified anthrax by using the SF lab set.	_____	_____
5. Identified anthrax by using other lab tests, if available.	_____	_____
6. Differentiated between anthrax and other diseases with similar signs and symptoms.	_____	_____
7. Managed anthrax on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
8. Ensured soldiers are vaccinated as soon as the vaccine becomes available.	_____	_____
9. Treated complications symptomatically with appropriate supportive care.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Lassa Fever**081-833-4271**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, Special Forces (SF) laboratory (lab) set, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify Lassa fever on the basis of the patient's history.
 - a. Patients will have a history of travel to Africa. (Currently, there have been outbreaks in Nigeria, Liberia, and Sierra Leone, but cases have been imported into the United States and United Kingdom.)
 - b. The disease is most probably spread to man from food contaminated with rat urine or through contact contaminated urine, feces, saliva, vomitus, or blood from infected rats or humans.
2. Perform a PE.
3. Identify Lassa fever on the basis of the patient's signs and symptoms.
 - a. Gradual onset of sore throat, fever, chills, headache, myalgia, and malaise followed by anorexia.
 - b. Vomiting.
 - c. Pains in the chest and epigastrium.
 - d. Patches of white or yellow exudate may appear on the tonsils and may coalesce into a pseudomembrane.
 - e. Relative bradycardia.
 - f. During the second week, severe lower abdominal pain and intractable vomiting are common.
 - g. Occasionally, patients will have tinnitus, epistaxis, bleeding from the gums and venipuncture sites, maculopapular rash, cough, and dizziness.
 - h. In the acute stage, systolic blood pressures (BPs) of less than 90 and pulse pressures of less than 20 millimeters (mm) mercury (Hg) occur in 60 to 80 percent of patients.
 - i. In the second week, patients who will recover will defervesce.
 - j. In the second week, fatally ill patients will develop shock, clouded mental status, agitation, rales, and pleural effusion.
4. Identify Lassa fever by using the Special Forces lab set.
 - a. The white blood cell (WBC) count may drop to less than 4,000 with relative neutrophilia.
 - b. Urinalysis will reveal proteinuria that is often massive.
5. Identify Lassa fever by using other lab tests, if available.
 - a. Definitive diagnosis is made by showing a four-fold rise in antibody titer with and indirect fluorescent antibody technique or by demonstrating Lassa immunoglobulin M (IgM) antibodies.
 - b. Chest X ray may show basilar pneumonitis and pleural effusion.
 - c. Aspartate aminotransferase (AST), alanine aminotransferase (ALT), creatine kinase (CK), and lactic dehydrogenase (LDH) levels will all be elevated (sometimes 10 times normal).
6. Differentiate between Lassa fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Dengue and other fevers with a hemorrhagic syndrome.
 - b. Appendicitis.
 - c. Influenza.
 - d. Malaria.

Performance Steps

7. Provide the patient maximum isolation with universal precautions.
8. Manage Lassa fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Ribavirin 2 grams (g) intravenous (IV) loading dose, then 1g IV every 6 hours (q6h) for (x) 4 days, and then 0.5 g IV every 8 hours (q8h) X 6 days.
 - b. Symptomatic management with emphasis being placed on correction of electrolyte and fluid balances is also imperative.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage Lassa fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified Lassa fever on the basis of the patient's history.	_____	_____
2. Performed a PE.	_____	_____
3. Identified Lassa fever on the basis of the patient's signs and symptoms.	_____	_____
4. Identified Lassa fever by using the SF lab set.	_____	_____
5. Identified Lassa fever by using other lab tests, if available.	_____	_____
6. Differentiated between Lassa fever and other diseases with similar signs and symptoms.	_____	_____
7. Observed maximum isolation with universal precautions.	_____	_____
8. Managed Lassa fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Scarlet Fever

081-833-4273

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, Special Forces (SF) laboratory (lab) set and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify scarlet fever on the basis of the patient's history.
 - a. This disease usually affects infants and children.
 - b. The patient will usually have a history of an untreated pharyngeal infection that progressively worsened.
2. Perform a PE.
3. Identify scarlet fever on the basis of the patient's signs and symptoms.
 - a. Initially the patient will present as streptococcus (strep) pharyngitis with sore throat, fever, beefy red pharynx, and tonsillar exudate. They will only develop scarlet fever if left untreated.
 - b. Patients who develop scarlet fever will develop a diffuse pink-red cutaneous flush that blanches on pressure--especially on the abdomen and lateral chest and the cutaneous folds.
 - c. They may also have the following:
 - (1) Circumoral pallor surrounded by a flushed face.
 - (2) Strawberry tongue.
 - (3) Pastia's lines, which are dark red lines in the creases of skin folds.
4. Identify scarlet fever by using the SF lab set. The white blood cell (WBC) count is indicative of a bacterial infection with a count of about 12 to 20,000 with 75 to 90 percent neutrophils with a left shift.
5. Identify scarlet fever by using other lab tests, if available.
 - a. Erythrocyte sedimentation rate (ESR) will be elevated (usually greater than 50 millimeters per hour (mm/h) in the Westergren or uncorrected Wintrobe test.
 - b. The organism can be cultured overnight in sheep's blood agar plate.
 - c. With group A strep, immediate staining with fluorescent antibodies will show the organism.
 - d. Proof of infection is gained by demonstrating streptococcal antibodies in the serum. (The antistreptolysin O titer rises in only 75 to 80 percent of infections.)
 - e. Streptozyme or other rapid strep tests may be useful in bolstering a diagnosis of presumptive strep.
6. Differentiate between scarlet fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Typhus.
 - b. Yellow fever.
 - c. Dengue or other fevers with hemorrhagic syndromes.
7. Manage scarlet fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Benzathine penicillin G 1.2 million units (mu) intramuscularly (IM) for (x) 1 dose or penicillin V 500 milligrams (mg) by mouth (PO) twice daily (b.i.d.) x 10 days.
 - b. When patient is allergic to penicillin, use erythromycin 500 mg four times a day (q.i.d.) x 10 days.
8. Treat complications symptomatically with appropriate supportive care.

Performance Steps

9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage scarlet fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified scarlet fever on the basis of the patient's history.	_____	_____
2. Performed a PE.	_____	_____
3. Identified scarlet fever on the basis of the patient's signs and symptoms.	_____	_____
4. Identified scarlet fever by using the SF lab set.	_____	_____
5. Identified scarlet fever by using other lab tests when available.	_____	_____
6. Differentiated between scarlet fever and other diseases with similar signs and symptoms.	_____	_____
7. Managed scarlet fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
8. Treated complications symptomatically with appropriate supportive care.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Assess Viral Infectious Diseases

081-833-4280

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, and determine the cause of the disease in accordance with The Merck Manual.

Performance Steps

1. Know the physical properties of viruses.
 - a. Viruses are the smallest of parasites. They are intracellular molecular particles.
 - b. Viruses have a central core of nucleic acid and an outer cover of protein and sometimes lipid.
 - c. Viruses are wholly dependent on cells (bacterial, plant, or animal) for reproduction.
 - d. Most viruses are invisible in the light microscope because of their small size.
 - e. Several hundred different viruses infect man.
 - f. Most viruses that infect man are spread by man.
2. Recognize the clinical presentation of important viral diseases.
 - a. Viral diseases that can be recognized by exanthems include the following:
 - (1) Rubeola (measles): A maculopapular, brownish-pink, and irregularly confluent rash that starts around the ears and on the face and neck and spreads over the trunk and limbs.
 - (2) Rubella (German measles): A fine pinkish macule that becomes confluent and often pinpoint on the second day. It also starts on the face and neck and spreads to the trunk and limbs.
 - (3) Roseola infantum: A diffuse macular or maculopapular rash that starts on the chest and abdomen and may involve the face and extremities.
 - (4) Chicken pox (varicella): Discrete lesions that progress from macule to papule to vesicle to crusting. They appear in crops so various stages of development of the rash are present at the same time. They usually start on the trunk and move to the face, neck, and extremities.
 - (5) Scarlet fever (scarlatina): A diffuse, pinkish-red flush of the skin that blanches on pressure. The rash usually progresses from face to neck, to chest, to abdomen, and to extremities. The entire body surface may be involved.

NOTE: All of the above viral diseases must be differentiated from rickettsial or other infections that cause rashes.

- b. Viral diseases that begin with flu-like symptoms (fever, headache, myalgias, and upper respiratory involvement) are as follows:
 - (1) Influenza.
 - (2) Parainfluenza.
 - (3) Mumps virus (parotitis).
 - (4) Adenovirus infection.
 - (5) Respiratory syncytial virus.
 - (6) Epstein-Barr virus (infectious mononucleosis).
 - (7) Rhinovirus infection.
 - (8) Flaviviruses (yellow fever, dengue, and Omsk hemorrhagic fever).
 - (9) Phleboviruses (Chagres fever, Rift Valley fever, and Crimean-congo hemorrhagic fever).
 - (10) Arenaviruses (Lassa fever, Bolivian hemorrhagic fever, and Argentinean hemorrhagic fever).
 - (11) Filoviruses (Marburg hemorrhagic fever and Ebola hemorrhagic fever).
 - c. Viral diseases that are commonly associated with meningitis or encephalitis are as follows:
 - (1) Coxsackievirus infection (aseptic meningitis and other diseases).
 - (2) Echovirus infection (aseptic meningitis, meningoencephalitis, and other diseases).
 - (3) Poliovirus infection (poliomyelitis and aseptic meningitis).
 - (4) Alphaviruses (western, eastern, and Venezuelan equine encephalitis).

Performance Steps

- (5) Flaviviruses (Japanese, Murray Valley, and St. Louis encephalitis).
- d. Viruses that are commonly associated with gastroenteritis are as follows:
 - (1) Rotaviruses.
 - (2) Norwalk viruses.
 - (3) Astroviruses.
 - (4) Adenoviruses types 40 and 41.
 - (5) Calciviruses.
- e. Other diseases that are caused by viruses are as follows:
 - (1) Rabies (task 081-833-4247, Manage Rabies).
 - (2) Hepatitis (task 081-833-4106, Manage Uncomplicated Viral Hepatitis).
 - (3) Human papillomavirus (warts of various types).
- 3. Differentiate between viral diseases and other diseases with similar signs and symptoms.
 - a. Viral diseases will not cause an elevated white blood cell count. However, most bacterial infections will.
 - b. Viral diseases will not cause eosinophilia. However, many parasitic infections will.
 - c. Viruses cannot be cultured in normal culture media. However, most bacteria can. Viruses must be cultured in living cells by inoculating susceptible animals or chick embryos.
 - d. Viruses are not visible under the microscope. However, bacteria, ova, and parasites are. With the inclusion of dark-field microscopy, spirochetes may be ruled out too.
 - e. Many viruses are now identifiable by immunofluorescent assay.

NOTE: In severe disease in an environment where lab equipment is not available or where lab tests are inconclusive, a trial dose of antibiotics can add to a confirmation of viral illness. If the disease is viral, the antibiotics will have no effect on the course of the disease. In general practice, antibiotics should only be used when the cause of the disease is known to be bacterial. Antibiotics reduce the risk of superinfection and slow the development of disease resistance.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess viral infectious diseases.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Knew the physical properties of viruses.	—	—
2. Recognized the clinical presentation of important viral diseases.	—	—
3. Differentiated between viral diseases and other diseases with similar signs and symptoms.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Viral Infectious Diseases

081-833-4281

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Manage viral infectious diseases with appropriate supportive therapy. In seriously ill patients, the following measures may be necessary:
 - a. Intravenous (IV) fluid resuscitation.
 - b. Urinary catheterization (tasks 081-833-4495, Perform Urinary Catheterization, and 081-833-4499, Perform Urinary Catheter Care).
 - c. Nasogastric intubation (tasks 081-833-4496, Perform Nasogastric Intubation, and 081-833-4097, Manage a Patient with a Nasogastric Tube).
2. Manage viral infectious diseases with appropriate pharmacological therapy, if indicated.

NOTE: Antiviral pharmacological agents are still fairly new in the medical field. Many are prohibitively expensive and are only used in immunocompromised and at-risk patients. The following is a list of some of the available antivirals.

- a. Amantadine, which is used mainly for prophylaxis against influenza A and treatment very early in the course of the disease. The usual prophylactic dose is 100 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for the duration of the epidemic.
- b. Ribavirin, which is approved for use by the United States Food and Drug Administration against respiratory syncytial virus (RSV) as an aerosol administered prophylactically in at-risk infants. It also has some efficacy against influenza A and B. It has been shown to reduce the mortality in Lassa fever. The dose used against Lassa fever is a 2-gram (g) loading dose intravenously (IV) followed by 1 g every 6 hours (q6h) IV for (x) 4 days.
- c. Vidarabine, which is effective in the treatment of herpes simplex virus infections. It is available as an ophthalmic ointment and a systemic drug, which has reduced mortality from 70 to 28 percent in herpes simplex encephalitis. It is given by IV infusion of 10 milligrams per kilogram per day (mg/kg/day) for 5 to 7 days.
- d. Acyclovir, which is effective in the treatment of some strains of herpes simplex and varicella zoster. Available in a 5 percent topical ointment and systemic drug used against neonatal herpes simplex (IV) and genital herpes infections (PO). The regimen for reducing the frequency and severity of genital herpes outbreaks is 200 mg PO three times a day (t.i.d.) for up to 6 months. It is effective in suppressing recurrent episodes, but they may recur again when therapy is stopped.

NOTE: Task 081-833-4686, Manage Acquired Immunodeficiency Syndrome, discusses drugs specific to the treatment of AIDS.

3. Record all treatment in the patient's medical record.
4. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage viral infectious diseases.

Performance Measures

1. Managed viral infectious diseases with appropriate supportive therapy.

GO **NO GO**

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Managed viral infectious diseases with appropriate pharmacological therapy when indicated.	_____	_____
3. Recorded all treatment in the patient's medical record.	_____	_____
4. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Assess Bacterial Infectious Diseases

081-833-4290

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, and determine the cause of the disease in accordance with The Merck Manual.

Performance Steps

1. Understand the categories of diseases on the basis of bacterial morphology.
 - a. Diseases caused by gram-positive cocci are as follows:
 - (1) Staphylococcal infections.
 - (2) Streptococcal infections.
 - (3) Pneumococcal infections.
 - b. Diseases caused by gram-negative, aerobic cocci is *Neisseria*.
 - c. Diseases caused by gram-positive bacilli are as follows:
 - (1) Erysipelothricosis.
 - (2) Listeriosis.
 - (3) Anthrax.
 - (4) Nocardiosis.
 - d. Diseases caused by gram-negative bacilli are as follows:
 - (1) Enterobacteriaceae infections.
 - (2) Salmonella infections.
 - (3) Shigellosis.
 - (4) Hemophilus infections.
 - (5) Brucellosis.
 - (6) Cholera.
 - (7) Tularemia.
 - (8) Plague.
 - (9) Pseudomonas infections.
 - (10) Melioidosis.
 - (11) Bartonellosis.
 - (12) Campylobacter and noncholera vibrio infections.
 - e. Diseases caused by anaerobic bacilli are as follows:
 - (1) Clostridial infections.
 - (2) Bacteroides and mixed anaerobic infections.
 - (3) Actinomycosis.
 - f. Diseases caused by mycobacteria are as follows:
 - (1) Tuberculosis.
 - (2) Other mycobacterial infections resembling tuberculosis.
 - (3) Leprosy.
2. Recognize the common manifestations of staphylococcal infections.
 - a. Staphylococcal abscesses are most commonly seen as pustular or bullous skin lesions generally located in the axillary inguinal or neck folds. Multiple subcutaneous abscesses, exfoliation, and bacteremia may also occur.
 - b. Furuncles and carbuncles are commonly seen in the back of the neck, although other areas also may be affected. Furuncles and carbuncles are usually the result of infected hair follicles.
 - c. Postoperative infections are commonly seen as staphylococci, ranging from stitch abscesses to extensive wound involvement. These infections could occur from days to weeks after an operation. The incidence is obviously greater for the patient in the absence of antimicrobial therapy.

Performance Steps

- d. Staphylococcal pneumonia should be suspected in patients with influenza who develop signs and symptoms such as dyspnea, recurrent fever, cyanosis, cough, tachypnea, and leukocytosis.
 - e. Staphylococcal bacteremia is commonly seen with long-term patients who develop infected intravenous sites, which in turn opens a pathway to the rest of the circulatory system for this "systemic" type of infection. A complication of the bacteremia commonly seen in intravenous (IV) drug users is endocarditis. Diagnosis is determined by positive blood cultures.
 - f. Staphylococcal osteomyelitis is mainly seen in children, causing chills, fever, and pain over the involved bone. Secondly, swelling and inflammation appear at the site of infection. An increase in the white blood cell (WBC) count is seen as an early sign. Often, radiological evidence can only be seen after 10 to 14 days.
 - g. Staphylococcal enterocolitis should be considered in patients presenting with fever, diarrhea, abdominal distention, and hypotension or ileus--especially as a postoperative sign.
3. Recognize the common manifestations of streptococcal infections.
 - a. Group A beta-hemolytic streptococci (Streptococcal progenies [*S. progenies*]) are the most virulent species in man. *S. progenies* causes pharyngitis, tonsillitis, wound and skin infections, septicemia, scarlet fever, pneumonia, rheumatic fever, and glomerulonephritis.
 - b. Group D includes enterococcal and nonenterococcal species. Most human infections caused by Group D strep are caused by *Enterococcus faecalis* (*E. faecalis*) or *Streptococcal* (*S. bovis*). Included in the diseases caused by Group D are endocarditis, urinary tract infections (UTIs), abdominal sepsis, cellulitis, wound infection, and bacteremia.
 - c. Group B streptococci may also cause infections--particularly neonatal sepsis, endocarditis, and septic arthritis.
 - d. Groups C and G streptococci are often carried by animals, they colonize the human pharynx, intestinal tract, vagina, and skin. They are responsible for suppurative infections, including pharyngitis, pneumonia, cellulitis pyoderma, erysipelas, impetigo, and wound infections. Most of these infections are susceptible to penicillin, vancomycin, erythromycin, or the cephalosporins.
 4. Recognize the common manifestations of pneumococcal Infections.
 - a. Pneumonia is the most serious infection caused by pneumococcus. Pneumonia is usually lobar, but it may also present as bronchopneumonia or tracheobronchitis.
 - b. Acute purulent empyema of the pleura is caused in 15 percent of cases by pneumococcus, making it the most common cause. However, less than 3 percent of the cases of pneumococcal pneumonia are complicated by empyema.
 - c. Acute otitis media is caused in about 50 percent of the infant cases of acute otitis media are attributable to pneumococcus (after the newborn period).
 - d. Acute sinusitis is an infection of pneumococcal etiology in the paranasal sinuses. These infections may extend into the meninges, producing bacterial meningitis that sometimes mixes with other bacteria.
 - e. Acute bacterial meningitis. Pneumococcal meningitis is one of the most common causes of meningitis, except for *Hemophilus influenza* and *Neisseria meningitides*. Pneumococcus is frequently responsible for acute bacterial (purulent) meningitis in all age groups.
 - f. Pneumococcal bacteremia. The acute phase of meningitis of pneumococcal pneumonia is often accompanied by bacteremia. Pneumococcal bacteremia also may be manifested in patients who are particularly susceptible.
 - g. Pneumococcal endocarditis. Endocarditis from pneumococcus may be a further complication of meningitis or pneumonia. A possible complication is a valvular lesion, which could be resultant of cardiac failure.
 - h. Pneumococcal peritonitis was often caused by pneumococcus and was previously a common complication of lipid nephrosis. However, it now occurs only rarely. Peritonitis with pneumococcal etiology now occurs mostly in young girls as an ascending infection from the vagina.

Performance Steps

- i. Pneumococcal arthritis is proven by direct smear or culture. Pneumococcus is the cause of purulent arthritis. Although not commonly seen, purulent arthritis usually originates from another source; for example, endocarditis or meningitis.
5. Recognize the common manifestations of gram-negative, aerobic cocci *Neisseria*.
 - a. *Neisseria meningitidis* is an important cause of meningitis, bacteremia, and other serious infections in children and adults.
 - b. *Neisseria gonorrhea* is a major cause of sexually transmitted disease, including urethritis, cervicitis, proctitis, pharyngitis, salpingitis, epididymitis, and bacteremia arthritis. Other species of *Neisseria* are present in the colon, oropharynx, and vagina as the normal flora, but rarely cause human disease.
 6. Recognize the common manifestations of gram-positive bacilli.
 - a. Erysipelothricosis is caused by *erysipelo*thrix *rhusiopathiae* and is normally manifested as an acute but slowly evolving skin affliction. Other forms of the disease are very rare. The mode of infection most commonly seen is by those who handle animal matter as an occupation, such as butchers, usually by way of penetrating wounds.
 - b. Listeriosis is caused by *listeriaceae*, which is a gram-positive, nonacid fast, nonencapsulated, psychrophilic bacilli found worldwide. The incidence is very low. However, neonates and adults older than 70 have the highest rates of infection. Infection usually occurs through ingestion; for example, contaminated dairy products or raw vegetables. Infection is facilitated by the fact that the bacteria can survive at low temperatures.
 - c. Anthrax is caused by *Bacillus anthracis*. Common names for anthrax are malignant pustule, Wool-sorter's disease. Anthrax is a highly infectious disease that is seen mainly in animals--especially ruminants--and transmitted to man by contact with animals or their products. Task 081-833-4269, Manage Anthrax, provides more information on the treatment of anthrax.
 - d. Nocardiosis is caused by *Nocardia asteroides*. Nocardiosis is usually transmitted via the lungs, rarely through the skin or gastrointestinal (GI) tract. Though distribution is worldwide, the incidence is low, with the majority of the cases being older adults and men. Those suffering from debilitating diseases or receiving immunosuppressive therapy are at higher risk of infection. Normally, Nocardiosis is initially manifested as a pulmonary infection. Skin or subcutaneous abscesses occur in a third of the cases. Cough, fever, chills, chest pain, weakness, anorexia, and weight loss resemble symptoms of tuberculosis (TB) or suppurative pneumonia and are seen with lung lesions. Another third of the cases displaying with symptoms of severe headache and focal and motor disturbances are caused by metastatic brain abscesses.
 7. Recognize the common manifestations of gram-negative bacilli.
 - a. *Escherichia coli* (*E. coli*) normally inhabits the GI tract. However, when possessing virulent or toxic states, they become major causes of watery, inflammatory, or bloody diarrhea. When the integrity of surrounding structures is compromised, the risk of systemic infection is greatly increased.
 - b. *Klebsiella*, *Enterobacter*, and *Serratia* infections are nosocomial in nature, usually acquired by patients with decreased host resistance. As a rule, these organisms are more resistant to antimicrobials than *E. coli*. However, the sites that are affected are generally the same, and they are also an important cause of bacteremia. *Klebsiella*, *Enterobacter*, and *Serratia* tend to respond to broad-spectrum penicillins, such as ticarcillin, carbenicillin, piperacillin, and the aminoglycosides.
 - c. *Salmonella* infections are caused by 2,220 known species of *Salmonella*. The species are classified into the following groups:
 - (1) Highly adapted to human hosts (*S. typhi*, *Salmonella* [*S. paratyphi*] A, B, and C, and *Salmonella sendai* [*S. sendai*], which are pathogenic in humans and commonly cause enteric fever).
 - (2) Adapted to nonhuman hosts.
 - (3) Unadapted to specific hosts.
- NOTE: Typhoid fever is caused by *Salmonella typhi* (*S. typhi*). *S. typhi* is characterized as a systemic infectious disease with fever, prostration, abdominal pain, and a rose-colored rash.

Performance Steps

- d. Shigellosis, which is an acute bacterial infection of the intestinal tract. The word "dysentery" implies blood and mucus in the stools, which are symptoms of shigellosis. Distribution is seen worldwide, and shigellosis accounts for 5 to 10 percent of all the diarrhea illness in many areas.
- e. Hemophilus infections in humans are caused mainly by the Hemophilus influenzae species, which normally manifests itself in the respiratory system. In children, Hemophilus infections could include meningitis, septic arthritis, bacteremia, pneumonia, tracheobronchitis, otitis media, acute epiglottitis, conjunctivitis, and sinusitis. In adults, endocarditis and the diseases already mentioned that affect children could be seen, although generally rarely. The treatment of Hemophilus depends upon the age of the patient, the strain of the pathogen, and the body system affected.

NOTE: Many of the Hemophilus species are found in the upper respiratory passages of children and adults.

- f. Brucellosis is caused by Brucella abortus (cattle), Brucella melitensis (sheep and goats), and Brucella suis (hogs). The pathogenic species mentioned previously are commonly seen in man. However, there are many other species of Brucella that infect caribou, moose, hares, chickens, desert rats, deer, horses, dogs, and so on. The disease is commonly seen in those exposed to direct contact with secretions and excretions from infected animals or by ingesting animal products. Transmission is usually not from person to person. The following are prone to infections: veterinarians, butchers, and dairy workers with worldwide distribution.
 - g. Cholera is caused by Vibrio cholerae. Vibrio cholerae cause an acute infection involving the entire small bowel and is characterized by profuse, watery diarrhea, vomiting, muscular cramps, dehydration, oliguria, and collapse. Distribution is worldwide; however, cholera usually is seen in developing countries. Children are more susceptible.
 - h. Tularemia is caused by Francisella tularensis. Tularemia is characterized by a primary ulcerative lesion, regional lymphadenopathy, fever, bacteremia, and occasionally atypical pneumonia. Usual vector is the rabbit, transmitted by an arthropod vector. Those at high risk to infection are hunters, butchers, meat handlers, and fur skinners.
 - i. Plague (task 081-833-4262, Manage Plague).
 - j. Pseudomonas aeruginosa is occasionally found as normal skin flora of the axillary, anogenital area. It is usually an opportunistic pathogen of open wounds in debilitated patients with diminished resistance to infection. The site of infection depends upon the portal of entry.
 - k. Glanders is caused by Pseudomonas mallei. Glanders is a serious infection of equines. However, other animals can be infected as well, with the exclusion of pigs and cattle, which are resistant. Occasional transmission to humans occurs. In humans, transmission is seen mainly in those in close contact with horses, donkeys, and mules.
 - l. Bartonellosis is caused by Bartonella bacilliformis. Bartonellosis is seen specifically in South America and is transmitted by the phlebotomine sand fly. The disease is sometimes called Oroya fever from a time that the railroad was being built between Lima and Oroya Peru, and many of the workers became ill from the disease. Oroya fever is characterized by sudden fever, weakness, pallor, severe headache, muscle and joint pain, and in many cases if not treated, delirium and coma. This form of the disease affects the red blood cells, creating a condition of anemia in the patient. Mortality rates may exceed 50 percent in the untreated patient.
8. Recognize the common manifestations of Campylobacter and noncholera Vibrio infections.
 - a. Campylobacter fetus (C. fetus) is associated with bacteremia in adults.
 - b. Campylobacter jejuni (C. jejuni) is implicated in infant meningitis and diarrhea.
 - c. Campylobacter coli (C. coli) is a common cause of diarrhea.
 - d. Noncholera Vibrio infections are serologically distinct from Vibrio cholerae. Some noncholera Vibrio (V.) species are the V. parahemolyticus, V. mimicus, V. alginolyticus, V. vulnificus and the so-called nonagglutinable Vibrios. V. parahemolyticus is responsible for food-borne outbreaks of diarrhea, usually caused by shellfish or other undercooked seafood (Japan and coastal areas of the United States).
 9. Recognize the common manifestations of anaerobic bacilli.

Performance Steps

- a. Clostridial infections are caused by clostridium. Clostridium are spore-forming, anaerobic, gram-positive bacilli that exist widely in nature, being found in dust, soil, vegetation, and the GI tracts of humans and animals. Many species of clostridium exist; however, only about 25 to 30 are recognized as pathogenic to man. Other than the effects of the bacteria itself, a commonly seen problem in clostridial infections is the toxic by-product of the bacteria.
 - (1) Tetanus (lockjaw) is caused by Clostridium (C.) tetani. This organism produces an exotoxin (tetanospasm). Tetanus may follow trivial and overly contaminated wounds, depending on a suitably lowered oxidation-reduction potential in the injured tissues. Drug addicts and those who have been severely burned are especially prone to tetanus. Neonates are prone to tetanus infection at the umbilicus (tetanus neonatorum) (task 081-833-4294, Manage Tetanus).
 - (2) Other clostridial infections are increasingly seen as nosocomial infections--especially in the immunocompromised patient. Severe clostridial sepsis may complicate intestinal perforation or obstruction. The most common of clostridial sepsis is probably C. perfringens type A. However, many other strains are involved too. Some of the diseases and conditions infected by Clostridium are cholecystitis, peritonitis, ruptured appendix, meningitis, otitis media, lung abscess and aspiration pneumonitis, brain abscess, endocarditis, pyelonephritis, septic arthritis, and osteomyelitis. C. ramosum is commonly associated with intra-abdominal infections following bowel perforation. Always suspect clostridial etiology in omphalitis of the newborn (task 081-833-4298, Manage Clostridial Cellulitis, Myositis, and Myonecrosis).
 - (3) Necrotizing enteritis. C. perfringens (type C) is often the cause of food poisoning. Often caused by ingesting infected meat, it can occasionally cause an acute, inflammatory, sometimes necrotizing, disease of the large and small bowels. Pig-bel, for example, which occurs in New Guinea, presumably results from eating pork contaminated by C. perfringens (type C).
 - (4) Clostridium difficile-induced colitis is responsible for almost all of the cases of antibiotic-associated colitis and about 20 to 25 percent of the antibiotic-associated diarrhea. Task 081-833-4103, Manage [Nonsurgically] Conditions of the Abdomen, provides additional information on colitis.
 - b. Bacteroides and mixed anaerobic infections. The bacteroides (gram-negative bacilli) and the gram-positive anaerobic cocci (peptococci and peptostreptococci) are opportunistic organisms that are a normal part of the normal flora of many parts of the body. Transmission often occurs when the integrity or physical structure of the body has been compromised.
 - c. Actinomycosis is caused by Actinomyces israelii. Actinomycosis is a chronic infectious disease that is often seen in adult males. This bacteria is present as a part of the normal flora of the gums, tonsils, and teeth. Mode of infection is often through decayed teeth or pulmonary disease via aspiration of oral secretions.
10. Recognize the common manifestations of mycobacteria.
 - a. TB (task 081-833-4182, Manage Tuberculosis).
 - b. Leprosy (task 081-833-4296, Manage Leprosy).
 - c. Other mycobacterial infections resembling TB. Disease that is pathologically and clinically similar to TB can be caused by mycobacterium other than Mycobacterium (M.) TB. Since these organisms are not nearly as virulent as M. TB, those infected are for the most part suffering from an immune system deficiency.
 11. Assess bacterial infectious diseases.
 - a. Most bacterial infectious diseases will trigger either a local or systemic increase in the number of WBCs.
 - (1) In a local infection, this will be expressed as pus.
 - (2) In a systemic disease, this will be expressed as an increased WBC count.

NOTE: Most viral illnesses will not cause a systemic increase in WBCs. Many parasitic diseases will cause only eosinophilia without leukocytosis.

Performance Steps

- b. Most bacteria can be cultured. A positive culture is the most common method for positively identifying a bacterial infection (task 081-833-4594, Interpret a Culture).

NOTE: Normal bacterial culture medium is not suitable for performing a culture of viruses. Viruses are obligate intracellular organisms and require cultures containing live cells or inoculation into live animals to reproduce.

- c. All bacteria and parasites can be seen under the microscope. In general, parasites and their ova are multicellular and much larger than bacteria. Viruses cannot be seen under the microscope. Certain stains will allow differentiation of various characteristics of bacteria.
- (1) Gram stain: Organisms that stain purple are gram positive. All others are gram negative.
 - (2) Acid-fast stain (Ziehl-Neelsen): Used to differentiate mycobacterium and nocardia species from other organisms. Acid-fast bacteria will appear red under the microscope.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess bacterial infectious diseases.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the categories of diseases on the basis of bacterial morphology.	—	—
2. Recognized the common manifestations of Staphylococcal infections.	—	—
3. Recognized the common manifestations of Streptococcal infections.	—	—
4. Recognized the common manifestations of Pneumococcal infections.	—	—
5. Recognized the common manifestations of gram-negative, aerobic cocci-Neisseria.	—	—
6. Recognized the common manifestations of gram-positive bacilli.	—	—
7. Recognized the common manifestations of gram-negative bacilli.	—	—
8. Recognized the common manifestations of Campylobacter and noncholera Vibrio infections.	—	—
9. Recognized the common manifestations of anaerobic bacilli.	—	—
10. Recognized the common manifestations of Mycobacteria.	—	—
11. Assessed bacterial infectious diseases.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Tetanus

081-833-4294

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

Tetanus is a disease caused by a toxin produced by the bacterium *Clostridium (C.) tetani*. *C. tetani* is a slender, mobile, gram-positive, anaerobic, spore-forming bacillus found in the gut and soil. The toxin, tetanospasmin, enters the central nervous system (CNS) via the peripheral motor nerves or the circulatory system and binds to the ganglioside membranes of nerve synapses, blocking release of the inhibitory transmitter and resulting in tonic spasticity. The toxin cannot be neutralized once fixed.

1. Identify tetanus on the basis of the patient's history.
 - a. History of ANY wound, no matter how small. Incubation period is 2 to 50 days (usually 5 to 10 days).
 - b. Patients with history of intravenous (IV) drug use, burns, or surgical wounds.
 - c. Postpartum infection in the uterus or in a newborn's umbilicus.
2. Identify tetanus on the basis of the signs and symptoms. Symptoms of the disease are caused by a toxin produced by the bacteria, NOT the bacteria itself.
 - a. Muscle spasms.
 - (1) Most frequent symptom is trismus, a strong muscle spasm of the masseter muscles.
 - (2) May also have muscle spasms of the chest, back, and limbs.
 - (3) Difficulty swallowing because of glottal spasm.
 - (4) Opisthotonos spasm of neck muscles (dorsal arching position of the back where only head, shoulders, and feet touch the bed).
 - (5) Fixed facial smile with raised eyebrows (risus sardonias).
 - b. Increased sweating and salivation.
 - c. Convulsions easily precipitated by minimal external stimuli; for example, bright lights and loud noises.
 - d. Rapid pulse and respirations.
 - e. Respiratory difficulty may induce paralysis.
 - f. Low-grade temperature.
 - g. Exaggerated reflexes.
3. Perform lab test to confirm or rule out tetanus. White blood cell count with differential may show moderate leukocytosis.
4. Differentiate between tetanus and diseases with similar signs and symptoms.
5. Treat contaminated wounds to prevent tetanus (Figure 1).

Performance Steps

TETANUS IMMUNIZATION SCHEDULE					
Td: Tetanus and Diphtheria Toxoids absorbed-For Adult Use;					
TIG: Tetanus Immune Globulin-Human					
History of Non-tetanus-prone wounds			Tetanus prone wounds		
Absorbed Toxoid	Td:1 dose	Tig:	Td:1 dose	Tig:	
Unknown or	Yes	No	Yes	Yes	
< 3 years					
> 3 years	No 3	No	No 4	No	
1. For children < 7 y/o; DTP is preferred to tetanus toxoid alone. For persons > 7 Td is preferred to tetanus toxoid alone.					
2. If only 3 doses of fluid toxoid have been received, a 4th dose of toxoid should be given.					
3. Yes if more than 10 years since last dose.					
4. Yes if more than 5 years since last dose. (More frequent doses are not needed and can accentuate side effects).					

Figure 1. Tetanus Immunization Schedule

6. Manage tetanus.

NOTE: If there is no focus of infection, approve a milder course of treatment. If treatment is delayed, patient's prognosis is poor with short incubation period and rapid progression of symptoms. Recovery takes months.

- a. Airway maintenance tracheostomy indicated for prolonged airway management (7 to 10 days).
- b. Thorough debridement of wound.
- c. Intravenous (IV) or gastrointestinal feedings.
- d. Foley catheter to treat retention.
- e. Minimal external stimuli (dark, quiet room with no touching of patient).
- f. Sedation.
 - (1) Diazepam is drug of choice (DOC) for seizures, to control muscle rigidity, and to induce sedation. Dose range is variable; titrate for effect.
 - (a) For severe cases, 10 to 20 milligrams (mg) every 3 hours (q3h) IV push slowly.
 - (b) For mild cases, 5 to 10 mg every 2 to 4 hours (q2/4h) by mouth (PO).
 - (2) Chlorpromazine and short-acting barbiturates help reduce the excessive neuroexcitability of tetanus.
- g. Pain management: codeine.
- h. Antibiotics manage the infection but have no effect on the toxin. They do not significantly alter the course of the disease.
 - (1) Tetanus immune globulin (human) (Hyper-tet) 3,000 units intramuscularly (IM) immediately (stat). Fights the toxin.
 - (a) Dose range 1,500 to 10,000 units, depending on wound severity.
 - (b) Can be injected directly into wound (good tissue).
 - (c) Human antitoxin is preferred to animal, since there is less risk of serum sickness, it is better tolerated, and it is a smaller dose.
 - (2) Antibiotics:
 - (a) DOC is metronidazole 500 mg four times a day (q.i.d.) or 1 gram (g) twice daily (b.i.d.) IV 7 to 10 days.
 - (b) Alternative drug is doxycycline 100 mg every 12 hours (q12h) IV.

7. Monitor the patient closely for complications.

- a. Pneumonia.
- b. Thrombosis.

Performance Steps

- c. Gastric ulceration.
 - d. Urinary retention and constipation.
8. Report case immediately to the local preventive medicine officer.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage tetanus.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified tetanus on the basis of patient's history.	_____	_____
2. Identified tetanus on the basis of on the signs and symptoms.	_____	_____
3. Performed lab test to confirm or rule out tetanus.	_____	_____
4. Differentiated between tetanus and diseases with similiar signs and symptoms.	_____	_____
5. Managed tetanus.	_____	_____
6. Monitored the patient closely for complications.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED
SANFORD, 1999

Manage Poliomyelitis

081-833-4295

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify poliomyelitis on the basis of the patient's history.
 - a. Primary means of transmission is from human to human by the oral route.
 - b. Man is the only natural host. Inapparent infection is common and exceeds clinical illness 100:1 in unimmunized populations.
 2. Identify poliomyelitis on the basis of the patient's signs and symptoms.
 - a. The minor illness, which accounts for 80 to 90 percent of infections occurs chiefly in young children. Its symptoms are as follows:
 - (1) Fever.
 - (2) Malaise.
 - (3) Headache.
 - (4) Sore throat.
 - (5) Vomiting.
 - (6) Complete recovery occurs within 24 to 72 hours.
 - b. The major illness may or may not be preceded by the minor illness. Initially the appearance is of aseptic meningitis with the following:
 - (1) Fever.
 - (2) Severe headache.
 - (3) Stiff neck and back.
 - (4) Deep muscle pain.
 - (5) Occasional hyperesthesias and paresthesias.
 - (6) The disease may end here or progress to loss on selective tendon reflexes and asymmetric weakness or paralysis of muscle groups depending on the site of the lesion.
 - (7) Dysphagia, nasal regurgitation, and nasal voice are early signs of bulbar involvement.
- NOTE: Asymmetric flaccid limb paralysis or bulbar palsies without sensory loss during an acute febrile illness in a child or young adult almost always indicates poliomyelitis.
3. It is not possible to identify poliomyelitis with the Special Forces lab set. The peripheral white blood cell (WBC) count may be normal or slightly elevated.
 4. Other lab tests that will give clues to the disease are as follows:
 - a. Cerebrospinal fluid (CSF) protein is slightly elevated.
 - b. CSF cell count is between 10 to 300 cells per microliter (predominantly lymphocytes).
 - c. Virus isolation from the throat or feces or demonstration of a rise in specific antibody is required to confirm the diagnosis.
 5. Differentiate between poliomyelitis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Coxsackievirus or echoviral meningitis.
 - b. Guillain-Barre syndrome.
 - c. Brain abscess.
 - d. Any of a number of other causative agents of meningitis.
 6. Management is symptomatic.

Performance Steps

- a. Administer analgesics and antipyretics for pain and fever.
 - b. During active myelitis, instruct patient to rest on a firm bed with footboard to help prevent foot drop.
 - c. Apply hot, moist packs every 20 minutes to help relieve muscle spasms.
 - d. Relieve urinary retention secondary to lower limb paralysis through a program of intermittent catheterization or administration of parasympathomimetics such as bethanechol 5 to 30 milligrams (mg) by mouth (PO) or 0.6 mg per kilogram per day (mg/kg/day) subcutaneously (SQ) in equal doses every 6 to 8 hours (q6/8h).
 - e. With respiratory failure, administer artificial respiration and an extensive program of respiratory management, including postural drainage and suction.
 - f. Prescribe physical therapy, which is the most important part of management during convalescence.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage polio.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified poliomyelitis on the basis of the patient's history.	_____	_____
2. Identified poliomyelitis on the basis of the patient's signs and symptoms.	_____	_____
3. Requested lab studies.	_____	_____
4. Differentiated between poliomyelitis and other diseases with similar signs and symptoms.	_____	_____
5. Managed poliomyelitis symptomatically.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Leprosy

081-833-4296

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (exam), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the etiology of leprosy (Hansen's disease).
 - a. Caused by bacillus *Mycobacterium* (M.) *leprae*.
 - b. Hansen discovered the bacterium in Norway in 1873.
 - c. Related to tuberculosis (TB) bacillus *M. tuberculosis*.
 - d. *M. leprae* is an obligate intracellular organism with a waxy covering. These factors make it difficult for the body's immune system to detect and to destroy the bacterium. The organism is relatively benign. It does not produce any toxins or destroy surrounding tissues, so the immune system does not get triggered.
 - e. *M. leprae* is the only bacterium to selectively invade peripheral nerves (cooler areas).
 - f. *M. leprae* enters and lives inside the Schwann cells. May also enter and live within the actual neuronal processes and surrounding erector pili muscles, sweat glands, and hair follicles.
 - g. *M. leprae* may be spread by contact with the armadillo.
 - h. Transmission and epidemiology of *M. leprae* is as follows:
 - (1) Not highly communicable.
 - (2) Ninety-five percent of adults are immune.
 - (3) Five percent of spouses living with patients with leprosy acquire the disease (only 5 percent are susceptible).
 - (4) Bacilli live up to 7 days in dried secretions.
 - (5) Direct contact, fomites, and mucous membranes may spread the disease.
 - (6) Entrance through nasal and oral mucous membranes or skin abrasions.
 - (7) Eighty percent of infection contacts are in Florida and Louisiana--no known leprosy contacts.
2. Recognize the signs and symptoms of leprosy.
 - a. Indeterminate (I) ghost form.
 - (1) Very early form before progression.
 - (2) Slightly erythematous or hypopigmented macule.
 - (3) Sensation normal or slightly impaired within lesion.
 - (4) No peripheral nerve involvement.
 - (5) May heal spontaneously over months.
 - (6) May progress to other forms.
 - b. Tuberculoid leprosy (TT).
 - (1) Flat hypopigmented area of skin with serpiginous, sharply defined, papillated border.
 - (2) Hyperesthetic or anesthetic within the border of the lesion.
 - (3) May be single or a few lesions.
 - (a) Usually distributed asymmetrically.
 - (b) May be extensive.
 - (4) Peripheral nerve involvement only if in proximity to lesion.
 - c. Borderline tuberculoid leprosy (BT).
 - (1) Variable lesions (papules, flattened nodules, and plaques).
 - (2) Numerous and widespread lesions that are nonsymmetrical in distribution.
 - (3) Diffuse margins, not sharp borders.
 - (4) Extensive peripheral nerve damage with anesthesia and paralysis.

Performance Steps

- d. Lepromatous leprosy (LL).
 - (1) Single or multiple, erythematous or hypopigmented macules.
 - (2) Macules evolve into papules, nodules, and plaques.
 - (3) May involve all of skin except warmer portions.
 - (4) Peripheral nerves are laden with bacilli even in early stage of disease. Anesthesia usually begins in hands and feet and eventually involves all four limbs.
 - (5) Lucio's phenomenon in Latin Americans.
 - (a) Diffuse infiltration without elevated lesions.
 - (b) "Spotted leprosy."
 - (c) In some, a necrotizing obliterative vasculitis in the skin with the development of multiple ulcers.

- 3. Apply specific chemotherapy on the basis of the World Health Organization (WHO) study group recommendations.

NOTE: Prevention and treatment of deformities and disability are dependent upon education.

- a. I, TT, and BT: rifampin 600 milligrams (mg) every month (qmo) for (x) 6 mo AND dapsone 100 mg every day (q.d.) (x) 6 mo. Current references state that after 6 mo, "disease is arrested," and "patient is no longer regarded as suffering from leprosy."
- b. BL and LL: rifampin 600 mg qmo x 2 years (yr) AND clofazimine 300 mg qmo x 2 yr AND dapsone 100 mg q.d. x 2 yr AND clofazimine 50 mg q.d. x 2 yr (until negative skin smears are obtained).
- c. TT: dapsone 100 mg q.d. x 5 yr.
- d. LL: dapsone 100 mg q.d. x life.

NOTE: Dapsone may be required indefinitely. Even after negative skin smears are acquired, viable bacilli may persist indefinitely in peripheral nerves, bone marrow, and deep organs. Dapsone is used only when other medications cannot be tolerated or are unavailable. Dapsone is not recommended when patient has resistance to dapsone (when patient is resistant to dapsone, add clofazimine 50 to 100 mg q.d. Secondary resistance development may vary--anywhere between 3 and 24 years. Dapsone renders patients noninfective in 1 to 2 weeks. Since the disease is directly related to a patient's inadequate cell-mediated immunity (CMI), the patient may catch the disease again, even after having been cured. Therefore, patients in an endemic area may take medications for life (particularly BL and LL).

- 4. Recognize lepra type-1 reactions.

NOTE: Treatment should be continued in full dosage throughout the course of both types of reactions.

- a. Reversal reactions (upgrading) are as follows:
 - (1) Increase in CMI.
 - (2) Borderline moves toward tuberculoid.
- b. Downgrading reactions are as follows:
 - (1) Decrease in CMI.
 - (2) Borderline moves toward lepromatous.
 - (3) Only occurs in a patient not receiving adequate treatment.

NOTE: Reversal and downgrading reactions may be clinically indistinguishable; for example, rapid change in some or all lesions, severe peripheral neuritis with cutaneous sensory loss, and paralytic deformities (clawhand, dropfoot, and lagophthalmos). Reversal and downgrading reactions require prompt treatment to prevent permanent damage.

- 5. Manage lepra type-1 reactions.

- a. Rest.
- b. Analgesics.
- c. Steroids.
- d. Protection to insensitive areas.
- e. Physical therapy to minimize contractures and damage to the eye.

- 6. Recognize lepra type-2 reactions. Erythema nodosum leprosum (ENL) occurs and may be fatal.

- a. Immune complex disease only in lepromatous (LL and BL) patients that is caused by humoral hypersensitivity.

Performance Steps

- b. Multiple, acute tender erythematous nodules.
 - c. Possibly with accompanying iridocyclitis, orchitis, and peripheral neuritis.
- 7. Manage type-2 reactions with the following:
 - a. Thalidomide (a teratogen).
 - b. Steroids.
 - c. Clofazimine (acts as an antileprosy and anti-inflammatory drug).
- 8. Rehabilitate leprosy patients.
 - a. Instruct patients to protect insensitive hands, feet, and eyes.
 - b. Instruct patient to use special shoes and special tools.
 - c. Implement physiotherapeutic measures.
 - d. Refer patient for surgical correction.
- 9. Manage complications symptomatically with appropriate supportive care.
- 10. Record all treatment in the patient's medical record.
- 11. Report the case immediately to the local preventive medicine officer.
- 12. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage leprosy.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the etiology of leprosy (Hansen's disease).	—	—
2. Recognized the signs and symptoms of leprosy.	—	—
3. Applied specific chemotherapy on the basis of the WHO study group's recommendations.	—	—
4. Recognized type-1 reactions.	—	—
5. Managed type-1 reactions.	—	—
6. Recognized type-2 reactions.	—	—
7. Managed type-2 reactions	—	—
8. Rehabilitated leprosy patients.	—	—
9. Managed complications symptomatically with appropriate supportive care.	—	—
10. Recorded all treatment in the patient's medical record.	—	—
11. Reported the case immediately to the local preventive medicine officer.	—	—
12. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Necrotizing Subcutaneous Infection

081-833-4297

Conditions: As a special operations medic working in a field, clinic, or hospital setting and given a wound with signs and symptoms of a necrotizing subcutaneous (SQ) infection.

Standards: Correctly identify the cause of the infection, and treat the wound so that it heals without complications.

Performance Steps

Necrotizing SQ infections are severe infections. They are usually caused by a mixture of aerobic and anaerobic organisms that cause necrosis of SQ tissue, usually including the fascia. There are several types of infections: Necrotizing Fasciitis; Synergistic Necrotizing Cellulitis, which is caused by Group A streptococcus; and Fournier's Disease, which involves the male genitalia.

1. Identify necrotizing subcutaneous infections on the basis of the patient's history.
 - a. History of trauma (may be minor), burns, surgery, ulcers, or infection.
 - b. Most commonly located on the extremities. Perineum is the second most common because of surgery or infection.
 - c. Patient has diabetes mellitus (DM).
 - d. Patient reports a rapidly spreading infection or ulcer.
2. Identify necrotizing SQ infections on the basis of patient's signs and symptoms.
 - a. Involved site is very painful.
 - b. Skin is red, hot, and swollen.
 - c. Rapidly spreading purple discoloration, bullae, and dermal gangrene may develop.
 - d. Gas crepitus may develop.
 - e. Fever is present and can be accompanied by altered mental status.
 - f. Patient has tachycardia with hypotension caused by volume depletion.
3. Identify necrotizing SQ infections on the basis of laboratory results.
 - a. Complete blood count (CBC) with differential reveals polymorphonuclear leukocytosis.
 - b. Increased specific gravity of urine occurs.
 - c. X ray reveals gas in tissue.
 - d. Gram stain of pus is performed to identify organisms.
4. Differentiate between necrotizing SQ infections and diseases with similar signs and symptoms.
 - a. Differentiate from gas gangrene by lack of muscle involvement.
 - b. Differentiate from other skin infections by rapid progression and signs and symptoms.
5. Manage necrotizing SQ infections.
 - a. Extensive incision and debridement.
 - b. Amputation possible.
 - c. Intravenous (IV) fluids to maintain blood pressure.
 - d. Pharmaceutical treatment includes administering the following in high doses. Once the exact cause of the infection has been identified, you can alter the course of treatment, if necessary.
 - (1) Clindamycin 900 milligrams (mg) every 8 hours (q8h) IV for (x) 4 to 5 days and penicillin G 24 million units per day (mu/d) IV in divided doses.
 - (2) Ceftriaxone 2.0 grams (g) every day (q.d.) IV x 5 days.
6. Record all treatment in the patient's medical record.
7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a necrotizing SQ infection.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified necrotizing SQ infections on the basis of the patient's history.	_____	_____
2. Identified necrotizing SQ infections on the basis of the patient's signs and symptoms.	_____	_____
3. Identified necrotizing SQ infections on the basis of laboratory results.	_____	_____
4. Differentiated between necrotizing SQ infections and diseases with similar signs and symptoms.	_____	_____
5. Managed necrotizing SQ infections.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED
SANFORD, 1999

Manage Clostridial Cellulitis, Myositis, and Myonecrosis

081-833-4298

Conditions: As a special operations medic working in a field, clinic, or hospital setting and given a wound with signs and symptoms of a clostridial infection.

Standards: Correctly identify the cause of the infection, and treat the wound so that it heals without complications.

Performance Steps

NOTE: Clostridia bacteria are anaerobic, spore-forming, gram-positive bacilli that occur naturally in dust, soil, vegetation, and gastrointestinal (GI) tracts. Only 25 to 30 of the 100 species cause disease in man. Most wounds are contaminated with clostridia bacteria, but usually they cause no problem if the wound is properly treated. The bacteria thrive in necrotic, hypoxic tissue, producing toxins that kill healthy tissue, allowing the bacteria or infection to spread. Removing the necrotic tissue removes source of infection. Clostridia infections can kill within one to several days. Clostridia species cause several types of infections: clostridial cellulitis (anaerobic cellulitis), clostridial myositis, clostridial myonecrosis (gas gangrene), and tetanus. (Tetanus is covered in task 081-833-4294.)

1. Identify clostridial wound infection on the basis of the patient's history.
 - a. History of wound or puncture.
 - b. Poor or no wound care.
 - c. Amount of time between injury and onset of symptoms.
 - (1) Onset of clostridial cellulitis is 3 or more days postinjury.
 - (2) Onset of clostridial myositis and myonecrosis is 8 hours to 4 days.
 - d. Factors that predispose a wound to development of anaerobic infections are as follows:
 - (1) Large amounts of devitalized tissue.
 - (2) High-velocity missile injury.
 - (3) Significant contamination.
 - (4) Area with poor blood supply (poor oxygenation); for example, the feet of patient with vascular disease or diabetes mellitus.
 - (5) Puncture wound.
2. Identify the type of clostridial infection on the basis of patient's signs and symptoms.
 - a. Clostridial cellulitis (anaerobic cellulitis): localized infection in superficial wound that does not effect healthy muscle.
 - (1) Presence of a thin, seropurulent exudate indicative of clostridia contamination.
 - (2) Infection may spread along fascial planes.
 - (3) Bullae are usually present.
 - (4) Presence of foul-smelling, serous, brown exudate.
 - (5) Presence of crepitation and bubbling of gas.

NOTE: Presence of gas bubbles is not unique to clostridial infections. Other illnesses may produce gas, and air may be introduced into wound mechanically.

 - (6) Rarely, gross edema and discoloration are present.
 - b. Clostridial myositis: localized deep infection of muscles and tissue.
 - (1) Same or similar signs and symptoms as clostridial cellulitis.
 - (2) Pain.
 - (3) Edema.
 - (4) Gas bubbles.
 - c. Clostridial myonecrosis (gas gangrene): rapidly spreading infection of muscle tissue, usually caused by *Clostridia perfringens*, with possible systemic affects.
 - (1) Signs and symptoms are the same as myositis, but more severe.
 - (2) Pain and edema tenderness are usually severe, with rapid progression over several hours.
 - (3) Exudate is serous and brown, but not always foul-smelling.

Performance Steps

- (4) Wound site may be pale initially. It then turns red, yellow, or brown and is covered with necrotic bullae.
 - (5) Muscle tissue is lusterless pink to deep red to gray-green or mottled purple.
 - (6) Gas bubbles in wound with crepitation. Gas dissects between tissue planes.
 - (7) Systemic signs and symptoms are as follows:
 - (a) Patient's condition becomes progressively toxic, and shock and renal failure are manifested.
 - (b) Rapid pulse.
 - (c) Change in mental status.
 - (d) Prostration.
3. Perform laboratory tests to rule out or confirm the diagnosis.
 - a. Gram stain of the wound and discharge should show a gram-positive bacilli. Try to identify the exact causative organism because other bacteria (Bacteroides, Streptococcus, and Staphylococcus) cause similar clostridia-like infections.
 - b. Culture and sensitivity of the wound and discharge.
 - c. White blood cell count with differential.
 4. Differentiate between clostridial infections and other wound infections.
 5. Manage the infection.
 - a. If clostridial myonecrosis is suspected, do not delay starting treatment until organism is identified. Mortality may be reduced to about 20 percent with proper management. This is a serious illness. Aggressive treatment is mandated!
 - b. Wide debridement to include contiguous normal tissues in severe cases. May even consider amputation.
 - c. Open drainage.
 - d. Antibiotic therapy is based on the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - (1) Drug of choice (DOC) is clindamycin 900 milligrams (mg) three times a day (t.i.d.) intravenously (IV) PLUS penicillin G 24 million units per day (mu/d) IV.
 - (2) Alternate is ceftriaxone 2 grams (g) twice daily (b.i.d.) IV OR erythromycin 1 g four times a day (q.i.d.) IV.
 - (3) Initial therapy starts with broad-spectrum antibiotics to cover the other infectious agents usually present in clostridial infections. Administer ticarcillin with clavulanate potassium OR ampicillin with beta-lactamase inhibitor sulbactam.
 - (4) Third generation cephalosporin with an aminoglycoside for some mixed clostridia infections.
 - e. Tetanus toxoid 0.5 cubic centimeters (cc) intramuscularly (IM) if previously immunized. Tetanus toxoid and Hyper-tet (250 to 500 units) intramuscularly (IM) given to patient not previously immunized.
 - f. Supportive care for shock and dehydration.
 - g. Evacuation for use of high-pressure oxygen hyperbaric therapy.
 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage clostridial cellulitis, myositis, and myonecrosis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified clostridial wound infection on the basis of the patient's history.	—	—
2. Identified the type of clostridial infection on the basis of signs and symptoms.	—	—
3. Performed laboratory tests to rule out or confirm the diagnosis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Differentiated between clostridial infections and other wound infections.	_____	_____
5. Managed the infection.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
SANFORD, 1999

Related
MERCK MANUAL 17TH ED

Manage Acquired Immunodeficiency Syndrome

081-833-4686

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify acquired immunodeficiency syndrome (AIDS) on the basis of the patient's history.
 - a. AIDS is a secondary immunodeficiency syndrome resulting from infection with the human immunodeficiency virus (HIV) type 1 or 2. (Type 2 appears to be less virulent.)
 - b. Transmission requires contact with body fluids containing infected cells or plasma. This typically occurs through sexual contact, but may occur through any other means.
 - c. Know the local terminology (slang) for AIDS. Many times, a patient will tell you that he or she has the disease on the basis of their own observations.
2. Identify AIDS on the basis of the patient's signs and symptoms.
 - a. Within 2 to 4 weeks after infection, some patients have a 3- to 14-day acute, nonspecific viral syndrome.
 - b. Late infection. After many years, opportunistic infections or rare tumors may occur. These are signs of AIDS.
 - (1) Unexplained oral candidiasis in adult; that is, no history of antibiotics use and no other signs or symptoms.
 - (2) Reactivation of tuberculosis and other mycobacterial diseases.
 - (3) Persistent lymphadenopathy for more than 3 months.
 - (4) Facial molluscum contagiosum.
 - (5) Severe seborrheic dermatitis that is unresponsive to usual therapy.
 - (6) Kaposi's sarcoma and other rare tumors.
3. It is not possible to identify AIDS by using the Special Forces lab set.
4. Identify AIDS by using other lab tests, if available.
 - a. The isolation of HIV from serum cells or lymph nodes provides the most specific diagnosis.
 - b. Testing for HIV antibodies using the enzyme-linked immunosorbent assay (ELISA) test (is a screening test like rapid plasma reagin [RPR]) and confirming the results with the western blot procedure. (The western blot procedure will not discover a positive HIV infection as soon as an RPR or ELISA.)
 - c. Demonstration of viral deoxyribonucleic acid (DNA) or ribonucleic acid (RNA).
5. Manage AIDS.

NOTE: Pharmacologic management of AIDS is not within the scope of the Special Forces medic. Multidrug therapies have shown promise in reducing the number of viral copies per milliliter (ml) and maintaining the CD4 cell count.

- a. Individual opportunistic infections should be managed in accordance with The Sanford Guide to Antimicrobial Therapy and along with AIDS-specific drug regimens that include suppression, if available.
- b. Counsel patients and families.
 - (1) Warn the patient and all sexual partners about the dangers of unprotected sex.
 - (2) Instruct the patient in proper personal hygiene as a tool to reduce the number of opportunistic infections.
 - (3) Instruct the patient to avoid persons who are ill because of his reduced immunity and susceptibility to disease.

Performance Steps

(4) Inform the patient and family that it is not possible to contract the disease through casual contact, but that they should avoid contact with the patient's blood and other body fluids.

6. Record all treatment in the patient's medical record.

7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage AIDS.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified AIDS on the basis of the patient's history.	_____	_____
2. Identified AIDS on the basis of the patient's signs and symptoms.	_____	_____
3. Knew it was not possible to identify AIDS by using the Special Forces lab set.	_____	_____
4. Identified AIDS by using other lab tests when available.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Managed AIDS.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Subject Area 20: Endoparasitic Diseases

Manage Giardiasis**081-833-4019**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the etiology, morphology, and mode of transmission of giardiasis.
 - a. Definition: infection of the small intestines by the protozoan *Giardia (G.) lamblia*.
 - b. Distribution: worldwide.
 - c. Transmission and life cycle:
 - (1) Ingesting of cysts in contaminated water or food.
 - (2) Excystation in the small intestine.
 - (3) Released trophozoites carried into the colon, where they grow and multiply as commensals.
 - (4) Trophozoites penetrate the mucous membranes, forming the following:
 - (a) Abscesses.
 - (b) Ulcers.
 - (c) Edema.
 - (d) Sloughing of large areas of mucosa.
 - d. Morphology of *G. lamblia* (two stages in man) is as follows:
 - (1) *G. lamblia* occurs as trophozoites and cysts.
 - (a) Trophozoite (Figure 1): flat, pear-shaped binucleated organism with four pairs of flagella. Most numerous in the duodenum and upper small intestine. A curved, disc-like structure ("suction plate") on the ventral surface probably aids in the mucosal attachment.

Giardia lamblia trophs



Figure 1. Giardia Lamblia Trophs

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- (b) Cysts: ovoid that contains either two or four nuclei and has a refractile wall. Reverts spontaneously to trophozoite form upon reaching the intestine (Figure 2).

Performance Steps

G. lamblia cysts



Figure 2. G. Lamblia Cysts

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- (2) Stools usually contain only cysts; however, with diarrhea, trophozoites may also be present.
2. Solicit a patient history.
3. Recognize significant subjective findings for giardiasis.
 - a. Giardiasis is often asymptomatic.
 - b. Symptomatic giardiasis can be acute or chronic.
 - c. Acute stage lasts about 3 to 4 days.
 - (1) Sudden onset of explosive, watery, malodorous diarrhea.
 - (2) Abdominal distention and flatulence.
 - (3) Nausea and anorexia.
 - d. Chronic stage (could continue for many months).
 - (1) Malabsorption.
 - (2) Debility.
 - (3) Weight loss.
4. Perform a PE.
5. Recognize significant objective findings for giardiasis.
 - a. The patient may have abdominal guarding.
 - b. The patient may complain of pain on deep palpation.
6. Perform lab tests with the SF lab set.
7. Recognize significant lab findings that are caused by giardiasis.
 - a. Microscopic exam of a spun stool sample will demonstrate cysts in the acute disease.
 - b. In chronic disease, excretion is irregular and may require repeated stool exams.
8. Order lab tests that cannot be performed with the SF lab set (if available).
9. Recognize significant lab results that are caused by giardiasis.
 - a. Duodenal contents, obtained with a nylon string (enterotest), can be examined for trophozoites.
 - b. Endoscopic aspiration of duodenal contents and a subsequent microscopic exam may also show trophozoites.
 - c. The antigen may also be detected in the stool.
10. Differentiate between giardiasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Amebiasis.
 - b. Shigellosis.
 - c. Salmonellosis.

Performance Steps

NOTE: To base differentiation on signs and symptoms is difficult. The preferred method is to identify cysts in feces.

11. Manage giardiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Drug of choice (DOC) is metronidazole 250 milligrams (mg) by mouth (PO) three times a day (t.i.d.) for (x) 5 days or albendazole 400 mg PO every day (q.d.) x 5 days.
 - b. Alternatives are tinidazole 2 grams (g) PO x 1 dose or quinacrine 100 mg PO t.i.d. after meals x 5 days.

NOTE: Warn patients of the anabuse-like effect of metronidazole.

12. Educate patients on preventive measures to observe against giardiasis.
 - a. Boil drinking water.
 - b. Kill cysts with a 2 percent solution of iodine.
 - c. Avoid salads, uncooked foods, and unpeeled fruits.
13. Record all treatment in the patient's medical record.
14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage giardiasis.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the etiology, morphology, and mode of transmission of giardiasis.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for giardiasis.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for giardiasis.	—	—
6. Performed lab tests with the SF lab set.	—	—
7. Recognized significant lab findings that are caused by giardiasis.	—	—
8. Ordered lab tests that cannot be performed with the SF lab set (if available).	—	—
9. Recognized significant lab results that are caused by giardiasis.	—	—
10. Differentiated between giardiasis and other diseases with similar signs and symptoms.	—	—
11. Managed giardiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
12. Educated patients on preventive measures to observe against giardiasis.	—	—
13. Recorded all treatment in the patient's medical record.	—	—
14. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLOGY
BATES PE, 8TH ED. 2002

Manage Amebiasis**081-833-4020**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy.

Performance Steps

1. Understand the definition, distribution and life cycle of amebiasis.
 - a. Definition: infection of the large intestines by the protozoa *Entamoeba* (E.) *histolytica*.
 - b. Distribution: worldwide.
 - c. Transmission and life cycle:
 - (1) Ingesting of cysts in contaminated water or food.
 - (2) Excystation in the small intestine.
 - (3) Released trophozoites carried into the colon, where they grow and multiply as commensals.
 - (4) Trophozoites penetrate the mucous membranes forming the following:
 - (a) Abscesses.
 - (b) Ulcers.
 - (c) Edema.
 - (d) Sloughing of large areas of mucosa.
 - (e) Extraintestinal amebiasis.
 - (5) Morphology of *E. histolytica* (two stages in man) is as follows:
 - (a) Cysts: found only in stools.
 - (b) Trophozoite: found in liquid stool and tissue.
2. Solicit a patient history.
3. Recognize significant subjective findings for amebiasis.
 - a. Intestinal amebiasis (acute amebic colitis).
 - (1) Amebic dysentery.
 - (a) Incubation is 8 to 10 days with sudden onset.
 - (b) Severe abdominal cramps.
 - (c) Chills, fever, nausea, and headache.
 - (d) Tenesmus.
 - (2) Nondysenteric intestinal amebiasis.
 - (a) Increased soft stools with intermittent constipation.
 - (b) Distention and flatulence.
 - (c) Increased fatigue.
 - b. Extraintestinal amebiasis may present with symptoms associated with the system that is affected.
 - (1) Perforation and peritonitis.
 - (2) Appendicitis.
 - (3) Amebic liver abscess.
4. Perform a PE.
5. Recognize significant objective findings for amebiasis.
 - a. Liquid stool with bloody mucous.
 - b. Fever.
 - c. Possible abdominal tenderness on deep palpation.

Performance Steps

6. Perform labs with the SF lab set.
7. Recognize significant lab findings that are caused by amebiasis.
 - a. Identification of trophozoite or cyst in stool specimen.
 - b. The most important assessment procedure in suspected liver abscess is a therapeutic trial of antiamebic drugs. The response is often dramatic within 3 days.
8. Differentiate between amebiasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Bacterial infections: shigellosis, salmonellosis, and so on.
 - b. Irritable bowel syndrome, diverticulitis, or regional enteritis.
9. Manage amebiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - a. For a patient who is asymptomatic and passing cysts, prescribe the following:
 - (1) Paromomycin 500 milligrams (mg) by mouth (PO) three times a day (t.i.d.) for (x) 7 days.
 - (2) An alternative is iodoquinol 650 mg t.i.d. x 20 days.
 - (3) Child dose: iodoquinol 40 mg per kilogram per day (mg/kg/day) in 3 equal doses x 20 days.
 - b. For a patient with diarrhea or dysentery, prescribe the following:
 - (1) Metronidazole 750 mg PO t.i.d. x 10 days followed by either paromomycin 500 mg PO t.i.d. x7 days or iodoquinol 650 mg t.i.d. x 20 days.
 - (2) An alternative is tinidazole (not available in the United States) 1 gram (g) PO every 12 hours (q12h) x 3 days followed by either paromomycin 500 mg PO t.i.d. x7 days or iodoquinol 650 mg t.i.d. x 20 days.
 - (3) Child dose is metronidazole 35 to 50 milligrams per kilogram (mg/kg) day in 3 divided doses x 10 days followed by iodoquinol 40 mg/kg/day in 3 equal doses x 20 days.
 - c. For patients with extraintestinal amebiasis, prescribe the following:
 - (1) Metronidazole 750 mg PO t.i.d. x 10 days followed by iodoquinol 650 mg t.i.d. x 20 days.
 - (2) Child dose is metronidazole 35 to 50 mg/kg/day in 3 divided doses x 10 days followed by iodoquinol 40 mg/kg/day in 3 equal doses x 20 days.
 - d. If possible, examine patient's stools 1, 3, and 6 months after treatment.
 - e. Manage complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Educate patients on measures to take to prevent amebiasis.
 - a. Boil water for longer than 10 minutes.
 - b. Wash fruit and vegetables in a strong detergent, and soak them in vinegar or acidic acid for 10 to 15 minutes.
12. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage amebiasis.

Performance Measures

1. Understood the definition, distribution, and life cycle of amebiasis.
2. Solicited a patient history.
3. Recognized significant subjective findings for amebiasis.
4. Performed a PE.
5. Recognized significant objective findings for amebiasis.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Performed lab tests with the SF lab set.	_____	_____
7. Recognized significant lab findings that are caused by amebiasis.	_____	_____
8. Differentiated between amebiasis and other diseases with similar signs and symptoms.	_____	_____
9. Managed amebiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Educated patients on measures to take to prevent amebiasis.	_____	_____
12. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

BATES PE, 8TH ED. 2002

Assess Endoparasitic Diseases

081-833-4275

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the cause of the disease.

Performance Steps

1. Understand general information about protozoal endoparasitic diseases that will lead to the discovery of their underlying cause.
 - a. Protozoa are the simplest of all animals.
 - b. Protozoa are microscopic in size and usually occur as single cells.
 - c. About 20 protozoa are capable of causing disease in man.
 - d. Protozoa are divided into four classes according to their means of locomotion.
 - (1) Sarcodina (pseudopods).
 - (2) Mastigophora (flagella).
 - (3) Ciliostoma (cilia).
 - (4) Sporozoa (nonmotile).
2. Understand general information about helminthic endoparasitic diseases that will lead to the discovery of their underlying cause.
 - a. Helminth is a Greek word meaning parasitic worm.
 - b. Helminths are either round worms or flat worms. They are divided into three major groups:
 - (1) Nematodes (round).
 - (2) Trematodes (flat, or flukes).
 - (3) Cestodes (flat, segmented, and ribbon-shaped, or tape worms).
 - c. In contrast to protozoans, helminths are more complex.
 - (1) Helminths are larger, multicellular organisms that have excretory, nervous, and reproductive systems.
 - (2) All helminths have a complex life cycle.
 - (3) Many helminths require at least one intermediate host and/or general developmental stages within the final host.
 - (4) Some have a tissue or blood migratory phase within the host, which generally results in a generalized immune response that causes eosinophilia.
3. Recognize the signs and symptoms of amebiasis.
 - a. Severe abdominal cramps.
 - b. Chills, fever, nausea, and headache.
 - c. Liquid stool with bloody mucous.
 - d. Tenesmus.

NOTE: Task 081-833-4020, Manage Amebiasis, provides more information on amebiasis.

4. Recognize the signs and symptoms of giardiasis.
 - a. Sudden onset of explosive, watery, malodorous diarrhea.
 - b. Abdominal distention and flatulence.
 - c. Nausea and anorexia.
 - d. Chronic stage could continue for many months, causing malabsorption, debility, and weight loss.

NOTE: Task 081-833-4019, Manage Giardiasis provides more information on giardiasis. For information on vector-borne endoparasitic diseases, see task 081-833-4248, Assess Vector-Borne Diseases, or the task for the specific disease process.

5. Recognize the signs and symptoms of ascariasis.
 - a. Shortness of breath.

Performance Steps

- b. Productive cough.
- c. Hemoptysis.
- d. Nausea.
- e. Anorexia and weight loss.
- f. Abdominal discomfort.
- g. Loose stools and diarrhea (sometimes with blood).
- h. Several worms may coil together if irritated by stimuli and form a bolus of worms leading to complete bowel obstruction.

NOTE: Task 081-833-4685, Manage Intestinal Nematodes, provides more information on ascariasis.

6. Recognize the signs and symptoms of enterobiasis.
 - a. Mainly asymptomatic.
 - b. Slight abdominal discomfort.
 - c. Loose stool or diarrhea with heavy worm load.
 - d. Perianal itching (nocturnal pruritis).
 - e. Perineal erythema and excoriation.
 - f. Vulvovaginitis (secondary complication in females).

NOTE: Task 081-833-4685, Manage Intestinal Nematodes, provides more information on enterobiasis.

7. Recognize the signs and symptoms of trichuriasis.
 - a. Abdominal pain or discomfort.
 - b. Nausea.
 - c. Diarrhea with occult blood.
 - d. Mild anemia (with heavy worm load).
 - e. Rectal prolapse common in children.

NOTE: Task 081-833-4685, Manage Intestinal Nematodes, provides more information on trichuriasis.

8. Recognize the signs and symptoms of ancylostomiasis and necatoriasis.
 - a. Erythema and edema.
 - b. Macular, papular, or vesicular lesions.
 - c. Intense local pruritis.
 - d. Rash lasting less than 2 weeks.
 - e. Shortness of breath.
 - f. Cough.
 - g. Hemoptysis.
 - h. Melena.

NOTE: Task 081-833-4685, Manage Intestinal Nematodes, provides more information on ancylostomiasis and necatoriasis.

9. Recognize the signs and symptoms of strongyloidiasis.
 - a. Abdominal pain (burning, epigastric, and colicky).
 - b. Nausea.
 - c. Diarrhea (mucoïd and bloody).
 - d. Distended abdomen.
 - e. Anemia.
 - f. Autoinfection.

NOTE: Task 081-833-4685, Manage Intestinal Nematodes, provides more information on strongyloidiasis.

10. Recognize the signs and symptoms of trichinosis.
 - a. Abdominal pain.
 - b. Nausea and vomiting.
 - c. Diarrhea.
 - d. Headache (HA), chills, and fever (low then to 104 degrees Fahrenheit).
 - e. Facial edema (periorbital and eyelids).
 - f. Conjunctivitis and subconjunctival hemorrhage.

Performance Steps

- g. Subungual splinter hemorrhages.

NOTE: Task 081-833-4277, Manage Tissue Nematodes, provides more information on trichinosis.

- 11. Recognize the signs and symptoms of schistosomiasis.
 - a. Acute fever, chills, and sweats (Katayama fever).
 - b. Headache and cough.
 - c. Abdominal pain.
 - d. Nausea and diarrhea.
 - e. Weight loss.
 - f. Chronic manifestations develop in accordance with affected systems.

NOTE: Task 081-833-4279, Manage Trematodes, provides more information on schistosomiasis.

- 12. Recognize the signs and symptoms of fascioliasis.
 - a. High fever.
 - b. Right upper quadrant (RUQ) pain with tenderness.
 - c. Hepatomegaly.
 - d. Leukocytosis with eosinophilia is often more than 80 percent.
 - e. Chronic infection may lead to liver and biliary cirrhosis or obstructive choleopathy (rare).

NOTE: Task 081-833-4279, Manage Trematodes, provides more information on fascioliasis.

- 13. Recognize the signs and symptoms of clonorchiasis.
 - a. Asymptomatic or acute presentation similar to fascioliasis.
 - b. Biliary manifestations with chronic infections.

NOTE: Task 081-833-4279, Manage Trematodes, provides more information on clonorchiasis.

- 14. Recognize the signs and symptoms of fasciolopsiasis.
 - a. Gastrointestinal (GI) irritation.
 - b. Nausea and anorexia.
 - c. Mucoïd diarrhea with intermittent constipation.
 - d. Ascites and edema of face and extremities.
 - e. Occasional intestinal obstruction, or ileus.

NOTE: Task 081-833-4279, Manage Trematodes, provides more information on fasciolopsiasis.

- 15. Recognize the signs and symptoms of paragonimiasis.
 - a. Initially, discomfort similar to that experienced with upper respiratory infection.
 - b. Productive cough.
 - c. Thick, tenacious brown-flaked sputum.
 - d. Hemoptysis.
 - e. Dyspnea.
 - f. Fever.
 - g. Night sweats.
 - h. Pleuritic chest pain.

NOTE: Task 081-833-4279, Manage Trematodes, provides more information on paragonimiasis.

- 16. Recognize the signs and symptoms of taeniasis.
 - a. Epigastric and umbilical pain.
 - b. Nausea.
 - c. Headache and dizziness.
 - d. Hunger sensation.
 - e. Weakness and weight loss.
 - f. If eggs of *Taenia* (T.) *solium* are ingested by man, the cysticerci encyst in tissues other than striated muscle (brain, heart, and eye). This leads to cysticercosis/cysticerciasis. Clinical manifestations are as follows:
 - (1) Central nervous system (CNS) signs and symptoms are as follows:
 - (a) Encephalomeningitis.
 - (b) Epileptic-type seizures.
 - (c) Paralysis.

Performance Steps

- (2) Cardiac signs and symptoms are as follows:
 - (a) Cardiac dysrhythmias.
 - (b) Valvular dysfunction.
 - (c) Congestive heart failure (CHF).
- (3) Ocular signs and symptoms are as follows:
 - (a) Retinal edema, or hemorrhage.
 - (b) Blurred vision.
 - (c) Blind spots in retina.

NOTE: Task 081-833-4684, Manage Cestodes, provides more information on taeniasis.

- 17. Recognize the signs and symptoms of diphyllbothriasis.
 - a. Mostly asymptomatic or same as taeniasis.
 - b. Vitamin B12 deficiency and pernicious anemia (*Diphyllbothrium* [D.] *latum* competes with host for B12 and folate).
 - c. CNS manifestations with vitamin B12 deficiency.

NOTE: Task 081-833-4684, Manage Cestodes, provides more information on diphyllbothriasis.

- 18. Record all findings in the patient's medical record.
- 19. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess endoparasitic diseases.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood general information about protozoal endoparasitic diseases that will lead to the discovery of their underlying cause.	—	—
2. Understood general information about helminthic endoparasitic diseases that will lead to the discovery of their underlying cause.	—	—
3. Recognized the signs and symptoms of amebiasis.	—	—
4. Recognized the signs and symptoms of giardiasis	—	—
5. Recognized the signs and symptoms of ascariasis.	—	—
6. Recognized the signs and symptoms of enterobiasis.	—	—
7. Recognized the signs and symptoms of trichuriasis.	—	—
8. Recognized the signs and symptoms of ancylostomiasis and necatoriasis.	—	—
9. Recognized the signs and symptoms of strongyloidiasis.	—	—
10. Recognized the signs and symptoms of trichinosis.	—	—
11. Recognized the signs and symptoms of schistosomiasis.	—	—
12. Recognized the signs and symptoms of fascioliasis.	—	—
13. Recognized the signs and symptoms of clonorchiasis.	—	—
14. Recognized the signs and symptoms of fasciolopsiasis.	—	—
15. Recognized the signs and symptoms of paragonimiasis.	—	—
16. Recognized the signs and symptoms of taeniasis.	—	—
17. Recognized the signs and symptoms of diphyllbothriasis.	—	—

Performance Measures

GO **NO GO**

18. Recorded all findings in the patient's medical record.

19. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

SANFORD, 1999

Manage Tissue Nematodes

081-833-4277

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with trichinosis.
 - a. Etiology: *Trichinella spiralis*.
 - b. General information:
 - (1) Very prevalent in underdeveloped countries.
 - (2) Worldwide distribution (except South Pacific Islands or Australia). Also includes northeastern and northwestern region of the United States.
 - (3) Adult worm is 1 to 3 millimeters (mm) in length.
 - (4) Life span is 1 to 2 weeks (but offspring remain).
 - (5) Mode of transmission is ingestion of undercooked contaminated meat (raw and smoked).
 - c. Life cycle:
 - (1) Intestinal phase lasts 1 to 7 days.
 - (a) Infected tissue is ingested (for example, pork, wild boar, bear, and walrus).
 - (b) Cysts in the meat are broken down by stomach acids, and larvae are released from cysts.
 - (c) Larvae mature to adult worms and then live in the mucosal villi of the small intestines.
 - (d) Gravid viviparous adult gives birth to larvae (5,000 to 15,000 offspring during 2-week life span).
 - (2) Invasion phase lasts 9 to 28 days.
 - (a) Larvae enter the bloodstream and migrate through blood.
 - (b) Larvae seek out tissue containing striated skeletal muscle.
 - (3) Muscle phase lasts 2 to 4 weeks.
 - (a) Larvae enter skeletal muscle tissue, encyst in muscle fibers, and grow to 1 mm.
 - (b) Skeletal muscles often involved are eye muscles, tongue, neck, limb flexors, masseters, larynx, diaphragm, and lumbar flexors.
 - (c) Host's immune response encapsulates the cysts.
 - (d) Encapsulated cysts remain in tissue and eventually become calcified after several years. Man is a dead-end host.
2. Solicit a patient history.
3. Recognize significant subjective findings for trichinosis.
 - a. In the intestinal phase, the patient may complain of the following:
 - (1) Abdominal pain or discomfort.
 - (2) Nausea.
 - (3) Diarrhea.
 - b. In the invasion phase, the patient may complain of the following:
 - (1) Headache.
 - (2) Chills.
 - (3) Anorexia.

Performance Steps

- c. In the muscle phase, the patient may complain of the same symptoms present in the invasion phase plus the following:
 - (1) Myalgia with movements such as chewing, looking, or talking.
 - (2) Malaise.
4. Perform a PE.
5. Recognize significant objective findings for trichinosis.
 - a. In the intestinal phase, the patient may present with the following:
 - (1) Vomiting.
 - (2) Low-grade fever.
 - (3) Enteritis.
 - b. In the invasion phase, the patient may present with the following:
 - (1) Fever (low at first and then rising to 104 degrees Fahrenheit).
 - (2) Facial edema (periorbital and eyelids).
 - (3) Conjunctivitis and subconjunctival hemorrhage.
 - (4) Subungual splinter hemorrhages.
 - c. In the muscle phase, the patient may present with the following:
 - (1) Myositis.
 - (2) Tenderness on palpation.
 - (3) Cutaneous maculopapular rash with petechia and/or urticaria over involved muscles.
6. Recognize lab findings that are caused by trichinosis.
 - a. White blood cell with differential will show eosinophilia.
 - b. Muscle biopsy will be positive for larval cysts.
7. Recognize significant complications that may develop during the invasion phase of trichinosis.
 - a. Encephalitis or meningitis with larval involvement in the central nervous system.
 - b. Myocarditis, congestive heart failure, or dysrhythmias with larval damage to heart.
8. Manage trichinosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - a. Drug of choice (DOC) is albendazole 400 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for (x) 14 days with concomitant prednisone 40 to 60 mg PO every day (q.d.).
 - b. Alternate is mebendazole 5 milligrams per kilogram (mg/kg) PO b.i.d. x 10 to 13 days with concomitant prednisone 40 to 60 mg PO q.d.
9. Manage complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage tissue nematodes.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with trichinosis.	—	—
2. Solicited a patient history.	—	—
3. Performed a PA.	—	—
4. Recognized significant subjective findings for trichinosis.	—	—
5. Recognized significant objective findings for trichinosis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Recognized lab findings that are caused by trichinosis.	_____	_____
7. Recognized significant complications that may develop during the invasion phase of trichinosis.	_____	_____
8. Managed trichinosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
9. Managed complications symptomatically with appropriate supportive care.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED SANFORD, 1999	

Manage Trematodes

081-833-4279

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with schistosomiasis (bilharziasis).

NOTE: Steps 1 through 7 pertain to schistosomiasis.

a. Etiology:

- (1) *Schistosoma mansoni* (*S. mansoni*) (Figure 1).



Figure 1. *Schistosoma* Mansoni

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- (2) *Schistosoma japonicum* (*S. japonicum*) (Figure 2).

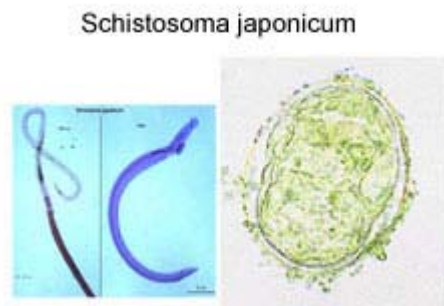


Figure 2. *Schistosoma* Japonicum

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- (3) *Schistosoma haematobium* (*S. haematobium*) (Figure 3).

Performance Steps

Schistosoma hematobium



Figure 3. *Schistosoma Haematobium*

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b. General information:

- (1) Worldwide distribution (but not in the United States). It is considered a major world public health problem.
- (2) All species require freshwater snails as an intermediate host.
- (3) Adult flukes are 1 1/2 centimeters (cm) in length.
- (4) Life span is 20 years.
- (5) Mode of transmission is skin penetration and occurs where people drink, bathe, wash clothes, and so on in contaminated water.

c. Life cycle:

- (1) Victim has contact with freshwater contaminated with cercariae larvae.
- (2) Cercariae penetrate into intact skin which results in a local transient dermatitic rash ("Swimmer's itch").
 - (a) Penetration occurs within a few minutes.
 - (b) Rash appears in less than 24 hours and resolves in 7 to 10 days.
- (3) Larvae eventually enter bloodstream and migrate to the heart, lungs, and then liver (3- to 6-day migration) where they mature into adult worms (4 to 6 weeks).
- (4) Adult worms then migrate to the venous vascular system of their target organs as their final habitat.
 - (a) *S. mansoni* affects liver and mesentery.
 - (b) *S. japonicum* affects liver and mesentery.
 - (c) *S. haematobium* affects urinary bladder.
- (5) Gravid oviparous female lays eggs. The eggs are embedded in the wall of target organs and 50 percent are swept upstream in blood and are enlodged in liver microvasculature.
- (6) Large percentage of eggs are encapsulated by granuloma.
- (7) Eggs pass into lumen of the target organ and are passed in feces (*S. mansoni* and *S. japonicum*) and urine (*S. haematobium*).
- (8) Eggs hatch in freshwater, and larvae enter the snail.
- (9) Snail discharges cercariae larvae.

2. Solicit a patient history.

3. Recognize significant subjective findings for schistosomiasis.

- a. Initially, the patient will complain of intense pruritus.
- b. During the liver phase, patients will complain of the following:
 - (1) Headache.
 - (2) Nausea.

Performance Steps

- (3) Abdominal pain.
 - (4) History of weight loss.
 4. Perform a PE.
 5. Recognize significant objective findings for schistosomiasis.
 - a. Local erythema.
 - b. Maculopapular lesions.
 - c. Acute fever, chills, and sweats (Katayama fever).
 - d. Diarrhea.
 - e. Enlarged lymph nodes.
 - f. Chronic manifestations develop in accordance with (IAW) affected systems.
 - (1) Hepatomegaly and splenomegaly.
 - (2) Portal hypertension.
 - (3) Ascites (*S. mansoni*).
 - (4) Hemorrhoids (*S. japonicum*).
 - (5) Esophageal varices.
 - (6) Eventual liver dysfunction.
 - (7) Dysuria.
 - (8) Hematuria.
 - (9) Cystitis (*S. haematobium*).
 - (10) Glomerulonephritis.
 - (11) Hydronephrosis.
 - (12) Eventual renal failure.
 6. Recognize significant lab findings that are caused by schistosomiasis.
 - a. Ova and parasites (O&P) examination (exam) of stool will be positive for ova with *S. mansoni* and *S. japonicum*.
 - b. Stool guaiac will be positive for occult blood.
 - c. Urinalysis (UA) will be positive for ova and hematuria with *S. haematobium*.
 - d. WBC with differential will demonstrate eosinophilia.
 7. Manage schistosomiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. For *S. haematobium*, give praziquantel 20 milligrams per kilogram (mg/kg) by mouth (PO) twice daily (b.i.d.) for (x) 1 day.
 - b. For *S. japonicum*, give praziquantel 20 mg/kg PO three times a day (t.i.d.) X 1 day.
 - c. For *S. mansoni*, give praziquantel 20 mg/kg PO b.i.d. x 1 day. With praziquantel resistance, give oxamniquine 1 dose of 15 mg/kg PO. In North and East Africa, give 20 mg/kg PO every day (q.d.) x 3 days.
 - d. For schistosome dermatitis, give with topical corticosteroids and parenteral antihistamines.
 - e. For Katayama fever, give PO anti-inflammatory and antipyretics. Administer parenteral antihistamines and corticosteroids for life-threatening illness.
- NOTE: Steps 8 through 14 pertain to fascioliasis.
8. Understand the definitions, etiology, and pathophysiology associated with fascioliasis.
 - a. Etiology: *Fasciola* (F.) *hepatica* (sheep liver fluke) (Figure 4).

Performance Steps

Fasciola hepatica



Figure 4. Fasciola Hepatica

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- b. General information:
 - (1) Found primarily in Latin America and the Mediterranean.
 - (2) Adult flukes are 3 cm in length.
 - (3) Life span is many years.
 - (4) Mode of transmission is ingestion of uncooked aquatic plants (for example, watercress, bamboo shoots, and water chestnuts). The reservoir is sheep, cattle, and other herbivores and omnivores.
- c. Life cycle:
 - (1) Vegetables are contaminated with metacercariae, and larvae are ingested.
 - (2) Larvae penetrate intestinal wall and migrate through peritoneal cavity to the liver.
 - (3) Larvae penetrate liver tissue and enter the biliary ducts where they mature and habitat. Clinical manifestations may be acute or asymptomatic.
 - (4) Eggs passed in feces and hatch. The larvae infect freshwater snails. The snails discharge metacercariae larvae, which encyst on aquatic plants.
9. Solicit a patient history.
10. Recognize significant subjective findings for fascioliasis.
 - a. Patients may be asymptomatic.
 - b. Patients may complain of right upper quadrant (RUQ) pain.
11. Perform a PE.
12. Recognize significant objective findings for fascioliasis.
 - a. High fever.
 - b. RUQ pain with tenderness on palpation.
 - c. Hepatomegaly.
 - d. Chronic infection may lead to liver and biliary cirrhosis or obstructive choleopathy (rare).
13. Recognize significant lab findings that are caused by fascioliasis.
 - a. Leukocytosis with eosinophilia are often greater than 80 percent.
 - b. O&P exam of the stool will be positive for ova.
14. Manage fascioliasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Drug of choice (DOC) is bithionol (lorothidol) 30 to 40 mg/kg (maximum dose of 2 grams [g] per day) PO b.i.d. every other day (qod) x 30 days (administer [adm] 15 of 30 days).
 - b. Alternate drug is triclabendazole 10 mg/kg PO x 1 dose.

Performance Steps

NOTE: Steps 15 through 21 pertain to clonorchiasis.

15. Understand the definitions, etiology, and pathophysiology associated with clonorchiasis.
 - a. Etiology: *Clonorchis sinensis*.
 - b. General information:
 - (1) Endemic in the Far East and Southeast Asia. There is an estimated 20 million infections worldwide.
 - (2) Adult flukes are 1 to 2 1/2 cm in length.
 - (3) Life span is 30 years.
 - (4) Mode of transmission is ingestion of raw or undercooked freshwater fish (that is, sushi, sushimi, cevichi, and smoked fish). The reservoir is dogs, cats, and other piscivores.
 - c. Life cycle:
 - (1) Fish infected with encysted larvae is ingested.
 - (2) Larvae are released and migrate through or to the biliary ducts where they mature to adult worms and habitat.
 - (3) Eggs are passed in feces. Eggs are ingested by freshwater snail, snail discharges cercariae larvae, and larvae penetrate tissue of fish and encyst.
16. Solicit a patient history.
17. Recognize significant subjective findings for clonorchiasis.
 - a. Patient may be asymptomatic.
 - b. Abdominal pain
18. Perform a PE.
19. Recognize significant objective findings for clonorchiasis. With acute presentation, patient will have the following:
 - a. High fever.
 - b. RUQ pain with tenderness on palpation.
 - c. Hepatomegaly.
20. Recognize significant lab findings that are caused by clonorchiasis.
 - a. O&P exam of stool will be positive for ova.
 - b. White blood cell count with differential will show eosinophilia.
21. Manage clonorchiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC is praziquantel 25 mg/kg PO b.i.d. x 1 day.
 - b. Alternate drug is bithionol 30 to 40 mg/kg (maximum dose of 2 g per day) PO b.i.d. qod x 30 days (adm 15 of the 30 days).

NOTE: Steps 22 through 28 pertain to Fasciolopsiasis.

22. Understand the definitions, etiology, and pathophysiology associated with fasciolopsiasis.
 - a. Etiology: *Fasciolopsis buski* (giant intestinal fluke).
 - b. General information:
 - (1) Found primarily in China and Southeast Asia. About 10 million are infected annually.
 - (2) Adult flukes are 2 to 7 1/2 centimeters (cm) in length.
 - (3) Life span is 6 months.
 - (4) Mode of transmission is ingestion of undercooked aquatic plants. The reservoir is pigs, dogs, other omnivores and herbivores.
 - c. Life cycle:
 - (1) Vegetables are contaminated with metacercariae, larvae are ingested, larvae are released and mature in 3 months, and larvae attach to the wall of the small intestines and habitat.

Performance Steps

- (2) Eggs are passed in feces and hatch. Miracidium larvae penetrate freshwater snail, and snail discharges metacercariae, which encyst on aquatic plants.
 23. Solicit a patient history.
 24. Recognize significant subjective findings for fasciolopsiasis.
 - a. Abdominal pain.
 - b. Nausea.
 - c. Anorexia.
 - d. Mucoid diarrhea with intermittent constipation.
 25. Perform a PE.
 26. Recognize significant objective findings for fasciolopsiasis.
 - a. Abdominal guarding on deep palpation.
 - b. Ascites (edema of the face and extremities).
 - c. Occasional intestinal obstruction.
 27. Recognize significant lab findings that are caused by fasciolopsiasis.
 - a. O&P exam of stool will be positive for ova.
 - b. WBC count with differential will show occasional eosinophilia.
 28. Manage fasciolopsiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC is praziquantel 25 mg/kg PO t.i.d. x 1 day.
 - b. Alternate drug is niclosimide (yomesan) 2 g PO qod x 3 doses.
- NOTE: Steps 29 through 35 pertain to hetrophyiasis and metagonimiasis.
29. Understand the definitions, etiology, and pathophysiology associated with hetrophyiasis and metagonimiasis.
 - a. Etiology:
 - (1) Heterophyes (H. heterophyes).
 - (2) Metagonimus (M. yokogawai).
 - b. General information:
 - (1) Both found in Japan, China, Korea, Philippines, and Israel.
 - (a) H. heterophyes also is found in the Nile Delta and India.
 - (b) M. yokogawai also is found in Indochina, Spain, and Russia.
 - (2) Adult flukes are 1 to 2 mm in length
 - (3) Life span is 2 months.
 - (4) Mode of transmission is ingestion of raw or undercooked freshwater (or brackish) fish. The reservoir is dogs, cats, and other piscivores.
 - c. Life cycle:
 - (1) Fish contaminated with cercariae is ingested, larvae are released, larvae mature, and larvae attach to the mucosa of the small intestines where they habitat.
 - (2) Eggs are passed in feces, eggs are ingested by freshwater snail, snail discharges cercariae larvae, and cercariae penetrate and encyst in tissue of freshwater fish.
 30. Solicit a patient history.
 31. Recognize significant subjective findings for hetrophyiasis and metagonimiasis.
 - a. Asymptomatic with light worm load.
 - b. Abdominal discomfort and tenderness (similar to that of peptic ulcer disease [PUD]).
 - c. Nausea and anorexia.
 - d. Weight loss.
 32. Perform a PE.

Performance Steps

33. Recognize significant objective findings for hetrophyiasis and metagonimiasis.
 - a. Possible guarding with deep abdominal palpation.
 - b. Chronic intermittent mucoid diarrhea.
 34. Recognize significant lab findings that are caused by malaria.
 - a. Occasional eosinophilia.
 - b. O&P exam of stool will be positive for ova.
 35. Manage hetrophyiasis and metagonimiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC is praziquental 25 mg/kg PO t.i.d. x 1day.
 - b. Alternate drug is niclosamide, which is administered the same as for Fasciolopsiasis.
- NOTE: Steps 36 through 42 pertain to paragonimiasis.
36. Understand the definitions, etiology and pathophysiology associated with paragonimiasis.
 - a. Etiology: Paragonimus (P.) westermani (Figure 5).

Paragonimus westermani



Figure 5. Paragonimus Westermani

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- b. Other human lung flukes are less common.
 - (1) Paragonimus kellicotti (P. kellicotti) (Canada and eastern United States).
 - (2) Paragonimus africanus (P. africanus) (Africa).
 - (3) Paragonimus peruviana (P. peruviana) (Central and South America).
 - (4) Paragonimus miyazakii (P. miyazakii) (Japan).
 - (5) All present clinically with pulmonary manifestations.
 - (6) Treatment is same as for P. westermani.
- c. General information:
 - (1) P. westermani is found throughout the Far East, West Africa, South Asia, Central America, and northern part of South America. It is the most widely distributed lung fluke (an estimated 3 million infected worldwide).
 - (2) Adult fluke is 8 to 16 mm in length.
 - (3) Life span is 20 years (average is 6 to 7 years).
 - (4) Mode of transmission is ingestion of undercooked freshwater crustaceans (that is, crayfish and crabs) or snails. The reservoir is cats, dogs, weasels, hogs, and other carnivores.
- d. Life cycle:
 - (1) Crustacean contaminated with cercariae is ingested.
 - (2) Larvae are released and penetrate intestinal wall.
 - (3) Larvae migrate through peritoneal cavity to RUQ or left upper quadrant (LUQ).
 - (4) Larvae penetrate diaphragm and enter thoracic cavity.
 - (5) Larvae penetrate pleura and enter lung tissue.

NOTE: Patient is normally asymptomatic during this migration phase.

Performance Steps

- (6) Larvae become encapsulated by granuloma formation, which forms a cyst (2 cm), and larvae mature in 5 to 6 weeks.
 - (7) Eggs are passed in sputum and feces (if sputum is swallowed).
 - (8) Eggs hatch, miracidia larvae penetrate freshwater snail, snail discharges cercariae larvae, and cercariae invade crustaceans and encyst in tissue.
37. Solicit a patient history.
 38. Recognize significant subjective findings for paragonimiasis.
 - a. Initially, patient has discomfort similar to that of an upper respiratory infection (URI).
 - b. Night sweats.
 - c. Pleuritic chest pain.
 - d. Dyspnea.
 39. Perform a PE.
 40. Recognize significant objective findings for paragonimiasis.
 - a. Productive cough.
 - b. Thick, tenacious brown-flaked sputum.
 - c. Hemoptysis.
 - d. Fever.
 - e. Secondary manifestations of bronchitis, bronchiectasis, bronchopneumonia, lung abscess, and pleural effusions (empyema) are common.
 - f. Ectopic infections occur occasionally in the intestines or brain and other sites.
 - g. GI manifestations or CNS dysfunction.
 41. Recognize significant lab findings that are caused by paragonimiasis.
 - a. O&P exam of sputum and stool will be positive for ova.
 - b. WBC count with differential will be positive for eosinophils.
 - c. Chest X ray may show patchy or cloudy infiltrates or nodules, abscess, or pleural effusion.
 42. Manage paragonimiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC is praziquantal 25 mg/kg PO t.i.d. x 2 days.
 - b. Alternate drug is bithionol, which is administered the same as for Fascioliasis.
 43. Manage complications symptomatically with appropriate supportive care.
 44. Record all treatment in the patient's medical record.
 45. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a trematode infestation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with schistosomiasis (bilharziasis).	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for schistosomiasis.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for schistosomiasis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Recognized significant lab findings that are caused by schistosomiasis.	—	—
7. Managed schistosomiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
8. Understood the definitions, etiology, and pathophysiology associated with fascioliasis.	—	—
9. Recognized significant subjective findings for fascioliasis.	—	—
10. Recognized significant objective findings for fascioliasis.	—	—
11. Recognized significant lab findings that are caused by fascioliasis.	—	—
12. Managed fascioliasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
13. Understood the definitions, etiology, and pathophysiology associated with clonorchiasis.	—	—
14. Recognized significant subjective findings for clonorchiasis.	—	—
15. Recognized significant objective findings for clonorchiasis.	—	—
16. Recognized significant lab findings that are caused by clonorchiasis.	—	—
17. Managed clonorchiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
18. Understood the definitions, etiology, and pathophysiology associated with fasciolopsiasis.	—	—
19. Recognized significant subjective findings for fasciolopsiasis.	—	—
20. Recognized significant objective findings for fasciolopsiasis.	—	—
21. Recognized significant lab findings that are caused by fasciolopsiasis.	—	—
22. Managed fasciolopsiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
23. Understood the definitions, etiology, and pathophysiology associated with hetrophyiasis and metagonimiasis.	—	—
24. Recognized significant subjective findings for hetrophyiasis and metagonimiasis.	—	—
25. Recognized significant objective findings for hetrophyiasis and metagonimiasis.	—	—
26. Recognized significant lab findings that are caused by hetrophyiasis and metagonimiasis.	—	—
27. Managed hetrophyiasis and metagonimiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
28. Understood the definitions, etiology, and pathophysiology associated with paragonimiasis.	—	—
29. Recognized significant subjective findings for paragonimiasis.	—	—
30. Recognized significant objective findings for paragonimiasis.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
31. Recognized significant lab findings that are caused by paragonimiasis.	_____	_____
32. Managed paragonimiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
33. Managed complications symptomatically with appropriate supportive care.	_____	_____
34. Recorded all treatment in the patient's medical record.	_____	_____
35. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLOGY

Manage Cestodes

081-833-4684

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiologies, and pathophysiologies associated with cestode infestations.
 - a. All cestodes have a similar anatomy.
 - (1) Scolex ("head") is organ of attachment.
 - (2) Acetabula and bothria (sucking cups) means of attachment.
 - (3) Rostellum (hooklets) are additional means of attachment. Only certain species have this.
 - (4) Neck (inferior to scolex) is where segments develop.
 - (5) Proglottids (individual segments) are each self-performing of all life functions and each are self-motile.
 - (6) Strobila ("body") is formed by all the longitudinally attached proglottids.
 - (7) Egg forms for all species of cestodes have "hexacanth oncosphere" (six-hooked) mouth parts that are visible through the embryonic envelope (egg shell).
 - b. Cestodes do not have a digestive system. Nutrients from the host are absorbed through the walls of the proglottids.
 - c. Cestodes are hermaphroditic; that is, they have one set and, in some species, two sets of reproductive organs per each proglottid.
 - d. Specifics of taenia species:
 - (1) *Taenia saginata* (*T. saginata*) (beef tapeworm) and *Taenia solium* (*T. solium*) (pork tapeworm). *Taenia* species has a worldwide distribution and is common where it is customary to eat rare beef or pork.
 - (2) *T. saginata* (Africa, Middle East, Latin America, South Asia, and Japan) (Figure 1).

Taenia saginata



Figure 1. *Taenia Saginata*

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- (3) *T. solium* (Latin America, Southeast Asia, China, India, and Iberia) (Figure 2).

Performance Steps

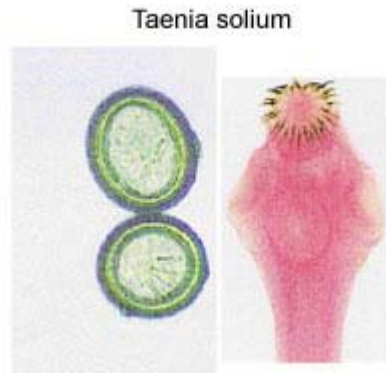


Figure 2. Taenia Solium

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- (4) Well controlled in the United States.
 - (5) Adult worms vary in length as follows:
 - (a) *T. saginata* are 5 to 12 meters.
 - (b) *T. solium* are 3 to 7 meters.
 - (6) Life span is 25 years.
 - (7) Mode of transmission is ingestion of undercooked meat.
 - (a) *T. saginata* (beef, camel, and other herbivores).
 - (b) *T. solium* (pork, wild boar, and other omnivores).
 - (8) Life cycle:
 - (a) Meat contaminated with encysted cysticercus is ingested.
 - (b) Cyst is dissolved, thus releasing scolex.
 - (c) Scolex attaches to the wall of the small intestines.
 - (d) Scolex grows into a mature tapeworm in 5 to 12 weeks. Proglottids develop one at a time at the neck, forming the strobila up through maturity or gravidity.
 - (e) Eggs are passed in feces, or the gravid proglottid detaches from the strobila, leaves the host (via anus), and ruptures, releasing eggs into the soil.
 - (f) Eggs are ingested by intermediate host, eggs hatch in gastrointestinal (GI) tract, oncospheres are released, oncospheres penetrate wall of intestines, oncospheres migrate to tissues (via blood), oncospheres develop and produce cysticerci that grow and encyst in tissues (size 4 to 10 millimeters [mm]).
 - (g) If eggs of *T. solium* are ingested by man, the same cycle as noted in (f) will occur. However, the cysticerci encyst in tissues other than striated muscle (brain, heart, or eye). This leads to a disease called cysticercosis/cysticerciasis.
- e. Specifics of *diphyllobothrium latum* (fish tapeworm).
- (1) Worldwide distribution occurs in temperate and subarctic lake regions (for example, Baltic's, Scandinavia, Canada, Alaska, and Russia).
 - (2) Large, broad tapeworm that is about 10 meters in size.
 - (3) Life span is many years
 - (4) Mode of transmission is ingestion of undercooked freshwater fish.
 - (5) Life cycle:
 - (a) Fish contaminated with plerocercoid larva is ingested.
 - (b) Larvae attach to wall of small intestines.
 - (c) Scolex matures, develops proglottid, and forms the strobila.
 - (d) Eggs are passed in feces. Proglottids do not detach from strobila, but pass eggs through a uterine pore.
 - (e) Eggs hatch, larvae are eaten by copepod crustacean, larvae develop in the crustacean, crustacean is eaten by freshwater fish, larvae migrate and lodge in muscle fibers, and larvae develop into infective stage.

Performance Steps

f. Other tapeworms that infect man are rare and inconsequential.

(1) *Hymenolepis nana* (dwarf tapeworm) is 2 inches long (Figure 3).

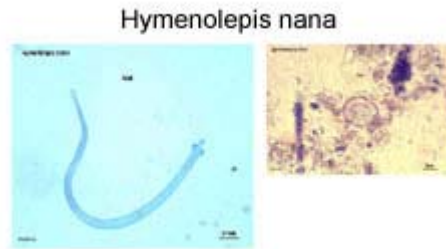


Figure 3. *Hymenolepis Nana*

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(2) *Hymenolepis diminuta* (Figure 4).

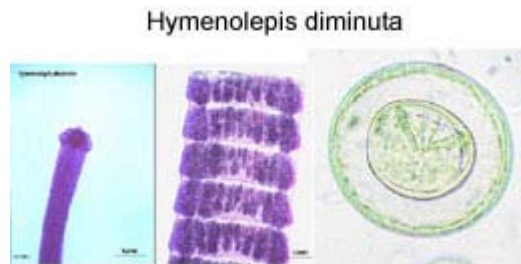


Figure 4. *Hymenolepis Diminuta*

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2. Solicit a patient history.
3. Recognize significant subjective findings for cestode infestation.
 - a. During the adult worm phase of taeniasis, patients will complain of the following:
 - (1) Epigastric or umbilical pain.
 - (2) Nausea.
 - (3) Headache and dizziness.
 - (4) Hunger sensation or increased appetite.
 - (5) Weakness and weight loss.
 - (6) Constipation or diarrhea.
 - (7) History of passing proglottid in stool.
 - b. With cysticercosis/cysticerciasis, patients may complain of the following:
 - (1) Epileptic-type seizures with central nervous system (CNS) involvement.
 - (2) Heart palpitations with cardiac involvement.
 - (3) Blurred vision or blind spots with ocular involvement.
 - c. With diphyllorhynchiasis, patients are usually asymptomatic, but may complain of symptoms similar to those of taeniasis.
4. Perform a PE.
5. Recognize significant objective findings for cestode infestation.
 - a. During the adult worm phase of taeniasis, patients will present with:
 - (1) General debilitation.
 - (2) Possible abdominal guarding on deep palpation.
 - b. With cysticercosis/cysticerciasis, patients may present with the following:

Performance Steps

- (1) CNS presentation is as follows:
 - (a) Encephalomeningitis.
 - (b) Epileptic-type seizures.
 - (c) Paralysis.
- (2) Cardiac presentation is as follows:
 - (a) Cardiac dysrhythmias.
 - (b) Valvular dysfunction.
 - (c) Congestive heart failure (CHF).
- (3) Ocular presentation is as follows:
 - (a) Retinal edema or hemorrhage.
 - (b) Blurred vision.
 - (c) Blind spots in retina.
- c. With diphyllbothriasis, patients usually have a clinical presentation similar to that of taeniasis except for the following:
 - (1) Vitamin B12 deficiency, resulting in pernicious anemia (*Diphyllbothrium latum* [D.latum] competes with host for B12 and folate).
 - (2) CNS manifestations with vitamin B12 deficiency.
6. Perform lab tests with the SF lab set.
7. Recognize significant lab findings that are caused by cestode infestation.
 - a. With taeniasis, the following findings are seen:
 - (1) Ova and parasites (O&P) examination (exam) of the stool will be positive.
 - (2) Scotch tape preparation may show proglottids.
 - (3) Eosinophilia is a rare finding.
 - b. With diphyllbothriasis, the following findings are seen:
 - (1) O&P exam of the stool will be positive.
 - (2) White blood cell count with differential will frequently show slight eosinophilia.
 - (3) Red blood cell morphology will show macrocytic, hyperchromic RBCs.
8. Manage cestode infestations on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. For all general cestode infestations, the drug of choice (DOC) is praziquantel 10 milligrams per kilogram (mg/kg) by mouth (PO) for (x) 1 dose for children and adults.
 - b. For cerebral cysticercosis, give praziquantel 50 milligrams per kilogram per day (mg/kg/day) PO in 3 equal doses x 15 days. Dexamethasone with or without seizure medications may be needed to control inflammation from cyst death.
9. Manage complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a cestode infestation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiologies, and pathophysiologies associated with cestode infestations.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for cestode infestation.	—	—
4. Performed a PE.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Recognized significant objective findings for cestode infestation.	_____	_____
6. Performed labs with the SF lab set.	_____	_____
7. Recognized significant lab findings that are caused by cestode infestation.	_____	_____
8. Managed cestode infestations on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
9. Managed complications symptomatically with appropriate supportive care.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLOGY

Manage Intestinal Nematodes

081-833-4685

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) set, the Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the etiology, distribution, and life cycle associated with ascariasis.
 - a. Etiology: *Ascaris lumbricoides* (Figure 1).

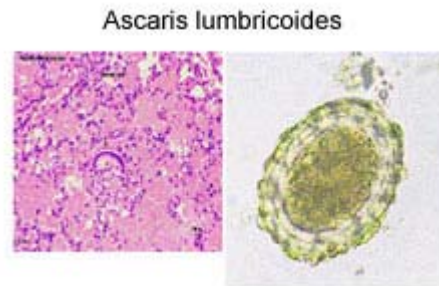


Figure 1. *Ascaris Lumbricoides*

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- b. Distribution:
 - (1) Most widely distributed helminth, as it is distributed worldwide.
 - (2) Highly prevalent in tropical and subtropical regions (including southeastern part of the United States [U.S.]).
 - (3) Most common in poor urban communities where poor sanitation exists and incidence of infection increases during rainy season.
- c. Color: whitish, yellowish, or reddish in color.
- d. Largest roundworm that infects man. It can be up to 2,035 centimeters (cm) in length.
- e. Life span: Adult lives 1 year.
- f. Mode of transmission: oral-fecal route.
- g. Life cycle is as follows:
 - (1) Infective (fertilized) eggs are ingested by host.
 - (2) Eggs hatch in small intestines of host and release larvae.
 - (3) Larvae penetrate intestinal wall and enter bloodstream.
 - (4) Larvae migrate to lungs via bloodstream. Body reacts with eosinophilia (30 to 50 percent).
 - (5) Larvae enter alveoli, where molting occurs (1 to 2 weeks).
 - (6) Larvae ascend trachea (larvae 1 to 1.5 mm long). This occurs often at night and during sleep.
 - (7) Larvae are swallowed by host (often subconsciously).
 - (8) Larvae reenter gastrointestinal (GI) tract and mature into adult worms. Larvae develop in 2 months. Adult worms live in the lumen of the small intestines.
 - (9) Adult worms sometimes migrate through the alimentary canal and GI tract.
 - (10) Gravid adult lays 200,000 eggs per day per worm.
 - (11) Eggs are passed in feces.
 - (12) Eggs develop (fertilize) in soil in 5 to 10 days.

Performance Steps

- (a) Eggs are infective.
 - (b) Eggs are very resilient to cold and dry climate.
 - (c) Direct, hot sunlight kills the eggs.
 - (d) Eggs survive for less than or equal to 1 year (optimum).
 2. Solicit a patient history.
 3. Recognize significant subjective findings for ascariasis.
 - a. During the pulmonary phase, the patient may complain of the following:
 - (1) Shortness of breath.
 - (2) Productive cough.
 - (3) Hemoptysis.
 - b. During the intestinal phase, the patient may complain of the following:
 - (1) Nausea.
 - (2) Anorexia and weight loss.
 - (3) Abdominal discomfort.
 - (4) Loose stools and diarrhea (sometimes with blood).
 - (5) Distended abdomen.
 - (6) Adult worms sometimes migrate through the alimentary canal and GI tract. Patients may have a history of worms protruding from the mouth, nose, or anus, or a history of worms passed in stool.
 4. Perform a PE.
 5. Recognize significant objective findings for ascariasis.
 - a. Abdominal guarding or tenderness on deep palpation of affected area.
 - b. Positive Guaiac on rectal examination (exam).
 - c. Possible wheezes during the pulmonary phase.
 6. Perform lab tests with the SF lab set.
 7. Recognize significant lab findings that are caused by ascariasis.
 - a. Ova and parasites (O&P) exam of stool will be positive for ova.
 - b. Larvae may be found during microscopic exam of the sputum during the pulmonary phase.
 - c. White blood cell (WBC) count with differential will show eosinophilia.
- NOTE: With concurrent infections always treat ascariasis first.
8. Manage ascariasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Primary drug is albendazole 400 milligrams (mg) by mouth (PO) for (x) 1 dose OR mebendazole 100 mg PO twice daily (b.i.d.) x 3 days.
 - b. Alternate drug is pyrantel pamoate 11 milligrams per kilogram (mg/kg) PO x 1 dose (maximum of 1 gram [g]).
- NOTE: If intestinal obstruction is suspected, use piperazine citrate 75 mg/kg to maximum dose of 3.5 g every day (q.d.) for 2 days.
9. Recognize complications of adult migration as follows:
 - a. Biliary obstruction.
 - (1) Colicky pain in right upper quadrant (RUQ).
 - (2) Nausea and vomiting.
 - (3) Jaundice (rare).
 - (4) Appendicitis.
 - b. If irritated by stimuli, several worms may coil together and form a bolus of worms, leading to complete bowel obstruction.
 - (1) Abdominal pain and cramps.
 - (2) Nausea and vomiting.

Performance Steps

- (3) Fecal breath.
- (4) Distended abdomen.
- (5) Absent bowel sounds.
- (6) Ileus.

NOTE: Steps 10 through 14 pertain to enterobiasis.

- 10. Understand the etiology, distribution, and life cycle associated with enterobiasis (pinworm, or seatworm).
 - a. Etiology: *Enterobius vermicularis* (Figure 2).

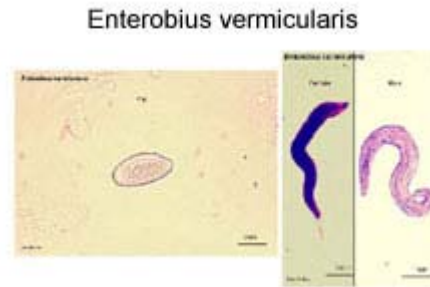


Figure 2. *Enterobius Vermicularis*

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- (1) Most common helminthic infection.
- (2) Highly prevalent in temperate zones (including U.S.).
- (3) Very common in children.
- (4) Human parasite only. Animals do not contract this disease.
- (5) Worms are 1cm in length and whitish in color.
- (6) Life span is 1 month.
- (7) Mode of transmission is oral-fecal route.
- b. Life cycle is as follows:
 - (1) Infective eggs are ingested.
 - (2) Eggs hatch in small intestines, and larvae are released.
 - (3) Larvae migrate to ileum and molt or mature (40 days).
 - (4) Adults migrate to the cecum.
 - (5) Gravid female migrates to perianal region to lay eggs 10,000 per day outside the host body. This usually occurs at night during sleep.
 - (6) Eggs become infective within 6 hours.
 - (7) Eggs adhere to perineum, cloths, bed linen, and fingers.
 - (8) Eggs are very resilient and can survive 1 to 2 weeks under optimum conditions.
- 11. Recognize significant subjective findings for enterobiasis.
 - a. During the adult infestation of the cecum, the patient may complain of the following:
 - (1) Slight abdominal discomfort.
 - (2) Loose stool or diarrhea with a heavy worm load.
 - (3) This stage is usually asymptomatic.
 - b. During active egg laying, the patient may complain of the following:
 - (1) Perianal itching (nocturnal pruritis).
 - (2) Vaginal itching or irritation in females.
 - (3) Symptoms of appendicitis on rare occasions where adult worm invades the appendix.
- 12. Recognize significant objective findings for enterobiasis.
 - a. Abdominal guarding on deep palpation.
 - b. Perineal erythema and excoriation.
 - c. Vulvovaginitis as a secondary complication in females.

Performance Steps

- d. With appendicitis, signs will be similar to those for appendicitis of other causes.

13. Recognize significant lab findings that are caused by enterobiasis.

NOTE: Use the "scotch tape preparation" technique to collect a morning specimen from the perianal region. Perform the technique in the morning before the patient washes or passes a bowel movement.

- a. Identification of ova on microscopic exam is definitive for enterobiasis.
- b. Occasionally, complete blood count with differential will show mild eosinophilia.

14. Manage enterobiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

- a. Primary drug is albendazole 400 mg PO x 1 dose, repeat in 2 weeks, OR mebendazole 100 mg PO x 1 dose, repeat in 2 weeks.
- b. Alternative drug is pyrantel pamoate 11 mg/kg (to a maximum dose of 1 g) PO x 1 dose, repeat every 2 weeks (q2wk) for a total of 4 doses.

NOTE: Steps 15 through 19 pertain to trichuriasis.

15. Understand the etiology, distribution, and life cycle associated with trichuriasis (whipworm disease).

- a. Etiology: trichuris trichiura.
 - (1) Very prevalent worldwide (including southeast part of U.S.).
 - (2) Most common helminthic infection in U.S. citizens returning from abroad.
 - (3) Adult worm is 30 to 50 mm in length.
 - (4) Life span for adult worm is 4 to 10 years.
- b. Mode of transmission is oral-fecal route.
- c. Life cycle is as follows:
 - (1) Infective eggs are ingested.
 - (2) Eggs hatch in small intestines, and larvae are released.
 - (3) Within 1 month, larvae invade intestinal villi and undergo molting.
 - (4) Mature larvae migrate to the cecum to complete the maturation process.
 - (5) Adult worms inhabit lumen of cecum and attach themselves by penetrating their anterior whip into the mucosal lining. They then feed on host blood (.005 milliliters per day [ml/day]).
 - (6) Gravid female lays eggs at a rate of 3,000 to 7,000 per day.
 - (7) Eggs are passed in feces.
 - (8) Eggs develop in the soil within 2 to 4 weeks (in ideal conditions). The eggs are immediately infective.

16. Recognize significant subjective findings for trichuriasis.

- a. Abdominal pain or discomfort.
- b. Nausea.
- c. Diarrhea with occult blood.
- d. Mild anemia (with heavy worm load).
- e. Symptoms of colitis or proctitis, if present as a complication of trichuriasis.

17. Recognize significant objective findings for trichuriasis.

- a. Children may present with rectal prolapse.
- b. Mild guarding with deep palpation.

18. Recognize significant lab findings that are caused by trichuriasis.

- a. Microscopic exam of a stool sample will reveal ova.
- b. WBC count with differential may show slight eosinophilia.

19. Manage trichuriasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

- a. Primary drug is albendazole 400 mg PO x 1 dose.

Performance Steps

- b. Alternate drug is mebendazole 100 mg PO b.i.d. x 3 days.

NOTE: With either drug, repeat treatment may be necessary in heavily infected patients.

20. Understand the etiology, distribution, and life cycle associated with ancylostomiasis/necatoriasis (hookworm disease and hookworm species).

NOTE: The following steps pertain to ancylostomiasis/necatoriasis.

- a. Etiology: (Figure 3)

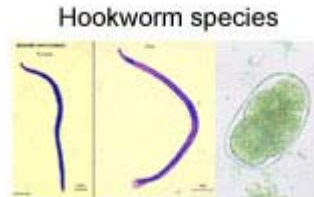


Figure 3. Hookworm Species

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- (1) *Ancylostoma duodenal* (Old World hookworm).
- (2) *Necator americanus* (New World hookworm).
- b. General information:
 - (1) Very prevalent in developing countries worldwide. It is estimated that one-fourth of world's population is infected.
 - (2) Geographic distribution: It is pervasive in tropical and subtropical zones. It is well controlled in the U.S. except in the Southeast.
 - (3) Adult worm is 8 to 13 mm in length.
 - (4) Life span of adult worm is 2 to 5 years.
 - (5) Mode of transmission is skin penetration.
- c. Life cycle is as follows:
 - (1) Larvae living in damp soil or mud penetrate the skin after several minutes of contact (for example, mud caked between toes). Where skin penetration has been made, a dermatitis rash forms. This is commonly known as "ground itch."
 - (2) Larvae enter bloodstream and migrate to lungs, causing the release of eosinophils.
 - (3) Larvae enter alveoli where molting occurs after several days.
 - (4) Larvae ascend the trachea, normally at night during sleep.
 - (5) Larvae are swallowed by the host (frequently subconsciously).
 - (6) Larvae enter GI tract and mature in the small intestines. This takes 1 to 2 months.
 - (7) Adult worms inhabit small intestines and attach themselves to intestinal wall with their mouth parts.
 - (a) *Ancylostoma duodenal* has cutting teeth.
 - (b) *Necator americanus* has cutting plates.
 - (c) The worms feed on host blood (.03 to 26 ml/day per worm).
 - (d) The worms continuously migrate and reattach themselves, causing a constant blood and serum loss in the GI tract from weeping bite wounds.
 - (8) Gravid female lays eggs.
 - (9) Eggs are passed in feces and develop in soil (in less than 1 week).
 - (10) Eggs hatch in the soil and release larvae, which will survive less than 2 days if not picked up by another host.
21. Recognize significant subjective findings for hookworm disease.
 - a. During the pulmonary phase, patients will complain of the following:
 - (1) Shortness of breath (SOB).
 - (2) Cough.
 - (3) Hemoptysis.
 - b. During the intestinal phase, patients will complain of the following:

Performance Steps

- (1) Occasional abdominal discomfort.
 - (2) Malaise.
 - (3) Fatigue.
 - (4) SOB on exertion.
 22. Recognize significant objective findings for hookworm disease.
 - a. During the pulmonary phase, patients will present with the following:
 - (1) Hemoptysis.
 - (2) Fever--especially with secondary pneumonia.
 - (3) Possible wheezing.
 - b. During the abdominal phase, patients will present with the following:
 - (1) Pale conjunctiva.
 - (2) Melena.
 - (3) Ascites or dependent edema.
 - (4) Retarded growth in children.
 23. Recognize significant lab findings that are caused by hookworm disease.
 - a. Iron deficiency anemia: RBC morphology equals microcytic/hypochromic.
 - b. Hypoalbuminemia: Hemoglobin (Hgb) is equal to or greater than 2 g per 100 ml.
 - c. Microscopic exam of stool samples will show ova.
 - d. WBC with differential will show eosinophilia.
 - e. Stool guiac will be positive.
- NOTE: If severe anemia, malnutrition, or anasarca are present, blood transfusion and high-protein diet should be administered before drug therapy.
24. Manage hookworm disease on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. For both species, the primary drug is albendazole 400 mg PO x 1 dose OR mebendazole 100 mg PO x 1 dose. With either drug, the dose should be repeated in 2 weeks.
 - b. For both species, the alternative is pyrantel pamoate 11 mg/kg (maximum of 1 g) PO q.d. x 3 days
- NOTE: Steps 25 through 29 pertain to strongyloidiasis.
25. Understand the etiology, distribution, and life cycle associated with strongyloidiasis (threadworm disease).
 - a. Etiology: *Strongyloides stercoralis* (Figure 4).



Figure 4. *Strongyloides Stercoralis*

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- b. General information:
 - (1) Less common than other intestinal nematodes.
 - (2) Found in tropics (for example, South Pacific Islands).

Performance Steps

- (3) Adult worms are 1 to 2 mm in length.
- (4) Life span is many years.
- (5) Mode of transmission is skin penetration.
- c. Life cycle is as follows:
 - (1) Same as hookworm species.
 - (2) Adults burrow into the mucosal lining of the small intestines.
 - (3) Since eggs may hatch in the rectum, allowing the larvae to penetrate the rectal wall, autoinfection is possible with this species.
- 26. Recognize significant subjective findings for strongyloidiasis.
 - a. Abdominal pain described as burning, epigastric, and colicky.
 - b. Nausea.
 - c. Mucoid bloody diarrhea.
- 27. Recognize significant objective findings for strongyloidiasis.
 - a. Distended abdomen.
 - b. Positive guaiac.
 - c. Possible guarding on deep palpation of the abdomen.
- 28. Recognize significant lab findings that are caused by strongyloidiasis.
 - a. Low hematocrit (Hct) may indicate anemia.
 - b. Microscopic exam of the stool will show ova and possibly larvae.
 - c. WBC count with differential will show eosinophilia.
- 29. Manage strongyloidiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Primary drug is ivermectin 200 micrograms per kilogram per day (ug/kg/day) x 2 days OR albendazole 400 mg PO q.d. x 3 days.
 - b. Alternative drug is thiabendazole 25 mg/kg PO b.i.d. x 2 days (7 to 10 days for hyperinfection syndrome).
- 30. Manage complications symptomatically with appropriate supportive care.
- 31. Record all treatment in the patient's medical record.
- 32. With all diseases, seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage intestinal nematodes.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the etiology, distribution, and life cycle associated with ascariasis.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for ascariasis.	—	—
4. Performed a physical exam.	—	—
5. Recognized significant objective findings for ascariasis.	—	—
6. Performed labs with the SF lab set.	—	—
7. Recognized significant lab findings that are caused by ascariasis.	—	—
8. Managed ascariasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
9. Recognized complications of adult migration.	—	—
10. Understood the etiology, distribution, and life cycle associated with enterobiasis (pinworm or seatworm disease).	—	—
11. Recognized significant subjective findings for enterobiasis.	—	—
12. Recognized significant objective findings for enterobiasis.	—	—
13. Recognized significant lab findings that are caused by enterobiasis.	—	—
14. Managed enterobiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
15. Understood the etiology, distribution, and life cycle associated with trichuriasis (whipworm disease).	—	—
16. Recognized significant subjective findings for trichuriasis.	—	—
17. Recognized significant objective findings for trichuriasis.	—	—
18. Recognized significant lab findings that are caused by trichuriasis.	—	—
19. Managed trichuriasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
20. Understood the etiology, distribution, and life cycle associated with ancylostomiasis/necatoriasis (hookworm disease and hookworm species).	—	—
21. Recognized significant subjective findings for hookworm disease.	—	—
22. Recognized significant objective findings for hookworm disease.	—	—
23. Recognized significant lab findings that are caused by hookworm disease.	—	—
24. Managed hookworm disease on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
25. Understood the etiology, distribution, and life cycle associated with strongyloidiasis (threadworm disease).	—	—
26. Recognized significant subjective findings for strongyloidiasis.	—	—
27. Recognized significant objective findings for strongyloidiasis.	—	—
28. Recognized significant lab findings that are caused by strongyloidiasis.	—	—
29. Managed strongyloidiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
30. Managed complications symptomatically with appropriate supportive care.	—	—
31. Recorded all treatment in the patient's medical record.	—	—
32. With all diseases, sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLOGY

Subject Area 21: Vector-borne Diseases

Manage Rabies

081-833-4247

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify rabies on the basis of the patient's history.
 - a. Patients normally will present with a history of an animal bite. Average incubation is 30 to 50 days.
 - b. There have been cases of transmission from the saliva of infected cattle through skin abrasions and respiratory infection from persons exploring bat-infested caves.
2. Identify rabies on the basis of the patient's signs and symptoms.
 - a. Mental depression.
 - b. Restlessness.
 - c. Malaise.
 - d. Fever.
 - e. Restlessness increases to uncontrollable excitement.
 - f. Excessive salivation.
 - g. Excruciatingly painful spasms of the laryngeal and pharyngeal muscles.
 - h. Since drinking precipitates the pharyngeal spasms, the patient cannot drink (hydrophobia).
3. It is not possible to identify rabies by using the SF lab set.
4. Identify rabies by using other lab tests, if available.
 - a. The fluorescent antibody test will definitively diagnose rabies.
 - b. The virus may be isolated from tissue in special lab facilities.
 - c. The brain of the attacking animal may be examined for Negri bodies. This test is usually no longer necessary.
5. Differentiate between rabies and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Encephalitis.
 - b. Meningitis.
 - c. Influenza (in early stages).
6. Manage rabies on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Immediate postexposure wound cleaning may be the most valuable preventive measure. The bite area should be cleaned immediately and thoroughly with a 20 percent solution of medical soft soap. Deep puncture wounds should be irrigated thoroughly with a syringe and catheter. The wound should be left open for secondary closure.
 - b. In the case of a bite by a known rabid animal, or one that develops rabies during confinement, give the following:

NOTE: Skunks, raccoons, bats, foxes and other wild carnivores should be assumed to be rabid.

 - (1) Give human rabies immune globulin (HRIG) 20 international units per kilogram (IU/kg) intramuscularly (IM) in the gluteal area.

Performance Steps

- NOTE: Infiltrate half a dose around the wound, if possible. Administer one dose concurrently with the first dose of human diploid cell vaccine (HDCV).
- (2) Give HDCV 1 milliliter (ml) intramuscularly (IM) in the deltoid area on days 0, 3, 7, 14, and 28.
 - (3) If a patient has developed rabies, treatment is symptomatic. Vigorous supportive treatment to control respiration, circulation, and central nervous system symptoms is imperative. With meticulous care, some patients have survived.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage rabies.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified rabies on the basis of the patient's history.	_____	_____
2. Identified rabies on the basis of the patient's signs and symptoms.	_____	_____
3. Identified rabies by using other lab tests, if available.	_____	_____
4. Differentiated between rabies and other diseases with similar signs and symptoms.	_____	_____
5. Managed rabies on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	
Required	Related
MERCK MANUAL 17TH ED	
SANFORD, 1999	

Assess Vector-Borne Diseases

081-833-4248

Conditions: As a special operations medic in a field environment and given Special Forces (SF) tactical medical equipment set, SF laboratory set, and SF medical book set.

Standards: Assess vector-borne diseases so that the cause of the disease is discovered and the life of the patient is preserved without causing further harm.

Performance Steps

1. Recognize definitions associated with vector-borne diseases.
 - a. Arthropods: animals with a segmented, articulated exoskeleton. Most dominant phylum on earth with over one million species.
 - b. Vector: a passive carrier capable of transmitting an infective organism.
 - c. Reservoir: a passive carrier.
 - d. Host: an animal that is the recipient of the infection.
2. Recognize the general route of infection for man.
 - a. Reservoir carries organism.
 - b. Vector attaches to reservoir, and organism infects vector.
 - c. Vector attaches to man, and organism infects man.
3. Recognize the types of vectors.
 - a. Mosquito: a blood-sucking, two-winged insect.
 - (1) Mosquito-borne diseases: dengue fever, yellow fever, encephalitis, filariasis, and numerous arboviruses in specific localized areas.
 - (2) Arbovirus: group of viruses transmitted to man via mosquitoes, sandflies, and ticks. "ARBO" indicates arthropod-borne.
 - b. Flea: small, wingless insect with piercing, sucking mouth parts.
 - (1) Flea-borne diseases are plague and murine typhus.
 - (2) Found worldwide wherever there are mammals.
 - c. Louse: grayish, wingless, blood-sucking parasite.
 - (1) Body lice are the only species that transmit disease; that is, epidemic typhus.
 - (2) Lice live in clothing and cement their eggs to seams of clothing or hair.
 - (3) Lice are especially prevalent during war, famine, or times of disaster.
 - d. Tick: blood-sucking, spider-like parasite with eight legs.
 - (1) Tick-borne diseases are Rocky Mountain spotted fever and Lyme Disease.
 - (2) Tick's habitat is a sylvan environment; that is, along paths and animal trails.
 - (3) All stages of life cycle (except eggs) feed on blood.
 - (4) Female might lay as many as 10,000 eggs at one time.
 - e. Mite: minute, transparent parasite (similar to tick, but much smaller).
 - (1) Mite-borne diseases: scrub typhus and various hemorrhagic fevers.
 - (2) Habitat: low areas such as stream banks.
 - f. Chigger (redbugs): the six-legged larval stage of the mite.
 - (1) Attach to skin and inject salivary secretion that dissolves tissue.
 - (2) Feed off of partially digested tissue.
 - (3) Results in papule or wheal with intense pruritis.
 - (4) Can transmit scrub typhus.
4. Recognize common reservoir hosts.
 - a. Rodents.
 - b. Other mammals.
 - c. Birds.
 - d. Man.

NOTE: For information concerning the clinical presentation and management of any of the vector-borne

Performance Steps

diseases, refer to the task for the management of the specific disease in this section. For more information on the control of disease vectors, see task 081-833-4501, Conduct Pest Control Operations With Chemical and Nonchemical Means, and task 081-833-4498, Establish a Malaria Prevention and Control Program.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess vector-borne diseases.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized definitions associated with vector-borne diseases.	_____	_____
2. Recognized the general route of infection for man.	_____	_____
3. Recognized the types of vectors.	_____	_____
4. Recognized common reservoir hosts.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED
SANFORD, 1999

Manage Hemorrhagic Fever

081-833-4249

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify hemorrhagic fever on the basis of the patient's history.
 - a. Disease reservoir in the wild is a number of types of rats, mice, and voles. The transmission to humans is through the inhalation of infectious aerosols of rodent urine, feces, or saliva.
 - b. The disease is present in rodent populations worldwide and is caused by various species of the hantavirus.
2. Identify hemorrhagic fever on the basis of the patient's signs and symptoms.
 - a. Febrile phase:
 - (1) Chills.
 - (2) Fever.
 - (3) Backache.
 - (4) Abdominal pain.
 - (5) Myalgia.
 - (6) Relative bradycardia.
 - (7) Diffuse reddening of the face resembling sunburn.
 - (8) Petechiae develop on the 3d to 5th day, initially on the palate, and then at pressure areas such as axillary folds. Conjunctival hemorrhages appear at about the same time.
 - b. At about the 5th day, the hypotensive phase may occur.
 - (1) In mild cases, the fall in blood pressure (BP) is only transient.
 - (2) On about the 8th day, BP returns to normal but oliguria develops
 - c. In the oliguric phase, blood urea nitrogen (BUN) levels increase rapidly and hemorrhagic manifestations become more prominent.
 - d. The diuretic phase occurs about the 11th day, and central nervous system (CNS) and pulmonary complications may be seen.
 - e. The convalescent phase lasts 3 to 6 weeks with an overall fatality rate of 6 to 15 percent.
3. Identify hemorrhagic fever by using the SF lab set.
 - a. During the febrile phase, lab findings are unremarkable except for albuminuria, which appears between the 2d and 5th day. Urinary sediment reveals hematuria, red blood cell (RBC) and white blood cell casts.
 - b. During the hypotensive phase, the hematocrit increases.
 - (1) Urinalysis will show marked proteinuria.
 - (2) Blood tests will show leukocytosis and thrombocytopenia.
4. Differentiate between hemorrhagic fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Lassa fever.
 - b. Dengue hemorrhagic fever.
 - c. Malaria--especially falciparum.
 - d. Any of the other arenaviral or filoviral diseases that may develop hemorrhagic tendencies.
5. Manage hemorrhagic fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

Performance Steps

NOTE: These patients will require extensive sophisticated supportive care if they are to survive.

Evacuation to a higher level medical facility is imperative.

- a. With renal syndrome, Lass, Korean hemorrhagic fever, Sabia, Argentinian hemorrhagic fever, Bolivian hemorrhagic fever, Junin, and Machupo give ribavirin intravenously (IV) 2 grams (g) loading dose then 1 g every 6 hours (q6h) for (x) 4 days and then 500 mg every 8 hours (q8h) x 6 days.
- b. For Congo-Crimean hemorrhagic fever, give ribavirin PO 4 g every day (q.d.) x 4 days and then 2.4 g q.d. x 6 days.

NOTE: Ribavirin has not been shown to be beneficial in patients with acute pulmonary syndrome (hantavirus or ebola or marburg hemorrhagic fever).

6. Treat complications symptomatically with appropriate supportive care.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage hemorrhagic fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified hemorrhagic fever on the basis of the patient's history.	—	—
2. Identified hemorrhagic fever on the basis of the patient's signs and symptoms.	—	—
3. Identified hemorrhagic fever by using the SF lab set.	—	—
4. Differentiated between hemorrhagic fever and other diseases with similar signs and symptoms.	—	—
5. Managed hemorrhagic fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Trypanosomiasis

081-833-4250

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with African trypanosomiasis.
 - a. African trypanosomiasis (African sleeping sickness).
 - (1) Definition: An acute and chronic disease caused by a hemoflagellate protozoa.
 - (a) *Trypanosoma brucei gambiense* (*T. brucei gambiense*) (chronic illness).
 - (b) *Trypanosoma brucei rhodesiense* (*T. brucei rhodesiense*) (acute illness).
 - (2) Transmission: Transmitted by the tsetse fly.
 - (3) Distribution:
 - (a) In West and Central Africa, *T. brucei gambiense* is endemic.
 - (b) In East Africa, *T. brucei rhodesiense* is endemic.
 - (4) Life cycle:
 - (a) Tsetse fly draws blood meal containing trypanosomes.
 - (b) Trypanosomes multiply in the midgut of the fly and migrate to the salivary glands.
 - (c) Fly inoculates man's bloodstream with trypanosomes.
 - (d) Trypanosomes enter lymphatic system, finally settling in the central nervous system (CNS).
2. Recognize the clinical presentation of African trypanosomiasis.
 - a. West African "Gambian" trypanosomiasis (chronic) has 3 stages:
 - (1) Early hemolymphatic stage:
 - (a) Chancre.
 - (b) Intermittent fevers, persistent headaches, and constant tachycardia.
 - (c) Winterbottom's sign, which is the visible enlargement of the glands of the posterior cervical triangle.
 - (2) Early neurologic stage:
 - (a) Alterations in personality, indifferent attitude, and aimless gaze.
 - (b) Inversion of sleep rhythms and nervous tremor.
 - (c) Polycritic, transient skin rash with generalized pruritis.
 - (3) Late neurologic stage:
 - (a) Somnolence, insomnia, and alteration in thermoregulatory system of the body (hypothermic and hyperthermic).
 - (b) Incoordination, impaired gait, stupor, and indifference.
 - (c) Death.
 - b. East African "Rhodesian" trypanosomiasis (acute):
 - (1) Chancre.
 - (2) Fever.
 - (3) Hemolymphatic involvement.
 - (4) Early CNS involvement.
 - (5) Meningoencephalitis and death.
3. Identify African trypanosomiasis by using the SF lab set.
 - a. Use the card agglutination test for African trypanosomiasis, if available.

Performance Steps

- b. Early in the disease, trypanosomes are found in smears of peripheral blood by using Giemsa's stain. However, as the disease progresses, trypanosomes may only be present in the cerebrospinal fluid.
- c. Chancre may demonstrate trypanosomes. Examine a drop of serous exudate for motile trypanosomes by using a wet preparation (Figure 1).

Trypanosoma cruzi

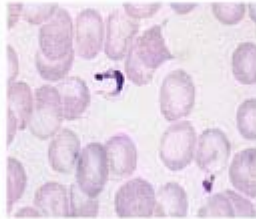


Figure 1. Trypanosoma Cruzi

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- 4. Identify trypanosomiasis by using other lab tests, if available.
 - a. Animal inoculation may be necessary to develop sufficient cell culture for diagnosis.
 - b. Specific serologic tests for the different types of trypanosomes are available.
- 5. Differentiate between African trypanosomiasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Typhus.
 - b. Dengue.
 - c. Malaria.
 - d. Relapsing fever.
- 6. Manage trypanosomiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. For early disease, drug of choice is suramin. Give a test dose of 0.2 grams (g) intravenously (IV). If no adverse reaction, give 20 milligrams per kilogram (mg/kg), up to a maximum of 1 g IV on days 1, 3, 7, 14, and 21. This drug is available from the Centers for Disease Control's parasitic drug service.
 - b. An alternative in early disease is pentamidine isethionate 4 mg/kg intramuscularly (IM) every other day (qod) for (x) 10 doses.
 - c. In late infection with CNS involvement, drug of choice is melarsopol, 2 to 3.6 milligrams per kilogram per day (mg/kg/day) in three equal doses on days 1, 7, and 14.
 - d. In debilitated patients, start with suramin 0.2 g IV for 2 days and then give the above dosage of melarsopol and prednisolone 1 mg/kg/day by mouth (PO).

NOTE: All of these drugs are hazardous in and of themselves and should only be used by the special operations medic in situations where evacuation of the patient for higher level medical care is impossible.

- 7. Understand the definitions, etiology, and pathophysiology associated with American trypanosomiasis.
 - a. Definition: Zoonotic disease caused by the protozoa *Trypanosoma cruzi* (T. cruzi). This organism causes acute or chronic parasitemia and paratization of parenchymal cells of many organs--especially the heart, brain, esophagus, and colon (megasyndromes).
 - b. Transmission: Transmitted by the triatomid (reduviid) bug "kissing bug."

Performance Steps

- c. Distribution: Central and South American countries.
- d. Life cycle:
 - (1) Triatomid (reduviid) bug draws blood meal containing trypanosomes.
 - (2) Trypanosomes congregate in the rectum of the bug and are discharged in the feces.
 - (3) Bug bites man and defecates while feeding.
 - (4) Trypanosomes enter bite site and penetrate various tissues.
 - (5) Cells rupture, and trypanosomes infect more cells.
8. Recognize the clinical presentation of American trypanosomiasis.
 - a. Congenital infections.
 - (1) Hepatosplenomegaly and lymphadenopathy.
 - (2) Persistent tachycardia.
 - (3) Measles-like rash.
 - b. Acute infections (most common in first 5 years of life):
 - (1) Roman's sign (unilateral, orbital edema, indicating the conjunctiva as the portal of entry).
 - (2) Chagoma (dusky, erythematous, indurated lesion with skin scaling over it).
 - (3) Fever.
 - (4) Hepatosplenomegaly.
 - (5) Lymphadenopathy.
 - (6) Tachycardia (reflects early cardiac involvement).
 - c. Chronic infections:
 - (1) Cardiomyopathy.
 - (2) Dilation of tubular organs (megasyndromes).
9. Identify American trypanosomiasis by using the SF lab set.
 - a. It is unclear at this time if the card agglutination test for African trypanosomiasis is useful in diagnosing the South American version.
 - b. The disease is identified by locating trypanosomes in peripheral blood smears or nonflagellated forms in lymph node biopsies.
10. Differentiate between American trypanosomiasis and other diseases with similar signs and symptoms. Consider the following:
 - a. Hepatitis.
 - b. Subacute bacterial endocarditis.
 - c. Malaria.
11. Manage American trypanosomiasis on the basis of the treatment modality in the most current version of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. The drug of choice is nifurtimox 8 to 10 mg/kg/day PO divided into 4 equal doses after meals for 120 days. This drug is available from the CDC parasitic drug service.
 - b. The alternate drug is benznidazole 7.5 mg/kg/day PO in 2 equal doses for 60 days.
12. Although drug therapy will remove trypanosomes from the patient's system, little can be done with both diseases when organ damage has already occurred.
13. Record all treatment in the patient's medical record.
14. With both diseases, vector avoidance through use of proper personal protective measures is very important.
15. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage trypanosomiasis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with African trypanosomiasis.	—	—
2. Recognized the clinical presentation of African trypanosomiasis.	—	—
3. Identified African trypanosomiasis by using the SF lab set.	—	—
4. Identified trypanosomiasis by using other lab tests, if available.	—	—
5. Differentiated between African trypanosomiasis and other diseases with similar signs and symptoms.	—	—
6. Managed trypanosomiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
7. Understood the definitions, etiology, and pathophysiology associated with American trypanosomiasis.	—	—
8. Recognized the clinical presentation of American trypanosomiasis.	—	—
9. Identified American trypanosomiasis by using the SF lab set.	—	—
10. Differentiated between American trypanosomiasis and other diseases with similar signs and symptoms.	—	—
11. Managed American trypanosomiasis on the basis of the treatment modality in the most current version of The Sanford Guide to Antimicrobial Therapy.	—	—
12. Recorded all treatment in the patient's medical record.	—	—
13. With both diseases, knew vector avoidance through use of proper personal protective measures is very important.	—	—
14. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

ATLAS OF HUMAN PARASITOLOGY

Manage Dengue

081-833-4252

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify dengue on the basis of the patient's history.
 - a. Patient will have a history of a mosquito bite. (The disease is transmitted by mosquitoes of the Aedes group.)
 - b. The patient will have a history of travel to the tropics or subtropics. The disease has been reported as far north as southern Florida.
2. Identify dengue on the basis of the patient's signs and symptoms.
 - a. Generalized myalgia and arthralgia, increasing in severity.
 - b. Severe headache.
 - c. Acute onset of high fever.
 - d. Relative bradycardia and hypotension are common during the febrile phase.
 - e. Chills.
 - f. Lumbar backache.
 - g. Retro-orbital pain exacerbated by eye movement.
 - h. Pink macular rash that blanches to pressure.
 - i. Profuse sweating after the first 96 hours.
 - j. An afebrile period that lasts for 24 hours.
 - k. A second rapid febrile period that produces a "saddle-back" temperature curve with a maculopapular eruption over the entire body (central to peripheral).
3. Identify dengue by using the SF lab set.
 - a. Leukopenia is present by the second day of fever.
 - b. By the fourth to fifth day, white blood cell count (WBC) has dropped to between 2,000 and 4,000 with 20 to 40 percent granulocytes.
 - c. Urinalysis will show albuminuria with a few casts.
4. Identify dengue by using other lab tests, if available.
 - a. Serologic diagnosis may be made by hemagglutination inhibition (HI) and complement fixation (CF) tests using paired sera.
 - b. Serologic diagnosis is complicated by cross-reactions with other flavivirus antibodies. Differentiate between dengue and other diseases with similar signs and symptoms.
5. Differentiate between dengue and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Malaria.
 - b. Rocky Mountain spotted fever.
 - c. Typhus.
 - d. Yellow fever.
6. Manage dengue on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Symptomatic treatment, to include the following:
 - (1) Bedrest.
 - (2) Fluid therapy, as needed.

Performance Steps

(3) Analgesics for pain and headache.

NOTE: Do not administer aspirin. You may administer acetaminophen and codeine.

7. Identify dengue hemorrhagic fever (DHF) on the basis of the patient's history.
 - a. The overall history will be the same as for dengue.
 - b. DHF usually occurs in children less than 10 years old living in areas where dengue is endemic.
 8. Identify DHF on the basis of the patient's signs and symptoms.
 - a. Abrupt onset of fever.
 - b. Headache.
 - c. Abdominal pain.
 - d. Pharyngitis.
 - e. Cough.
 - f. Dyspnea.
 - g. Nausea and vomiting.
 - h. Bleeding tendencies, including the following:
 - (1) Petechiae and purpura.
 - (2) Ecchymosis.
 - (3) Hematemesis.
 - (4) Epistaxis.
 - (5) Melena.
 - i. Hepatomegaly is common.
 - j. Bronchopneumonia is common.
 - k. Myocarditis may be present.
 9. Identify DHF by using the SF lab set.
 - a. Hematocrit is greater than 50 percent in the presence of shock.
 - b. Positive tourniquet test.
 10. Identify DHF by using other lab tests, if available.
 - a. Thrombocytopenia (less than 100,000 per microliter).
 - b. Prolonged prothrombin time.
 - c. Serologic tests usually show high CF titers against flaviviruses, which is suggestive of a secondary immune response.
 11. Differentiate between DHF and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Pneumonia.
 - b. Gastroenteritis.
 - c. Influenza.
 12. Manage DHF. Currently there is no drug therapy for DHF, and treatment is symptomatic.
 - a. Be prepared to support circulation with crystalloids. (Avoid fluid overload.)
 - b. Fresh blood or platelets may be needed to control bleeding.
 - c. Agitated patients may be given diazepam, chloral hydrate, or paraldehyde.
- NOTE: Evacuation of the patient for higher level medical care should be done as soon as possible.
13. Record all treatment in the patient's medical record.
 14. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage dengue.

Performance Measures

GO **NO GO**

1. Identified dengue on the basis of the patient's history.

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
2. Identified dengue on the basis of the patient's signs and symptoms.	_____	_____
3. Identified dengue by using the SF lab set.	_____	_____
4. Identified dengue by using other lab tests, if available.	_____	_____
5. Differentiated between dengue and other diseases with similar signs and symptoms.	_____	_____
6. Manage dengue on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Identified DHF on the basis of the patient's history.	_____	_____
8. Identified DHF on the basis of the patient's signs and symptoms.	_____	_____
9. Identified DHF by using the SF lab set.	_____	_____
10. Identified DHF by using other lab tests, if available.	_____	_____
11. Differentiated between DHF and other diseases with similar signs and symptoms.	_____	_____
12. Managed DHF.	_____	_____
13. Recorded all treatment in the patient's medical record.	_____	_____
14. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Relapsing Fever

081-833-4253

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify relapsing fever on the basis of the patient's history.
 - a. The tick-borne variety is endemic worldwide and is carried by soft ticks of the genus *Ornithodoros*. However, the tick bite is painless and many patients will not report a history of tick bite.
 - b. The louse-borne variety is only endemic in parts of Africa and South America. Patients with this variety will usually report a history of pediculosis.
2. Identify relapsing fever on the basis of the patient's signs and symptoms.
 - a. Sudden onset of chills.
 - b. High fever.
 - c. Tachycardia.
 - d. Severe headache.
 - e. Vomiting.
 - f. Muscle and joint pain.
 - g. Delirium.
 - h. An erythematous macular or purpuric rash may appear early over the trunk and extremities.
 - i. Conjunctival subcutaneous or submucous hemorrhages may be present.
 - j. Late in the course of the fever, jaundice, hepatomegaly, splenomegaly, myocarditis, and cardiac failure may appear--especially in the louse-borne variety.
 - k. Fever remains high for 3 to 5 days and then clears abruptly by crisis.
 - l. Patient is usually asymptomatic for several days to a week and then relapses with sudden return of fever and other symptoms. Jaundice is more common in relapse.
3. Identify relapsing fever by using the SF lab set.
 - a. Spirochetes are visible in Wright- or Giemsa's-stained blood drawn during the febrile period. The spirochetes are delicate, threadlike organisms 8 to 30 microns long with pointed ends and 4 to 10 large, irregular coils.
 - b. Mild polymorphonuclear leukocytosis may be present.
4. Identify relapsing fever by using other lab tests, if available.
 - a. Darkfield microscopy will show the presence of the spirochetes in blood.
 - b. Acridine orange stain is more sensitive than Wright or Giemsa stain for peripheral blood smears.
5. Differentiate between relapsing fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Malaria.
 - b. Dengue.
 - c. Yellow fever.
 - d. Lyme disease.
 - e. Typhus.
 - f. Leptospirosis.
 - g. Influenza.
 - h. Enteric fevers.

Performance Steps

6. Manage relapsing fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Drug of choice is doxycycline 100 milligrams (mg) by mouth (PO) twice daily (b.i.d.) x 7 days.
 - b. Alternate drug is erythromycin 500 mg PO four times a day (q.i.d.) x 7 days.
 - c. Treatment should be started early during fever or during the afebrile period. Treatment should be avoided near the end of a febrile period because of the danger of a Jarisch-Herxheimer reaction (rigors, increase of fever, and a rise in blood pressure [BP] followed by a fall in BP to near shock levels). The Jarisch-Herxheimer reaction is typical and sometimes fatal in louse-borne infections.
7. Treat complications symptomatically with appropriate supportive care.
8. With both diseases, avoid vector through use of proper personal protective measures.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage relapsing fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified relapsing fever on the basis of the patient's history.	_____	_____
2. Identified relapsing fever on the basis of the patient's signs and symptoms.	_____	_____
3. Identified relapsing fever by using the SF lab set.	_____	_____
4. Identified relapsing fever by using other lab tests, if available.	_____	_____
5. Differentiated between relapsing fever and other diseases with similar signs and symptoms.	_____	_____
6. Managed relapsing fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Treated complications symptomatically with appropriate supportive care.	_____	_____
8. With both diseases, knew to avoid vector through use of proper personal protective measures.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Filariasis

081-833-4254

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, patient's medical record, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with filariasis.
 - a. Etiology is *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*.
 - b. General information:
 - (1) Found in tropics and subtropics of Africa, Asia, the Pacific islands, and the Americas, including parts of the Caribbean.
 - (2) Adult worm is white, threadlike, and 40 to 100 millimeters (mm) long.
 - (3) Life span may be as long as 15 years.
 - (4) Mode of transmission is mosquito bite (vector).
 - c. Life cycle:
 - (1) Mosquito bites victim, filiform larvae enter skin tissue, and larvae migrate into lymph system.
 - (2) Larvae mature to adult worms in lymph nodes and lymphatic ducts within 6 to 12 months.
 - (3) Gravid viviparous female discharges microfilariae about 6 to 12 months postinfection.
 - (4) Microfilariae enter peripheral blood and cause a recurrent, transient febrile illness that lasts 4 to 7 days.
 - (a) Febrile attacks occur within certain daytime or nighttime periodic patterns, depending on species of the vector (day or night feeder) or the nematode.
 - (b) Nocturnal febrile episodes occur between 10 pm and 2 am.
 - (c) Diurnal febrile episodes occur during the day.
 - (5) Chronic or repeated infections over several years lead to lymphatic tissue damage.
 - (a) Scarring of lymphatics.
 - (b) Hyperplasia.
 - (c) Obstruction of lymphatic tissue.
 - (d) Enlarged or swollen lymph vessels.
 - (e) Elephantiasis of limbs, breasts, and genitalia.
 - (6) Mosquito bites infected host during febrile episode and picks up microfilariae.
2. Solicit a patient history.
3. Recognize significant subjective findings for filariasis.
 - a. Travel to the tropics or subtropics. May be months in the past, as the prepatent period is at least 8 months.
 - b. Exposure to the vector, which is any of a number of types of mosquitoes.
 - c. Headache.
 - d. Nausea.
 - e. Myalgia.
4. Perform a PE.
5. Recognize significant objective findings for filariasis.
 - a. Lymphangitis.
 - b. Lymphadenitis.
 - c. Orchitis.

Performance Steps

- d. Epididymitis.
 - e. A viral-like syndrome of fever, chills, headache, and malaise may also be present.
 - f. Elephantiasis and other late sequelae occur with long-term residence in endemic areas and repeat infections.
6. Recognize significant lab findings associated with filariasis.
 - a. Microfilariae may be found in blood or lymph fluid. Blood samples should be taken at night, as the microfilaria are more likely to be found in the blood then. This may be reversed and occur during the day in many Pacific islands.
 - b. It is important to identify the species of filaria as the treatment varies between species. However, by far the most common species are *Wuchereria bancrofti* and *Brugia malayi*.
 - c. Other serologic tests are unreliable. White blood cell (WBC) count with differential may demonstrate eosinophilia.
 7. Differentiate between filariasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Lymphogranuloma venereum.
 - b. Plague.
 8. Manage filariasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing.
 - a. For *Wuchereria bancrofti* and *Brugia malayi*, the drug of choice is ivermectin 100 to 440 micrograms per kilogram (ug/kg) in a one-time dose.
 - b. Alternate drug is diethylcarbamazine. Administer 50 milligrams (mg) three times a day (t.i.d.) on days 1 and 2, 100 mg t.i.d. on day 3, and, 2 milligrams per kilogram (mg/kg) t.i.d. on days 4 through 21.
 - c. Allergic manifestations during therapy are common (result of antigenic properties of dying parasites). Allergic reaction may be severe.
 - (1) Reaction appears in 1 to 2 days and persists for 2 to 4 days.
 - (2) Manage reaction with antihistamines and corticosteroids, as needed.
 9. Understand the definitions, etiology, and pathophysiology associated with loiasis.
 - a. Etiology: *Loa loa* (filarioidea species).
 - b. General information:
 - (1) Geographically endemic to the central and western parts of the African rain forests and equatorial Sudan.
 - (2) Adult worm is white, threadlike, and 30 to 70 mm long.
 - (3) Life span is 15 years.
 - (4) Mode of transmission is deerfly or horsefly bite. Deerflies (genus *Chrysops*) are also known as tabanid flies and mango flies.
 - c. Life cycle:
 - (1) Deerfly bites victim; bite is painful.
 - (2) Larvae penetrate into subcutaneous (SQ) tissue and mature to adults.
 - (3) Adult worms live in SQ or connective tissue and frequently migrate through these tissues during their life span.
 - (4) Occasionally adult worm may be seen crossing the anterior chamber of the eye or between conjunctiva and sclera.
 - (5) Gravid viviparous female discharges microfilariae.
 - (6) Microfilariae enter peripheral blood.
 - (7) Deerfly bites infected host and ingests microfilariae.
 10. Solicit a patient history.
 11. Recognize significant subjective findings for loiasis.
 - a. Transient swellings of local SQ tissue.
 - b. Occasionally adult worm may be seen crossing the anterior chamber of the eye or between conjunctiva and sclera. This will be associated with intense pain and lacrimation.

Performance Steps

12. Perform a PE.
13. Recognize significant objective findings for loiasis.
 - a. Transient swellings of local SQ tissue (calabar swellings):
 - (1) Size of a hen's egg.
 - (2) Swellings preceded by intense pruritus, erythema, and edema.
 - (3) Swellings are painless.
 - (4) Common around joints of extremities.
 - (5) Appear suddenly, last for less than 13 days, then resolve, then reappear weeks or months later.
14. Recognize significant lab findings that are caused by loiasis.
 - a. Peripheral blood smear will be positive for microfilariae.
 - b. Smear of fluid aspirate from calabar swelling will possibly be positive for microfilariae.
 - c. Biopsy of calabar swelling may reveal adult parasites.
 - d. WBC differential will show eosinophilia (70 percent).
15. Manage loiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. DOC is diethylcarbamazine in the same dose as above for filariasis.
 - b. Worms under the conjunctiva can be anesthetized with 10 percent cocaine drops (gtt) and then carefully excised with forceps after a delicate surgical incision with a surgical needle.
 - c. Treatment for allergic reactions is antihistamines and corticosteroids, as needed.
16. Treat complications symptomatically with appropriate supportive care.
17. Record all treatment in the patient's medical record.
18. Practice vector avoidance through use of proper personal protective measures.
19. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage filariasis

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with filariasis.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for filariasis.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for filariasis.	—	—
6. Recognized significant lab findings associated with filariasis.	—	—
7. Differentiated between filariasis and other diseases with similar signs and symptoms.	—	—
8. Managed filariasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
9. Understood the definitions, etiology, and pathophysiology associated with loiasis.	—	—
10. Solicited a patient history.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
11. Recognized significant subjective findings for loiasis.	_____	_____
12. Performed a PE.	_____	_____
13. Recognized significant objective findings for loiasis.	_____	_____
14. Recognized significant lab findings that are caused by loiasis.	_____	_____
15. Managed loiasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
16. Treated complications symptomatically with appropriate supportive care.	_____	_____
17. Recorded all treatment in the patient's medical record.	_____	_____
18. Practiced vector avoidance through use of proper personal protective measures.	_____	_____
19. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Rocky Mountain Spotted Fever

081-833-4256

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify Rocky Mountain spotted fever (RMSF) on the basis of a patient who presents with a history of a tick bite received anywhere in the western hemisphere.
2. Identify RMSF on the basis of the following signs and symptoms:
 - a. Abrupt, severe headache.
 - b. Fever of 103 to 104 degrees Fahrenheit.
 - c. Chills.
 - d. Prostration.
 - e. Myalgia.
 - f. A peripheral rash that may include the palms and the soles of the feet. The rash becomes central and may include the face. Often a warm water or alcohol compress brings out the rash. The rash may coalesce to form hemorrhagic lesions that ulcerate.
 - g. Neurologic symptoms may include insomnia, restlessness, delirium, and coma. All of these are indicative of the development of encephalitis.
3. Identify RMSF by using the SF lab set. A Giemsa stain MAY reveal the presence of intracellular pleomorphic coccobacilli that stain purple.
4. Identify RMSF by using other lab tests, if available.
 - a. The Weil-Felix test is useful for screening to identify patients with RMSF or typhus. Other tests must be used to identify the specific causative agent.
 - b. Immunofluorescence is useful to identify the agent in skin or other tissues.
 - c. The various rickettsial diseases can be differentiated by using group-specific, soluble rickettsial antigens in complement fixation (CF) reaction.
5. Differentiate between RMSF and other possible diseases with similar signs and symptoms. Consider the following diseases:
 - a. Rubeola.
 - b. Rubella.
 - c. Typhus.
 - d. Meningococcal rash.
6. Manage RMSF on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 NOTE: Since an untreated patient may become moribund and die before serologic tests are available, treatment should begin as soon as a presumptive diagnosis is made.
 - a. Drug of choice is doxycycline 100 milligrams (mg) by mouth (PO) intravenously (IV) twice daily (b.i.d.) for (x) 7 days or until 2 days after the fever has subsided, whichever is longer.
 - b. The alternate drug is chloramphenicol 500 mg PO or IV four times a day (q.i.d.) x 7 days or until 2 days after the fever has subsided, whichever is longer.
 - c. Symptomatic treatment is given, to include adequate hydration and nutrition and sufficient rest.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage RMSF.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified RMSF on the basis of a patient who presents with a history of a tick bite received anywhere in the western hemisphere.	—	—
2. Identified RMSF on the basis of signs and symptoms.	—	—
3. Identified RMSF by using the SF lab set.	—	—
4. Identified RMSF by using other lab tests, if available.	—	—
5. Differentiated between RMSF and other possible diseases with similar signs and symptoms.	—	—
6. Managed RMSF on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Lyme Disease

081-833-4257

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify Lyme disease on the basis of the patient's history.
 - a. Patients will have a history of a tick bite received anywhere in the northern hemisphere or Australia.
 - b. Onset of the disease is usually summer or early fall when ticks are most active.
 - c. Most patients are children or young adults living in heavily wooded areas. However, the disease can effect any age and either sex.
2. Identify Lyme disease on the basis of the patient's signs and symptoms.
 - a. The early stages of the disease are characterized by a condition known as erythema chronicum migrans (ECM). ECM begins as a red macule or papule, usually on the proximal portion of an extremity or on the trunk, that expands, often with a clearing center, to a diameter of up to 50 centimeters (cm). At least 75 percent of patients with Lyme disease have this early lesion.
 - b. In the United States, nearly 50 percent of patients develop multiple smaller lesions without indurated centers.
 - c. ECM usually lasts for a few weeks. Former lesions may reappear, sometimes before recurrent attacks of arthritis.
 - d. Symptoms accompanying or slightly precluding ECM include a flu-like syndrome with malaise, fever, chills, headache, stiff neck, myalgias, and arthralgias.
 - e. About 15 percent of patients will present with neurologic abnormalities, including lymphocytic meningitis, meningoencephalitis, cranial neuritis (especially Bell's palsy which may be bilateral), and sensory and motor radiculoneuropathies. These may occur alone or in combination and commonly last for months, usually resolving completely.
 - f. About 8 percent of patients will develop myocardial abnormalities such as fluctuating degrees of atrioventricular (AV) block and, less commonly, myopericarditis.
 - g. Arthritis occurs in about 50 percent of patients with ECM within weeks to months of onset. It is characterized by intermittent swelling and pain in a few large joints, especially the knee, and typically recurs for several years. Affected knees are usually swollen and hot but not red or painful.
3. Lab tests that can be conducted with the SF lab set will appear normal.
4. Identify Lyme disease by using other lab tests, if available.
 - a. Significant serum titers of immunoglobulin M (IgM) and immunoglobulin G (IgG) in the presence of a negative test result for venereal disease should raise a high degree of suspicion of Lyme disease. IgG titers will be higher later in the illness. Titers are best determined by enzyme-linked immunosorbent assay (ELISA) or western blot.
 - b. Synovial fluid of arthritic joints typically shows a white blood cell count in the 25,000 range with mostly granulocytes.
5. Differentiate between Lyme disease and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Juvenile rheumatoid arthritis.
 - b. Acute rheumatic fever.

Performance Steps

- c. Insect bite reaction (with early ECM).
6. Manage Lyme disease on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. With ECM, the DOC is doxycycline 100 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for (x) 14 to 21 days, amoxicillin 500 mg PO three times a day (t.i.d.) x 14 to 21 days, cefuroxime axetil 500 mg b.i.d. x 21 days, or clarithromycin 500 mg b.i.d. x 14 to 21 days.
 - b. With carditis, the DOC is ceftriaxone intravenously (IV) 2.0 grams (g) every day (q.d.) x 14 to 21 days or cefotaxime 2 g IV every 4 hours (q4h) x 14 to 21 days. Alternate drugs are doxycycline 100 mg PO b.i.d. x 21 days or amoxicillin PO 250 to 500 mg q.d. x 21 days.
 - c. With meningitis, the DOC is ceftriaxone in the above dose. An alternative drug is penicillin G 20 million units (mu) IV q.d. in 2 equal doses x 21 days or cefotaxime 2.0 g every 8 hours (q8h) IV x 21 days.
 - d. For facial nerve paralysis and arthritis, the DOC is doxycycline or amoxicillin in the above dose. An alternative drug is ceftriaxone IV 2.0 g q.d. x 14 to 28 days.
7. Treat complications symptomatically with appropriate supportive care.
8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage Lyme disease.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified Lyme disease on the basis of the patient's history.	—	—
2. Identified Lyme disease on the basis of the patient's signs and symptoms.	—	—
3. Identify Lyme disease by using other lab tests, if available.	—	—
4. Differentiated between Lyme disease and other diseases with similar signs and symptoms.	—	—
5. Managed Lyme disease on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
6. Treated complications symptomatically with appropriate supportive care.	—	—
7. Recorded all treatment in the patient's medical record.	—	—
8. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Yellow Fever

081-833-4258

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify yellow fever on the basis of the patient's history.
 - a. Travel in central and sub-Saharan Africa or endemic areas of Central or South America.
 - b. Exposure to the vector--either the *Aedes aegypti* or *Haemagogus* group of mosquitos.
2. Identify yellow fever on the basis of the patient's signs and symptoms.
 - a. In the acute phase, the patient will have the following:
 - (1) Sudden onset of 102 to 104 degrees Fahrenheit fever.
 - (2) Pulse initially rapid, then slowing on the 2d day relative to the level of fever (Faget's sign).
 - (3) Face flushed with corneal injection.
 - (4) Nausea and vomiting.
 - (5) Headache.
 - (6) Myalgia.
 - (7) Irritability.
 - b. During the period of remission, the fever falls (usually 2 to 5 days after onset) with remission lasting several hours or days.
 - c. During the period of intoxication, the patient will be dull, confused, and apathetic. The patient will present a characteristic triad of the following:
 - (1) Jaundice.
 - (2) Extreme albuminuria.
 - (3) Epigastric tenderness with hematemesis.
3. Identify yellow fever by using the SF lab set.
 - a. White blood cell (WBC) count drops to 1,500 to 2,500 by the 5th day.
 - b. Urinalysis will reveal albuminuria of up to 20 grams per liter (g/L).
 - c. Thrombocytopenia.
4. Differentiate between yellow fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Malaria.
 - b. Typhus.
 - c. Spirillary rat bite fever.
5. Manage yellow fever symptomatically.
 - a. Maintain fluid and electrolyte balance.
 - b. Give prochlorperazine 5 to 10 milligrams (mg) intramuscularly (IM) for nausea and vomiting.
 - c. Give codeine 15 to 60 mg by mouth (PO) every 6 hours (q6h) for headache and pain.

CAUTION: Do not use acetaminophene because of the increased risk of liver damage.

 - d. Hemorrhagic tendencies may require calcium gluconate 1 g IV twice daily (b.i.d.).

NOTE: Do not use aspirin because of its antiplatelet activity.
6. Isolate patients from vector contact to reduce the risk of spreading the disease.
7. Vaccinate soldiers with 17D live attenuated yellow fever vaccine. Give 0.5 milliliters (ml) subcutaneously (SQ) every 10 years (q10yr) before entry into an endemic area.

Performance Steps

8. Record all treatment in the patient's medical record.
9. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage yellow fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified yellow fever on the basis of the patient's history.	_____	_____
2. Identified yellow fever on the basis of the patient's signs and symptoms.	_____	_____
3. Identified yellow fever by using the SF lab set.	_____	_____
4. Differentiated between yellow fever and other diseases with similar signs and symptoms.	_____	_____
5. Managed yellow fever symptomatically.	_____	_____
6. Isolated patients from vector contact to reduce the risk of spreading the disease.	_____	_____
7. Vaccinated soldiers with 17D live attenuated yellow fever vaccine at 0.5 ml SQ q10yr before entry into an endemic area.	_____	_____
8. Recorded all treatment in the patient's medical record.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Leishmaniasis

081-833-4260

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify leishmaniasis on the basis of the patient's history.
 - a. Disease occurs worldwide in many developing countries.
 - b. Disease is transmitted by several types of phlebotomine, lutzomya, and psychodopygus sand flies.
2. Identify leishmaniasis on the basis of the patient's signs and symptoms.
 - a. Visceral leishmaniasis (Kala-Azar or dum dum fever).
 - (1) Irregular fever.
 - (2) Pronounced hepatosplenomegaly.
 - (3) Emaciation.
 - (4) Death, if untreated.
 - b. Cutaneous leishmaniasis (tropical sore or Delhi boil).
 - (1) Single or multiple sharply demarcated, ulcerating, granulomatous, autoinoculated skin lesions.
 - (2) Secondary infection is common, and the only systemic symptoms are related to secondary infection.
 - c. American leishmaniasis (Espundia, Uta, or Chiclero ulcers).
 - (1) Chiclero ulcers and Uta manifest as localized, painless cutaneous ulcers, usually on the face.
 - (2) Espundia manifests as metastatic mucocutaneous lesions of the nose and pharynx.
3. Identify leishmaniasis by using the SF lab set.
 - a. Patients will usually present with pancytopenia.
 - b. The parasite may be found in needle biopsy of skin lesions or lymph nodes.
4. Identify leishmaniasis by using other lab tests, if available.
 - a. The parasite may be cultured from tissue or from blood.
 - b. The leishmanin skin test is negative during active disease.
5. Differentiate between leishmaniasis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Leprosy.
 - b. Hepatitis.
 - c. Malaria.
6. Manage leishmaniasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. The drug of choice is antimony as stibogluconate or meglumine antimonate 20 milligrams per kilogram per day (mg/kg/day) in 2 equal doses IM or IV for 28 days (must obtain from The Centers for Disease Control [CDC] parasitic drug service).
 - b. The alternate is amphotericin B 1 mg/kg/day IV for 20 days or liposomal amphotericin B 3 mg/kg IV on days 1 through 5 and 10.
 - c. In cutaneous leishmaniasis only, pentamidine 2 mg/kg IV every other day (qod) x 7 doses as an alternate to antimony.

Performance Steps

NOTE: These drugs are highly toxic in and of themselves and should only be used by the special operations medic when patient referral or evacuation is impossible.

7. With all forms of the disease, avoid vector through use of proper personal protective measures.
8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage leishmaniasis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified leishmaniasis on the basis of patient's history.	—	—
2. Identified leishmaniasis on the basis of the patient's signs and symptoms.	—	—
3. Identified leishmaniasis by using the SF lab set.	—	—
4. Identified leishmaniasis by using other lab tests, if available.	—	—
5. Differentiated between leishmaniasis and other diseases with similar signs and symptoms.	—	—
6. Managed leishmaniasis on the basis of the treatment modality in the most current edition of Sanford's Guide to Antimicrobial therapy.	—	—
7. With all forms of the disease, stressed the importance of vector avoidance through use of proper personal protective measures.	—	—
8. Treated complications symptomatically with appropriate supportive care.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Q Fever**081-833-4261**

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify Q fever on the basis of the patient's history.
 - a. Most patients will have a history of working in close contact with domestic livestock. The disease is passed to humans through inhalation of infective aerosols and has an incubation period of 9 to 28 days.
 - b. The disease may also be spread to man through the tick vector (*Dermacentor andersoni* has been identified in the United States).
2. Identify Q fever on the basis of the patient's signs and symptoms.
 - a. Abrupt onset of fever.
 - b. Headache.
 - c. Chills.
 - d. Malaise.
 - e. Myalgia.
 - f. Chest pains.
 - g. Nonproductive cough may develop during the second week.
 - h. Patients may develop hepatitis with hepatomegaly and right upper quadrant (RUQ) pain.
 - i. In fatal Q fever, the lungs will give the clinical appearance of bacterial pneumonia.
3. Identify Q fever by using the SF lab set. *Rickettsia burnetti* may be isolated from the blood. However, it is unlikely that the SF medic will be able to identify the rickettsia in this manner.
4. Identify Q fever by using other lab tests, if available.
 - a. X rays may show evidence of pneumonitis or bacterial pneumonia with lobar consolidation, occurring in fatal cases.
 - b. Specific complement fixation (CF) and agglutinating antibody tests will give a definitive diagnosis.
 - c. The Weil-Felix reaction will be negative.
5. Differentiate between Q fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Bacterial pneumonia.
 - b. Typhus.
 - c. Influenza.
 - d. Hepatitis.
6. Manage Q fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Doxycycline 100 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for (x) 5 days or for 2 days after the patient is afebrile, whichever is longer.
 - b. Chloramphenicol 500 mg PO four times a day (q.i.d.) x 5 days or for 2 days after the patient is afebrile, whichever is longer.
 - c. In chronic disease where patients have developed endocarditis, prolong the treatment. There is no clear-cut regimen for patients who have developed chronic hepatitis.

Performance Steps

7. Vaccinate at-risk workers with phase 1 rickettsial vaccine available from United States Army Medical Research Institute of Infectious Diseases (USAMRIID).
8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage Q-fever.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified Q fever on the basis of the patient's history.	_____	_____
2. Identified Q fever on the basis of the patient's signs and symptoms.	_____	_____
3. Identified Q fever by using the SF lab set.	_____	_____
4. Identified Q fever by using other lab tests, if available.	_____	_____
5. Differentiated between Q fever and other diseases with similar signs and symptoms.	_____	_____
6. Managed Q fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Vaccinated at-risk workers with phase 1 rickettsial vaccine available from USAMRIID.	_____	_____
8. Treated complications symptomatically with appropriate supportive care.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Plague

081-833-4262

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify plague on the basis of the patient's history.
 - a. Travel to a known plague endemic area.
 - b. Exposure to the vector, which is a flea that has fed on the host organism. (The host may be any number of wild rodents.)
 - c. History of vaccination does not preclude a diagnosis of plague, as clinical illness may occur in vaccinated persons. The current military vaccine is not effective against pneumonic plague.
2. Identify plague on the basis of the signs and symptoms.
 - a. Bubonic, pneumonic, and septicemic plague share the following symptoms:
 - (1) Chills.
 - (2) High fever, usually with a sudden onset.
 - (3) Severe headache.
 - (4) Tachycardia.
 - b. Septicemic plague may be differentiated from the other two by the presence of nausea and vomiting.

NOTE: Septicemic plague often results in death before the development of buboes.

- c. Pneumonic plague may be differentiated from the other two by the presence of dyspnea with a painless cough, and sputum that is mucoid and then becomes pink or red.

NOTE: Death is probable within 48 hours if left untreated.

- d. Bubonic plague may be differentiated from the other two by the presence of painful, inflamed lymph nodes (buboes).

3. Identify plague by using the SF lab set. In gram-stained smears of sputum, lymph fluid, or exudates from localized lesions, *Yersinia pestis* (the causative agent of plague) will appear as gram-negative, plump, ovoid bacilli exhibiting bipolar staining and often resembling safety pins in shape. Patients with pneumonic plague will have enormous amounts of bacilli in their sputum. Differentiate between plague and other possible diseases. Consider the following diseases with Signs and symptoms that resemble those of plague.
4. Identify plague by using other lab tests, if available.
 - a. Plague may be cultured on ordinary culture media or isolated by animal inoculation.
 - b. Serologic tests include complement fixation (CF), passive hemagglutination, and immunofluorescent staining of secretions or tissues.
5. Differentiate between plague and other possible diseases. Consider the following diseases with signs and symptoms that resemble those of plague:
 - a. Dengue.
 - b. Meningitis.
 - c. Typhus.
6. Manage plague on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

Performance Steps

- a. Gentamicin 2 milligrams per kilogram (mg/kg) loading dose intravenously (IV) then 1.7 mg/kg every 8 hours (q8h) IV or streptomycin 1 gram (g) every 12 hours (q12h) intramuscularly (IM) or IV.
 - b. Alternate drugs are doxycycline 100 milligrams (mg) by mouth (PO) or IV twice daily (b.i.d.) x 10 days or chloramphenicol 500 mg four times daily (q.i.d.) PO or IV x 10 days.
7. Manage symptomatically any complications that may occur as a result of the disease.
 8. Vaccinate soldiers who will travel to endemic areas.
 9. Record all treatment in the patient's medical record.
 10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage plague.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified plague on the basis of the patient's history.	_____	_____
2. Identified plague on the basis of the signs and symptoms.	_____	_____
3. Identified plague by using the SF lab set.	_____	_____
4. Identified plague by using other lab tests, if available.	_____	_____
5. Differentiated between plague and other possible diseases.	_____	_____
6. Managed plague on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
7. Managed symptomatically any complications that occurred as a result of the disease.	_____	_____
8. Vaccinated soldiers who were to travel to endemic areas.	_____	_____
9. Recorded all treatment in the patient's medical record.	_____	_____
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Onchocerciasis

081-833-4264

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination (PE), perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with onchocerciasis.
 - a. Etiology: *Onchocerca volvulus* (filarioidea species).
 - b. General information:
 - (1) Estimated 18 million people infected.
 - (2) Second leading cause of blindness in the world.
 - (3) Highly prevalent in central and western parts of Africa and in Central and South America.
 - (4) Adult worm is white, thread-like, an 30 to 400 millimeters (mm) in length.
 - (5) Life span is many years (15 years).
 - (6) Mode of transmission is black fly bite (vector). Black flies (genus *Simulium*) whose habitat is along fast-moving streams.
 - c. Life cycle:
 - (1) Black fly bites victim; bite is painless.

NOTE: Black fly species in Africa tend to bite their victims on the lower body while the species of Central and South America tend to bite on the upper body.

- (2) Larvae penetrate skin and migrate to connective and subcutaneous (SQ) tissues where they mature to adults in about 1 year.
 - (3) Adult worms coil together and become encapsulated in SQ tissues after several months. Signs and symptoms are nodules forming near bony prominences and are palpable and nontender. The nodules form slowly over several months to full size (2 to 4 centimeters [cm]).
 - (4) Gravid viviparous female discharges microfilariae.
 - (5) Microfilariae migrate within tissues (not in blood) toward skin surface and other sites (some in lymph system).
 - (6) Microfilariae often migrate to the eye (conjunctiva, sclera, cornea, anterior and posterior chamber), causing tissue damage with ocular lesions (10 to 15 percent of infections develop this).
 - (7) Lesions develop from destruction of microfilariae by the body's immune response.
 - (8) Black fly bites infected host and ingests microfilariae.
2. Solicit a patient history.
3. Recognize significant subjective findings for onchocerciasis.
 - a. Patient will have a history of travel to Southern Mexico or Central America or Sub-Saharan Africa where more than 90 percent of cases occur.
 - b. Patient will have a history of exposure to the vector.
 - c. Intense pruritic dermatitis over involved area (similar to prickly heat or scabies).
4. Perform a PE.
5. Recognize significant objective findings for onchocerciasis.
 - a. Intense pruritic dermatitis over involved area (similar to prickly heat or scabies).
 - b. Depigmentation of skin ("leopard skin").
 - c. Thickening of the skin ("lizard skin").
 - d. Enlarged lymph nodes.

Performance Steps

- e. Obstructive inguinal lymphadenopathy ("hanging groin syndrome").
- f. Ocular lesions represented by the following:
 - (1) Punctate keratitis (ulcerative lesions).
 - (2) Corneal pannus (opaque film).
 - (3) Blindness resulting from pupillary occlusion and total corneal opacity.
6. Recognized significant lab findings caused by onchocerciasis.
 - a. Ocular lesions may be seen with a slit lamp during ophthalmoscopy.
 - b. Incised skin scraping or skin biopsy of dermatitic area will be positive for microfilariae.
 - c. Excision of an SQ nodule will contain adult worms.
7. Differentiate between onchocerciasis and other diseases with similar signs and symptoms.
Consider the following diseases:
 - a. Dracunculiasis.
 - b. Guinea worm disease.
8. Manage onchocerciasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Ivermectin 150 micrograms per kilogram (ug/kg) by mouth (PO) for (x) 1 dose every 6 months x 15 years to suppress dermal and ocular microfilaria. If the eyes are involved, start prednisone 1milligram per kilogram per day (mg/kg/day) PO 5 days before ivermectin.

NOTE: Ivermectin decreases the number of microfilaria in the skin and impairs female worm fertility, but does not kill the adult worms. Therefore, treatment must be maintained for the life of the adult worm to prevent autoinfection.

 - b. Suramin is effective, but is no longer widely used because of its toxicity.

NOTE: Diethylcarbamazine (DEC) is no longer recommended because it causes nephrotoxicity, severe allergic reactions, and possibly ocular damage.

 - c. Excise SQ nodules, and remove the adult worms.
9. Treat complications symptomatically with appropriate supportive care.
10. Record all treatment in the patient's medical record.
11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage onchocerciasis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with onchocerciasis.	—	—
2. Solicited a patient history.	—	—
3. Recognized significant subjective findings for onchocerciasis.	—	—
4. Performed a PE.	—	—
5. Recognized significant objective findings for onchocerciasis.	—	—
6. Recognized significant lab findings caused by onchocerciasis.	—	—
7. Differentiated between onchocerciasis and other diseases with similar signs and symptoms.	—	—
8. Manage onchocerciasis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
9. Treated complications symptomatically with appropriate supportive care.	_____	_____
10. Recorded all treatment in the patient's medical record.	_____	_____
11. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References Required	Related
	MERCK MANUAL 17TH ED SANFORD, 1999

Manage Leptospirosis

081-833-4266

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify leptospirosis on the basis of the patient's history.
 - a. Leptospirosis should be considered in any patient with a fever of unknown origin that occurs in a setting conducive to exposure to the disease.
 - b. The patient may have a history of contact with contaminated animal urine or tissue.
 - c. The disease may also be contracted through indirect contact with contaminated water or soil.
2. Identify leptospirosis on the basis of the following signs and symptoms:
 - a. Patients will experience a leptospiremic phase with leptospires in the blood lasting 4 to 9 days.
 - (1) Frontal or retroorbital headache.
 - (2) Severe myalgia.
 - (3) Chills, followed by rapidly rising fever.
 - (4) Prominent conjunctival suffusion.
 - b. In the immune phase, the leptospires have disappeared from the blood.
 - (1) Fever and other symptoms remit for 1 to 3 days.
 - (2) Fever returns to 102 degrees Fahrenheit along with the return of other symptoms.
 - c. Weil's syndrome is severe leptospirosis with jaundice.
 - (1) Patients usually have a higher fever with longer duration.
 - (2) Hepatic signs include jaundice, right upper quadrant (RUQ) tenderness, and enlargement of the liver.
 - (3) Renal signs include proteinuria, pyuria, hematuria, and azotemia.
3. Identified leptospirosis by using the SF lab set.
 - a. The presence of more than 70 percent neutrophils will differentiate leptospirosis from any viral illness.
 - b. Patients with Weil's syndrome will display leukocytosis greater than 15,000.
 - c. Urinalysis of patients with Weil's syndrome will show proteinuria, hematuria, and azotemia.
4. Identify leptospirosis by using other lab tests, if available.
 - a. After the first week, leptospires may be cultured from patient urine or found through darkfield microscopy.
 - b. With meningitis, the cerebrospinal fluid (CSF) cell count is between 10 to 1,000 per microliter with predominantly mononuclear cells.
 - c. Serum bilirubin levels may reach 40 milligrams per deciliter (mg/dl) in severe infection. Blood urea nitrogen (BUN) is usually less than 100 mg/dl. These findings indicate liver and renal involvement.
5. Differentiate between leptospirosis and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Meningitis.
 - b. Hepatitis.
 - c. Acute cholecystitis.
 - d. Malaria.
 - e. Renal failure.

Performance Steps

6. Manage leptospirosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Penicillin G 20 million units per day (mu/day) in 4 equal doses intravenously (IV) or ampicillin 0.5 to 1 gram (g) every 6 hours (q6h) IV.
 - b. In less severe cases, doxycycline 100 mg by mouth (PO) or IV twice daily (b.i.d.) for (x) 7 days, ampicillin 500 mg PO q6h x 7 days, or amoxicillin 500 mg PO q6h x 7 days.
7. Carefully dispose of patient urine to prevent infection of others.
8. Treat complications symptomatically with appropriate supportive care.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage leptospirosis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified leptospirosis on the basis of the patient's history.	—	—
2. Identified leptospirosis on the basis of signs and symptoms.	—	—
3. Identified leptospirosis by using the SF lab set.	—	—
4. Identified leptospirosis by using other lab tests, if available.	—	—
5. Differentiated between leptospirosis and other diseases with similar signs and symptoms.	—	—
6. Managed leptospirosis on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
7. Carefully disposed of patient urine to prevent infection of others.	—	—
8. Treated complications symptomatically with appropriate supportive care.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Rat Bite Fever

081-833-4268

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify streptobacillary rat bite fever on the basis of the patient's history.
 - a. Patient presents with a history of a bite by a wild rat, mouse, or other rodent.
 - b. Patient presents with a history of ingestion of unpasteurized milk.
 2. Identify streptobacillary rat bite fever on the basis of its signs and symptoms.
 - a. An incubation period of 1 to 22 days (usually less than 10 days).
 - b. The patient develops a viral-like syndrome with the following:
 - (1) Chills.
 - (2) Fever.
 - (3) Vomiting.
 - (4) Headache.
 - (5) Back and joint pain.
 - c. Most patients develop a morbilliform petechial rash in about 3 days on the hands and feet.
 3. Identify streptobacillary rat bite fever by using the SF lab set.
 - a. Streptobacillus moniliformis is a pleomorphic, gram-negative bacillus.
 - b. The patient will usually have a white blood cell (WBC) count between 6 to 30,000.
 - c. It is usually possible to culture the organism from the blood or joint fluid.
 4. Identify streptobacillary rat bite fever by using other lab tests, if available.
 - a. The organism may be cultured from blood or joint fluid.
 - b. Agglutinins develop during the 2d to 3rd week and are diagnostically important if the titer increases.
 5. Differentiate between streptobacillary rat bite fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Rocky Mountain spotted fever.
 - b. Meningococcemia.
 - c. Typhus.
 6. Manage streptobacillary rat bite fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Augmentin 1 tablet by mouth (PO) twice daily (b.i.d.) for (x) 7 days.
 - b. Alternate drugs are doxycycline 100 mg PO b.i.d. x 7 days or erythromycin 500 mg PO four times a day (q.i.d.) x 7 days.
- NOTE: Steps 7 through 12 pertain only to spirillum minus rat bite fever.
7. Identify spirillum minus rat bite fever on the basis of the patient's history. The patient will usually present with a history of a rat or mouse bite that healed and then reinfamed after a period of time. (usually more than 10 days).
 8. Identify spirillum minus rat bite fever on the basis of patient's signs and symptoms.
 - a. Wound heals but inflammation recurs after incubation period of 4 to 28 days (usually 10 days)
 - b. Relapsing fevers.

Performance Steps

- c. Regional lymphadenitis near the area of the bite.
 - d. Occasional roseolar-urticarial rash.
9. Identify spirillum minus rat bite fever by using the SF lab set.
 - a. WBC count will be between 5,000 to 30,000.
 - b. Gimsea stain of blood will reveal spirochetes.
 10. Identify spirillum minus rat bite fever by using other lab tests, if available.
 - a. Darkfield microscopy of blood will reveal spirochetes.
 - b. Test for venereal disease will be false positive in 50 percent of patients.
 11. Differentiate between spirillum minus rat bite fever and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. Malaria.
 - b. Meningococcemia.
 - c. Borrelia recurrentis infection.
 12. Manage spirillum minus rat bite fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. Procaine penicillin G 1.2 million units (mu) intramuscularly (IM) per day x 7 days or penicillin V 500 mg PO q.i.d.
 - b. Doxycycline 100 mg PO b.i.d. x 7 days.
 13. Treat complications symptomatically with appropriate supportive care.
 14. Record all treatment in the patient's medical record.
 15. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage rat bite fever.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified streptobacillary rat bite fever on the basis of the patient's history.	—	—
2. Identified streptobacillary rat bite fever on the basis of its signs and symptoms.	—	—
3. Identified streptobacillary rat bite fever by using the SF lab set.	—	—
4. Identified streptobacillary rat bite fever by using other lab tests, if available.	—	—
5. Differentiated between streptobacillary rat bite fever and other diseases with similar signs and symptoms.	—	—
6. Managed streptobacillary rat bite fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—
7. Identified spirillum minus rat bite fever on the basis of the patient's history.	—	—
8. Identified spirillum minus rat bite fever on the basis of the patient's signs and symptoms.	—	—
9. Identified spirillum minus rat bite fever by using the SF lab set.	—	—
10. Identified spirillum minus rat bite fever by using other lab tests, if available.	—	—
11. Differentiated between spirillum minus rat bite fever and other diseases with similar signs and symptoms.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
12. Managed spirillum minus rat bite fever on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
13. Treated complications symptomatically with appropriate supportive care.	_____	_____
14. Recorded all treatment in the patient's medical record.	_____	_____
15. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Typhus

081-833-4270

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify typhus on the basis of the patient's history.
 - a. Scrub typhus patients will have a history of a chigger bite that occurred in the Asia-Pacific area or Australia.
 - b. Epidemic typhus patients will usually have a history of pediculosis. The disease is transmitted in the feces of the body louse when a puncture wound is contaminated by scratching.
 - c. Murine typhus patients will have a history of being bitten by the rat flea. The disease is more prevalent in congested urban areas where rats abound.
2. Identify typhus on the basis of the signs and symptoms.
 - a. Scrub typhus signs and symptoms are as follows:
 - (1) Eschar at the bite site.
 - (2) Nonblanching central macular rash.
 - (3) Acute onset of fever, slowly progressing to a high of 105 degrees Fahrenheit.
 - (4) Conjunctival injection.
 - (5) Chills.
 - (6) Regional lymphadenopathy.
 - (7) Cough in the first week.
 - (8) In the second week, apathy progressing to stupor with the onset of meningoencephalitis.
 - (9) The disease may progress to myocarditis and circulatory failure.
 - b. Epidemic typhus signs and symptoms are as follows:
 - (1) Abrupt onset of fever.
 - (2) Severe headache.
 - (3) Myalgia of the back and legs.
 - (4) Chills.
 - (5) Hot and dry skin.
 - (6) Face flushed and dusky.
 - (7) Late phase, beginning on the fourth to seventh day, involves the following:
 - (a) A macular rash beginning on the trunk and axillary folds, spreading to the extremities. The rash will become maculopapular and may become hemorrhagic or purpuric.
 - (b) Rapid, weak, and irregular pulse with possible hypotension.
 - (c) Stupor or coma interrupted by periods of delirium or excitement.
 - c. Murine typhus signs and symptoms are generally the same as with Epidemic typhus, but less severe and of shorter duration with the exception of the following:
 - (1) Rash on the trunk and inner arm surfaces.
 - (2) Fever that remains high (102 to 105 degrees Fahrenheit) for 2 weeks.
3. Identify typhus by using the SF lab set.
 - a. Scrub typhus causative agent is *Rickettsia tsutsugamushi*. Epidemic typhus causative agent is *Rickettsia prowazekii*. Murine typhus causative agent is *Rickettsia typhi*.
 - b. All of the causative agents are intracellular pleomorphic coccobacilli that stain purple with Giemsa's stain.
 - c. Rickettsials require living cells for growth and will not colonize normal bacterial media.

Performance Steps

4. Identify typhus by using other lab tests, if available.
 - a. The Weil-Felix test is useful for screening and will identify patients with typhus or Rocky Mountain spotted fever (RMSF).
 - b. Identification of the causative agent by immunofluorescence.
 - c. The various rickettsial diseases can be differentiated by using the group-specific, soluble rickettsial antigens in the complementation-fixation reaction.
5. Differentiate between various forms of typhus and other diseases with similar signs and symptoms. Consider the following diseases:
 - a. RMSF.
 - b. Rubeola.
 - c. Rubella.
 - d. Rash of meningococcemia.
6. Manage typhus on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - a. The drug of choice is doxycycline 100 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for (x) 7 days or until 2 days after the fever has subsided, whichever is longer.
 - b. Alternate drug is chloramphenicol 500 mg PO four times a day (q.i.d.) x 7 days or until 2 days after the fever has subsided, whichever is longer.
7. Record all treatment in the patient's medical record.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage typhus.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified typhus on the basis of the patient's history.	—	—
2. Identified typhus on the basis of the signs and symptoms.	—	—
3. Identified typhus by using the SF lab set.	—	—
4. Identified typhus by using other lab tests, if available.	—	—
5. Differentiated between various forms of typhus and other diseases with similar signs and symptoms.	—	—
6. Managed typhus on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Malaria

081-833-4274

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, Special Forces (SF) laboratory (lab) set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request lab studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Identify malaria on the basis of the patient's history.
 - a. Travel in a malarious area (basically all of the tropics and subtropics worldwide).
 - b. Exposure to the vector (the anopheles mosquito).
 2. Identify malaria on the basis of its signs and symptoms.
 - a. During the prodromal period, there are flu-like symptoms to include the following:
 - (1) Headache.
 - (2) Photophobia.
 - (3) Myalgia.
 - (4) Anorexia.
 - (5) Nausea.
 - (6) Vomiting.
 - b. During the malarial paroxysm, there are three phases as follows:
 - (1) Chill phase involves sudden, shaking chills or rigor of 10- to 15-minutes duration. The patient complains of extreme cold, although his temperature is elevated and continues to rise during this phase to 104 to 106 degrees Fahrenheit.
 - (2) Hot phase involves sudden hot flash with flushed skin. Patient may be agitated and restless, disoriented, or delirious. Patient has severe frontal headache and pain in the limbs and back. This phase lasts from 2 to 6 hours.
 - (3) Sweat phase involves profuse sweating. The patient starts to feel better. This phase will last for hours with the patient showing improvement until the next paroxysm.
 - (4) Patients will often present with splenomegaly and occasional jaundice.
 - c. Chronic malaria with low-grade parasitemia occurs in partially immune persons in hyperendemic areas and may be accompanied by malaise, listlessness, periodic headache, anorexia, fatigue, and mild fever. These symptoms may culminate in acute attacks of chills and fever that are considerably milder and shorter in duration than the primary attack.
 - d. Blackwater fever is a rare complication, characterized by intravascular hemolysis, hemoglobinemia, and hemoglobinuria. It occurs, perhaps exclusively, in chronic falciparum malaria--especially in patients treated with quinine.
 3. Identify malaria by using the SF lab set.
- NOTE: Use Giemsa stain for best results. It may be necessary to collect blood smears every 2 to 6 hours for 3 days before a patient can be considered negative for malaria.
- a. If available, use Becton Dickinson "parasight" test to rule out Plasmodium falciparum (P. falciparum). This is a card agglutination type test that is very accurate in diagnosing P. falciparum.
 - b. Use a thick smear to locate protozoa (task 081-833-4675, Perform a Giemsa Stain for the Presence of Blood Parasites).
 - c. Use a thin smear to identify protozoa.
 - (1) Schuffner's dots inside the red blood cells (RBC) indicates Plasmodium vivax (P. vivax) or Plasmodium ovale (P. ovale).
 - (2) Banana- or sausage-shaped gametocytes in the RBCs indicates P. falciparum.

Performance Steps

4. Differentiate between malaria and other possible causes of the signs, symptoms, and lab findings. Consider the following diseases:

- a. Typhoid fever.
- b. Dengue fever.
- c. Encephalitis.
- d. Gastroenteritis.

5. Manage malaria on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

- a. Chloroquine-sensitive malaria: chloroquine phosphate, 1 gram (g) by mouth (PO) followed by 500 milligrams (mg) PO in 6 hours followed by 500 mg every day (q.d.) for (x) 2 days PLUS primaquine phosphate 26.3 mg q.d. x 14 days.

NOTE: Primaquine may cause hemolysis in patients with a deficiency in glucose-6-phosphate dehydrogenase (G6PD).

- b. Chloroquine-resistant malarias: quinine sulfate 600 mg, PO three times a day (t.i.d.) x 7 days plus doxycycline hydrochloride 100 mg PO twice daily (b.i.d.) x 7 days.
- c. Mefloquine-loading dose of 15 milligrams per kilogram (mg/kg) PO once then 10 mg/kg 8 to 24 hours later. (Maximum single dose is 1,250 mg.)
- d. If patient is too ill to take oral medications, give quinidine gluconate 10 mg/kg intravenously (IV) over 1 hour and then 0.02 milligrams per kilogram per minute (mg/kg/min) for 72 hours (monitor electrocardiogram [ECG]) or until patient can take oral medications..
6. Monitor the patient's blood smears while he is under treatment. If a clinical response is not evident within 36 hours, use an alternative drug.
7. Treat all unspiciated malaria as *P. falciparum*.
8. Report all drug-resistant strains of malaria to the Armed Forces Medical Intelligence Center.
9. Record all treatment in the patient's medical record.
10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage malaria.

Performance Measures

1. Identified malaria on the basis of the patient's history.
2. Identified malaria on the basis of its signs and symptoms.
3. Identified malaria by using the SF lab set.
4. Differentiated between malaria and other possible causes of the signs, symptoms, and lab findings.
5. Managed malaria on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy.
6. Monitored the patient's blood smears while under treatment.
7. Treated all unspiciated malaria as *P. falciparum*.
8. Reported all drug-resistant strains of malaria to the Armed Forces Medical Intelligence Center.
9. Recorded all treatment in the patient's medical record.

GO **NO GO**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
10. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required MERCK MANUAL 17TH ED SANFORD, 1999	

Subject Area 22: Pediatrics

Assess Common Pediatric Diseases

081-833-4340

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the cause of the disease in accordance with The Merck Manual.

Performance Steps

1. Recognize the signs and symptoms of common bacterial pediatric diseases.
 - a. Bacterial (streptococcal) pharyngitis.
 - (1) Fever of 101 to 103 degrees Fahrenheit.
 - (2) Tender anterior cervical lymph nodes.
 - (3) Exudative pharyngitis or tonsillitis.
 - (4) Leukocytosis--erythrocyte sedimentation rate (ESR) 50, white blood cell (WBC) count 12,000 to 20,000, and 75 to 90 percent neutrophils.
 - (5) Throat cultures for definitive assessment.
 - b. Scarlet fever.
 - (1) Abrupt onset of fever (103 degrees Fahrenheit is usual).
 - (2) Vomiting.
 - (3) Headache.
 - (4) Malaise.
 - (5) The oral mucous membranes are bright red, and there may be scattered petechiae and red punctate lesions on the soft palate. Tonsils and pharynx are swollen and red with exudate, the tongue appears strawberry red.
 - (6) Rash.
 - (a) Diffuse "sunburn with goose pimples" 12 to 48 hours after fever.
 - (b) Blanches with pressure, and patient peels after 1 week and for next 6 weeks.
 - (c) Fingertips may peel.
 - c. Tonsillitis.
 - (1) Fever.
 - (2) Sore throat.
 - (3) Very young children may not complain of sore throat, but may refuse to eat.
 - (4) Tonsillar and pharyngeal reddening and edema are suggestive of streptococcal infection.
 - d. Otitis media.
 - (1) Pain is progressive until tympanic membrane (TM) ruptures. Presence of otitis media is often associated with upper respiratory infection (URI).
 - (2) Infant or young children may present with fever, poor feeding, diarrhea, irritability, difficulty in sleeping, and ear pulling (ear pulling is often falsely positive).
 - (3) Hearing loss may occur.
 - (4) Loss of light reflex before TM rupture. TM landmarks are distorted.
 - (5) Loss of TM mobility with pneumomassage. TM may be bulging and red or yellow.
 - (6) Rupture of TM. Discharge may start as bloody to serosanguinous and then become purulent.
 - e. Pertussis (whooping cough).
 - (1) Insidious onset with prodromal catarrhal upper respiratory tract symptoms that last for 1 to 3 weeks (rhinitis, sneezing, and an irritating cough).
 - (2) Slight fever of 101 degrees Fahrenheit, which is suggestive of bacterial superinfection.
 - (3) Paroxysmal cough (after about 2 weeks) characterized by 10 to 30 forceful coughs ending with a loud inspiration (the whoop).
 - (4) Vomiting commonly follows coughing.

Performance Steps

- (5) Coughing is accompanied by cyanosis, sweating, prostration, and exhaustion.
- (6) Infants have severe apnea with bradycardia, which is sometimes associated with gagging or coughing.
- f. Diphtheria.
 - (1) Pseudomembrane forms in pharynx, trachea, and nose (gray, tough, adherent). Death results from obstructed airway.
 - (2) Mild sore throat.
 - (3) Moderate fever.
 - (4) Cervical edema and lymphadenopathy ("bull neck").
 - (5) Tachycardia.
 - (6) Nausea, chills, emesis, headache, and fever are more common in children.
 - (7) Neuritis that causes paralysis of pharyngeal and palatal nerve (from toxin).
 - (a) Patient regurgitates fluid and has a nasal voice.
 - (b) Usually resolves in 1 to 2 weeks.
 - (8) External eye muscles. Patient gets diplopia and strabismus.
 - (9) Diaphragm needs mechanical ventilator to prevent death.
- g. Croup.
 - (1) Prodromal period. There is usually a prodrome of upper respiratory tract symptoms.
 - (2) Barking cough and stridor (usually at night).
 - (a) Mildly affected children may exhibit stridor only when agitated.
 - (b) Symptoms may progress to stridor at rest, accompanied by retractions, air hunger, and cyanosis in severe cases.
- h. Epiglottitis (a medical emergency).
 - (1) Sudden onset of fever.
 - (2) Dysphagia.
 - (3) Drooling.
 - (4) Muffled voice.
 - (5) Inspiratory retractions.
 - (6) The definitive diagnosis is made by direct inspection of the epiglottis. This inspection should be done by an experienced airway specialist under controlled conditions.
 - (7) The typical findings are a cherry red and swollen epiglottis and arytenoids.
- i. Meningitis.
 - (1) A prodromal period of respiratory illness or sore throat may precede other signs and symptoms.
 - (2) Stiff neck and severe headache (stiff neck may be absent) progress to opisthotonos.
 - (3) Fever and chills.
 - (4) Decreased level of consciousness. Patient progresses through irritability, confusion, drowsiness, stupor, and coma.
 - (5) Rash (meningococcal).
 - (6) Nausea and vomiting.
 - (7) Bulging fontanel in infants.

NOTE: In infants between birth and 2 years of age, the signs and symptoms are less predictable.

2. Recognize the signs and symptoms of common viral pediatric diseases.

- a. Rubeola (7-day measles).
 - (1) Prodromal phase lasts 2 to 3 days.
 - (a) Fever of 101 to 104 degrees Fahrenheit or higher.
 - (b) Chills.
 - (c) Malaise.
 - (d) Perspiration.
 - (e) Occulonasal catarrh.
 - (f) Conjunctivitis and photophobia lead one to suspect measles before Koplik's spots appear.
 - (g) Coryza with mucopurulent discharge.
 - (h) Persistent, dry, hacking cough (barking and refractory to most antitussive).

Performance Steps

NOTE: These signs almost always proceed Koplik's spots by 2 to 3 days.

- (2) Koplik spots are nearly pathognomonic.
 - (a) Appear on buccal mucosa opposite the first molar.
 - (b) Characterized by many pinpoint blue or white elevations resembling grains of salt sprinkled on an erythematous base.
 - (c) They appear and disappear rapidly, usually within 12 to 18 hours.
- (3) Rash stage makes its appearance 3 to 4 days after the onset of illness, lasts for 3 days in each affected area, and lasts a total of 7 to 10 days.
 - (a) Temperature rises abruptly as the rash appears (104 to 105 degrees Fahrenheit).
 - (b) Rash starts as faint macules on the head and lateral neck.
 - (c) Rash becomes maculopapular as it spreads to the trunk and upper and lower extremities.
 - (d) When the rash reaches the legs and feet, in about 2 days, symptoms subside.
 - (e) As it finally reaches the feet on the 2d to 3d day, it begins to fade on the face.
- b. Rubella (3-day measles).
 - (1) Prodromal phase is mild.
 - (a) Lasts 1 to 5 days.
 - (b) May not be noticed in adolescents and adults.
 - (c) Malaise.
 - (d) Most characteristic sign is retroauricular, posterior, cervical, and postoccipital adenopathy. No other disease causes the tender enlargement of all these nodes to the same extent as rubella.
 - (e) A exanthem may appear just before the onset of the skin rash. It consists of discrete rose spots on the soft palate that may coalesce into a red blush and may extend over the fauces.
 - (2) Rash.
 - (a) Rose maculopapular (discrete).
 - (b) Begins on face and spreads quickly.
 - (c) Its evolution is so rapid that the rash on the face may be fading by the time it appears on the trunk.
 - (d) Mild itching may occur.
 - (e) Eruption usually clears by the 3d day.
 - (f) Desquamation is minimal.
 - (g) Fever is slight or absent.
- c. Roseola infantum (exanthem subitum or pseudorubella).
 - (1) Prodromal phase is 3 to 4 days long.
 - (a) Rapid onset of fever of 103 to 105 degrees Fahrenheit, persisting 3 to 5 days without any evident cause.
 - (b) May be anorexic and irritable.
 - (c) Infant does not appear as sick as the high fever would suggest.
 - (2) Rash (most notable feature).
 - (a) Appears as fever subsides.
 - (b) Lasts 1 to 2 days.
 - (c) Faintly erythematous macular and diffusely disseminated.
 - (d) Starts on the trunk first and then spreads to neck, arms, face, and legs.
- d. Varicella (chicken pox) is caused by varicella zoster virus.
 - (1) Prodromal symptoms last 1 day and precede the rash by 24 hours.
 - (a) Fever is usually slight but parallels severity of rash.
 - (b) Malaise or anorexia.
 - (c) Accompanied at times by a scarlatiniform or morbilliform rash.
 - (2) Rash lasts 5 to 20 days.
 - (a) Rash begins as crops of small, red papules, which almost immediately develop into clear, often oval, "teardrop" vesicles on an erythematous base. Vesicles scab in 7 to 8 days from onset.
 - (b) The contents become cloudy within about 24 hours.

Performance Steps

- (c) The vesicles are easily broken and become scabbed.
 - (d) Crops of widely scattered vesicles continue to erupt for 3 to 4 days.
 - (e) Rash begins on the trunk, which is the most common site, and spreads to the periphery.
 - (f) Lesions--papules, vesicles, and crusts--are present in all stages of development.
 - (g) Pruritus is constant and annoying.
 - (h) Ulcerated lesions may also be present on the mucous membranes, including the oropharynx and upper respiratory tract, palpable conjunctiva, and the rectal and vaginal mucosa.
- e. Infectious parotitis (mumps).
- (1) Pain (especially on swallowing acidic foods such as vinegar or lemon juice), swelling, and tenderness of parotid glands.
 - (2) Other salivary glands may be involved. Maximum involvement usually occurs by the second day.
 - (3) Swelling slowly subsides within 3 to 7 days.
 - (4) Low-grade fever, headache, malaise, and anorexia.
3. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must assess common pediatric diseases.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of common bacterial pediatric diseases.	_____	_____
2. Recognized the signs and symptoms of common viral pediatric diseases.	_____	_____
3. Recorded all findings in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

PEDS EMER, BRADY 2ND ED
SANFORD, 1999

Manage Common Viral Pediatric Diseases

081-833-4341

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, and a selection of pharmacological agents.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Understand the general characteristics of rubeola (measles).
 - a. Rubeola is a viral illness.
 - b. Virus is present in nasopharyngeal secretions, blood, and urine.
 - c. Virus can remain active for at least 34 hours at room temperature.
 - d. Dissemination of virus occurs by droplet spray from respiratory tract during the prodromal stage (catarrhal stage).
 - e. Infants acquire immunity transplacentally from mothers who have had measles. Immunity lasts for the first 4 to 6 months of life and disappears at different rates.
 - f. Infants of susceptible mothers have no immunity.
 - g. An infected person becomes infective for others by the 9th to 14th day after exposure.
 - h. Isolation precautions to prevent spread--especially in hospitals or other institutions for children--should be maintained from the 7th day after exposure until about 5 days after the rash has appeared.
2. Recognize the signs and symptoms of rubeola.
 - a. Incubation period is about 9 to 14 days. A slight rise in temperature may occur 9 to 10 days from the date of infection and then subside for 24 hours or so.
 - b. Prodromal phase lasts 2 to 3 days.
 - (1) Fever of 101 to 104 degrees Fahrenheit or higher.
 - (2) Chills.
 - (3) Malaise.
 - (4) Perspiration.
 - (5) Occulonasal catarrh.
 - (6) Conjunctivitis and photophobia lead one to suspect measles before Koplik's spots appear.
 - (7) Coryza with mucopurulent discharge.
 - (8) Persistent, dry, hacking cough (barking and refractory to most antitussive).

NOTE: These signs almost always proceed Koplik's spots by 2 to 3 days.

- (9) Koplik spots are nearly pathognomonic
 - (a) Appear on buccal mucosa opposite the first molar.
 - (b) Characterized by many pinpoint blue or white elevations resembling grains of salt sprinkled on an erythematous base.
 - (c) They appear and disappear rapidly, usually within 12 to 18 hours.
- c. Rash stage makes its appearance 3 to 4 days after the onset of illness, lasts 3 days on each affected area, and lasts a total of 7 to 10 days.
 - (1) Temperature rises abruptly as the rash appears (104 to 105 degrees Fahrenheit).
 - (2) Rash starts as faint macules on the head and lateral neck.
 - (3) Becomes maculopapular as it spreads to the trunk and upper and lower extremities.
 - (4) When the rash reaches the legs and feet (about 2 days) symptoms subside.
 - (5) As it finally reaches the feet on the 2d to 3d day, it begins to fade on the face.

NOTE: The severity of the disease is directly related to the extent and confluence of the rash.

3. Recognize significant laboratory results for rubeola.
 - a. Leukopenia.
 - b. Immunoglobulin M (IgM) antibody in serum.

Performance Steps

- c. Fluorescent staining and detection of antigen in nasopharyngeal cells.
- d. X ray shows perihilar infiltrates or parenchymal patchy densities.

4. Differentiate between rubeola and other diseases with similar signs and symptoms. Consider the following diseases:

- a. Rubella.
- b. Scarlet fever.
- c. Roseola infantum.

5. Manage rubeola.

- a. Provide respiratory isolation or protection from streptococcal infections.
- b. Prescribe bedrest until patient is afebrile.
- c. Treat fever with antipyretics and tepid baths (avoid salicylates).
- d. Administer antitussives and humidification for cough (avoid narcotic suppressants in infants).
- e. Ensure adequate fluid intake.
- f. Protect patient from bright lights (photophobia).
- g. Administer antimicrobial therapy for secondary bacterial infections, as needed.

NOTE: For children with history of febrile seizures, anticonvulsants may be needed.

6. Vaccinate all children against the disease.

- a. Active immunization: live, attenuated measles vaccine. Give patient a single dose at 12 months of age or as soon as possible thereafter. The optimal age in Africa or Asia is 9 to 10 months.
- b. Revaccinations: Children who received their initial vaccination before 12 months and those who did not receive proper immunizations should receive a booster immunization.
- c. Since the vaccine virus is grown in chick fibroblast culture rather than in eggs, it can be given safely to children who are allergic to egg protein.

NOTE: Steps 7 through 11 pertain to rubella.

7. Understand the general characteristics of rubella (German measles or 3-day measles).

- a. A contagious exanthematous disease, usually with mild constitutional symptoms that may result in abortion, stillbirth, or congenital defects in infants born to mothers infected during early months of pregnancy.
- b. Moderately contagious.
- c. Virus is present in nasopharyngeal secretions, blood, feces, and urine. Virus has been recovered from the nasopharynx 7 days before exanthem and 7 to 8 days after its disappearance.
- d. Spread is by oral droplets or transplacentally in congenital infection.
- e. Infants with congenital rubella may continue to shed virus in nasopharyngeal secretions and urine for 1 year or more and may continue to transmit infection to susceptible contacts.

8. Recognize the signs and symptoms of rubella.

- a. Incubation period is 2 to 3 weeks.
- b. Prodromal phase is mild.
 - (1) Lasts 1 to 5 days.
 - (2) May not be noticed in adolescents and adults.
 - (3) Malaise.
 - (4) Most characteristic sign is retroauricular, posterior, cervical, and postoccipital adenopathy. No other disease causes the tender enlargement of all these nodes to the same extent as rubella.
 - (5) A exanthem may appear just before the onset of the skin rash. It consists of discrete rose spots on the soft palate, which may coalesce into a red blush and may extend over the fauces.
 - (6) Rash.
 - (a) Rose maculopapular (discrete).
 - (b) Begins on face and spreads quickly.

Performance Steps

- (c) Evolution of rash is so rapid that the rash on the face may be fading by the time it appears on the trunk.
 - (d) Mild itching may occur.
 - (e) Eruption usually clears by the 3d day.
 - (f) Desquamation is minimal.
 - (g) In contrast to rubeola, there is no photophobia.
 - (h) Slight or absent fever.
9. Differentiate between rubella and other diseases with similar signs and symptoms. Consider the following diseases:
- a. Rubeola.
 - b. Roseola infantum.
 - c. Epstein-Barr virus (in the event it presents with a rash).
10. Manage rubella.
- a. Prescribe bedrest.
 - b. Provide respiratory isolation from susceptible individuals.
 - c. Administer antipyretics while febrile (avoid salicylates).
 - d. Maintain hydration.
11. Vaccinate all children.
- a. All children between the ages of 12 months and puberty and of nonpregnant postpubertal females who test negative for antibodies.
 - b. If rubella vaccine is given to a woman of childbearing years, she should not get pregnant for 2 to 3 months.
- NOTE: Steps 12 through 16 pertain to roseola infantum.
12. Understand the general characteristics of roseola infantum.
- a. Occurs mostly in the spring and fall.
 - b. Minimally contagious.
 - c. Infants 6 months to 3 years of age are most susceptible.
 - d. Caused by human herpes virus type 6.
13. Recognize the signs and symptoms of roseola infantum.
- a. Incubation period is estimated to be 7 to 17 days.
 - b. Prodromal phase is 3 to 4 days long.
 - (1) Rapid onset of fever 103 to 105 degrees Fahrenheit, persisting 3 to 5 days without any evident cause.
- NOTE: Febrile convulsions can happen during the early phase, especially as the fever rises.
- (2) Infant may be anorexic and irritable.
 - (3) Infant does not appear sick.
 - (4) Rash is the most notable feature.
 - (a) Appears as fever subsides.
 - (b) Lasts 1 to 2 days.
 - (c) Faintly erythematous, macular, and diffusely disseminated.
 - (d) Starts on the trunk first, then spreads to neck, arms, face, and legs.
 - (e) Other findings may be entirely normal except for infection of the pharyngeal, tonsillar, and tympanic membranes.
14. Recognize significant lab results that are caused by roseola infantum.
- a. Progressive leukopenia (3,000 to 5,000).
 - b. Relative lymphocytosis as high as 90 percent.
15. Differentiate between roseola infantum and other diseases with similar signs and symptoms. Consider the following diseases:
- a. Rubella.
 - b. Rubeola.

Performance Steps

- c. Bacterial infection.
- d. Rule out bacterial meningitis if patient has a febrile seizure and there are other clinical signs of meningitis (photophobia, stiff neck, mental status changes, and petechiae).

16. Manage roseola infantum.

- a. Restrict infant's activity until the rash appears.
- b. Administer antipyretics for temperature over 103 degrees Fahrenheit.
- c. Give tepid water sponge baths for high fever uncontrolled by antipyretics.
- d. Administer barbiturate sedatives to possibly prevent convulsions resulting from hyperpyrexia--especially in children with convulsive tendencies.

NOTES:

1. There is no vaccine for roseola infantum.
2. Steps 17 through 20 pertain to chicken pox.

17. Understand the general characteristics of chicken pox (varicella).

- a. Cause is varicella zoster virus (a herpes virus).
- b. Virus is present in the vesicles, but is not contained in the crusts.
- c. Virus is spread by the upper respiratory tract secretions and by direct contact.
- d. Virus occurs in winter and early spring in 3- to 4-year cycles.
- e. Virus is highly communicable. Patients are infectious from about 24 hours before the rash appears until all lesions are crusted (usually 6 to 7 days after eruption).
- f. In reported cases, virus occurs 50 percent of cases occur in child by age 5 and 80 to 90 percent of cases occur in child by age 15.

Note: Chicken pox is usually a mild disease in young children but is very severe and sometimes fatal in adults. Unimmunized adults must avoid chicken pox.

18. Recognize the signs and symptoms of chicken pox.

- a. Incubation period is 2 to 3 weeks.
- b. Prodromal phase is 1 day long and precedes the rash by 24 hours. Symptoms are as follows:
 - (1) Fever is usually slight but parallels severity of rash.
 - (2) Malaise or anorexia is present.
 - (3) At times, a scarlatiniform or morbilliform rash is present.
- c. Rash is usually lasts 5 to 20 days.
 - (1) Rash begins as crops of small, red papules that almost immediately develop into clear, often oval, "teardrop" vesicles on an erythematous base. The vesicles scab in 7 to 8 days from onset.
 - (2) The contents of vesicles become cloudy within about 24 hours.
 - (3) The vesicles are easily broken and become scabbed.
 - (4) Crops of widely scattered vesicles continue to erupt for 3 to 4 days.
 - (5) Rash begins on the trunk, which is the most common site, and spreads to the periphery.
 - (6) Lesions--papules, vesicles, and crusts--are present in all stages of development at a given point in time.
 - (7) Pruritus is constant and annoying. If it does not itch, it is probably not chicken pox.
 - (8) Ulcerated lesions may also be present on the mucous membranes, including the oropharynx and upper respiratory tract, palpable conjunctiva, and the rectal and vaginal mucosa.

19. Differentiate between chicken pox and other diseases with similar signs and symptoms. Consider the following diseases:

- a. Contact dermatitis.
- b. Coxsackievirus (hand-foot-mouth disease).
- c. Impetigo.
- d. Secondary syphilis.

20. Manage chicken pox.

NOTE: A vaccine is available and now is fully approved by all major medical associations.

Performance Steps

- a. Isolate patient until all lesions have crusted, and instruct patient to avoid contact with susceptible individuals.
- b. Concurrent with isolation, disinfect articles soiled by discharge from the nose, throat, and lesions.
- c. Direct symptomatic treatment toward alleviation of itching and secondary bacterial infections.
- d. Ensure patient remains hydrated.
- e. Inform patient to take frequent baths with oatmeal or starch solution to help decrease pruritis.
- f. Apply topical antipruritics, such as calamine, caladryl, and so on.
- g. Prescribe acetaminophen for fever and discomfort.
- h. For intense pruritus, prescribe Benadryl or Atarax.
- i. Instruct patient to bathe with soap and water to decrease skin bacteria. Skin bacteria are the cause of secondary bacterial infection, which is the major complication of chicken pox.

NOTE: Steps 21 through 23 pertain to the management of Infectious parotitis (mumps).

21. Understand the general characteristics of infectious parotitis (mumps).
 - a. Acute, contagious, generalized viral disease, usually causing painful enlargement of the salivary glands, most commonly the parotids.
 - b. A paramyxovirus.
 - c. Although the disease may occur at any age, most cases occur in children 5 to 15 years of age.
 - d. Incidence peaks late winter to early spring.
22. Recognize the signs and symptoms of infectious parotitis.
 - a. Is asymptomatic in 25 to 30 percent of cases.
 - b. Incubation period is 2 to 3 weeks.
 - c. Pain (especially on swallowing acidic foods such as vinegar or lemon juice), swelling, and tenderness of parotid glands.
 - d. Other salivary glands may be involved. Maximum involvement usually occurs by the second day.
 - e. Swelling slowly subsides within 3 to 7 days.
 - f. Low-grade fever, headache, malaise, and anorexia.
 - g. Orchitis may occur with adolescent and older men (20 percent). Symptoms are as follows:
 - (1) Chills and fever.
 - (2) Testicular swelling that is very painful. The pain is usually unilateral.
 - (3) Symptoms subside in 3 to 4 days (sterility rare).
23. Manage infectious parotitis.
 - a. Prescribe rest.
 - b. Administer analgesics.
 - c. Administer antipyretics.
 - d. Apply testicular compress, if needed.
 - e. Prevent mumps by giving vaccine to patients 12 months of age. The mumps vaccine is part of the measles, mumps, rubella (MMR) vaccine.
24. Manage complications symptomatically with appropriate supportive care.
25. Record all treatment in the patient's medical record.
26. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage common viral pediatric diseases.

Performance Measures

1. Understood the general characteristics of rubeola (measles).
2. Recognized the signs and symptoms of rubeola.

GO **NO GO**

— —
— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Recognized significant lab results for rubeola.	—	—
4. Differentiated between rubeola and other diseases with similar signs and symptoms.	—	—
5. Managed rubeola.	—	—
6. Vaccinated all children against rubeola.	—	—
7. Understood the general characteristics of rubella (German measles or 3-day measles).	—	—
8. Recognized the signs and symptoms of rubella.	—	—
9. Differentiated between rubella and other diseases with similar signs and symptoms.	—	—
10. Managed rubella.	—	—
11. Understood the general characteristics of roseola infantum.	—	—
12. Recognized the signs and symptoms of roseola infantum.	—	—
13. Recognized significant lab results that are caused by roseola infantum.	—	—
14. Differentiated between roseola infantum and other diseases with similar signs and symptoms.	—	—
15. Managed roseola infantum.	—	—
16. Understood the general characteristics of chicken pox (varicella).	—	—
17. Recognized the signs and symptoms of chicken pox.	—	—
18. Differentiated between chicken pox and other diseases with similar signs and symptoms.	—	—
19. Managed chicken pox.	—	—
20. Understood the general characteristics of infectious parotitis (mumps).	—	—
21. Recognized the signs and symptoms of infectious parotitis.	—	—
22. Managed infectious parotitis.	—	—
23. Managed complications symptomatically with appropriate supportive care.	—	—
24. Recorded all treatment in the patient's medical record.	—	—
25. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED

Related

PEDS EMER, BRADY 2ND ED
SANFORD, 1999

Manage Common Bacterial Pediatric Diseases

081-833-4342

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Recognized the signs and symptoms of bacterial (streptococcal) pharyngitis.
 - a. Fever of 101 to 103 degrees Fahrenheit.
 - b. Tender anterior cervical lymph nodes.
 - c. Exudative pharyngitis or tonsillitis.
 - d. Complications:
 - (1) Rheumatic fever, which is preventable by adequate therapy.
 - (2) Poststreptococcal glomerulonephritis (PSGN) antibiotics do not halt the progression of the nephritis, unlike their effect in rheumatic fever. Refer patient to a definitive care facility.
 2. Recognize significant lab findings that are caused by streptococcal pharyngitis.
 - a. Leukocytosis--erythrocyte sedimentation rate (ESR) 50, white blood cell (WBC) count 12,000 to 20,000, and 75 to 90 percent neutrophils.
 - b. Throat cultures for definitive assessment.
 3. Manage bacterial pharyngitis.
 - a. Maintain patient hydration.
 - b. Administer antipyretics for fever and analgesia.
 - c. Administer penicillin VK 30 milligrams per kilogram per day (mg/kg/day) to a maximum of 250 milligrams (mg) by mouth (PO) four times a day (q.i.d.) or 500 mg twice daily (b.i.d.) for (x) 10 days. If patient weighs over 27 kg, administer benzathine penicillin G 600,000 units (u) intramuscularly (IM) x 1 dose.
 - d. If patient has an allergy to penicillin, use erythromycin 50 mg/kg/d divided q.i.d. to a maximum of 250 mg q.i.d. or clindamycin 30 mg/kg/day divided q.i.d. x 10 days.
- NOTE: Steps 4 through 7 pertain to pertussis (whooping cough).
4. Recognize the general characteristics of pertussis (whooping cough).
 - a. An acute, highly communicable disease of the respiratory tract.
 - b. Highly communicable.
 - c. Active immunity follows natural pertussis. Immunity following immunization wanes in 5 to 10 years.
 - d. Etiology is *Bordetella pertussis*.
 - e. Children usually acquire the disease from symptomatic family contacts. Adults who have a mild respiratory problem that is not recognized as pertussis are frequently the source of infection.
 - f. The disease is most common and most severe in early infancy.
 5. Recognize the signs and symptoms of pertussis.
 - a. Insidious onset with prodromal catarrhal upper respiratory tract symptoms that lasts 1 to 3 weeks (rhinitis, sneezing, and an irritating cough).
 - b. Slight fever (temperature of 101 degrees Fahrenheit suggests bacterial superinfection).
 - c. Paroxysmal cough (after about 2 weeks) is characterized by 10 to 30 forceful coughs, ending with a loud inspiration (the whoop).
 - d. Vomiting commonly follows coughing.

Performance Steps

- e. Coughing is accompanied by cyanosis, sweating, prostration, and exhaustion.
- f. Infants have severe apnea with bradycardia, which is sometimes associated with gagging and coughing.

6. Recognize significant lab findings that are caused by pertussis.

- a. WBC count of 20,000 to 30,000.
- b. Identification of *Bordetella pertussis* (*B. pertussis*) by culture from nasopharyngeal swabs prove the diagnosis.

7. Manage pertussis.

- a. General measures include nutritional support during the paroxysmal stage. Minimizing stimuli that trigger coughing is probably the best way of controlling it.
- b. Drug of choice (DOC) is erythromycin 40 to 50 milligrams per kilogram per 24 hours (mg/kg/24h) in 4 divided doses x 14 days.
- c. Chemoprophylaxis with erythromycin should be given for 14 days to exposed family members and hospital contacts, particularly those under 2 years of age.
- d. Hospitalized children with pertussis should be isolated.
- e. Treat complications, as needed. Respiratory complications are best treated with warm, humidified oxygen and assisted ventilation.

NOTE: Steps 8 through 11 pertain to diphtheria.

8. Recognize the characteristics of diphtheria.

- a. Source is *Corynebacterium diphtheriae*. Shows as gram-positive, club-shaped rods on Gram stain.
- b. Spread is by secretions of infected persons, either directly or via contaminated fomites.
- c. Five or fewer cases per year are reported in the United States, but significant numbers of elderly and unimmunized children are susceptible to infection.

9. Recognize the signs and symptoms of diphtheria.

- a. Incubation period is 1 to 4 days. Prodromal phase is 12 to 48 hours.
- b. Physical findings:
 - (1) Pseudomembrane forms in pharynx, trachea, and nose (gray, tough, and adherent). Death results from obstructed airway.
 - (2) Mild, sore throat.
 - (3) Moderate fever.
 - (4) Cervical edema and lymphadenopathy ("bull neck").
 - (5) Tachycardia.
 - (6) Nausea, chills, emesis, headache, and fever are more common in children.
 - (7) Neuritis that causes paralysis of pharyngeal and palatal nerve (from toxin).
 - (a) Patient regurgitates fluid and has a nasal voice.
 - (b) Usually resolves in 1 to 2 weeks.
 - (8) External eye muscles. Patient gets diplopia and strabismus.
 - (9) Diaphragm needs mechanical ventilator to prevent death.

10. Recognize significant lab findings that are caused by diphtheria.

- a. WBC is usually normal.
- b. There may be a slight leukocytosis.
- c. Thrombocytopenia caused by peripheral destruction is frequent.

11. Manage diphtheria.

- a. Antitoxin. In suspected cases, antitoxin must be given immediately upon clinical diagnosis without waiting for culture confirmation. Antitoxin should be given within 48 hours to be effective. The doses range from 20,000 to 100,000 u. The amount given is decided empirically.
- b. Diphtheriae antitoxin is derived from horse serum, so a skin test to rule out sensitivity should always precede administration.

Performance Steps

- c. Administer penicillin G 150,000 units per kilogram per day (u/kg/day) intravenously (IV) or if patient is allergic to penicillin, erythromycin PO.
- d. Immunize unimmunized contacts. Administer prophylactic antibiotics--either erythromycin PO for 7 days or 1 dose benzathine penicillin IM.
- e. Prescribe bedrest for 10 to 14 days.
- f. All patients must be strictly isolated from other persons until antibiotic treatment has made respiratory secretions noninfectious (1 to 7 days). Isolation may be discontinued after three nose and throat cultures are negative at 24 hour intervals. The cultures are taken 48 hours after antibiotic therapy has been discontinued.

NOTE: Steps 12 through 15 pertain to sepsis.

12. Recognize the general characteristics of sepsis.

- a. Any infant under 4 months old is a prime candidate.
- b. Bottle-fed infants are more susceptible to sepsis than breast-fed infants.
- c. A newborn may be predisposed to sepsis by obstetric complications, such as the following examples:
 - (1) Premature rupture of membranes, occurring 12 to 24 hours before birth (or as little as 6 hours before if accompanied by active labor).
 - (2) Maternal bleeding (placenta previa or abruptio placentae).
 - (3) Toxemia precipitous delivery.
 - (4) Maternal infection (particularly of the urinary tract or the endometrium, most commonly manifested as maternal fever shortly before or during parturition).

CAUTION: Any child suspected of being septic needs to be evacuated to a pediatrician or hospital for admission and evaluation.

13. Recognize the signs and symptoms of sepsis.

- a. History of temperature instability with hypothermia as common as fever.
- b. Changes in feeding pattern.
- c. Anorexia.
- d. Poor weight gain.
- e. Increasing lethargy.
- f. Irritability.
- g. Fails to recognize or respond normally to mother.

14. Recognize significant lab findings that are caused by sepsis.

- a. Blood cultures will be positive for bacteria.
- b. Other cultures may be positive for bacteria (in urine and spinal fluid).
- c. WBC count will often be elevated for the child's age but may be normal or below normal if the infection is already overwhelming the child's immune system.

15. Manage sepsis.

- a. Initially start broad-spectrum antibiotics as soon as cultures are drawn.
- b. Administer appropriate antibiotic therapy on the basis of the culture results as soon as they return.
- c. Administer total parenteral nutrition if required for gravely ill infants.
- d. Administer oxygen therapy to reduce the labor of breathing.
- e. Provide other supportive measures as they become necessary.

16. Record all treatment in the patient's medical record.

17. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage common bacterial pediatric diseases.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of bacterial (streptococcal) pharyngitis.	—	—
2. Recognized significant lab findings that are caused by streptococcal pharyngitis.	—	—
3. Managed bacterial pharyngitis.	—	—
4. Recognized the general characteristics of pertussis (whooping cough).	—	—
5. Recognized the signs and symptoms of pertussis.	—	—
6. Recognized significant lab findings that are caused by pertussis.	—	—
7. Managed pertussis.	—	—
8. Recognized the characteristics of diphtheria.	—	—
9. Recognized the signs and symptoms of diphtheria.	—	—
10. Recognized significant lab findings that are caused by diphtheria.	—	—
11. Managed diphtheria.	—	—
12. Recognized the general characteristics of sepsis.	—	—
13. Recognized the signs and symptoms of sepsis.	—	—
14. Recognized significant lab findings that are caused by sepsis.	—	—
15. Managed sepsis.	—	—
16. Recorded all treatment in the patient's medical record.	—	—
17. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

PEDS EMER, BRADY 2ND ED

Manage Common Fungal Pediatric Diseases

081-833-4343

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Recognize the signs and symptoms of thrush (oral candidiasis).
 - a. Overgrowth in the mouth that looks like cheese curds.
 - b. When overgrowth is wiped off, it leaves a raw, bleeding surface.
 - c. Mostly harmless in babies but presence in older children indicates malnutrition or disease.
2. Manage thrush. Initially, recommend feeding plain yogurt, several tablespoonfuls three or four times a day. Ensure that the yogurt has active cultures. If this fails, one of the following may be used.
 - a. Local (topical) antifungal therapy, which consists of either nystatin or clotrimazole. This is usually enough to treat oral candidiasis.
 - b. In more severe or refractory cases, systemic ketoconazole or fluconazole may be necessary.
3. Manage fungal skin conditions (task 081-833-4034, Manage Common Fungal Skin Conditions).
4. Record all treatment in the patient's medical record.
5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage common fungal pediatric diseases.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of thrush (oral candidiasis).	—	—
2. Managed thrush.	—	—
3. Managed fungal skin conditions.	—	—
4. Recorded all treatment in the patient's medical record.	—	—
5. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Croup
081-833-4348

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the general characteristics of croup.
 - a. Croup is a series of acute inflammatory diseases of the larynx, including viral croup (laryngotracheal bronchitis), epiglottitis (epiglottitis), and bacterial tracheitis.
 - b. Younger children (6 months to 3 years) are generally affected in the fall and early spring.
 - c. Croup is most often caused by parainfluenza virus type.
 - d. Other sources include parainfluenza virus types 2 and 3, respiratory syncytial virus, influenza virus, rubeola virus, adenovirus, and mycoplasma pneumonia.
 - e. Croup is spread by airborne route or contact with infectious persons.
 2. Recognize the signs and symptoms of croup.
 - a. Prodromal period usually involves upper respiratory tract symptoms.
 - b. Barking cough and stridor (usually at night).
 - c. Mildly affected children may exhibit stridor only when agitated.
 - d. Symptoms may progress to stridor at rest.
 - e. Stridor and cough may be accompanied by retractions, air hunger, and cyanosis in severe cases.
 3. Manage croup.
 - a. Keep child comfortable.
 - b. Ensure child is hydrated.
 - c. Provide humidified environment.
 - d. Measure arterial blood gasses (ABGs) since moderate hypoxemia may exist without cyanosis. If partial pressure of oxygen in arterial blood is less than (PaO₂) 60 millimeters (mm) mercury (Hg) or if percentage of oxygen saturation by pulse oximeter is less than 95 percent on room air, humidified oxygen should be given. If the partial pressure of carbon dioxide in arterial blood (PaCO₂) is greater than 45 mm Hg, then the need for intubation should be anticipated.
 - e. Administer mist therapy to reduce viscosity of tracheal secretions.
- NOTE: The use of steroids is controversial, but many physicians use steroids early in the course of severe hospitalized cases of viral croup.
4. Record all treatment in the patient's medical record.
 5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage croup.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of croup.	—	—
2. Recognized the signs and symptoms of croup.	—	—
3. Managed croup.	—	—

Performance Measures

4. Recorded all treatment in the patient's medical record.

GO **NO GO**

5. Sought the advice and assistance of a higher medical authority whenever possible.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Epiglottitis

081-833-4350

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the general characteristics of epiglottitis.

WARNING: Epiglottitis is a medical emergency.

- a. Resulting swelling of the supraglottic structures (epiglottis and arytenoids) can develop rapidly and lead to life-threatening upper airway obstruction.
- b. Epiglottitis is almost always caused by *Haemophilus influenzae* type B, although others such as *Streptococcus pneumoniae* and groups A and C *Streptococcus pyogenes* have been implicated.

2. Recognize the signs and symptoms of epiglottitis.

- a. Sudden onset of fever.
- b. Dysphagia.
- c. Drooling.
- d. Muffled voice.
- e. Inspiratory retractions.

WARNING: If epiglottitis is suspected, never gag the child to inspect pharynx.

- f. Direct inspection of the epiglottis, which is a procedure that should be done by an experienced airway specialist under controlled conditions. The typical findings are a cherry red and swollen epiglottis and arytenoids. Direct inspection of the epiglottis is the definitive diagnosis for epiglottitis.

3. Manage epiglottitis.

- a. Once the diagnosis is made, perform tracheal intubation immediately. To prevent accidental extubation and tube obstruction, provide adequate restraint, humidification, and suctioning.

WARNING: If intubation to safeguard the airway is not possible at your location, keep the child calm and give supplemental oxygen while transporting to a medical facility that can intubate. Do not agitate the child with unnecessary tests or exams, because if the child begins crying hard, the swollen airway may close completely and an emergency cricothyrotomy will be required.

- b. Once an airway is established, obtain cultures of blood and the epiglottis and start the patient on antibiotics to cover *Haemophilus influenzae*.
- c. Drug of choice (DOC) is ceftriaxone (or equivalent cephalosporin) 150 milligrams per kilogram per day (mg/kg/day) in 2 divided doses.
- d. Alternate drug of choice (ADOC) is chloramphenicol 100 mg/kg/day in 4 divided doses.
- e. Second alternative should ADOC not be available is ampicillin 200 mg/kg/day in 4 divided doses. (Ampicillin should probably not be used alone unless cultures are positive and demonstrate a sensitive organism.)
- f. Intravenous (IV) antibiotics should be continued for 2 to 3 days, followed by oral antibiotics to complete 10 days.

4. Manage complications symptomatically with appropriate supportive care.

5. Record all treatment in the patient's medical record.

6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage epiglottitis.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of epiglottitis.	_____	_____
2. Recognized the signs and symptoms of epiglottitis.	_____	_____
3. Managed epiglottitis.	_____	_____
4. Managed complications symptomatically with appropriate supportive care.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

Manage Dehydration in a Pediatric Patient

081-833-4352

Conditions: Given stethoscope, sphygmomanometer, otoscope and ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Recognize the signs and symptoms of dehydration in a pediatric patient.

NOTE: In patients of any age, dehydration and metabolic acidosis may develop within 24 hours of onset if vomiting is intractable, diarrhea is explosive, or fluid intake is drastically reduced.

- a. Mild:
 - (1) Slightly dry buccal mucous membranes.
 - (2) Increased thirst.
- b. Moderate:
 - (1) Sunken eyes.
 - (2) Sunken fontanelle.
 - (3) Loss of skin turgor.
 - (4) Dry buccal mucous membranes.
 - (5) Tachycardia.
 - (6) Irritability.
 - (7) No urination for several hours.
- c. Severe:
 - (1) All signs of moderate dehydration.
 - (2) Rapid, thready pulse.
 - (3) Cyanosis.
 - (4) Rapid breathing.
 - (5) Lethargy.
 - (6) Coma.

2. Manage dehydration in a pediatric patient.

- a. Mild: Administer oral rehydration solution of 50 milliliters per kilogram (ml/kg) given over 4 hours.

NOTE: If commercial oral rehydration solution is unavailable, a sugar and salt solution of similar composition can be used during rehydration and maintenance. It is prepared by adding 1 liter of clean, sterilized or boiled water to 2 tablespoons of sugar and 1/2 teaspoon of salt.

- b. Moderate: Administer oral rehydration solution of 100 ml/kg given over 4 hours.
- c. Severe: Administer intravenous (IV) fluids (lactated Ringer's is the solution of choice) 20 milliliters per kilogram per hour (ml/kg/hr) until pulse and level of consciousness return to normal and then oral rehydration solution of 50 to 100 ml/kg until completely rehydrated. If IV cannot be started and child refuses oral fluids, oral rehydration solution can be given via nasogastric or orogastric tube. May need to restrain child's hands to prevent him from pulling out the nasogastric or orogastric tube.

NOTE: After rehydration has been accomplished, oral rehydration solution must be supplemented by offering free water or a low-sodium fluid.

- d. Once immediate rehydration has been achieved, replace continuing stool losses by giving the patient an oral rehydration solution of at least 10 ml/kg for each diarrheal stool.
- e. Ensure hydration is maintained through breast feeding, full strength or diluted lactose containing milk (to tolerance), or undiluted lactose free formula (if available). In children, maintain hydration and nutrition with juices, cereal, and staple foods to tolerance.

Performance Steps

NOTE: Antibiotics should only be used when specifically indicated by findings of a bacterial cause for the underlying disease.

3. Record all treatment in the patient's medical record.
4. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated pediatric patient and a scenario in which he must manage dehydration.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of dehydration in a pediatric patient.	_____	_____
2. Managed dehydration in a pediatric patient.	_____	_____
3. Recorded all treatment in the patient's medical record.	_____	_____
4. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

PEDS EMER, BRADY 2ND ED

Perform Physical Examination of Infants and Pediatrics

081-833-4354

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a selection of antimicrobial agents, and The Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Ensure an immediate examination (exam) of newborns is conducted and other children are examined as soon as possible.
 - a. Infants less than 1 year old.
 - (1) Examine immediately after birth to determine general condition and again at 12 and 72 hours.
 - (2) Perform exam while the child is sleeping in the mother's arms or on an exam table.
 - b. Small children from 1 to 6 years old.
 - (1) Gain the child's confidence by telling a story or letting it play with the instruments.
 - (2) Examine chest, heart, and lungs first with child in mother's lap, if possible.
 - (3) Place the child supine, and examine the abdomen first and then the rest of the body, saving the throat and ears for next to last and the rectum and genitalia for last.
 - c. Children more than 6 years old.
 - (1) Modesty is more of an issue. Let children keep their underpants on, even when draped, until removal is required.
 - (2) Sequence of exam is not as crucial; however, always examine painful areas last.
2. Always take temperatures rectally.
3. Determine the heart rate.
 - a. Newborn's rate should be expected between 120 to 170 beats per minute.
 - b. Children 1 year old should be between 80 to 160 beats per minute.
 - c. Children 3 years old should be between 80 to 120 beats per minute.
 - d. Children 6 years old should be between 75 to 115 beats per minute.
 - e. Children 10 years old should be between 75 to 110 beats per minute.
4. Determine the respiratory rate.
 - a. Newborns should be between 30 to 60 per minute. (Above 60 is abnormal.)
 - b. Children 1 to 6 years old should be between 22 to 40 breaths per minute.
 - c. Children more than 6 years old should be between 16 to 20 breaths per minute.
5. Take the blood pressure (BP).
 - a. Use a cuff 1/2 to 2/3 the width of the arm or leg you will use to obtain the pressure.
 - b. Use the flush method in infants and children less than 3 years of age in whom auscultation is not possible.
 - (1) Place the BP cuff as normal.
 - (2) Wrap an elastic bandage snugly around the elevated arm, beginning at the fingers and moving up to the antecubital space.
 - (3) Inflate the BP cuff to a pressure above the expected systolic reading.
 - (4) Remove the bandage, and place the pallid arm at the patient's side.
 - (5) Allow the pressure in the BP cuff to fall slowly until the flush of normal color returns to the forearm, hand, and fingers.
 - (6) When flushing occurs, the sphygmomanometer reading will indicate a BP value somewhere between the systolic and diastolic level.
 - c. Recognize the expected mean BP for infants and children by age group.

Performance Steps

- (1) Birth to 6 weeks: systolic range is 74 to 100 millimeters (mm) mercury (Hg); diastolic range is 50 to 68 mm Hg.
- (2) 7 weeks to 1 year: systolic range is 84 to 106 mm Hg; diastolic range is 56 to 70 mm Hg.
- (3) 1 to 2 years: systolic range is 98 to 106 mm Hg; diastolic range is 50 to 70 mm Hg.
- (4) 2 to 6 years: systolic range is 98 to 112 mm Hg; diastolic range is 64 to 70 mm Hg.

NOTE: For the above age groups, the lower limit of normal systolic BP is 70 mm Hg.

- (5) 6 to 13 years: systolic range is 104 to 124 mm Hg; diastolic range is 64 to 80 mm Hg.

- (6) 13 to 16 years: systolic range is 118 to 132 mm Hg; diastolic range is 70 to 82 mm Hg.

NOTE: For the above age groups, the lower limit of normal systolic BP is 80 mm Hg.

6. Examine the skin of infants up to 1 year old. The texture should be smooth and soft. The color may have erythematous flush during the first 24 hours.
 - a. Acrocyanosis (blue hands and feet during first few days). When it persists, an underlying cardiac defect should be suspected.
 - b. Pallor.
 - (1) With slow pulse, may indicate anoxia.
 - (2) With rapid pulse, may indicate anemia.
 - c. Lanugo (fine, downy hair over entire body--especially in premature infants). Lanugo usually is shed in 10 to 14 days.
 - d. Vernix caseosa (cheesy, white material covering body in varying amounts at birth).
 - (1) Composed of sebum and cornified epidermis.
 - (2) Usually disappears within 2 to 3 days.

7. Examine the head and neck.
 - a. The bones of the skull are separated by membranous tissue called sutures, which meet at fontanelles.
 - (1) Anterior fontanelle.
 - (a) Measures 4 to 6 centimeters (cm) at birth.
 - (b) Closes completely by 18 to 24 months of age.
 - (2) Posterior fontanelle.
 - (a) Measures 1 to 2 cm at birth.
 - (b) Closes by 2 months of age.

NOTE: Fontanelles normally pulse with the heart rate.

- (c) Bulging fontanelles may indicate increased intracranial pressure (ICP).

- (d) Depressed fontanelles may indicate decreased ICP or dehydration.

- b. Neck inspection.
 - (1) Note the suppleness and mobility: birth injury, trauma, or edema.
 - (2) Note any abnormalities of the skin.
 - (3) Check the lymph nodes as in an adult and palpate for masses.
8. Examine the eyes by using the same procedure for adults with the following emphasis in newborns.
 - a. There may be swelling of lids and conjunctivitis secondary to installation of silver nitrate drops at birth.
 - b. Check for red reflex (elicit bilaterally on every newborn).
 - (1) In infants, loss of red reflex may be caused by the following:
 - (a) Cataracts.
 - (b) Retrolental fibroplasia.
 - (2) In older children, loss of red reflex may be caused by the following:
 - (a) Retinal detachments.
 - (b) Chorioretinitis (inflammation of the retina posteriorly).
 - (c) Retinoblastoma (highly malignant tumor). During exam, you will see white reflex or "cat's eye" reflex).

9. Examine the heart (same procedure as for adults) with emphasis on the following:

- a. The point of maximal impulse is usually at the 4th intercostal space until age 7; then it drops to the 5th.

Performance Steps

- b. Sinus arrhythmia. Premature ventricular contractions are common.
- c. Perform palpation of pulses.

10. Examine the abdomen. The abdomen should be protuberant in infants because of poorly developed musculature.

- a. Check the umbilical cord at birth for two arteries and one vein.
- b. Umbilical hernias are evident when the child cries.
- c. Palpate the abdomen with the knees flexed.

11. Examine the genitalia and rectum.

a. Genitalia.

(1) Males.

(a) Testes are normally in scrotum or inguinal canal, from which they can be milked down to the scrotum.

(b) Hydroceles are common and can be differentiated from hernia by the fact that they are transilluminable and not reducible.

(2) Females.

(a) Infants may have mucoid, whitish vaginal discharge, occasionally mixed with blood, the first 1 to 2 weeks of life because of hormonal influence.

(b) Labia minora in newborns are prominent and quickly atrophy until puberty.

b. Do rectal exams with the index finger to allow for greater tactile sensitivity. The rectum can be easily done with the patient in the supine position with feet held together and knees and hips flexed toward the abdomen.

NOTE: The procedure is not automatically performed on infants and children unless there is a particular problem.

12. Check the musculoskeletal system.

- a. Examine the infant for normal number of digits and appendages, and palpate all extremities.
- b. Examine the hips of infants to detect signs of dislocation.

13. Check the neurological system of the infant. Exam differs from the adult because the central nervous system is not completely developed.

- a. Note the general appearance, positioning, activity, cry, and alertness of the infant.
- b. Test motor function by putting each major joint through its range of motion to determine normal muscle tone, and the presence of spasticity or flaccidity.

14. Ensure the nutritional requirements of newborns and infants are given to health care team members.

NOTE: A newborn or infant must be fed by frequent intake of fluid and calories. Any sick child must be encouraged to eat and drink.

- a. Feedings from the mother's breast is superior to bottle feedings.

NOTE: Newborns and infants will receive all the vitamins and nutrients that are required if the mother is healthy and receiving proper nutrition.

- b. Feedings by a bottle will require a milk formula or one will be improvised.

- c. Requirements for nutrition if breast feeding cannot occur.

(1) Calories required per day for the child's first year will equal 50 calories times the child's weight in pounds.

(2) Fluids should be administered at 2 to 3 ounces per pound per day.

16. Ensure immunization of childhood diseases is begun.

17. Ensure a record of each child is maintained.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform newborn or infant physical exam.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Examined newborns immediately after birth to determine general condition and again at 12 and 72 hours.	—	—
2. Examined infants less than 1 year old while the child was sleeping in the mother's arms or on exam table.	—	—
3. Examined small children from 1 to 6 years old as follows: a. Examined chest, heart, and lungs first with child in mother's lap, if possible. b. Placed the child supine and examined the abdomen first, then the rest of the body, saving the throat and ears for next to last and the rectum and genitalia for last.	—	—
4. Examined children older than 6 years old. a. Knew sequence of exam was not crucial. b. Examined painful areas last.	—	—
5. Took temperature rectally and noted whether or not it was within normal limits (WNL).	—	—
6. Determined the heart rate and noted whether or not it was WNL.	—	—
7. Determined the respiratory rate and noted whether or not it was WNL.	—	—
8. Took the blood pressure and noted whether or not it was WNL. a. Used a cuff 1/2 to 2/3 the width of the arm or leg used to obtain the pressure. b. Used the flush method in infants and children less than 3 years of age in whom auscultation is not possible.	—	—
9. Examined the skin of infants up to 1 year old.	—	—
10. Examined the head and neck as follows: a. Inspected the anterior and posterior fontanelles for closure, bulging, and depression. b. Examined the neck for suppleness, mobility, masses, and abnormalities of the lymph nodes.	—	—
11. Examined the eyes. a. Performed an ophthalmoscopic exam. b. Checked for red reflex bilaterally on every newborn.	—	—
12. Examined the ears. a. Checked that the top of the ears were no lower than a line extending from across the inner and outer canthus of the eye. b. Checked for other congenital defects when the ears are low set, had an unusual angle, or were malformed. c. Performed an otoscopic exam of the tympanic membrane. d. Buffered the otoscope from puncturing the eardrum.	—	—
13. Checked the nose, mouth, and throat. a. Checked for patency of newborn nostrils. b. Checked the pharynx. c. Checked for palpable clefts of hard and soft palate. d. Checked the teeth.	—	—
14. Checked the thorax and lungs.	—	—
15. Examined the heart as follows:	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
a. Located the point of maximal impulse.		
b. Performed palpation of pulses.		
16. Examined the abdomen.	—	—
a. Checked the umbilical cord at birth for two arteries and one vein.		
b. Palpated the abdomen with the knees flexed.		
17. Examined the genitalia and rectum.	—	—
NOTE: Rectal exam is performed only if there is a particular problem.		
18. Checked the musculoskeletal system as follows:	—	—
a. Examined the infant for normal number of digits and appendages and palpate all extremities.		
b. Examined the hips of infants to detect signs of dislocation.		
19. Checked the neurological system of the infant as follows:	—	—
a. Noted the infant's general appearance, positioning, activity, cry, and alertness.		
b. Tested motor function by putting each major joint through its range of motion to determine normal muscle tone and the presence of spasticity or flaccidity.		
20. Ensured the nutritional requirements of newborns and infants were given to health care team members.	—	—
22. Ensured immunization of childhood diseases was begun.	—	—
23. Ensured a record of each child was maintained.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

MERCK MANUAL 17TH ED
SANFORD, 1999

Related

BATES PE, 8TH ED. 2002

Manage Infectious/Noninfectious Diarrhea in a Pediatric Patient

081-833-4355

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, The Merck Manual, a selection of antimicrobial agents, and the Sanford Guide to Antimicrobial Therapy for the current year.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Understand the general characteristics of infectious and noninfectious diarrhea.
 - a. Acute infectious or noninfectious diarrhea or gastroenteritis (GE) is one of the most common pediatric illnesses and causes great morbidity and mortality in underdeveloped countries.
 - b. Common etiologies are as follows:
 - (1) Bacteria (primarily shigella, salmonella, and campylobacter).
 - (2) Parasites (entamoeba histolytica) (Figure 1).

Entamoeba histolytica

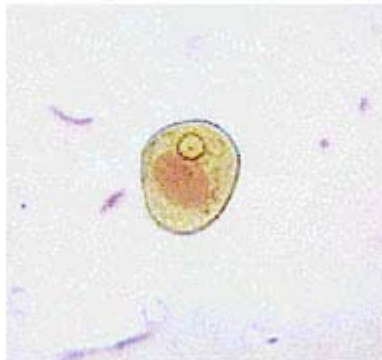


Figure 1. Entamoeba Histolytica

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- (3) Viruses (rota virus, adenovirus, and Norwalk-like agents).
 - (4) Antibiotic therapy.
 - (5) Parenteral infections (respiratory infections and otitis media).
 - (6) Malnutrition.
 - (7) Diet (overfeeding).
 - (8) Allergic (lactose intolerance).
 - (9) Chronic or nonspecific (irritable colon syndrome).
 - c. The above-listed etiologies are generally hardy agents and are spread by oral-fecal transmission. Outbreaks are common. In winter, rotavirus epidemics and outbreaks in daycare centers and hospitals are well known.
2. Recognize the signs and symptoms of infectious and noninfectious diarrhea.
 - a. Patient may have been in contact with others who have GE. There is usually no particular exposure to travel, animals, or foods.
 - b. Incubation period is 2 to 4 days.
 - c. Patient has 3 to 12 stools per day with high water content.
 - d. Shigella can cause bloody or nonbloody diarrhea.

Performance Steps

- e. Salmonella can cause bloody or nonbloody diarrhea.
- f. Escherichia coli (E. Coli) causes nonbloody diarrhea.
- g. Dehydration can cause diarrhea (most symptoms derive from the degree of dehydration).
- h. Fever is variable.
- i. Occasionally, there is a transient abdominal distention because of ileus or dysmotility.
- j. Vomiting is initially nonbloody and nonbilious.

NOTE: Lab findings will reflect the specific cause of the diarrhea.

- 3. Manage infectious and noninfectious diarrhea.
 - a. Provide fluid and electrolyte therapy (oral rehydration with glucose-electrolyte solution, if possible).
 - b. Provide specific antibiotic therapy only if bacterial infection is confirmed.
 - c. Resume the child's regular, age-appropriate diet (formula, solid foods, and so on) as soon as the child is rehydrated. Special bland diets, half-strength formula, and so on are no longer recommended since recent studies have proven that regular diets do not prolong diarrhea and do provide better nutrition for an ill child.
 - d. Instruct patient that good hygiene reduces fecal oral spread.
- 4. Record all treatment in the patient's medical record.
- 5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage infectious or noninfectious diarrhea in a pediatric patient.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of infectious and noninfectious diarrhea.	_____	_____
2. Recognized the signs and symptoms of infectious and noninfectious diarrhea.	_____	_____
3. Managed infectious and noninfectious diarrhea.	_____	_____
4. Recorded all treatment in the patient's medical record.	_____	_____
5. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

ATLAS OF HUMAN PARASITOLOGY
 MERCK MANUAL 17TH ED
 PEDS EMER, BRADY 2ND ED
 SANFORD, 1999

Subject Area 23: Trauma

Manage a Convulsive and/or Seizing Patient

081-831-0035

Conditions: Given padded tongue blade and padding materials.

Standards: Manage a convulsive and/or seizing patient without allowing or causing unnecessary injury to the patient.

Performance Steps

1. Identify the types of convulsions and/or seizures according to the following characteristic signs and symptoms.

- a. Petit mal.

- (1) Brief loss of consciousness without loss of motor tone.
- (2) Found chiefly in children and rarely an emergency.

- b. Focal.

- (1) One part of the body (arm, leg, or face) is usually involved in tonic-clonic twitching.

NOTE: "Tonic" is muscle tension (stiffness or rigidity). "Clonic" is the alternating contraction and relaxation of muscles in rapid succession.

- (2) Motor symptoms begin in the patient's hand and/or foot and progress up the extremity or spread from the corner or the mouth.

- (3) May rapidly progress to generalized convulsions.

- c. Grand mal (generalized).

- (1) May be preceded by an aura.
- (2) Loss of consciousness and intense tonic-clonic movement.
- (3) May involve incontinence, biting of the tongue, or mental confusion.
- (4) The patient will have a stuporous or comatose period following the seizure.

- d. Status epilepticus.

- (1) Two or more seizures without intervening periods of consciousness.
- (2) A dire medical emergency; if untreated may lead to:
 - (a) Aspiration of secretions.
 - (b) Cerebral or tissue hypoxia.
 - (c) Brain damage or death.
 - (d) Fractures of long bones.
 - (e) Head trauma.
 - (f) Injured tongue from biting.

NOTE: Mentally note the aspects of seizure activity for recording after the seizure.

2. Maintain the airway of a patient exhibiting tonic-clonic movement.

- a. For a patient with a patent airway, insert a padded tongue blade, or similar item, between the patient's back teeth.

CAUTION If the patient's teeth are clenched, do not attempt to forcibly open his jaw.

- b. For a patient with an obstructed airway, an oral pharyngeal airway should be inserted, if possible and necessary, by trained medical personnel. A patient in status epilepticus should have oxygen administered by face mask or nasal prongs.

3. Place the patient on his side, if possible.

- a. Observe the patient to prevent asphyxiation and suffocation.
- b. The patient's mouth and throat should be suctioned by trained personnel, if necessary.

CAUTION DO NOT elevate the patient's head. DO NOT restrain the patient's limbs during seizures.

4. Prevent injury to tissue and bones by padding or removing objects on which the patient may injure himself.

Performance Steps

- 5. Manage the patient after the convulsive state has ended.
 - a. Place the patient on his side, if necessary.
 - b. Continue to maintain the patient's airway.
 - c. Observe for apnea (the cessation of breathing).
 - d. If possible, place the patient in a quiet, reassuring atmosphere.

CAUTION Sudden, loud noises may cause another seizure.
- 6. Record the seizure activity.
 - a. Duration of the seizure.
 - b. Presence of cyanosis, breathing difficulty, or apnea.
 - c. Level of consciousness before, during, and after the seizure.
 - d. Preceded by aura (asks the patient).
 - e. Muscles involved.
 - f. Type of motor activity.
 - g. Incontinence.
 - h. Eye movement.
 - i. Previous history of seizures, head trauma, and/or drug or alcohol abuse.
- 7. Evacuate the patient.
 - a. Position the patient on his side.
 - b. Arrange for the administration of oxygen or suction, if available and necessary.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as a patient.

Brief Soldier: Tell the soldier to manage the patient.

Performance Measures	GO	NO GO
1. Identified the types of convulsions and/or seizures according to the following characteristic signs and symptoms. a. Petit mal. (1) Brief loss of consciousness without loss of motor tone. (2) Found chiefly in children and rarely an emergency. b. Focal. (1) One part of the body (arm, leg, or face) is usually involved in tonic-clonic twitching. NOTE: "Tonic" is muscle tension (stiffness or rigidity). "Clonic" is the alternating contraction and relaxation of muscles in rapid succession. (2) Motor symptoms begin in the patient's hand and/or foot and progress up the extremity or spread from the corner or the mouth. (3) May rapidly progress to generalized convulsions. c. Grand mal (generalized). (1) May be preceded by an aura. (2) Loss of consciousness and intense tonic-clonic movement. (3) May involve incontinence, biting of the tongue, or mental confusion. (4) The patient will have a stuporous or comatose period following the seizure. d. Status epilepticus. (1) Two or more seizures without intervening periods of consciousness. (2) A dire medical emergency; if untreated may lead to: (a) Aspiration of secretions. (b) Cerebral or tissue hypoxia. (c) Brain damage or death. (d) Fractures of long bones. (e) Head trauma.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
(f) Injured tongue from biting.		
2. Maintained the airway of a patient exhibiting tonic-clonic movement.	—	—
a. For a patient with a patent airway, inserted a padded tongue blade, or similar item, between the patient's back teeth.		
CAUTION If the patient's teeth were clenched, did not attempt to forcibly open his jaw.		
b. For a patient with an obstructed airway, an oral pharyngeal airway should be inserted, if possible and necessary, by trained medical personnel. A patient in status epilepticus should have oxygen administered by face mask or nasal prongs.		
3. Placed the patient on his side, if possible.	—	—
a. Observed the patient to prevent asphyxiation and suffocation.		
b. The patient's mouth and throat should be suctioned by trained personnel, if necessary.		
CAUTION Soldier should NOT elevate the patient's head or restrain the patient's limbs during seizures.		
4. Prevented injury to tissue and bones by padding or removing objects on which the patient may injure himself.	—	—
5. Managed the patient after the convulsive state has ended.	—	—
a. Placed the patient on his side, if necessary.		
b. Continued to maintain the patient's airway.		
c. Observed for apnea (the cessation of breathing).		
d. If possible, placed the patient in a quiet, reassuring atmosphere.		
CAUTION Soldier recognized that sudden, loud noises may cause another seizure.		
6. Recorded the seizure activity.	—	—
a. Duration of the seizure.		
b. Presence of cyanosis, breathing difficulty, or apnea.		
c. Level of consciousness before, during, and after the seizure.		
d. Preceded by aura (asks the patient).		
e. Muscles involved.		
f. Type of motor activity.		
g. Incontinence.		
h. Eye movement.		
i. Previous history of seizures, head trauma, and/or drug or alcohol abuse.		
7. Evacuated the patient.	—	—
a. Positioned the patient on his side.		
b. Arranged for the administration of oxygen or suction, if available and necessary.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage an Unconscious Casualty

081-833-0048

Conditions: You have an unconscious casualty in a field environment. You are not in an NBC environment. Given a blanket, field jacket, poncho, lactated Ringer's, and field medical card.

Standards: Manage and stabilize an unconscious casualty, and arrange for prompt evacuation.

Performance Steps

1. Establish unresponsiveness.

2. Establish and maintain an open airway.

CAUTION Maintain C-spine control. Suspect C-spine injury with trauma involving head and neck, motor vehicle accidents (MVAs), falls, and diving accidents.

- a. Open the airway.
- b. Clear any upper airway obstruction.
- c. Insert an oral pharyngeal airway, if necessary, to maintain the airway.
- d. Perform artificial respiration if breathing is absent.

3. Survey the casualty.

4. Position the casualty.

- a. Place the casualty on his or her side or face down, if the injury permits, to prevent aspiration of vomitus.
- b. Maintain good body alignment by using padding for head and limb support. Use a folded or rolled blanket, field jacket, or poncho.
- c. In extended care situations, turn the casualty from side to side every hour.

NOTE: Protect the casualty against extremes of heat or cold.

5. Observe the casualty.

- a. Check for drainage of blood or cerebrospinal fluid (CSF) from the ears and nose.

WARNING Do not attempt to control cerebrospinal/bloody drainage with a dressing. The dressing may cause increased pressure on the brain and collection of fluids between the brain and skull.

- b. Take the vital signs.

NOTE: Check the vital signs every 15 to 20 minutes and record the data on the field medical card.

- c. Assess the casualty's level of consciousness using the AVPU scale.

- (1) A--alert. The casualty responds spontaneously to stimuli and is able to answer questions in a clear manner.
- (2) V--verbal. The casualty does not respond spontaneously, but is responsive to verbal stimuli.
- (3) P--pain. The casualty does not respond spontaneously or to verbal stimuli, but is responsive to painful stimuli.
- (4) U--unresponsive. The casualty is unresponsive to any stimuli.

NOTE: Even if unresponsive, assume the casualty can hear you, and explain the procedures.

- d. Assess the casualty's pupils.

- (1) Observe the size of each pupil.

NOTE: A variation of pupil size may indicate a brain injury. In a very small percentage of people, unequal pupil size is normal.

- (2) Shine a light into each eye to observe the pupillary reaction to light.

NOTE: The pupils should constrict promptly when exposed to bright light. Failure of the pupils to constrict may indicate brain injury.

- e. Check movement of the extremities.

NOTE: Record which movements are spontaneous and which are stimulus related.

- f. Observe for seizure activity.

6. Obtain the casualty's history, if possible.

Performance Steps

- a. Events immediately preceding current condition.
 - b. Recent illness or infection.
 - c. History of epilepsy, diabetes, or other medical conditions.
 - d. Prior periods of unconsciousness.
 - e. Drug or alcohol abuse (evacuate any medications with the casualty.)
7. Initiate an IV line of lactated Ringer's and run it slowly to keep the vein open (TKO). (See Task No. 081-833-0033.)
 8. Administer supplemental oxygen without pressure, if available.
 9. Record the treatment on the field medical card.
 10. Evacuate the casualty.

NOTE: An unconscious casualty should have an artificial airway inserted before evacuation and must be constantly monitored during evacuation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Established unresponsiveness.	_____	_____
2. Established and maintained an open airway.	_____	_____
3. Surveyed the casualty.	_____	_____
4. Positioned the casualty.	_____	_____
5. Observed the casualty.	_____	_____
6. Obtained the casualty's history.	_____	_____
7. Initiated an IV lifeline.	_____	_____
8. Administered oxygen, if available.	_____	_____
9. Recorded the treatment.	_____	_____
10. Evacuated the casualty.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Triage Casualties on a Conventional Battlefield

081-833-0080

Conditions: You are in the field and have several casualties with conventional injuries.

Standards: Survey and establish priorities for the treatment and evacuation of casualties.

Performance Steps

1. Survey the situation.
 - a. Sort the casualties and allocate treatment.
 - (1) Survey and classify the casualties for the most efficient use of available medical personnel and supplies.
 - (2) Give available treatment first to the casualties who have the best chance of survival.
 - (3) The primary goal is to locate and return to duty troops with minor wounds. The abandonment of any casualties will never be considered.
 - (4) Triage establishes the order of treatment, not whether treatment is given. It is usually the responsibility of the senior medical person.
 - b. Determine the tactical and environmental situation.
 - (1) Whether casualties must be transported to a more secure area for treatment.
 - (2) The number and location of the injured and severity of injuries.
 - (3) The available assistance (self-aid, buddy-aid, medical personnel).
 - (4) The evacuation support capabilities and requirements.

NOTE: Nuclear weapons exposure will not be used as a criteria for sorting. Field experience with these injuries does not exist.

2. Survey the casualties.
 - a. Immediate--casualties where conditions demand immediate treatment to save life or limb. This category has the highest priority.
 - (1) Airway obstruction.
 - (2) Respiratory failure and cardiopulmonary failure from otherwise treatable injuries (for example, electrical shock or chemical exposure).

NOTE: A casualty with cardiorespiratory distress may not be classified "immediate" on the battlefield. The casualty may be classified "expectant," contingent upon such things as the situation, number of casualties, and support.

- (3) Massive external bleeding.
- (4) Shock.
- (5) Burns on the face, neck, hands, feet, or perineum and genitalia.

NOTE: After all life- or limb-threatening conditions have been successfully treated, no further treatment will be given to the casualty until all other "immediate" casualties have been treated. Salvage of life takes priority over salvage of limb.

- b. Delayed--casualties who have less risk of loss of life or limb if treatment is delayed.
 - (1) Open wounds of the chest without respiratory distress.
 - (2) Open or penetrating abdominal injuries without shock.
 - (3) Severe eye injuries.
 - (4) Damaged blood vessels in the extremities causing poor or no blood supply.
 - (5) Second- and third-degree burns covering 20 percent or more of the total body surface area (BSA).
 - (6) Other open wounds.
 - (7) Fractures.
- c. Minimal--can be treated by self-aid or buddy-aid.
 - (1) Minor lacerations and contusions.
 - (2) Sprains, strains, and minor fractures.
 - (3) Burns under 20 percent total BSA.
 - (4) Minor combat stress reactions.

Performance Steps

- d. Expectant--the casualty is so critically injured that only complicated and prolonged treatment can improve life expectancy. This category is to be used only if resources are limited. If in doubt as to the severity of the injury, place the casualty in one of the other categories.
 - (1) Massive head injuries with signs of impending death.
 - (2) Burns, mostly third degree, covering more than 85% of the total BSA.
3. Record all treatment given on the field medical card.
4. Establish medical evacuation (MEDEVAC) priorities.
 - a. Urgent--casualties must be evacuated as soon as possible, but within 2 hours, to save life, limb, or eyesight. Generally, this category includes casualties whose conditions cannot be controlled and have the greatest opportunity for survival.
 - (1) Cardiorespiratory distress.
 - (2) Shock not responding to IV therapy.
 - (3) Prolonged unconsciousness.
 - (4) Head injuries with signs of increasing intracranial pressure.
 - (5) Decreased circulation in the extremities.
 - (6) Open chest and/or abdominal wounds with decreased blood pressure.
 - (7) Penetrating wounds, uncontrollable bleeding, severe facial injuries, and/or open fractures with severe bleeding.
 - (8) Burns covering 20 percent to 85 percent of the total BSA.
 - b. Priority--the casualty must be evacuated within 4 hours, or the condition could worsen. Generally, this category involves any casualty who is not stable or who is at risk of trauma-related complications.
 - (1) Closed-chest injuries, such as rib fractures without a flail segment, or other injuries that interfere with respiration.
 - (2) Brief periods of unconsciousness.
 - (3) Soft tissue injuries and open or closed fractures.
 - (4) Abdominal injuries with no decreased blood pressure.
 - (5) Eye injuries that do not threaten eyesight.
 - (6) Spinal injuries.
 - (7) Burns on the hands, face, feet, and genitalia or perineum, even if under 20 percent of the total BSA.
 - c. Routine--the casualty must be evacuated within 24 hours for further care. Immediate evacuation is not critical. Generally, this category includes casualties who can be controlled without jeopardizing their condition or who can be managed by the evacuating facility for up to 24 hours.
 - (1) Burns covering 20 percent to 80 percent of the total BSA if the casualty is receiving and responding to IV therapy.
 - (2) Simple fractures and minor open wounds.
 - (3) Other open wounds including chest injuries without respiratory distress.
 - (4) Psychiatric cases.
 - (5) Terminal cases.
5. Prepare the evacuation request.
 - a. Pickup location--provided by the unit leader.
 - b. Radio frequency, call sign, and suffix--provided by the radiotelephone operator.
 - c. Number of patients by precedence category.
 - d. Special equipment required--none, hoist, Stokes litter, forest and/or jungle penetrator.
 - e. Number of patients by type--litter, ambulatory.
 - f. Security of the pickup site.
 - g. Method of marking the pickup site--provided by the unit leader.
 - h. Patients' nationality and status.
 - i. CBR (NBC) contamination, if any.

NOTE: As a minimum, the first five items must be provided in the exact sequence listed.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Surveyed the situation.	_____	_____
2. Surveyed the casualties.	_____	_____
3. Initiated treatment in the correct sequence.	_____	_____
4. Recorded the treatment given.	_____	_____
5. Assigned the MEDEVAC priorities.	_____	_____
6. Prepared the evacuation request.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform a Needle Chest Decompression

081-833-3007

Conditions: You have a conscious, breathing casualty with chest trauma who requires needle chest decompression. Given a field medical card, stethoscope, large bore needle (10 to 14 gauge), 35 to 60 cc Luer-Lok syringe with 3-way stopcock, povidone-iodine swab, and sterile gloves.

Standards: Perform a needle chest decompression without causing unnecessary injury to the casualty.

Performance Steps

NOTE: Pneumothorax is defined as the presence of air within the pleural space. Air may enter the pleural cavity either from the lungs through a rupture or laceration or from the outside through a sucking chest wound. Trapped air in the pleural space compresses the lung beneath it. Unrelieved pressure will push the contents of the mediastinum in the opposite direction, away from the side of the tension pneumothorax. This pressure, in turn, will compromise venous return to the heart and interfere with respiration.

1. Verify the presence of tension pneumothorax (Figure 1) by checking for indications of the condition.

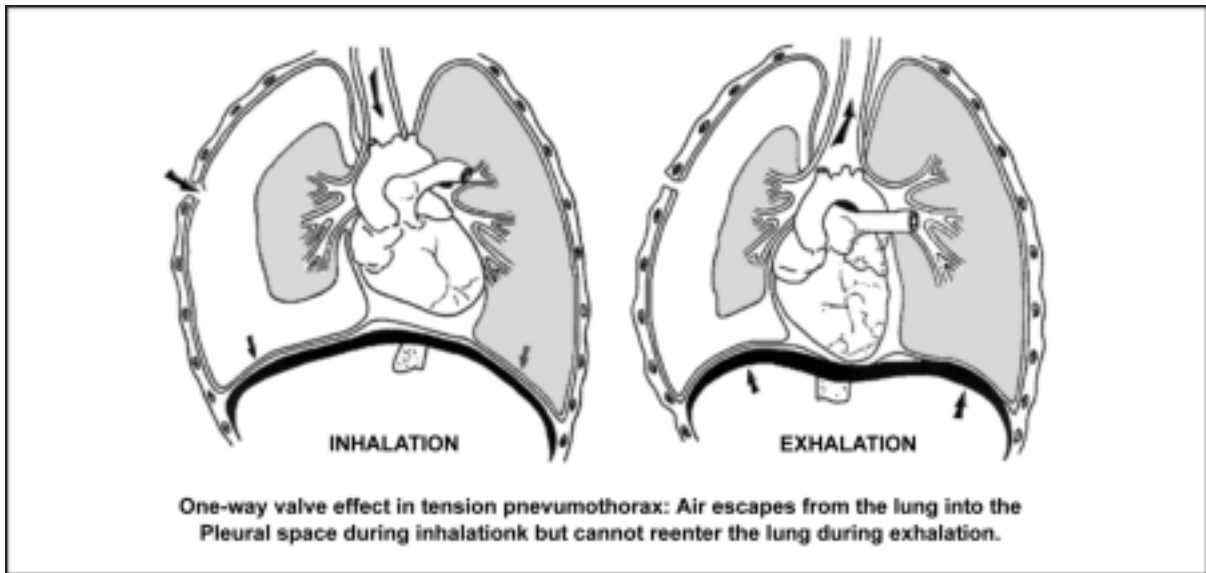


Figure 1. Tension Pneumothorax

WARNING Correct assessment is essential. Insertion of a needle into the pleural space of a nonaffected person will result in pneumothorax.

- a. Question a conscious casualty about difficulty in breathing, pain on the affected side, or coughing up blood.
- b. Observe a bared anterior chest and upper abdomen for respiratory rate and depth.
- c. Look for mediastinal shift manifested as a tracheal deviation and/or jugular distension.
- d. Look and listen for gasping for air (dyspnea) and progressive respiratory distress.

NOTE: Dyspnea may be, but is not always, an indication of pneumothorax.

- e. Look at and feel the patient's chest for signs of subcutaneous emphysema.
- f. Check for lack of chest excursion.
 - (1) Observe the rising and falling of the chest on respiration.
 - (2) Compare chest excursion bilaterally.
- g. Look for unilateral distension.
 - (1) Place one hand on the affected side.
 - (2) Place the other hand on the unaffected side.
 - (3) Observe the height of each hand.

Performance Steps

- (4) Determine if the height of the hand on the affected side is greater during expiration than the height of the hand on the unaffected side.
- h. Use a stethoscope to listen to breath sounds.
 - (1) Compare the sides for equality.
 - (2) Auscultate both sides of the chest.
 - (3) If breath sounds are unequal, percuss both sides to determine the difference in tone.

NOTE: Breath sounds will be diminished or absent on the affected side.

- i. Check for progressive distension of the abdomen that is not relieved by gastric aspiration and endotracheal intubation.
 - j. Look for deep cyanosis.
 - k. Look for signs and symptoms of shock.
2. Locate the insertion site (Figure 2).
 - a. Locate the sternomanubrial junction (Angle of Louis).
 - b. From the sternomanubrial joint, follow the adjacent intercostal space to the midclavicular line.

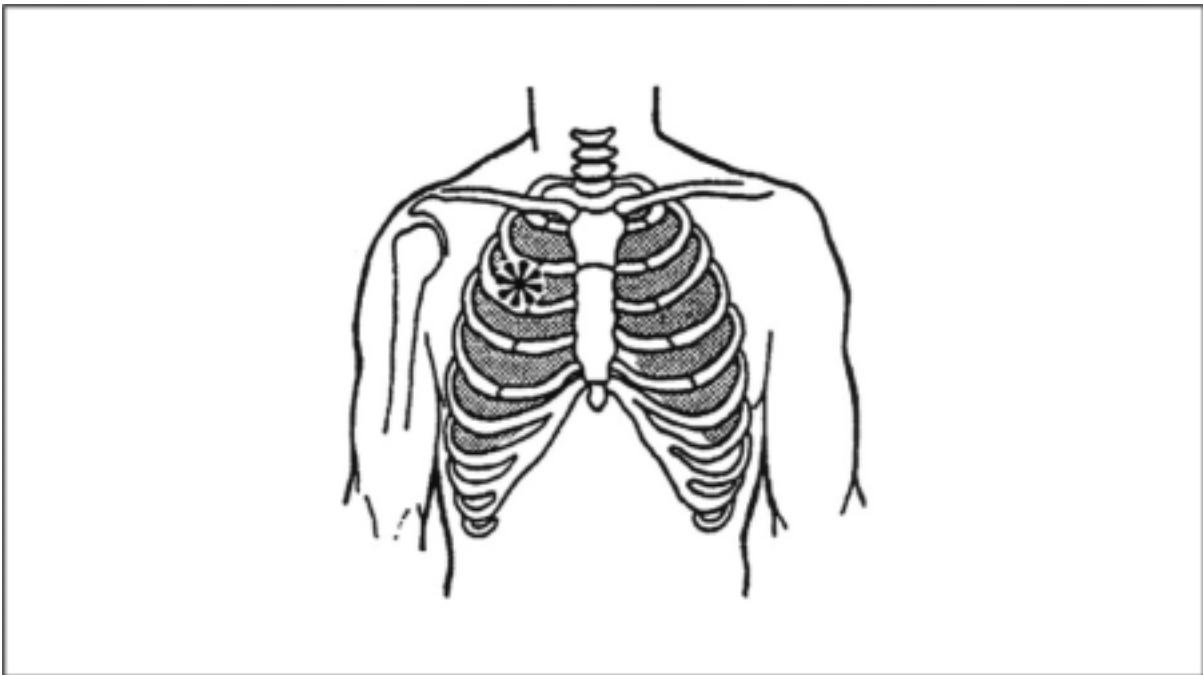


Figure 2. Insertion Site of Chest Decompression

NOTE: The preferred entry site is the space between the second and third ribs approximately in line with the nipple on the affected side of the patient's chest.

3. Thoroughly clean a 3- to 4-inch area around the insertion site. Begin in the center and work outward using a circular motion.
4. Insert a large bore (14 gauge) needle with attached syringe.
 - a. Place the needle tip, bevel up, on the insertion site, centered over the third rib.
 - b. Lower the proximal end of the needle to permit the tip to enter the skin just above the third rib margin.
 - c. Firmly insert the needle into the skin over the third rib, until the pleura has been penetrated, as evidenced by feeling a "pop" as the needle enters the pleural space.

WARNING Proper positioning of the needle is essential to avoid puncturing blood vessels and/or nerves.

Performance Steps

5. Decompress the affected side by aspirating as much air as is necessary to relieve the patient's acute symptoms.

NOTE: If using a catheter-over-needle, hold the needle still and push the catheter into the pleural space until resistance is felt. Withdraw the needle along the angle of insertion while holding the catheter still.

NOTE: If a three-way stopcock (Figure 3) is used, additional air can be aspirated from the pleural cavity by turning the stopcock lever to allow expulsion of the air from the syringe.

6. Initiate closed chest drainage with underwater seal, if available (Figure 4). Proceed to step 7 if improvisation is required. The needle may be removed once chest tube thoracostomy has been achieved.

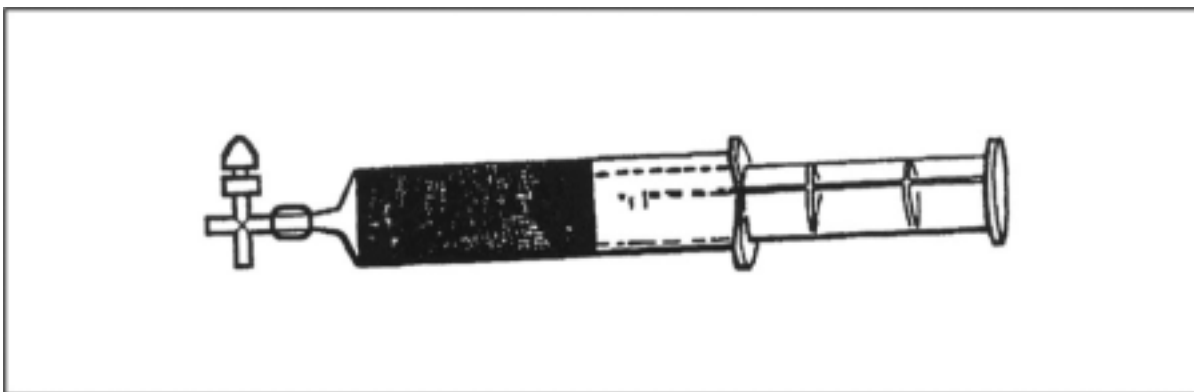


Figure 3. Three-Way Stopcock

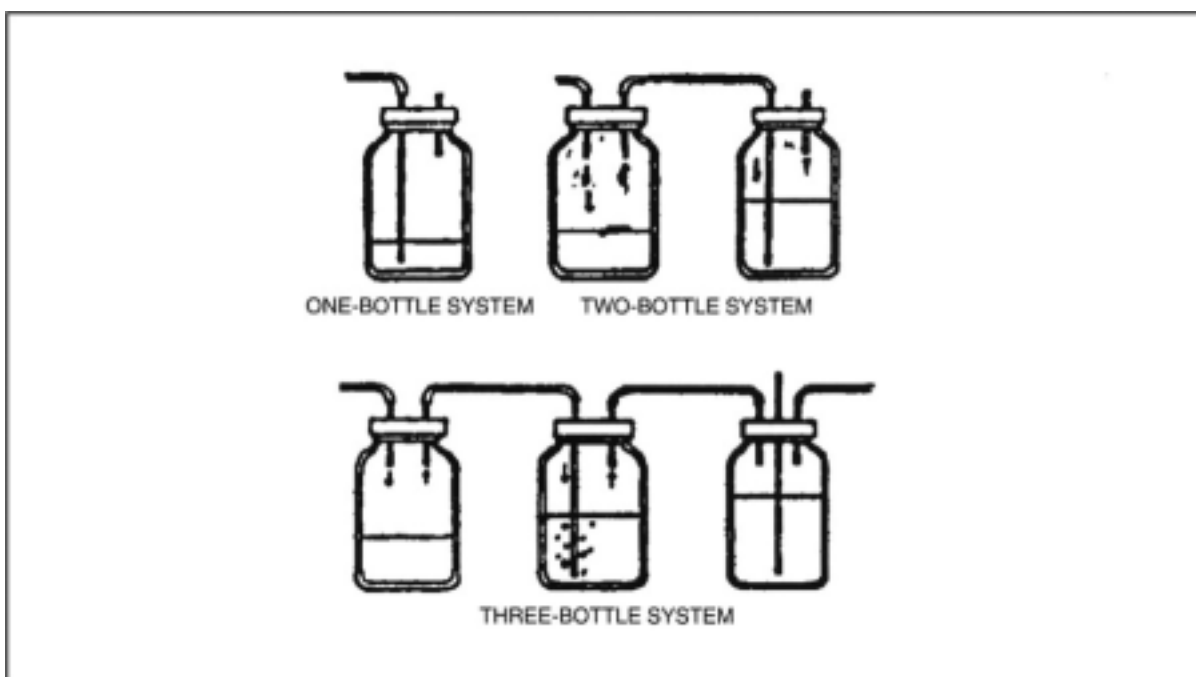


Figure 4. Drainage System

7. If underwater seal drainage is not available, use a commercial one-way flutter valve or improvise one (Figure 5).
 - a. Cut a finger casing from a sterile glove.

Performance Steps

- b. Cut off the fingertip.
- c. Tie or tape the finger casing to the needle hub.
- d. Check the operation of the improvised flutter valve.

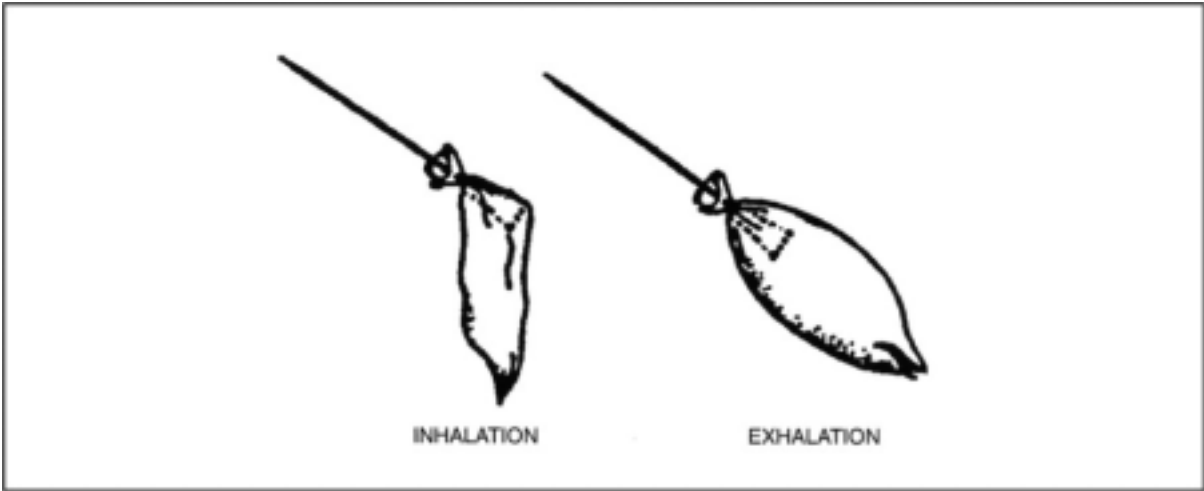


Figure 5. Improvised Flutter Valve

- (1) Ensure air passes through the needle-valve assembly and improvised flutter valve on expiration.
- (2) Ensure the flutter valve collapses against itself on inspiration.

NOTE: This valve prevents air from entering the plural cavity.

- 8. Secure the needle or catheter to the chest.
- 9. Record the treatment on the field medical card.

Evaluation Preparation: Setup: For training and evaluation, use a mannequin or have another soldier act as the casualty. Under no circumstances will the needle be inserted. Have the soldier demonstrate and explain what he would do.

Brief Soldier: Tell the soldier to perform needle chest decompression.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Verified the presence of tension pneumothorax.	—	—
2. Located the insertion site.	—	—
3. Thoroughly cleaned the area.	—	—
4. Inserted a large bore needle.	—	—
5. Decompressed the affected chest.	—	—
6. Initiated closed chest drainage or apply a flutter valve.	—	—
7. Secured the needle or catheter to the chest.	—	—
8. Recorded the treatment on the field medical card.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

STP 31-18D34-SM-TG

**References
Required**

Related
STP 8-91B15-SM-TG

Perform a Neurological Examination on a Patient With Suspected Central Nervous System Injuries

081-833-3014

Conditions: You have a casualty with head and neck injuries. The vital signs have been taken. Given a flashlight or penlight, a pin or sharp object, and a rubber hammer.

Standards: Perform a neurological examination on a casualty with a suspected CNS injury without causing further injury to the casualty.

Performance Steps

1. Look for the cause(s) of the injury.
 - a. Observe the casualty's position.
 - b. Observe the environmental conditions.

NOTE: If the casualty is unconscious, ask bystanders for information.

2. Evaluate the casualty's mental status.
 - a. Determine the level of consciousness.
 - (1) Alert--awake and responsive (verbal and motor). The casualty responds immediately, fully, and appropriately to commands.
 - (2) Lethargic--sleepy or drowsy. The casualty can be aroused and responds appropriately, but will fall asleep again as soon as he or she is left alone.
 - (3) Comatose--partial to complete unconsciousness. Use the Glasgow Coma Scale to determine the level of coma (task 081-833-4159, Evaluate a Casualty With a Head Injury).
 - b. Ask the casualty to perform calculations (basic math) to assess cognition. For example, have the casualty count backward from 100 by threes or sevens.
 - c. Observe the casualty's verbal and nonverbal behavioral responses to evaluate affect (mood). For example,
 - (1) Does the casualty laugh inappropriately?
 - (2) Does the casualty display excessive or inappropriate anger, fear, anxiety, or confusion?
 - (3) Does the casualty respond to stimuli in a normal manner?
 - d. Question the casualty to evaluate long- and short-term memory.
 - (1) Discuss the casualty's past to evaluate remote recall (long-term memory). Verify the casualty's responses with information on his unit of assignment and mission or query the unit's members.
 - (2) Discuss current events to evaluate recent recall (short-term memory). For example, ask the casualty what he was doing just before being injured or what his unit was doing the previous day.
 - e. Question the casualty to evaluate his orientation to person, place, and time.
 - (1) Ask the casualty to spell his name, name family or unit members, and recite his home or unit address. (This determines whether the patient knows who he is and who others are.)
 - (2) Ask the casualty to identify his location, naming the city, state, or country. (This determines whether the casualty knows where he is.)
 - (3) Ask the casualty to identify the year, month, and approximate time of day.
3. Evaluate the casualty's cerebellar functions.
 - a. Test coordination and balance.
 - (1) Ask the casualty to extend one arm, close the eyes, and touch the index finger to the nose.
 - (2) Ask the casualty to slap the palms of the hands on his legs and then the backs of the hands on the legs, alternating in a rapid motion.
 - (3) Ask the casualty to stand relaxed with the eyes open. Watch for movement.
 - (4) Perform the "Romberg's test."
 - (a) Have the casualty stand up and relax. Instruct the casualty to close the eyes.
 - (b) If the casualty cannot maintain balance when the eyes are closed, the test is positive.

NOTE: The medic should stand close to the casualty to support the casualty if he starts to fall.

Performance Steps

- b. Check the casualty for normal gait and heel-toe-heel walking. Assess the casualty for coordination, balance, and posture. Note inability to walk heel-toe-heel with one foot in front of the other.
4. Evaluate the casualty's motor function.
 - a. Check for mild weakness.
 - (1) Have the casualty stand with the arms outstretched, palms upward, and eyes closed for 20 to 30 seconds.
 - (2) Observe the casualty's arms for the "pronator sign" (the arm starts dropping and the hand turns over slightly).
 - b. Test muscle tone.
 - (1) Ask the casualty to relax.
 - (2) If the casualty is ambulatory, have him sit on the edge of the examining table. Watch the freedom of movement of the legs. This indicates tone.
 - (3) If the casualty is in bed, lift the casualty's arm, drop it, and observe the arm as it falls. Look for atrophy--loss of muscle tone or strength.
 - c. Test muscle strength.
 - (1) Ask the casualty to walk on the heels.
 - (2) Ask the casualty to walk on the toes.
 - (3) Extend your hands and ask the casualty to firmly grip and squeeze your hands. Note strength and equality of grip.
 - (4) Ask the casualty to alternately flex and extend the feet while providing resistance with your hands. Look for atrophy.
5. Evaluate the casualty's cranial nerve function.
 - a. Test pupillary reflexes.
 - (1) Dim the lighting and shine a light into one of the casualty's eyes.
 - (2) Observe the pupillary response.
 - (3) Repeat the procedure on the other eye.
 - (4) If the pupils are unreactive or unequal, they are abnormal (Figure 1).
 - (5) If the pupils are equal and reactive, record PERRLA (pupils equal, round, and reactive to light and accommodation).

Performance Steps



Figure 1. Testing Pupillary Reflexes

b. Test facial nerves.

- (1) Ask the casualty to smile and raise the eyebrows.
- (2) Look for weakness or drooping on either side of the face when smiling.
- (3) Look to see if there is even movement of both eyebrows.

6. Evaluate the casualty's sensory functions.

NOTE: When doing this test, ask the casualty not to watch what you are doing.

- a. Allow the casualty to assume a comfortable position with the eyes closed.
- b. Test perception of pain by using a safety pin. Lightly touch the skin with the sharp and dull areas of the pin.
 - (1) Ask the casualty to identify the sensation felt (sharp or dull).
 - (2) Ask the casualty to identify where the sensations were felt.
- c. Test perception of touch by using a cotton ball to lightly brush the skin, asking the casualty to tell you when and where the sensation was felt.

7. Check for the presence of a Babinski's reflex (Figure 2).

Performance Steps

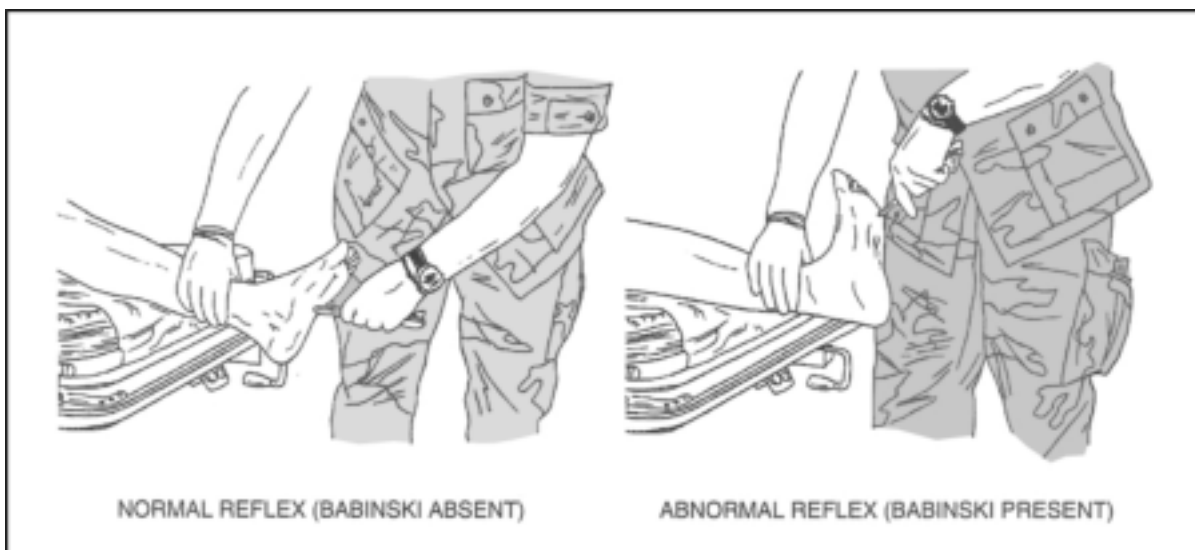


Figure 2. Checking for Babinski's Reflex

- a. Grasp the ankle with your left hand.
 - b. With a blunt point and moderate pressure, stroke the sole near its lateral border from the heel toward the ball of the foot. The course of the stroke should curve to the middle to follow the bases of the toes.
 - c. Normal reflex--toes curl. (Recorded as the absence of a Babinski's reflex.)
 - d. Abnormal reflex. (Recorded as the presence of a Babinski's reflex.)
 - (1) Dorsiflexion of the great toe.
 - (2) Fanning of all the toes.
 - (3) Dorsiflexion of the ankle.
 - (4) Flexion of the knee and hip.
8. Evaluate the casualty's deep tendon reflexes (DTRs).
- a. Biceps.
 - (1) Position the elbow at about a 90-degree angle of flexion with the arm slightly pronated.
 - (2) Grasp the elbow with your left hand so the fingers are behind it and your abducted thumb presses the biceps brachii tendon.
 - (3) Strike your thumb a series of blows with the rubber hammer, varying your thumb pressure with each blow until the most satisfactory response is obtained.
 - (4) A normal response will be elbow flexion.
 - b. Triceps.
 - (1) Grasp the casualty's wrist with your left hand and pull the arm across the chest so the elbow is flexed about 90 degrees and the forearm is partially pronated.
 - (2) Tap the triceps brachii tendon directly above the olecranon process.
 - (3) A normal response is elbow extension.
 - c. Knee.
 - (1) Legs dangling (Figure 3).
 - (a) Have the casualty sit on a table, high bed, or litter to permit free swinging of the legs.
 - (b) Tap the patellar tendon directly.

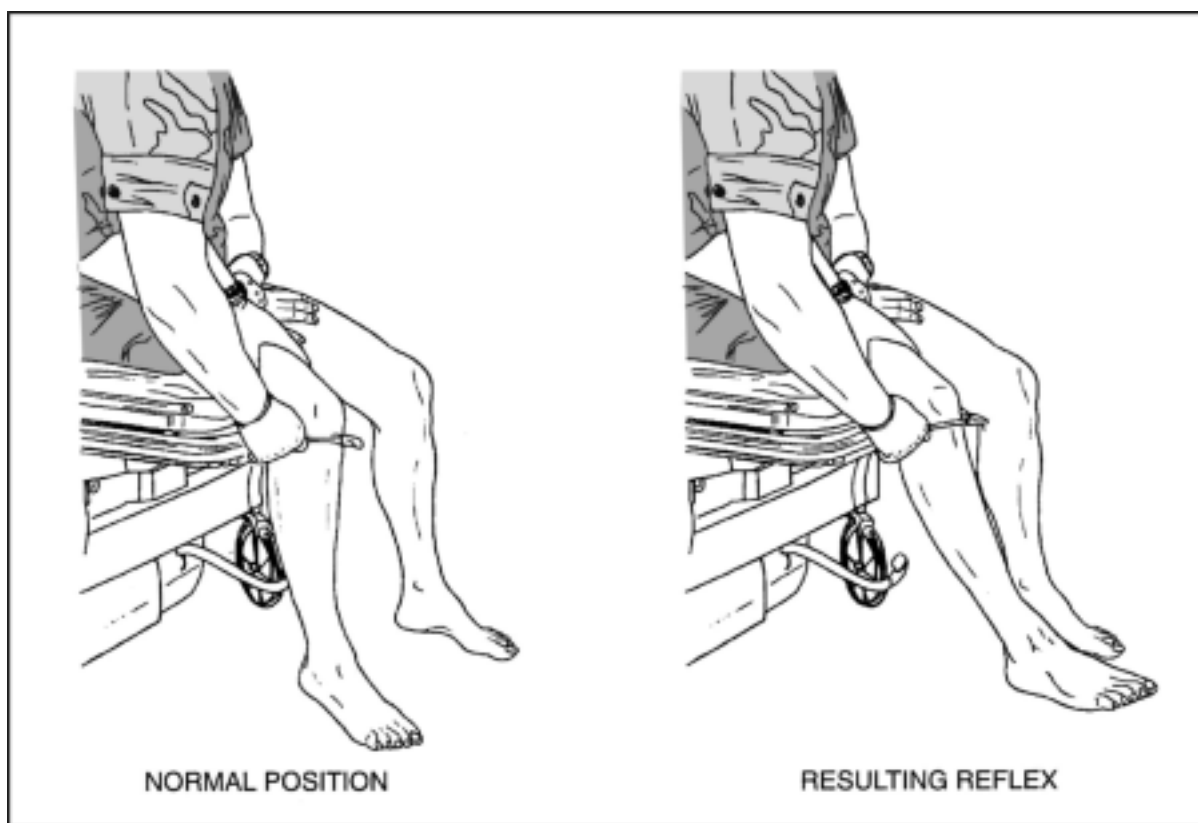
Performance Steps

Figure 3. Checking Knee Reflex of Dangling Leg

NOTE: The tendon is distal to the patella.

- (c) A normal response is extension of the knee.
- (2) Lying supine (Figure 4).
 - (a) With your hand under the popliteal fossa, lift the knee from the table.
 - (b) Tap the patellar tendon directly.
 - (c) A normal response is extension.

Performance Steps



Figure 4. Checking Knee Reflex While Lying Supine

d. Ankle.

(1) Legs dangling (Figure 5).

- (a) With your left hand, grasp the foot and pull it in dorsiflexion. Find the degree of stretching of the Achilles tendon that produces the optimal response.
- (b) Tap the Achilles tendon directly.
- (c) A normal response is contraction of the gastrocnemius and plantar flexion of the foot.

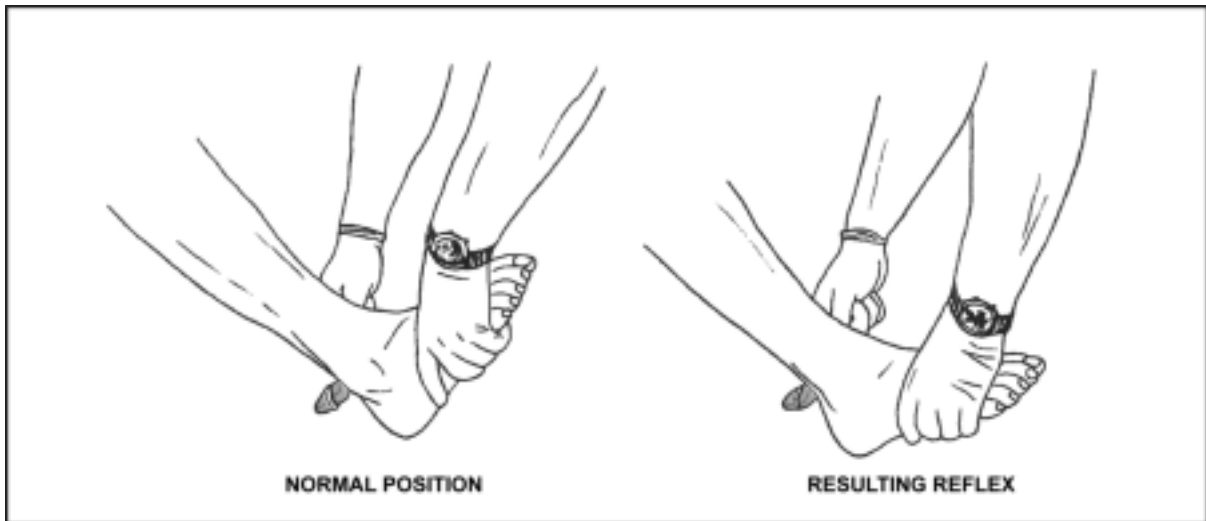
Performance Steps

Figure 5. Checking Ankle Reflex With Legs Dangling

- (2) Lying supine (Figure 6).
- (a) Partially flex the hip and knee. Rotate the knee outward as far as comfort permits.
 - (b) With your left hand, grasp the foot and pull it in dorsiflexion.
 - (c) Tap the Achilles tendon directly.
 - (d) A normal response is plantar flexion.



Figure 6. Checking Ankle Reflex While Lying Supine

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Looked for the cause(s) of the injury.	_____	_____
2. Evaluated the casualty's mental status.	_____	_____
3. Evaluated the casualty's cerebellar functions.	_____	_____
4. Evaluated the casualty's motor function.	_____	_____
5. Evaluated the casualty's cranial nerve functions.	_____	_____
6. Evaluated the casualty's sensory functions.	_____	_____
7. Checked for the presence of a Babinski's reflex.	_____	_____
8. Evaluated the casualty's deep tendon reflexes.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

STP 8-91B15-SM-TG

Manage a Burned Casualty**081-833-4023**

Conditions: Given field dressings, Ringer's lactate, an intravenous (IV) infusion set, pain medications, Silvadine cream, and a selection of antibiotics.

Standards: Assess the extent of the burns, and effectively manage the casualty without causing further harm.

Performance Steps

1. Take proper action to prevent further injury.

NOTE: If the cause of the burn is not evident, ask the casualty or bystanders.

- a. Thermal burns: Remove the casualty from the source of heat.

NOTE: If possible, remove metal items such as jewelry.

- b. Electrical burns: If the current cannot be turned off, stand on a dry surface and move the casualty with a nonconductive material, such as a dry, wooden pole.

CAUTION: Do not directly touch a casualty receiving a shock.

- c. Chemical burns:

- (1) Take precautions to protect yourself.
- (2) Remove and dispose of the contaminated clothing.
- (3) Brush off solid chemical particles.
- (4) Flush the affected area with large amounts of water.
- (5) If the chemical is white phosphorus (WP), flush the area thoroughly and cover it with a wet dressing.

CAUTION: Do not touch the chemicals or get them on your clothing.

2. Assess the type and extent of the burn.

- a. Expose the entire burned area by cutting away or removing clothing.

CAUTION: Do not remove clothing that is stuck to the burn.

- b. Determine the percentage of body area burned by using the "Rule of Nines" (Figure 1).

Performance Steps

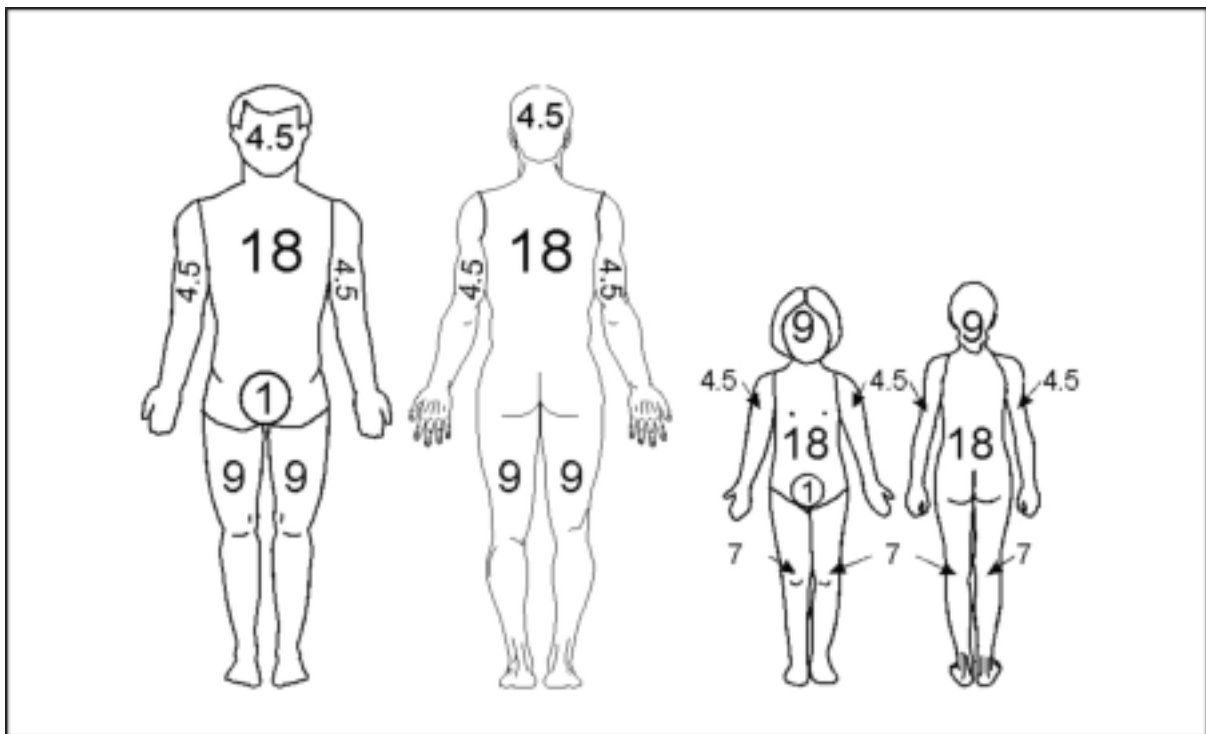


Figure 1. Rule of Nines

- (1) Head and neck equals 9 percent.
 - (2) Anterior-posterior equals 18 percent.
 - (3) Each upper extremity equals 9 percent.
 - (4) Each lower extremity equals 18 percent.
 - (5) Perineum equals 1 percent.
- c. Assess and determine the depth of the burns.
- (1) First degree: The first layer of skin is red and painful; for example, sunburn (Figure 2).

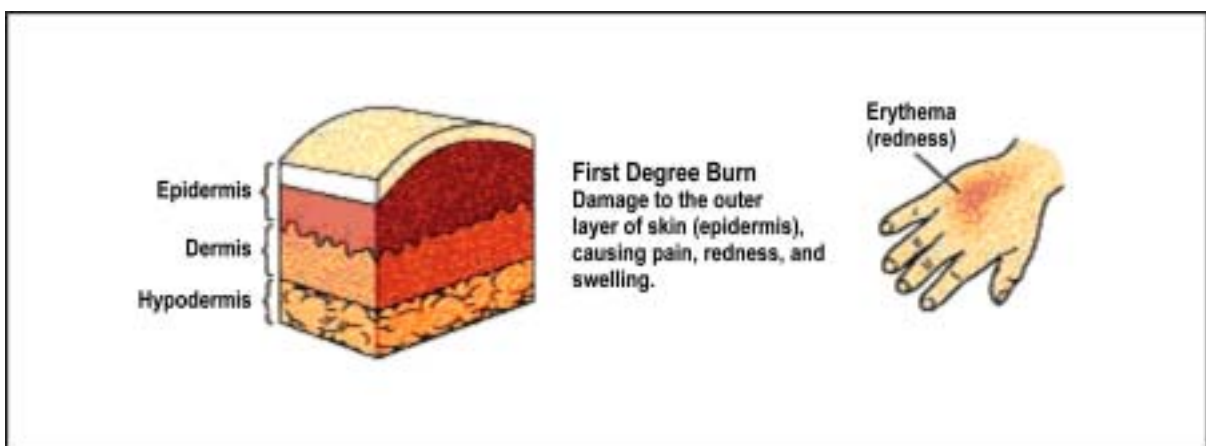


Figure 2. First Degree Burn

- (2) Second degree: Skin is red, blistered, and painful (Figure 3).

Performance Steps

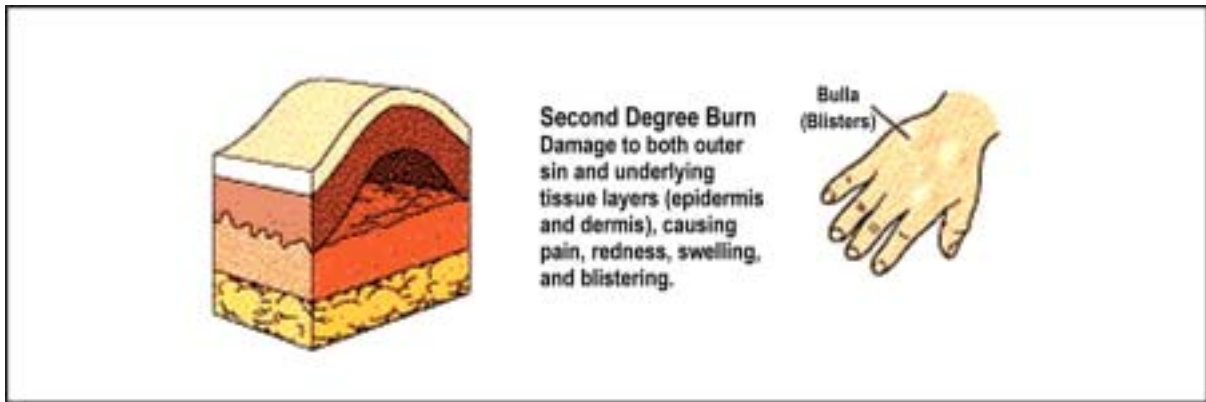


Figure 3. Second Degree Burn

- (3) Third degree: The full thickness of skin is destroyed by being burned down to fat, muscles, and/or bone, including the nerve endings. Skin may have a waxy white or leathery appearance and is insensate (Figure 4).

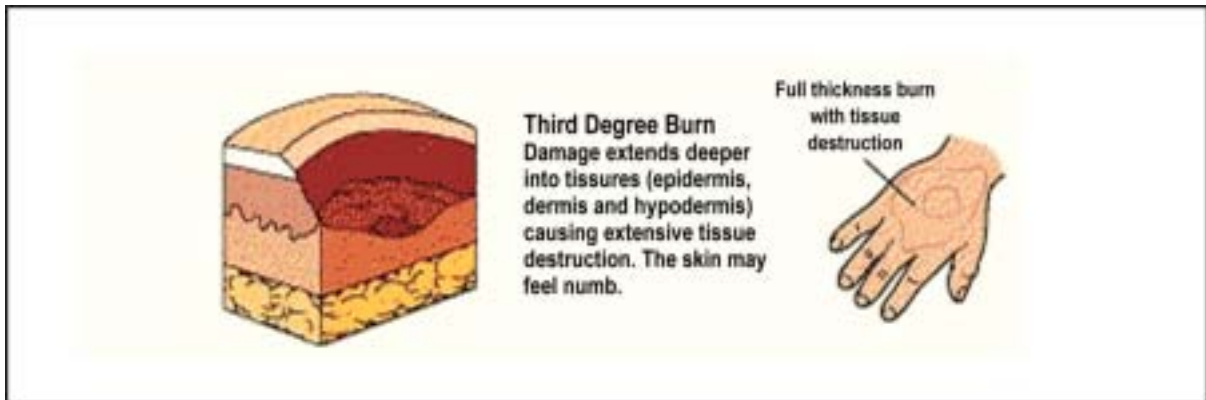


Figure 4. Third Degree Burn

CAUTION: Check patient's respiratory functions frequently.

3. Manage shock (task 081-833-4073, Manage Shock).

CAUTION: Burn casualties are susceptible to shock because of the large amounts of body fluid lost from the burned area.

- a. If shock is present and an IV line cannot be started, perform a venous cutdown IAW task 081-833-4514, Perform a Venous Cutdown.

CAUTION: The IV line should be started in an unburned area if possible.

- b. Titrate the IV to patient response at this point.

CAUTION: Give nothing by mouth if an IV line is started. If not, give small sips of water to alert patients who will not reach a medical treatment facility (MTF) within 3 hours.

4. Evacuate the patient to the aid station for further care, if possible.

NOTE: The following steps should be taken if a burned casualty must be maintained at your location.

5. Manage the burn, if evacuation is not possible.

- a. Manage inhalation burns IAW task 081-833-4197, Manage Inhalation/Aspiration Injuries.
- b. Calculate fluid replacement by using the Brooke formula or the Parkland formula.

WARNING: Any resuscitation formula only provides an estimate of the fluid need. Fluid requirement calculations for infusion rates are based on the time from injury, not for the time fluid resuscitation is initiated.

Performance Steps

- (1) Brooke formula.
 - (a) Milliliters of fluid to be given first 24 hours = (percent body burned) x (weight in kilograms [kg]) x 2 to 4 cubic centimeters (cc) of lactated Ringer's solution.
 - (b) Do not calculate first-degree burns.
 - (c) Give half the total calculated 24-hour requirement in the first 8 hours. Give the remainder over the next 16 hours.
 - (d) During the second 24-hour period, give dextrose 5 percent in water (D5W) at half the volume of crystalloid administration.
- (2) Parkland formula.
 - (a) Milliliters of fluid to be given first 24 hours = (percentage of body burned) x (weight in kg) x 2 cc of lactated Ringer's or normal saline.
 - (b) Do not calculate first-degree burns.
 - (c) Give half the total calculated 24-hour requirement in the first 8 hours. Give the remainder over the next 16 hours.
 - (d) During the second 24-hour period, give D5W at half the volume of crystalloid administration.

CAUTION: After the first 24 hours, normal saline should be used instead of lactated Ringer's because the patient may develop hyperkalemia.

- (3) For children who weigh 30 kg or less, the formula is infuse fluids at a rate sufficient to produce 1 milliliter (ml) of urine per kg of body weight per hour.
 - (4) Adjust the amount of fluid given on the basis of the patient's urinary output, vital signs, and general condition.
- c. Clean the burned area by gently washing it with phisohex and sterile water.
- (1) Leave blisters intact until they break themselves. Cut away the skin after the blister breaks.

NOTE: Immediately open and debride infected blisters.

- (2) Apply antibiotic ointment (Furcin or Silvadine cream) to second- and third-degree burns.
- d. Bandage the burns.
- e. Administer a tetanus toxoid booster for second or third-degree burns.
- f. Treat for pain. Small burns can be managed with oral codeine at a dose of 1/2 grain from 1 to 3 hours. Second-degree burns over 20 percent require parenteral narcotic analgesics, for example, morphine or demerol.

CAUTION: If hypotension or shock exists, which is possible if the burn is over 20 percent, give the analgesic intravenously in one-third to one-half of the intramuscular (IM) doses. The reason for this is that subcutaneous IM medications are not picked up by the patient in shock because of decreased blood flow. Therefore, the medications will not give pain relief even if repeated and will accumulate in the extravascular spaces until such time as the shock is corrected. Once the shock is corrected, the medication is picked up all at once into the patient's circulation, which creates an overdose.

- g. Pass a nasogastric tube if the abdomen is distended or bowel sounds are absent (ileus) (081-833-4496, Perform Nasogastric Intubation). This is generally the case if the burn size is more than 25 percent.
- h. Insert a Foley catheter.
- i. Monitor the urine output hourly to ensure that enough urine is being produced.
 - (1) For adults, the output should be 30 to 50 ml per hour.
 - (2) For children, the output should be 1 ml per kg of body weight per hour.

NOTE: Adjust IV fluid rate to maintain the volume of urine output discussed in (1) and (2).

- j. If possible, regulate room temperature to 75 to 80 degrees Fahrenheit.

6. Record all treatment in the patient's medical record.

7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a burned casualty.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Took action to prevent further injury.	_____	_____
2. Assessed the injury.	_____	_____
3. Managed the injury.	_____	_____
4. Evacuated the patient, if possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED
SANFORD, 1999
VT 1136

Manage Bite Injuries

081-833-4025

Conditions: Given gauze roller bandage, providone iodine solution, surgical soft soap, sterile water, a 30 cubic centimeter (cc) syringe, a large-bore intravenous (IV) catheter, The Sanford Guide to Antimicrobial Therapy, patient's medical record, and an appropriate selection of antibiotics from which to choose.

Standards: Clean, irrigate, and bandage the wound, and administer appropriate antibiotic therapy and tetanus prophylaxis in accordance with the current edition of The Sanford Guide to Antimicrobial Therapy.

Performance Steps

NOTE: This task is performed as a part of task 081-833-4149, Perform Initial Assessment and Management of a Trauma Patient. All other life-threatening conditions have been addressed.

1. Clean the wound.

NOTE: Bite wounds can have characteristics of lacerations, avulsions, and puncture wounds, depending on the type and size of the animal.

- a. Clean the intact skin surrounding the wound with soap and water or mild skin disinfectant.
- b. Irrigate the wound with copious amounts of normal saline.

2. Control hemorrhage created by the wound irrigation, if necessary.

- a. Venous or capillary bleeding may be controlled by bandaging, direct pressure, and elevation.
- b. Arterial bleeding may require ligation (task 081-833-4534, Perform Ligation or Clamping to Control Hemorrhage).

NOTE: Do not suture bite wounds. Refer or evacuate patients with bite wounds causing facial disfigurement or those with extensive involvement of a joint or underlying muscle, ligaments, or tendons.

3. Bandage the wound with sterile roller gauze. The wound should be reevaluated in 48 hours for signs and symptoms of infection (task 081-833-4492, Assess Wound Healing).

4. Administer appropriate antibiotic therapy on the basis of the type of animal and the treatment modality in the current edition of The Sanford's Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:

NOTE: All wild animal bites should be treated as rabid (task 081-833-4247, Manage Rabies). The following are empiric therapies that are based on statistical evidence. If possible, culture all bite wounds and give antibiotic therapy on the basis of the sensitivity of the causative organism.

- a. Bat, raccoon, rat, and skunk: amoxicillin/clavulanate (augmentin) 875/125 milligrams (mg) by mouth (PO) twice daily (b.i.d.) for (x) 7 to 10 days or doxycycline 100 mg PO b.i.d. x 7 to 10 days.
- b. Cat: amoxicillin/clavulanate (augmentin) 875/125 mg PO b.i.d. x 7 to 10 days or cefuroxime 500 mg every 12 hours (q12h) PO.

NOTE: Eighty percent of cat bites become infected. The primary causative agent is *Pasturella multocida*, which is widely resistant to dicloxacillin, cephalexin, clindamycin, and erythromycin.

- c. Dog: amoxicillin/clavulanate (augmentin) 875/125 mg PO b.i.d. x 7 to 10 days or clindamycin 300 mg four times a day q.i.d. PO plus ciprofloxacin 500 mg b.i.d. PO both for 10 days (adults) or clindamycin plus trimethoprim/sulfamethoxazole (children).

NOTE: Only 5 percent of dog bites become infected.

- d. Human: If the bite occurred recently and the wound is not yet infected, you may treat the wound prophylactically with amoxicillin/clavulanate (augmentin) 875/125 mg PO b.i.d. x 5 days. Later, with signs and symptoms of infection, ampicillin/sulbactam 1.5 grams (g) every 6 hours (q6h) intravenously (IV) or cefoxitin 2 g every 8 hours (q8h) IV.
- e. Pig: Amoxicillin/clavulanate (augmentin) 875/125 mg PO b.i.d. x 7 to 10 days or a third-generation cephalosporin.
- f. Primate (nonhuman): Because of the possibility of transmission of the potentially fatal *Herpesvirus simiae*, give acyclovir. The appropriate dosage regimen is not clear at this time. A prophylactic dose of 800 mg five times per day for 7 to 10 days is recommended.

Performance Steps

- 5. Record all treatment in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a bite injury.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Cleaned the wound.	_____	_____
2. Controlled hemorrhage created by the wound irrigation when necessary.	_____	_____
3. Bandaged the wound with sterile roller gauze.	_____	_____
4. Administered appropriate antibiotic therapy on the basis of the type of animal and the treatment modality in the current edition of The Sanford Guide to Antimicrobial Therapy.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
SANFORD, 1999	MERCK MANUAL 17TH ED

Manage Hemorrhagic/Hypovolemic Shock

081-833-4072

Conditions: As a special operations medic in a field environment and given intravenous (IV) administration equipment, crystalloid solutions, patient's medical record, stethoscope, and sphygmomanometer. All other life-threatening conditions have been controlled.

Standards: Manage hemorrhagic/hypovolemic shock in accordance with (IAW) the algorithm for fluid resuscitation and the mini-fluid challenge.

Performance Steps

1. Recognize the general signs and symptoms of hypovolemic shock. These may vary considerably with the individual patient.

- a. Thirst.

NOTE: Thirst is an early symptom of hypovolemic shock, easily overlooked in situations in which concealed bleeding occurs. Explanations regarding the cause of thirst are many, although the underlying cause is probably related to decreased blood volume and increased osmolarity. Patients with trauma frequently have a decreased renal blood flow as a result of an intense adrenal medullary response along with an increase in antidiuretic hormone (ADH) levels, which causes water retention. Water should be given cautiously because water intoxication can occur in a patient who continues to drink in the face of altered renal function.

- b. Decrease in skin temperature.

NOTE: The skin reflects the existence of two different peripheral responses to shock. In one, sympathetic stimulation leads to intense vasoconstriction of the skin vessels with activation of sweat glands, causing the skin to be cool and moist. In the other, the skin is warm and flushed. The former can be observed in hypovolemic and cardiogenic shock; the latter in septic shock. In cardiogenic shock, the lips, nail beds, and skin are cyanotic because of stagnation of blood flow and increased extrication of oxygen from the hemoglobin as it passes through the capillary bed. In hemorrhagic shock, the loss of red blood cells (RBCs) leaves the skin and mucous membranes pale. The decrease in body temperature, often observed in shock, reflects a decrease in the body's metabolic rate. In septic shock, body temperature may be elevated because of infection and the skin may be harmed because of non-nutrient shunting of blood flow in the capillary beds of the skin and peripheral tissue.

- c. Pulse rate changes.

NOTE: Pulse rate will be greater than 100--most sensitive sign in early shock and is the earliest measurable sign. Like vasoconstriction, tachycardia of early shock is a sign of sympathetic nervous system response to injury. Tachycardia may also reflect emotional aspects surrounding the injury or the pain associated with trauma. Blood volume and vessel tone are reflected on the quality of the pulse. A weak and thready pulse indicates vasoconstriction and a reduction in the filling of the vascular compartment. Vasoconstriction does not occur as an early sign in slow hemorrhage. The greater the increase in vasoconstriction, the more profound the shock.

- d. Systolic blood pressure decreased with less of a decrease in diastolic.

NOTE: The earliest measurable sign of circulatory impairment is tachycardia. Because of compensatory mechanisms, tachycardia may exclude a measurable fall in systolic blood pressure until the patient has lost up to 30 percent of his or her blood volume.

- e. Narrowed pulse pressure. (This is the difference between the systolic and diastolic blood pressure.)

- f. Respiratory rate increases (tachypnea).

- g. Failed capillary blanch test. Test is conducted by compressing and releasing. The pressure point should lose color and return to normal color within 2 seconds. A response greater than 2 seconds indicates decreased perfusion.

- (1) Test at the hypothenar eminence (palm below little finger).

- (2) Test at the nail bed.

- h. Decreased urinary output, which is a late sign.

Performance Steps

NOTE: The maintenance of vascular volume is further enhanced by renal mechanisms. A decrease in renal blood flow resulting from sympathetic vasoconstriction causes a decrease in glomerular filtration rate and an increase in the reabsorption of sodium and water as a result of the activation of the renin-angiotensin-aldosterone mechanism. The decrease in blood volume also stimulates the centers in the hypothalamus that regulate ADH and thirst. A decrease in blood volume of 10 percent is enough to stimulate or activate these mechanisms. ADH-vasopressin increases the permeability of the distal convoluted tubules and collecting ducts, thereby allowing greater amounts of water to be reabsorbed.

- (1) Only accurate check is with a Foley catheter.
- (2) Persistent hourly output of less than 25 cubic centimeters per hour (cc/hr) could be the result of an inadequate renal perfusion or renal failure. Consider shock.
- (3) Maintain adult hourly output of greater than 50 cc/hr.
- (4) Maintain pediatric hourly output of greater than 0.5 to 1 (ml/kg).
- (5) Altered mental status--possibly anxious and confused.

NOTE: Restlessness and apprehension are common behaviors in early hypovolemic shock. As the shock progresses and blood flow to the brain decreases, the restlessness of an earlier stage is replaced by apathy and stupor. During the latter stage, there is no longer an expression of concern about the outcome of the injury and complaints of pain and discomfort cease. If shock is unchecked, the apathy will progress to coma. Coma as a result of blood loss alone and not related to head injury or other factors is usually an unfavorable sign. It usually means the patient has sustained a lethal blood loss.

2. Manage hemorrhagic/hypovolemic shock.

- a. Maintain the airway.

NOTE: Administer oxygen, if available.

- b. Gain hemorrhage control.
- c. Reassure the casualty to reduce anxiety.

NOTE: Anxiety increases the heart rate, which worsens the casualty's condition.

- d. Administer appropriate fluid therapy.

- (1) In case of massive hemorrhage, fluid of choice is blood, if available, that is typed and crossmatched, if possible. The ratio is 1 cc of blood for each cc of blood lost. Type O negative blood must be used if specific type and crossmatch are not available.
- (2) In the field environment, administer fluids per the algorithm for fluid replacement in trauma and the algorithm for the minifluid challenge (Figure 1).

Performance Steps

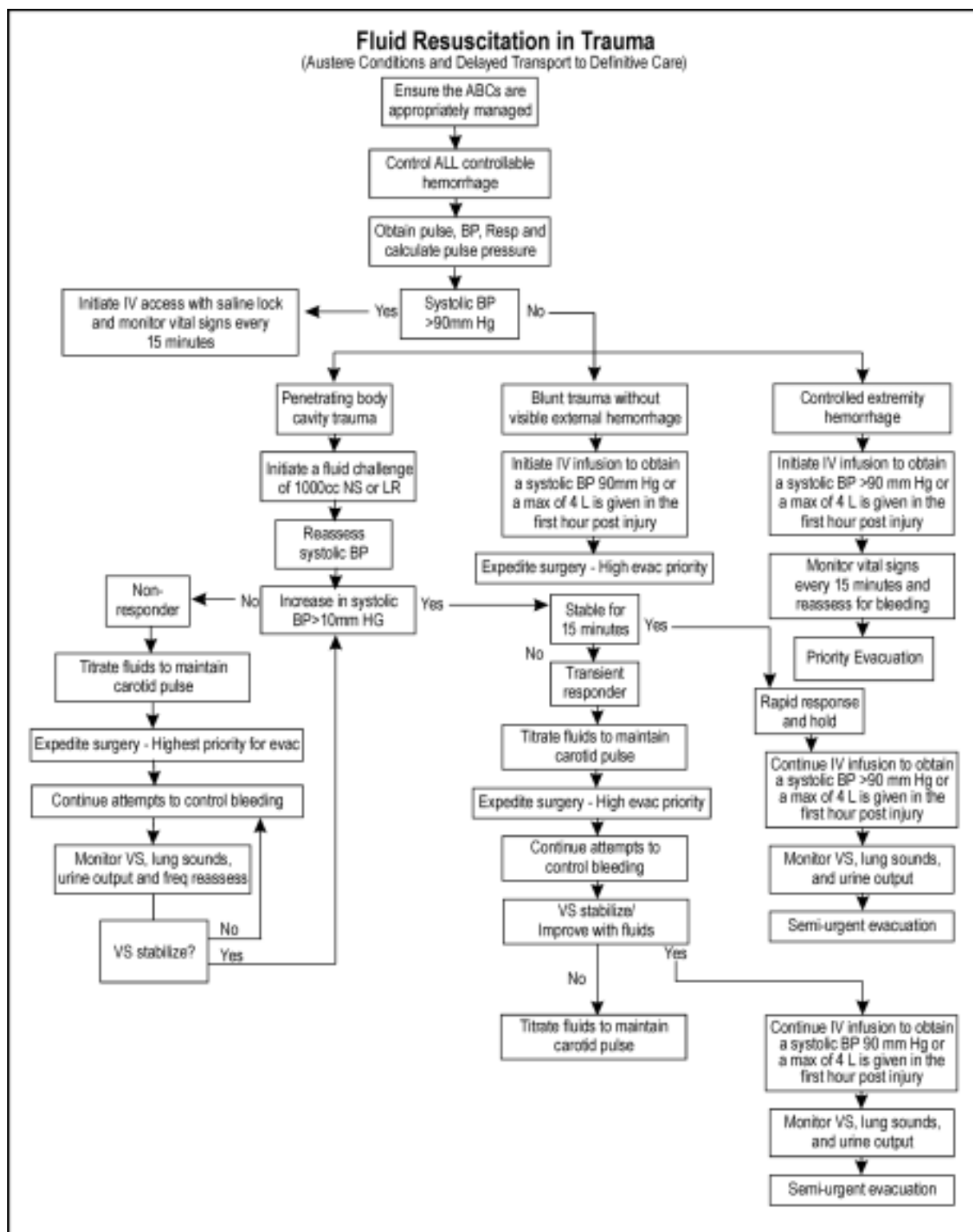


Figure 1. Fluid Replacement Algorithm

Performance Steps

- e. The application of military antishock trousers (MAST) (if available) is indicated before IV therapy (if hypovolemic shock is the result of pelvic fracture, an intra-abdominal hemorrhage, or veins that are not palpable or visible).
- f. If condition of the patient allows the start of IV therapy, MAST (if indicated) will be applied after IV therapy has been started.
- g. Elevate the casualty's legs.
 - (1) Elevate the casualty's legs above chest level, without lowering the head below chest level.

NOTE: Splint leg or ankle fractures before elevating the legs, if necessary.

- (2) If the casualty is on a litter, elevate the foot of the litter.
- h. Maintain normal body temperature.
 - (1) Watch for signs of sweating or chilling.
 - (2) Cover the casualty in cold weather.
 - (3) Do not cover the casualty in hot weather unless signs of chilling are noted.

3. Record all treatment in the patient's medical record.

4. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage hemorrhagic/hypovolemic shock.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the general signs and symptoms of hypovolemic shock.	_____	_____
2. Managed hemorrhagic/hypovolemic shock.	_____	_____
3. Recorded all treatment in the patient's medical record.	_____	_____
4. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Shock

081-833-4073

Conditions: As a special operations medic in a field environment and given typed and crossmatched blood or appropriate crystalloid or colloid fluids, intravenous (IV) administration equipment, military antishock trousers (MAST), a selection of broad-spectrum antibiotics, patient's medical record, and The Sanford Guide to Antimicrobial Therapy.

Standards: Manage shock so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Define shock. Shock is a condition of inadequate blood flow and/or perfusion of tissues that leads to inadequate oxygenation of tissues and ultimately results in widespread cellular dysfunction.
2. Recognize the types of shock.
 - a. Hypovolemic shock, which is caused by diminished blood volume.
 - b. Cardiogenic shock, which is the failure of the heart to adequately pump blood.
 - c. Septic shock, which is caused by bacteria--especially gram-negative.
 - d. Neurogenic shock, which is caused by decreased sympathetic control of blood vessel tone.
 - e. Anaphylactic shock, which is caused by hypersensitivity reaction from an injection of protein.

NOTE: For more information on anaphylactic shock, see task 081-833-4006, Manage Anaphylaxis.

3. Recognize the possible causes of cardiogenic shock.
 - a. Heart failure leading to pump failure (congestive heart failure [CHF] or myocardial infarction [MI]). It is most often associated with massive anterior infarction and more than 50 percent loss of left ventricular functioning myocardium.
 - b. Acute valve dysfunction leading to pump failure.
 - c. Infection leading to pump failure, bacterial or fungal invasion of the endothelial heart muscle and valves (task 081-833-4061, Manage Infective Endocarditis).
 - d. Cardiac tamponade leading to restriction of cardiac expansion and causing inadequate filling of the "pump"--Beck's triad (task 081-833-4194, Manage Nonpenetrating Trauma to the Chest).
 - e. Tension pneumothorax results from impaired venous return, which is secondary to pressure gradient etiology of the hose (the inferior and superior venae cavae) (task 081-833-3007, Perform Needle Chest Decompression).
4. Recognize the signs and symptoms of cardiogenic shock.
 - a. Distended neck veins is the hallmark of cardiac shock. Cardiac shock is the only type of shock in which this finding is seen.
 - b. Hypotension.
 - c. Tachycardia.
 - d. Reduced urine output.
 - e. Mental confusion.
 - f. Diaphoresis.
 - g. Cold extremities.

NOTE: Cardiogenic shock has a mortality rate of about 65 percent when optimally managed.

5. Manage cardiogenic shock.
 - a. Administer high-flow oxygen via mask.
 - b. Rule out mechanical causes caused by trauma, such as tension pneumothorax and cardiac tamponade.
 - c. Rule out abnormalities of cardiac rhythm such as symptomatic tachycardia or bradycardia.
 - d. Manage blood pressure in accordance with advanced cardiac life support protocols.

Performance Steps

6. Define septic shock. Septic shock is the loss of vascular muscle tone caused by the action of toxic products of bacteria. Clinically, septic shock is defined as sepsis-induced hypotension (systolic blood pressure [BP] is less than 90 millimeters [mm] mercury [Hg]) not responsive to a 500 milliliter (ml) fluid challenge plus peripheral hypotension.

CAUTION: This is a very serious condition with a very high mortality rate of 50 to 90 percent.

7. Recognize the possible causes of septic shock.

- a. Peritonitis.
- b. Clostridial myonecrosis (gas gangrene).
- c. Any septicemia.

NOTE: Any minor infection can rapidly lead to a septic condition if the patient has a decreased immune response.

8. Recognize the signs and symptoms of septic shock.

- a. The signs and symptoms of bacteremia usually appear first.
 - (1) Tachypnea.
 - (2) Shaking chills (rigors).
 - (3) Fever.
 - (4) Nausea and vomiting (because of ileus).
- b. When septic shock develops, the presenting sign is often altered mental alertness or delirium.
- c. The blood pressure will be reduced, but the skin is paradoxically warm and pink or mottled.
- d. Tachycardia.
- e. Oliguria.
- f. Cool, pale extremities with peripheral cyanosis and mottling are late signs.
- g. With progression, multi-organ failure involves the kidneys, lungs, and liver. Disseminated intravascular coagulation (DIC) and heart failure may also occur.

9. Manage septic shock.

- a. Manage any potential source; for example, drain an abscess.
- b. Perform culture and test sensitivity of the source of the infection. (Blood, wound drainage, and so on.)

NOTE: Early administration of broad-spectrum antibiotics is a crucial factor in saving a patient's life. Unnecessary antibiotics should be changed or discontinued after the culture and sensitivity results are received.

- c. Frequently these patients will require up to 6 liters or more of crystalloid for resuscitation from full-blown septic shock, then titrate to maintain adequate urine output.
- d. Administer broad-spectrum antibiotics on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - (1) Ticarcillin or clavulanate (timentin) 3.1 grams (g) every 4 hours (q4h) IV. OR
 - (2) Piperacillin-tazobactam 3.375 g every 4 hours (q4h) IV. OR
 - (3) Imipenem cilastatin (primaxin) 500 milligrams (mg) every 6 hours (q6h) IV.
- e. Supportive measures, as necessary.
- f. Dopamine or other vasoconstrictors may be needed to support BP in severely ill patients. Titrate all vasoconstrictors to patient BP.

10. Define neurogenic shock. Neurogenic shock results when blood vessels lose muscle tone as a result of loss of nerve impulses, which results in paralysis of the vascular system.

11. Recognize the possible causes of neurogenic shock.

- a. Fear, fright, and pain.
 - (1) More commonly classified as causes of syncope ("fainting" or a vasovagal response), which is typically marked by bradycardia, not tachycardia.
 - (2) Usually requires minimal therapy as is usually self-limiting.
- b. Regional anesthetic agents (for example, spinal block).

Performance Steps

- c. Spinal shock, which is caused by acute spinal cord transection. The typical neurogenic shock patient is one who has acute traumatic paraplegia or quadriplegia. Nerve impulses from the brain cannot reach the periphery maintaining vessel tone, resulting in dilation and the subsequent pooling of blood.

12. Manage neurogenic shock.

- a. Place the patient in the Trendelenburg position. (For neurogenic shock caused by fear or vasovagal discharge, this is the only treatment necessary.)
- b. IV fluids.
 - (1) Normal saline or Ringer's lactate.
 - (2) Give bolus, and then titrate to maintain adequate urine output.
- c. If hypotension is refractory to the above measures, consider the use of a vasopressor drug.
 - (1) Dopamine 2 to 10 micrograms per kilogram per minute (ug/kg/min) for low dose administration or may be titrated up to 50 ug/kg/min, if necessary to support BP.
 - (2) Norepinephrine initially at 8 to 12 micrograms per minute (ug/min) followed by a maintenance dose of 2 to 4 ug/min (with wide variations). Must be titrated to patient response.

NOTE: Norepinephrine or dopamine may be used to raise the systolic pressure to between 90 and 100 mm Hg. Once the BP is stabilized, correct the underlying cause so that administration of the vasopressor drug can be reduced or discontinued.

13. Assess the effectiveness of shock management.

NOTE: These signs of improvement apply to all forms of shock.

- a. Pulse rate decreases and character becomes normal.
- b. Systolic and diastolic BP increase with a widening pulse pressure.
- c. Increased urinary output.
- d. Mental status improves.
- e. Skin is warm and dry with color (except for septic shock).
- f. Mucous membranes and axillary areas are moist.
- g. Respirations are full and regular.

NOTE: In the conventional setting, evacuate patients in shock to a higher medical facility as soon as possible. In the unconventional setting or where patients cannot be evacuated, monitor patient long term for postshock complications.

14. Manage complications symptomatically with appropriate supportive care.

15. Record all treatment in the patient's medical record.

16. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient whom he must manage for shock.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Defined shock.	—	—
2. Recognized the types of shock.	—	—
3. Recognized the possible causes of cardiogenic shock.	—	—
4. Recognized the signs and symptoms of cardiogenic shock.	—	—
5. Managed cardiogenic shock.	—	—
6. Defined septic shock.	—	—
7. Recognized the possible causes of septic shock.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
8. Recognized the signs and symptoms of septic shock.	_____	_____
9. Managed septic shock.	_____	_____
10. Defined neurogenic shock.	_____	_____
11. Recognized the possible causes of neurogenic shock.	_____	_____
12. Managed neurogenic shock.	_____	_____
13. Assessed the effectiveness of shock management.	_____	_____
14. Managed complications symptomatically with appropriate supportive care.	_____	_____
15. Recorded all treatment in the patient's medical record.	_____	_____
16. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	ACLS 1997-1999
	EMT-P, BRADY 3RD ED. 1997
	TF 8-3693

Manage Electrical and Lightening Injuries

081-833-4075

Conditions: As a special operations medic in a field environment and given M-5 medical kit, patient's medical history, and a patient who has suffered an electrical or lightning injury.

Standards: Assess and manage the patient's airway, breathing, circulation, and disability, and provide supportive care so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Ensure scene safety.
 - a. Electrical injuries:
 - (1) Shut off the source of electricity.
 - (2) Remove the casualty from the source of the electricity by using a dry, nonconductive material.

NOTE: If in doubt about the safety of removing a casualty from the source of electricity, await professional help. Do not become a casualty in an attempt to rescue a casualty.

- b. Lightning injuries: Ensure the casualty is taken to shelter from the storm if the potential for further lightning strikes remains high.

2. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient. The protocols established in tasks 081-833-4149 and 081-833-4075, Perform Tactical Combat Casualty care, establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of nonpenetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and then airway (A2) through full set of vital signs (F).

3. Assess the severity of the specific injury.
 - a. Electrical injuries.
 - (1) Airway and breathing.
 - (2) Circulation. (Electrical injuries often result in a pulseless state.)
 - (3) Entry and exit wounds.
 - (4) Type of current.
 - (a) Direct current (DC) is generally less dangerous than alternating current (AC). DC tends to cause convulsive contractions, often forcing the victim away from the source of the current. AC at 60 Hertz produces muscle tetany, often freezing the hand to the current source, resulting in severe burns.
 - (b) Generally, the higher the voltage and amperage, the greater the damage from either type of current.
 - (c) Internal tissues are burned depending on their resistance. Nerves, blood vessels, and muscles conduct electricity more readily than denser tissue such as bone, tendon or fat, and are more readily damaged.
 - (d) The pathway of the current through the body may also influence the severity of the injury. Current traveling from arm to arm or from one arm to the opposite foot is likely to traverse the heart, resulting in asystole or fibrillation.
 - (e) Electrical injury to the head may result in seizures, respiratory arrest, asystole, or fibrillations.
 - (f) The duration of the current flow is directly proportional to the extent of the underlying tissue injury. The longer the victim is exposed to the current, the greater the tissue destruction and resultant problems such as myoglobinuria.
 - b. Lightning injuries.
 - (1) Airway and breathing.
 - (2) Circulation. (Lightning injuries often result in a pulseless state.)
 - (3) Lightning injuries rarely produce entry and exit wounds. The typical burn pattern has been described as fern-like.

Performance Steps

- (4) Lightning injuries seldom cause extensive muscle damage leading to myoglobinuria, because the duration of the current is too short to break down the skin and tissues.

4. Manage the injury.

a. Electrical injuries.

- (1) Maintain the patient's airway.
- (2) Perform rescue breathing or ventilation with oxygen, if available.
- (3) Perform cardiopulmonary resuscitation (CPR), if necessary.
- (4) Manage cardiac dysrhythmias per advanced cardiac life support (ACLS) protocol.

NOTE: Cardiac monitoring for 12 hours postinjury is indicated if there is any suggestion of cardiac damage.

- (5) Bandage any burned areas as per task 081-833-4023, Manage a Burned Casualty.
- (6) Be prepared to manage complications of electrical injury--especially myoglobinuria.
- (7) Administer tetanus prophylaxis, as required.

b. Lightning injuries.

- (1) Maintain the patient's airway.
- (2) Perform rescue breathing or ventilation with oxygen, if available.
- (3) Perform CPR, if necessary.

NOTE: Cardiac arrest is the most common cause of death in lightning injuries. With early ventilation and CPR, it is possible for these patients to survive.

- (4) Manage cardiac dysrhythmias per ACLS protocol.
- (5) Restrict the patient's fluid intake for 24 to 48 hours postinjury or until the possibility of injury-induced cerebral edema can be ruled out.

NOTE: The need to restrict fluid is especially true for victims who were struck on the head.

- (6) Bandage any burned areas as per task 081-833-4023.

5. Record all treatment in the patient's medical record.

6. Evacuate the patient to a higher level medical facility, if necessary.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient whom he must manage for electrical and lightning injuries.

Performance Measures**GO** **NO GO**

1. Ensured scene safety.

- a. Shut off the source of electricity or removed the casualty from the source of the electricity by using a dry, nonconductive material.
- b. Took a lightning casualty to shelter from the storm when there was a chance for further lightning strikes.
- c. Did not risk injury in rescuing the casualty.

2. Assessed casualty IAW task 081-833-4149.

3. Assessed the severity of the specific injury.

4. Managed lightning and electrical injuries.

- a. Maintained the patient's airway.
- b. Performed rescue breathing or ventilation with oxygen, if available.
- c. Performed CPR when necessary.
- d. Managed cardiac dysrhythmias per ACLS protocol.
- e. Bandaged any burned areas.
- f. Managed lightning injuries specifically.
 - (1) Performed cardiac monitoring for 12 hours postinjury when there was any suggestion of cardiac damage.
 - (2) Restricted the patient's fluid intake for 24 to 48 hours postinjury or until the possibility of injury-induced cerebral edema can be ruled out.

Performance Measures

GO **NO GO**

g. Managed electrical injuries specifically.

(1) Prepared to manage complications--especially myoglobinuria.

(2) Administered tetanus prophylaxis as required.

5. Recorded all treatment in the patient's medical record.

6. Evacuated the patient to a higher level medical facility when necessary.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

ACLS 1997-1999

EMT-P, BRADY 3RD ED. 1997

MERCK MANUAL 17TH ED

Manage Trauma of the Genitourinary Tract

081-833-4140

Conditions: As a special operations medic in a field environment and given field dressings, Kerlix roller gauze, 0.9 percent normal saline (NS), pain medications, a selection of broad-spectrum antibiotics, patient's medical record, and The Sanford Guide to Antimicrobial Therapy.

Standards: Solicit a patient history, perform a physical examination, and administer emergency supportive care and antimicrobial therapy (if indicated) in accordance with The Sanford Guide to Antimicrobial Therapy without causing further harm.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient. The protocols established in tasks 081-833-4149 and 081-833-4679, Perform Tactical Combat Casualty Care, establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of genitourinary trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and then the second sequence of airway through full set of vital signs (A2 through F).

2. Assess the severity of the genitourinary injury.
 - a. Inspect for abnormalities, such as blood at the meatus and around the testicles.
 - b. Bruising of the testicles.
 - c. Palpate for swelling, abnormal enlargement, and abnormalities of the external genitalia.

NOTE: Although the physical severity of the injury may not be life-threatening, the pain and psychological factors will be quite severe. If the present trauma would lead to a loss of sexual function, the patient should be evacuated as urgent if surgical intervention would possibly preserve sexual function.

- d. Palpate the lower abdomen above the symphysis pubis for tenderness. This may indicate damage to the bladder.
 - e. Percuss the costovertebral angle for tenderness. This may indicate damage to the kidneys.

3. Bandage an injury of the external genitalia.
 - a. Place a roll of Kerlix or a field dressing over the entire genital area.
 - b. Form a diaper with two triangular cravats or other material to hold the absorbent material in place.

NOTE: If bleeding is severe, you may need to apply direct pressure by hand for 10 to 15 minutes. It is not possible to apply enough pressure to stop arterial bleeding with the above bandage.

4. Manage trauma to the genitourinary tract.
 - a. Administer pain medications. (See task 081-833-4690, Manage Pain.)

NOTE: Injuries to the external genitalia are extremely painful. Narcotic analgesics are indicated.

- b. Clean superficial lacerations to the external genitalia. Genitalia may be sutured (task 081-833-4530, Perform Suturing).

NOTE: Never use lidocaine with epinephrine on the penis.

- c. Burns to the external genitalia should be managed IAW task 081-833-4023, Manage a Burned Casualty.
 - d. If a patient cannot void following trauma to the genitourinary tract, consider insertion of a urinary catheter.

CAUTION: A high-riding prostate, blood at the urethral meatus, or scrotal hematoma indicate a possible urethral compromise and contraindicate urinary catheterization. If possible, these patients should be evacuated for surgical intervention.

Performance Steps

- e. If the patient is successfully catheterized or is able to void without catheterization and blood is found in the urine (gross hematuria), suspect trauma to the kidneys. Minor blunt trauma to even one kidney can result in gross and alarming hematuria. A decision to evacuate the patient should be based on the patient's overall condition and the progression of or diminution of the hematuria over a 12-hour period.
 - f. Evacuate patients with the following conditions:
 - (1) Oliguria or anuria in the presence of a fluid challenge.
 - (2) Patients with signs of urethral compromise.
 - (3) Patients with signs of bladder rupture.
 - (4) Other signs of an acute abdomen (task 081-833-4105, Manage Acute and Nonacute Abdomen).
5. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage trauma of the genitourinary tract.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149.	_____	_____
2. Assessed the severity of the genitourinary injury. a. Inspected for abnormalities. b. Palpated for swelling, abnormal enlargement, and abnormalities of the external genitalia. c. Palpated the lower abdomen above the symphysis pubis for tenderness. d. Percussed the costovertebral angle for tenderness.	_____	_____
3. Bandaged an injury of the external genitalia. a. Covered the injury with a secure bandage and dressing. b. Achieved hemostasis.	_____	_____
4. Managed trauma to the genitourinary tract. a. Administered pain medications. b. Sutured clean, superficial lacerations to the external genitalia. c. Managed burns to the external genitalia IAW task 081-833-4023. d. Considered insertion of a urinary catheter when a patient could not void following trauma to the genitourinary tract.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Evacuated patients when the following conditions were present: a. Oliguria or anuria in the presence of a fluid challenge. b. Patients with signs of urethral compromise. c. Patients with signs of bladder rupture. d. Other signs of an acute abdomen. e. Patient's overall condition and the progression of or diminution of the hematuria over a 12-hour period.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
SANFORD, 1999

Related

Perform Initial Assessment and Management of Trauma Patient

081-833-4149

Conditions: Given the M-5 medical equipment set.

Standards: Solicit a patient history, perform a physical examination, and manage all life-threatening conditions without causing further harm to the patient.

Performance Steps

NOTE: There are many things that affect the sequences, priorities, amount of time spent, and need for performing a step. A medic who has several casualties in a tactical situation will not do the same steps as a medic who only has one casualty in a nontactical situation.

1. Checks scene security and safety.
 - a. Task 081-833-4679, Perform Tactical Combat Casualty Care, establishes the protocols for managing a casualty in a combat situation.
 - b. Take whatever measures are required to secure the area and treat the casualty.
 - c. Move casualty to prevent further injury, if necessary.
2. Perform a quick visual assessment of the casualty for any of the trauma conditions that are not conducive to survival in accordance with (IAW) task 081-833-4014, Determine Death.
3. Solicit a patient history. If the history of the trauma or mechanism of injury is unknown, take a history from the casualty or witnesses.
4. Determine casualty's responsiveness by using AVPU.
 - a. Alertness.
 - b. Responsive to local stimuli.
 - c. Responsive to painful stimuli.
 - d. Unresponsiveness.
5. Perform a primary survey of the casualty.
 - a. Take cervical spine precautions, as appropriate. The need for cervical spine precautions is based on the following:
 - (1) Situation.
 - (2) Mechanism of injury.
 - (3) Casualty's signs and symptoms.
 - (4) Presence of any injuries above the clavicles.
 - b. Manage the airway IAW task 081-833-4167, Maintain a Patient's Airway.
 - (1) Casualty must have a patent and secured airway.
 - (a) If casualty is unconscious, casualty requires an artificial airway.
 - (b) Protect the airway from aspiration, drainage, or occlusion by using an endotracheal (ET) tube and/or by positioning the casualty to allow drainage out of the mouth.
 - (2) Casualty must have adequate air exchange. Adequate air exchange is defined as either of the following:
 - (a) Moderate to deep voluntary respirations that occur at a regular rate of 12 to 20 breaths per minute.
 - (b) Use of the bag valve mask or Ambu bag to assist ventilations by tubing the patient every 3 to 5 seconds.
 - c. Assess the breathing and respiratory efforts of the casualty and manage any life threatening conditions.

NOTE: Assessment of the respiratory effort begins at the same time as assessment of the airway. When listening and feeling for breath sounds, watch the chest for bilateral rise and fall. If bilateral rise and fall is present, both lungs are working and receiving air.

- (1) Inspect, auscultate, palpate, and percuss the thorax.
 - (a) Inspect for bilateral rise and fall of the chest during respirations and any penetrating chest wounds, deformities, bruising, or other signs of trauma.

Performance Steps

- (b) Auscultate the thorax for breath sounds and a heartbeat. Quickly check one or two locations in each lung for breath sounds. Auscultate the heart for several seconds to assess the rate, rhythm, and character of the heartbeat.
 - (c) Palpate the anterior thorax for pain, tenderness, crepitus, rib fractures, flail segments, and the strength and location of the point of maximal impulse (PMI).
 - (d) Percuss the left and right sides of the thorax for hyporesonance and hyperresonance.
 - (e) Palpate and rake the posterior thorax for posterior injuries.
 - (2) Immediately initiate treatment for a tension pneumothorax IAW 081-833-3007, Perform Needle Chest Decompression, as soon as two of the signs and symptoms of a tension pneumothorax are detected.
 - (3) Treat all penetrating injuries with four-sided occlusive dressings as soon as the wounds are found.
 - (a) Occlude and stabilize penetrating objects.
 - (b) Posterior penetrating injuries are initially managed with four-sided occlusive dressings when the patient is lifted for movement.
 - d. Control hemorrhage.
 - (1) Attempt to control life-threatening hemorrhage during the assessment of the airway and breathing, if it does not interfere with the management of the respective area.
 - (2) Identify all gross bleeding
 - (3) Remember, life over limb if a limb must be moved to stop bleeding.
 - (4) Identify exactly the origin of the bleeding.
 - (5) Apply the appropriate dressing, pressure dressing, or hemostats, when necessary.
 - (6) Place tourniquets on amputations. They may or may not need to be tightened at this time.
 - (7) Wipe away all blood on and around the patient to help identify continued hemorrhage.
 - e. Assess and manage the life-threatening conditions of the casualty in order of priority: airway, breathing, and circulation.
6. Perform a secondary survey of the casualty to identify and manage all injuries.
- a. Reassess and manage the airway.
 - (1) Look, listen, and feel for a minimum of 6 seconds to determine if the casualty is breathing on his own and to obtain the respiratory rate and rhythm.

NOTE: If the patient is being ventilated, remove the Ambu bag.

- (a) Intubation is indicated if the patient is unconscious and does not have the presence of gag reflex, needs assisted ventilation, has a respiratory rate less than 12 or more than 20 breaths per minute, or requires a protected airway as a result of his injuries or conditions.
- (b) If the patient's airway and respirations are adequate, complete the steps for airway assessment before intubation.

- (2) Intubate patient IAW task 081-833-3016, Intubate a Patient.

NOTE: If positive control of the airway is indicated because of injuries and conditions and the patient cannot be intubated, the patient must receive a cricothyroidotomy IAW 081-833-4528, Perform a Surgical Cricothyroidotomy.

- (3) Inspect for jugular venous distensions (JVD) and tracheal deviation.
- (4) Inspect and palpate the cervical spine.
 - (a) Dress any injuries.
 - (b) Apply a cervical collar, as needed.
- b. Reassess and manage breathing and respirations.
 - (1) Inspect the anterior thorax for the following:
 - (a) Bilateral rise and fall of the chest during respirations.
 - (b) Dressings are still in place and effective.
 - (c) Additional wounds that have not been addressed.
 - (2) Auscultate the chest.
 - (a) Auscultate lung fields bilaterally, and report rate, rhythm, and depth of respirations.
 - (b) Auscultate heart sounds, and report rate, rhythm, and character.

Performance Steps

- (3) Percuss the lung fields bilaterally for hyporesonance or hyperresonance.
- (4) Palpate for flail segments, crepitus, and tenderness.
- (5) Manage or reassess all injuries.
- c. Assess the abdomen.
 - (1) Inspect, auscultate, percuss, and palpate the abdomen.
 - (2) Inspect for bright red bleeding from the rectum.
- d. Assess all limbs, pelvis, and shoulder girdle for fractures and amputations.
- e. Log-roll the patient, being careful of the cervical spine at all times.
 - (1) Log-roll the patient over, and inspect and palpate the patient's posterior.
 - (2) Palpate the long spine for step-offs, deviations, and lacerations.
 - (3) Treat all posterior injuries on the thorax with four-sided occlusive dressings.
 - (4) After completion of the posterior examination (exam), logroll the patient back into the lateral recumbent position.
 - (5) Reassess the patient after completion of the log roll.
- f. Assess the circulatory status.
 - (1) Reassess dressings, and manage uncontrolled hemorrhage.
 - (2) Tighten tourniquets, as needed.
 - (3) Initiate one or two large-bore intravenous (IV) Ringer's lactate at the best available sites.

NOTE: The number of IVs required depends on the casualty's hemodynamic state. If the casualty can be effectively managed with just one IV Ringer's lactate, then that is all that is required.

- (a) After each IV has been initiated, reassess the patient's airway, breathing, and circulation (ABC).

NOTE: ABC is a quick reassessment; that is, check for signs of life, check bleeding injuries for further hemorrhage, and if the patient is being ventilated, look for rise and fall of the chest.

- (b) Administer appropriate fluid therapy IAW 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock.

- g. Assess the patient's disability.
 - (1) AVPU: Does the patient respond to verbal stimuli? Was the patient responsive to the painful stimuli of the cutdown?
 - (2) PERRLA: Are the patient's pupils equal, round, and reactive to light and accommodation?
- h. Expose the patient, as required to, look for injuries or to manage any injuries found.
 - (1) Cover or redress the patient as the situation dictates.
- i. Take a full set of vital signs from the patient.
 - (1) Pulse to include rate, character, and rhythm.
 - (2) Respirations to include rate, character, and rhythm.
 - (3) Record all vital signs on the appropriate medical record.
- j. Identify all injuries by the end of the primary assessment.

7. Move the casualty.

- a. The casualty should be moved only under the following conditions:
 - (1) Because of the tactical situation.
 - (2) Conditions are not safe for the casualty and the medic.
 - (3) Evacuation to higher medical care is available and the casualty is stable.
- b. The patient must be moved safely and with caution to his current injuries.
- c. If possible, the casualty should be moved after steps 5 or 6 are completed.
- d. Reassess casualty during and after the movement.
 - (1) Level of consciousness.
 - (2) Patency of airway and respiratory effort.
 - (3) Hemorrhage control.

NOTE: If any problems are noted, perform immediate corrective procedures, as appropriate.

8. Call for medical evacuation (MEDEVAC).

- a. MEDEVAC is requested by using the nine-line format.
- b. The call is initiated as soon as possible.
- c. Changes in casualty status are relayed as appropriate.

Performance Steps

9. Reassess the casualty after he has been moved, resuscitative measures, or any absence from the casualty.

- a. Check casualty's level of consciousness and alertness.
 - (1) AVPU.
 - (2) Situational awareness times 3.
- b. Reassess the casualty's airway.
 - (1) Look, listen, and feel to obtain the rate, character, and rhythm of respirations.
 - (2) Check placement and patency of the ET tube. Re-intubate patient, as necessary.
 - (3) Check the cervical spine, and reinforce any dressings.
 - (4) Assess for tracheal deviation and JVD.
- c. Reassess the casualty's breathing.
 - (1) Inspect the chest for the following:
 - (a) Bandages that may have come off. Reinforce them, as required.
 - (b) Symmetrical rise and fall of the chest.
 - (2) Auscultate for the following:
 - (a) Bilateral breath sounds in the lung fields.
 - (b) Heart rate. State the rate, character, and rhythm.
 - (3) Percuss for abnormal resonance (hyporesonance or hyperresonance) bilaterally.
 - (4) Palpate for flail segments, fractured ribs, and/or any other abnormalities.
- d. Check hemorrhage control.
 - (1) Complete a gross inspection of the patient to ensure that all injuries are treated and that proper hemorrhage control has been achieved.
 - (a) Reinforce or replace any dressings, as needed.
 - (2) Check the patient's IVs.
 - (a) Ensure that they are properly functioning and not infiltrating.
 - (b) Reestablish any lost IV so that the casualty has a patent IV.
 - (c) Ensure there is enough fluid in the bags.
 - (d) Ensure catheters are secured and the tubing is not tangled.
 - (e) Suture all cut-down sites in place.
 - (f) Splint positional IVs sites.
 - (g) Titrate the flow according to the casualty's vital signs IAW 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock.
 - (3) Monitor and record the casualty's vital signs every 5 to 15 minutes.
 - (a) Pulse rate, rhythm, and character.
 - (b) Respiratory rate, rhythm, and character.

10. Perform a head-to-toe assessment, and initiate appropriate resuscitative measures.

NOTE: The head-to-toe assessment is performed as the situation permits. Do not delay transport if the casualty is stable and all life-threatening conditions have been addressed. This step is also dependent on the equipment that the medic has available to perform the exams.

- a. Inspect the head and neck.
 - (1) Inspect and palpate the head for symmetry, size, masses, deformities, and signs of injury or bruising.
 - (2) Inspect and palpate the face for symmetry, discoloration, and signs of injury or bruising.
 - (a) Check for bruising or discoloration behind the ears (Battle Sign).
 - (b) Check for bruising or discoloration around the eyes (Raccoon Eyes).
 - (3) Perform an exam of the eyes by using all equipment available.
 - (a) Examine the eyelids and eyelashes for burns or injuries, symmetry, drooping, swelling, and excessive tearing.
 - (b) Check position and alignment, bilateral symmetry, and extra ocular movement of the eyes.
 - (c) Examine the conjunctivas and sclera for edema, inflammation, and redness.
 - (d) Examine the corneas, irises, and lenses for clearness.
 - (e) Check for PERRLA.

Performance Steps

- (f) If an ophthalmoscope is available, examine the fundi for disc margins, color, disc-cup ratio, ratio of arteriole and venule pulsations, ratio of arteriole or venule pulsations to vascular nicking, vessels branching, retina, macula hemorrhages, exudates, and ocular tensions.
- (4) Examine the ears by using all equipment available.
 - (a) Check for otorrhea.
 - (b) Check bilateral gross hearing.
 - (c) Check for mastoid tenderness discoloration.
 - (d) Check for trauma, edema, deformity, or discoloration to the pinna.
 - (e) Using the otoscope, if available, examine the tympanic membrane for color, trauma, mobility, and fluid levels.
- (5) Examine the nose and sinuses by using all equipment available.
 - (a) Check for rhinorrhea.
 - (b) Examine the nose for trauma, edema, deformity, or discoloration.
 - (c) Examine the mucous membranes for inflammation, edema, pallor, septum deviation or perforation, masses, and obstructions.
 - (d) Percuss the maxillary and frontal sinus for tenderness.
- (6) Examine the mouth and throat.
 - (a) Examine the lips for cyanosis, injury, edema, and burns.
 - (b) Examine the tongue for trauma, edema, deformity, or discoloration.
 - (c) Examine the teeth for fractures, looseness, or if any are missing.
- (7) Examine the anterior neck.
 - (a) Check for mobility, stiffness, tenderness, masses, and JVD.
 - (b) Palpate the carotid artery for bilateral symmetry.
 - (c) Examine the trachea for midline position.
- (8) Examine the posterior neck by "walking" the cervical spine and noting step-offs or deviations.
- b. Examine the thorax.
 - (1) Ensure all chest wounds are treated, and reinforce dressings.
 - (2) Auscultate for breath sounds in at least 3 fields bilateral.
 - (3) Assess the heart rate for rate, character, and rhythm and PMI.
 - (4) Percuss for hyporesonance or hyperresonance.
 - (5) Thoroughly palpate the thorax.
- c. Examine the abdomen.
 - (1) Inspect the abdomen for shape, size, distension, herniation, injuries, or bruising that may indicate internal hemorrhage.
 - (2) Auscultate for hyperactive, hypoactive, or normoactive bowels sounds in all four quadrants.
 - (3) Percuss for a fluid line along the sides and for hyporesonance, hyperresonance, or normal resonance over the abdominal quadrants.
 - (4) Perform light and deep palpations for tenderness, rigidity, guarding, rebound tenderness, fluid wave, masses, or pulsations.
- WARNING: Do not palpate when an evisceration is present.
- (5) Perform a rectal exam.
 - (a) Examine the anus for blood.
 - (b) Note presence or absence of sphincter tone.
 - (c) Check for a high riding prostate, which would indicate a torn urethra.
 - (d) Check for rectal wall integrity.
 - (e) Check for occult blood by using the guaiac test.
- (6) Check for costovertebral angle tenderness.
- d. Examine the genitalia.
 - (1) Inspect for signs of trauma or injury such as blood at the meatus and around the testicles.
 - (2) Check for bruising of the testicles.
 - (3) Palpate for swelling, abnormal enlargement, and abnormalities.
- e. Examine the shoulder and pelvic girdles.

Performance Steps

- (1) Examine the shoulders and pelvis for signs of trauma such as injuries, bruising, deformity, unequal symmetry, or edema.
- (2) Perform a shoulder and pelvic rock to check for tenderness, crepitus, and instability.
- f. Examine the extremities.
 - (1) Inspect for signs of trauma such as injuries, bruising, edema, deformity, and bilateral symmetry.
 - (2) Palpate for signs of tenderness or crepitus.
 - (3) Palpate the arterial pulses (radial, ulnar, femoral, popliteal, dorsalis pedis and posterior tibial) for presence and for bilateral symmetry.
 - (4) Check the nails for signs of cyanosis (2-second blanch).
- g. Examine the neurological system.

NOTE: For information on a complete neurological examination, see task 081-833-4150, Assess Nervous System Disorders.

- (1) Check for PERRLA.
- (2) Check the casualty's level of alertness or consciousness by using AVPU.
- (3) If casualty is conscious, check for orientation times 3.
- (4) Check deep tendon reflexes (scale 0 to 4+) and superficial reflexes such as the cremasteric and Babinski.
- (5) Check sensory function distal to injuries by using light and heavy touch, sharp or dull touch, two-point discrimination, and vibrations of the knees, tibias, and elbows.
- (6) Check the bilateral symmetry of the extremities in range of motion, strength, and sensation.
- h. Examine the 12 cranial nerves (CNs).
 - (1) Check sense of smell in each nostril. (CN I)
 - (2) Check visual acuity in each eye. (CN II)
 - (3) Check accommodation and elevation of eyelid. (CN III)
 - (4) Make an "H" in the air while patient follows finger. (CNs III, IV, and VI)
 - (5) Check sense of sharp or dull and light or heavy touch over the forehead, cheek, and chin. (CN V)
 - (6) Have casualty clench teeth. (CN V)
 - (7) Have casualty frown, pucker lips, smile, raise eyebrows, and puff out cheeks. (CN VII)
 - (8) Check taste function for anterior two-thirds of tongue. (CN VII)
 - (9) Ask the casualty to look away from you, and lightly touch the cornea with a cotton wisp. (CN VII)
 - (10) Assess hearing. (CN VIII)
 - (11) Test for taste sensation on posterior two-thirds of the tongue. (CN IX)
 - (12) Have casualty say "ah," and test gag reflex for motor function. (CNs IX and X)
 - (13) Have patient shrug shoulders, and turn head against resistance. (CN XI)
 - (14) Test by having patient stick out his tongue. Tongue will deviate to side of injury on testing. (CN XII)

11. Manage the casualty's injuries and conditions.

- a. Treat all life-threatening conditions as soon as they are found IAW the appropriate task.
 - (1) Manage a tension pneumothorax IAW task 081-833-3007, Perform Needle Chest Compression.
 - (2) Intubate the casualty, if necessary, IAW task 081-833-3016, Intubate a Patient.
 - (3) Perform a cricothyroidotomy IAW task 081-833-4528, Perform a Cricothyroidotomy.
 - (4) Initiate an IV IAW task 081-833-0033 in STP-31-18-SM-TG, Soldier's Manual and Trainer's Guide, CMF 18, Special Forces Basic Tasks, Skill Levels 3/4.
 - (5) Perform a cutdown IAW task 081-833-4514, Perform Venous Cutdown.
 - (6) Insert a chest tube IAW task 081-833-4524, Perform a Closed Tube Thoracostomy.
 - (7) Manage amputations IAW task 081-833-4424, Manage Traumatic Amputations.
- b. Manage the injuries in order of priority: airway, breathing, and circulation.
- c. Manage fractures.

Performance Steps

- (1) Stabilize fractures at the earliest possible moment after life-threatening problems are addressed.
 - (2) Avoid unnecessary manipulation of unstabilized fractures.
 - (3) Splint fractures.
 - (a) Dress any open injuries of the extremity before splinting.
 - (b) Assess distal neurovascular status.
 - (c) Immobilize and splint fractures.
 - (d) Reassess distal neurovascular status.
12. Prepare the casualty for evacuation.
- a. Assess patient's airway, breathing, and circulation.
 - b. Ensure IVs are free-flowing and have enough fluid for transport.
 - c. Reassess all treatments given.
 - d. Get a transport set of vital signs.
 - e. Record all appropriate information concerning casualty's injuries and treatments on appropriate medical forms. Attach field medical card or other forms to casualty.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and scenario in which he must manage a trauma patient.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Checked scene security and safety.	_____	_____
2. Performed a quick visual assessment of the casualty for any of the trauma conditions that are not conducive to survival IAW task 081-833-4014, Determine Death.	_____	_____
3. If the history of the trauma or mechanism of injury was unknown, took a history from the casualty or witnesses.	_____	_____
4. Determined casualty's responsiveness by using AVPU.	_____	_____
5. Performed a primary survey of the casualty.	_____	_____
6. Performed a secondary survey of the casualty to identify and manage all injuries.	_____	_____
7. Moved the casualty.	_____	_____
8. Called for MEDEVAC.	_____	_____
9. Reassessed the casualty after he had been moved, resuscitative measures, or any absence from the casualty.	_____	_____
10. Performed a head-to-toe assessment and initiated appropriate resuscitative measures.	_____	_____
11. Managed the casualty's injuries and conditions.	_____	_____
12. Prepared the casualty for evacuation.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

ACLS 1997-1999

Manage a Casualty with a Closed Head Injury

081-833-4153

Conditions: Given a patient who has sustained a head injury and who has been evaluated, Special Forces (SF) tactical medical equipment set, and SF laboratory (lab) set.

Standards: Correctly determine and manage a closed head injury without causing further injury to the patient.

Performance Steps

1. Evaluate patient in accordance with (IAW) task 081-833-4159, Evaluate Casualty With a Head Injury.
 2. Determine which intracranial injuries the casualty may have.
 - a. Concussion.
 - (1) Etiology:
 - (a) Force of an injury causes brain to move out of synchronization with skull movement.
 - (b) Brain minimally impacts on bony shelves in skull without anatomic damage.
 - (c) Since brain is "shaken up," neurons are incapable of functioning properly for very short time periods, but quickly return to normal (in seconds-minutes).
 - (2) Signs and symptoms: Assessment is made clinically since there are no available tests.
 - (a) Confusion following blunt head trauma, with or without a history of unconsciousness, is the most consistent feature of concussion.
 - (b) Amnesia--either retrograde, antegrade, or both--is a constant feature.
 - (c) Equilibrium may be lost.
 - (d) Visual disturbances may occur; for example, diplopia or decreased acuity.
 - (e) Vomiting is common.
 - b. Contusion.
 - (1) Etiology:
 - (a) Same as in concussion where a movement component of brain-skull interface causes injury or, alternatively, direct impact of force can cause the injury
 - (b) Force was great enough to cause anatomic damage and functional damage.
 - (c) A focal area of brain bruising (can be deep or superficial). Neurologic deficit correlates with the area of brain that is injured.
 - (2) Classifications:
 - (a) Coup: Damage occurs directly beneath impact point.
 - (b) Contrecoup: Damage occurs on side opposite the impact point.
- Caution: If force was still greater, bony shelves can lacerate the cortex. In addition, contusion and/or fracture can also accompany injuries.
- (3) Concerning signs and symptoms:
 - (a) Severity depends on location and extent of damage.
 - (b) Range from mild, which is similar to concussion except unconsciousness is greater than 5 to 10 minutes, to severe with devastating neurologic impairment or coma.
 - (c) Special diagnostic studies are available in the hospital to confirm and pinpoint damage.
- c. Epidural (extradural) hematoma.

NOTE: Hematomas may involve hematoma formation between any of the meningeal layers, or alternatively, may involve injury to the brain tissue itself as in a penetrating missile, depressed skull fracture, concussion, contusion, or intracerebral bleeding. They are based on location.

- (1) Etiology:

Performance Steps

- (a) Significant head injury when associated with a skull fracture. This is the most common cause of epidural hematoma (91 percent in adults). Typically, the injury occurs in the parietal-temporal region. Fracture line tears across an artery, typically the middle meningeal. Leaking blood under arterial pressure collects between dura and inner table of skull; this increases intracranial pressure (ICP). Expanding hematoma puts pressure on brain that results in increased ICP, leading to neurological changes. Depending on bleeding rate, it can take minutes to hours for enough pressure to be put on brain to cause characteristic signs.
- (b) Insignificant head injury without skull fracture. A relatively minor blow to any part of head, but usually to side of head, produces this type of injury. The blow produces a transient, local, inbowing deformation of the skull, stripping the dura from inner table over a small area and shearing or rupturing arteries. Bleeding occurs, which puts pressure on the brain. This injury is common in children, who have greater skull elasticity and ease of dural detachment. However, this injury is less common in adolescents and young adults who were "just knocked out for a minute."
- (2) Signs and symptoms are a classical, clinical presentation.
 - (a) Transient period of unconsciousness followed by apparent return to normal (lucid interval).
 - (b) Lucid interval, which is long considered a hallmark sign, lasts minutes to hours, depending on rate of bleeding and subsequent pressure on brain
 - (c) Increasing headache, nausea, and vomiting (commonly projectile vomiting) typically accompany lucid intervals.
 - (d) Increasing brain compression (increased ICP) finally results in decreasing level of consciousness with pupil dilation on same side, positive Babinski, contralateral hemiparesis/hemiplegia, coma, abnormal extension, hyperreflexia, and death.

NOTE: Casualty may not have this typical time progression sequence in every case, since a wide clinical spectrum exists as a result of the force of the original blow and resultant bleeding rate. The most dependable sign is decreasing level of consciousness as a result of increased ICP.

d. Acute subdural hematoma.

(1) Etiology:

- (a) The force of injury can be from a blow to side of head, jaw, or forehead. Force can also be from an acceleration-deceleration event that causes the brain to move out of synchronization with skull movement.
- (b) Cerebral veins, which are located on surface of pia mater, traverse the subdural space to venous sinuses.
- (c) Rotating or sliding brain shears vein in subdural space, since it has no structural support.
- (d) Blood oozes out into subdural space, which has no absorbing capability.
- (e) Unlike an epidural hemorrhage where the bleeding is confined to a specific area by the strong retention of the dura tightly attached to inner skull, subdural bleeding is free to spread thinly and widely throughout the subdural space.

(2) Signs and symptoms:

- (a) The typical patient with an acute subdural hematoma has a history of a blow to the head accompanied by a loss of consciousness and followed by progressive neurologic deterioration.
- (b) Subdural hematomas are accompanied by a significant amount of primary brain injury (due to the blow itself). The subsequent bleeding merely further contributes to increased morbidity and mortality.

e. Subarachnoid hemorrhage.

- (1) Etiology: The vast majority of subarachnoid hemorrhages are spontaneous. For example, the rupture of an intracranial aneurysm could cause subarachnoid hemorrhage.
- (2) Signs and symptoms: Typically, sudden onset of "worst headache in my life" occurs with signs of meningeal irritation (stiff neck).

f. Intracerebral hemorrhage (subpial): Symptoms are those of a cerebrovascular accident (CVA).

Performance Steps

3. Determine the differential diagnosis.
4. Order or perform lab tests to confirm or rule out the diagnosis.
 - a. X ray to look for fractures.
 - b. Referral for computed tomography (CT) scan, if available.
5. Manage the injury.
 - a. Concussion.
 - (1) Observe for at least 8 hours.
 - (2) If patient's symptoms are minimal and the neurological examination (exam) is still normal, send patient home in the care of a responsible adult. Issue home aftercare instructions. (This will guard against the development of a worse injury.)
 - (3) The patient must eat and drink minimally during the 24-hour period. The patient must not consume no alcoholic beverages.
 - (4) Place cool cloth on patient's head for mild headache and/or give acetaminophen.
 - (5) Check the patient every 2 hours.
 - (a) Check for ease of awakening.
 - (b) Check for ability to talk clearly.
 - (c) Check for size of each pupil.
 - (d) Check for strength of arms and legs.
 - (e) Check for pulse rate for 1 minute.
 - (6) Evacuate the patient, if any of the following occurs:
 - (a) Progressively difficult to awaken.
 - (b) Slurred speech.
 - (c) One pupil becomes larger than the other.
 - (d) Pulse below 60 in an adult and below 80 in a child (or relative bradycardia in an extremely fit individual.
 - (e) Weakness of arms and legs.
 - (f) Severe headaches.
 - (g) Vomiting more than twice.
 - b. Contusion.

NOTE: Evacuate casualty for definitive care. If unable to evacuate casualty, treat supportively (task 081-833-4157, Manage Increased Intracranial Pressure).

- (1) Severity: The severity depends on the location and the extent of damage that has occurred. It can range from mild as in a concussion to severe with neurological impairment and coma.
- (2) Management: Refer or evacuate casualty for definitive evaluation and management.
- c. Epidural hematoma.
 - (1) Treat the casualty supportively until evacuation is complete (task 081-833-4157, Manage Increased Intracranial Pressure).
 - (2) Evacuate to a definitive care center immediately. This condition requires immediate surgical decompression to prevent death.
- d. Subdural hematoma.
 - (1) Requires surgical decompression.
 - (2) Requires evacuation of patient as soon as possible. Treat the patient supportively until the evacuation is complete (task 081-833-4157, Manage Increased Intracranial Pressure).
- e. Subarachnoid hematoma. Treat the casualty supportively until evacuation is complete (task 081-833-4157, Manage Increased Intracranial Pressure).

6. Record all treatment given.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a casualty with a closed head injury.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Evaluated patient IAW task 081-833-4159, Evaluate Casualty With a Head Injury.	_____	_____
2. On the basis of the information learned in the history and physical exam, determined which intracranial injuries the casualty may have.	_____	_____
3. Determined the differential diagnosis.	_____	_____
4. Ordered or performed lab tests to confirm or rule out the diagnosis.	_____	_____
5. Appropriately managed the injury.	_____	_____
6. Recorded all treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage a Casualty with an Open Head Injury

081-833-4155

Conditions: You are in a field environment. Given a surgical razor, 1 percent lidocaine with epinephrine, surgical scrub, gloves, drapes, suture needles, and various sizes of sutures.

Standards: Manage an open wound of the head without causing further injury to the patient.

Performance Steps

1. Evaluate patient in accordance with (IAW) task 081-833-4159, Evaluate a Casualty With a Head Injury.

WARNING: Every laceration, no matter how innocent-appearing, should be considered a potential penetrating wound of the brain.

2. Inspect wound to rule out a more serious injury.

NOTE: The scalp has greater vascularity than other portions of the body, so a scalp wound may appear to bleed excessively. Vessels are interspersed vertically and horizontally in a dense network of fibrous connective support tissue that does not allow vessels to retract when they are cut. Most cuts will involve the galea, a tendon which will retract and hold vessels open.

- a. Inspect for the following:

- (1) Penetrating objects.
- (2) Obvious deformity.
- (3) Exposed brain tissue.

- b. Palpate gently with a gloved finger for a fracture.

NOTE: If a fracture is associated with a laceration, then it is a compound fracture by definition.

3. Apply a pressure dressing to try to stop the bleeding.

NOTE: Hemostat clamps do not work well because of the density of the thick, fibrous connective support tissue. Suturing the wound may achieve hemostasis.

4. Shave or clip the hair around the laceration for at least 2 inches.

5. Irrigate the wound with copious amounts of saline solution.

- a. Irrigate especially well any open flap of the scalp, even to the point of manually cleaning.
- b. Avoid leaving any matter, dirt, hair, or any other material that might cause infection.

6. Anesthetize area around laceration by using 1 percent lidocaine with epinephrine.

7. Drape wound and gently palpate affected area with gloved fingers to check for fracture. If you find a fracture, close the laceration with temporary sutures and immediately evacuate the casualty.

8. Minimally debride the wound, if a fracture is not found.

9. Suture the wound.

- a. If aponeurotica galea, occipital, or frontalis muscle is involved, close in two layers; otherwise, close with 1 layer.
- b. Close galea or muscle with 3-0 chromic suture.
- c. Close skin with 3-0 nylon or other monofilament suture.

10. Start antibiotic therapy, if indicated. Ceftriaxone (rocephin) 500 milligrams (mg) to 1 gram (g) every 8 to 12 hours (q8/12h). Indications are as follows:

- a. Foreign bodies in the wound.
- b. Extensive tissue destruction.
- c. The possibility of a significant delay from the time of first treatment to definitive care.

11. Remove skin sutures in 6 to 7 days.

WARNING If evidence of pus or hematoma is present, remove sutures earlier.

Performance Steps

12. Record the treatment.
13. Evacuate the patient as soon as possible if the following occurs:
 - a. Patient has a fracture.
 - b. Patient develops signs or symptoms of serious head injury or increased intracranial pressure (ICP).

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage an open head injury.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Evaluated patient IAW task 081-833-4159.	_____	_____
2. Inspected wound to rule out a more serious injury.	_____	_____
3. Applied a pressure dressing to try to stop the bleeding.	_____	_____
4. Shaved around the laceration for at least 2 inches.	_____	_____
5. Irrigated the wound with copious amounts of saline solution.	_____	_____
6. Anesthetized wound by using 1 percent lidocaine with epinephrine.	_____	_____
7. Draped wound, gently palpated affected area with gloved fingers to check for fracture. When fracture was found, closed wound with temporary sutures and immediately evacuated the casualty.	_____	_____
8. Minimally debrided the wound when a fracture was not found.	_____	_____
9. Sutured the wound.	_____	_____
10. Started antibiotic therapy when indicated.	_____	_____
11. Removed skin sutures in 6 to 7 days.	_____	_____
12. Recorded the treatment.	_____	_____
13. Evacuated the patient as soon as possible when the following occurred: a. Patient found to have a fracture. b. Patient developed signs or symptoms of serious head injury or increased ICP.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Increased Intracranial Pressure

081-833-4157

Conditions: Given a patient with signs and symptoms of increased intracranial pressure (ICP), patient's medical record, and M-5 medical set.

Standards: Manage increased intracranial pressure so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the pathophysiology of increased intracranial pressure (ICP).
 - a. When ICP is above a certain point, blood flow to the brain is no longer maintained.
 - b. Lack of blood flow to the brain causes hypoxia, which then causes reflex vasodilation to restore blood flow.
 - c. ICP is then further increased by the renewed blood flow, which starts the vicious cycle all over again.
 - d. Eventually, sufficient pressure builds up within the cranial vault to force the brain stem to herniate through the foramen magnum, causing damage to brain tissue and destroying basilar brain function. Loss of basilar brain function results in death.

2. Evaluate the patient (task 081-833-4159, Evaluate a Casualty With a Head Injury).

3. Manage the patient's airway (with cervical spine control) (task 081-833-4167, Maintain a Patient's Airway).

NOTE: Maintenance of an airway is the single most important emergency measure that can be done for an unconscious patient and has priority over all else in every phase of management.

- a. Injury to brain invariably results in some degree of cerebral swelling that can be massively increased by even moderate degrees of hypoventilation.
 - (1) Resultant hypercapnia and hypoxia cause cerebral vasodilation.
 - (2) Cerebral vasodilation increases brain-blood volume, which leads to further cerebral edema.
 - (3) Cerebral edema causes further increased ICP to lethal levels.
 - (4) Airway obstruction is a common factor that exacerbates increased ICP.
 - b. Adequate ventilation is especially important in patients with concomitant chest injuries.
 - (1) Assist the patient's respirations, as necessary. If blood gas monitoring is available, ventilate the patient to no lower than a partial pressure of carbon dioxide in arterial blood (PaCO₂) of 30 millimeters (mm) mercury (Hg).
 - (2) Oxygenate the patient with high-flow oxygen, if available.
 - c. Maintain cervical spine control throughout by using chin lift or jaw thrust method, not head tilt method, to open airway. Then apply a cervical collar and restrain the patient. (See task 081-833-0092, Transport a Casualty With a Suspected Spinal Injury.)
4. Bandage the wound, as necessary.
 5. Establish an intravenous (IV) (task 081-833-0033, Initiate an Intravenous Infusion).
 - a. The fluid of choice, if available, is 1/2 normal saline with dextrose in 2.5 percent water (D2.5W).
 - b. Titrate fluid to maintain urine output of at least 30 to 50 cubic centimeters (cc) per hour (or ½ to 1 cubic centimeter per kilogram per hour [cc/kg/hr]).
 6. Administer medications that may be of benefit to patients with increased ICP.
 - a. Riopan 60 milliliters (ml) every 2 hours (q2h) via nasogastric (NG) tube to protect against gastric stress ulcer.
 - b. Mannitol (diuretic antiedema measure).
 - (1) Initiate under the advice of a neurosurgeon, if available.

Performance Steps

- (2) Mannitol causes diuresis (water loss relative to sodium) thus reducing fluid volume and slowing the progression of swelling. Showing the swelling buys time until a neurosurgeon can operate.
 - (3) Give 12.5 to 25 grams (g) IV over 15 to 30 minutes Repeat every 1 to 4 hours (q1/4h), as needed.
 - c. Narcotics and valium are generally contraindicated in a serious head injury for the following reasons:
 - (1) Level of consciousness cannot be accurately evaluated.
 - (2) Narcotics cause pupillary constriction, which adversely affects neurological examination (negates use of this valuable observation tool).
- NOTE: You may need to use valium, however, to control recurrent convulsions or seizures.
- d. Seizure control (anticonvulsants).
 - (1) Status epilepticus: valium 10 mg IV for (x) 2d dose, if needed.
 - (2) Intermittent seizures: dilantin at the following doses:
 - (a) Either 1g loading dose or 325 mg every 30 minutes (q30min) x 3 dosages slow IV push. Do not give faster than 50 milligrams per minute (mg/min), and monitor vital signs
 - (b) Maintain dosage at 200 mg every 12 hours (q12h) IV or by mouth (PO), but never intramuscularly (IM).
 - e. Blood pressure (BP) control. Head injuries can cause acute hypertension, which must be treated. When BP is above 160 mm Hg systolic, administer morphine at 2 to 3 milligrams per hour (mg/h) IV.
 - f. War wound antibiotic therapy for all open fractures or sinus fractures--especially if cerebrospinal fluid (CSF) leaks have developed.

CAUTION: If the administration of antibiotics is delayed for greater than 6 hours after the wounding, do not administer the antibiotics. The development of bacterial resistance and/or superinfection is potentially dangerous. With signs and symptoms of infection, you should debride the wound and perform a delayed primary closure and culture.

- (1) Ceftriaxone (rocephin) 500 mg to 1g IV every 8 to 12 (q8/12h).
- (2) Tetanus toxoid:
 - (a) If previously immunized, 0.5 ml IM once.
 - (b) Hyper-tet 250 units IM.

CAUTION: Perform steps 7 through 11 if it is not possible to evacuate the patient to a higher level medical facility or while awaiting evacuation. Evacuation should not be delayed to perform any of these steps.

- 7. Perform wound care.
 - a. Hemostasis.
 - b. No debridement.
 - c. Protective dressing to achieve and maintain hemostasis.
 - d. Protect foreign bodies since manipulation may cause hemorrhage and/or further brain damage.
- 8. Insert a NG tube to empty the patient's stomach and prevent regurgitation and subsequent aspiration or pneumonia (task 081-833-4496, Perform Nasogastric Intubation).
 - a. Danger of intracranial intubation if basilar skull fracture is present.
 - b. Pass tube orally, or carefully insert nasally after a cribiform plate fracture has been ruled out.
- 9. Insert a Foley catheter to prevent urine retention. Monitor urine output (task 081-833-4495, Perform Urinary Catheterization).
- 10. Monitor the patient's intake and output (task 081-833-4099, Monitor a Patient's Intake and Output).
- 11. Prevent hyperthermia-induced brain damage.
 - a. Fully undress patient.
 - b. If rectal temperature is greater than 100 degrees Fahrenheit, do the following:
 - (1) Give patient aspirin or acetaminophen.

Performance Steps

- (2) Sponge baths.
- (3) Cooled IV solutions and enemas.
- (4) Cooling blanket, if available.
- (5) If shivering occurs, give patient thorazine 25 mg IV q4h to control shivering and safely continue cooling.

WARNING: Do not try or allow others to try a lumbar puncture in a patient with suspected increased ICP. This may increase the rate at which the lower brain stem can herniate, thus worsening the patient's condition.

12. Record all treatment in the patient's medical record.
13. Evacuate immediately for decompressive surgery, if possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage ICP.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the pathophysiology of increased ICP.	_____	_____
2. Evaluated the patient.	_____	_____
3. Managed the patient's airway (with cervical spine control).	_____	_____
4. Bandaged the wound, as necessary.	_____	_____
5. Established an IV.	_____	_____
6. Transported the patient in the "coma position."	_____	_____
7. Administered medications that may be of benefit to patients with increased ICP.	_____	_____
8. Performed wound care.	_____	_____
9. Inserted a NG tube.	_____	_____
10. Inserted a Foley catheter.	_____	_____
11. Monitored the patient's intake and output.	_____	_____
12. Prevented hyperthermia-induced brain damage.	_____	_____
13. Recorded all treatment in the patient's medical record.	_____	_____
14. Evacuated patient immediately for decompressive surgery, if possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Evaluate a Casualty With a Head Injury

081-833-4159

Conditions: Given a patient with a head injury, patient's medical record, and M-5 medical equipment set.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, and determine the severity of the head injury without causing further injury to the patient.

Performance Steps

The purpose of evaluating a casualty with a head injury is to determine the type and extent of the injury. Once a specific head injury is diagnosed, initiate treatment for the appropriate condition, but continue to perform the full exam. The full evaluation may be conducted in conjunction with treatment or after treatment is initiated.

1. Know the types of injuries involving the head.
 - a. Trauma with no injury to the brain.
 - b. Open head injury, but not involving internal injury.
 - c. Closed head injury.
 - d. Skull fractures.

2. Take a detailed history from the patient or witnesses.
 - a. Determine the mechanisms of injury.

NOTE: Knowing the magnitude of energy involved helps you make management decisions and assess the injury.

- (1) Blunt trauma.
 - (a) Direct trauma (coup) is injury to the brain itself beneath the point of impact.
 - (b) Indirect trauma (contrecoup) is where the brain rotates or slides linearly slightly out of phase relative to the movement of the skull at time of impact (concussion or contusion).
- (2) Penetrating or perforating trauma is caused by any foreign body like a knife, stake, shrapnel, or bullet. This is a more serious injury.

WARNING: Every laceration, no matter how innocent-appearing, should be considered a potential penetrating wound of the brain.

- b. Ask patient or witnesses about the following symptoms:
 - (1) Loss of consciousness and duration.
 - (a) Initial or transient unconsciousness followed by improvement is usually from a concussion.
 - (b) Unconsciousness that lasts for minutes or hours is usually the result of increased ICP from an expanding hematoma.
 - (2) Loss of function (motor or sensory).
 - (3) Occurrence of seizures.
 - (4) Extent of any amnesia.
 - (5) Headache.
 - (6) Extent of any blood loss.
 - (7) Extent of any vomiting-aspiration.

NOTE: Establish if patient is right or left handed to establish cerebral dominance. Knowing cerebral dominance will allow you to compare later abnormal lateralization neurological findings.

- c. Ask about associated medical problems that could have been the precipitating cause of a fall and subsequent head injury. Examples of associated medical problems are epilepsy, myocardia infarction, and cerebrovascular accident.

NOTE: Lack of knowledge of these conditions will interfere with the assessment by masking or changing signs or affecting the subsequent clinical course.

3. Establish a baseline neurological evaluation upon your first contact with patient. At a minimum, determine level of consciousness by using AVPU and the Glasgow Coma Scale (GCS).
 - a. AVPU:

Performance Steps

- (1) Alert and oriented.
- (2) Responds to vocal stimuli.
- (3) Responds to painful stimuli.
- (4) Unresponsive to all stimuli.
- b. GCS:
 - (1) Rate the eyes.
 - (a) Open spontaneously: 4.
 - (b) Open to command: 3.
 - (c) Open to pain: 2.
 - (d) Closed (no response): 1.
 - (2) Rate best motor response.
 - (a) To verbal command (obeys): 6.
 - (b) Localizes pain: 5.
 - (c) Withdrawal from pain: 4.
 - (d) Abnormal flexion: 3.
 - (e) Abnormal extension: 2.
 - (f) No response: 1.
 - (3) Rate best verbal response.
 - (a) Oriented and conversing: 5.
 - (b) Disoriented and conversing: 4.
 - (c) Inappropriate words: 3.
 - (d) Incomprehensible sounds: 2.
 - (e) No response: 1.
 - (4) Score the examination by adding up the points in each area.
 - (a) Score of less than 4 equals 80 percent death or vegetative state probability.
 - (b) Score of 5 to 7 equals 54 percent death or vegetative state probability.
 - (c) Score of 8 to 10 equals 27 percent death or vegetative state probability.
 - (d) Score greater than 10 equals 6 percent death or vegetative state probability.
4. Establish baseline vital signs.
5. Examine patient for signs of serious or internal injury to the head.
 - a. State of consciousness.
 - (1) If unconsciousness is immediate and continuous, contusion or laceration should be considered.
 - (2) Decreasing level of consciousness (LOC) indicates increased ICP.
 - b. Shock is rarely associated with head injury alone without severe lacerations.
 - (1) If no obvious blood loss is present with shock and head injury, internal bleeding into the thoracic or abdominal cavities is the cause until proven otherwise.
 - (2) If shock and increased ICP coexist in the same patient, you will observe the following.
 - (a) Vital sign changes will be those of shock.
 - (b) Vital sign changes of increased ICP will appear only after volume deficit has been corrected.
 - (c) Vital sign changes associated with increased ICP occur only quite late in the patient's course (for example, if tentorial herniation is imminent).
 - c. Changes seen in the pupils.
 - (1) An ipsilateral dilating pupil that is still reactive to light is often the first sign of an epidural hematoma.
 - (2) Pupil dilates (and may be fixed) on same side (ipsilateral) of injury 85 percent of the time; 15 percent is contralateral pupil dilation.
 - d. Abnormal Babinski reflex is one of the first signs to appear after pupillary changes
 - e. Changes seen in the fundus.
 - (1) Potential papilledema from increased ICP.
 - (2) Usually not initially present since it takes about 12 hours for optic nerve head to swell after an acute rise in ICP.

Performance Steps

- f. Changes in motor function, listed below in order of severity, occur on side of body opposite the head injury in a progressively worsening patient.

- (1) Monoplegia: localized paralysis occasionally seen in trauma.
- (2) Hemiparesis: partial paralysis or muscle weakness of one entire side of body.
- (3) Hemiplegia: paralysis of one entire side of body.
- (4) Abnormal extension: first on opposite side, then bilaterally

- g. Deep tendon reflexes (DTRs):

- (1) Hyperactive.
- (2) Side opposite injury.
- (3) Develop in a progressively worsening patient.
- (4) Coma. Coma with unobtainable reflexes is an ominous finding.

- h. Restlessness in previously quiet patient.

- (1) First ensure this is not a result of pain from uncomfortably tight bandages, wraps, straps, casts, IVs, dehydration, full bladder, fecal impaction, hypoxia, and so on.

NOTE: Hypoxia and hypotension are the causes of restlessness until proven otherwise.

- (2) In the absence of the above, may be first sign of an expanding hematoma and thus increased ICP.

- i. Cranial nerve (CN) damage.

- (1) Any nerve could be damaged.
- (2) Most vulnerable are CNs I to VIII.

- j. Sensory. Sensory problems are usually only present in spinal injuries. When sensory problems are present, they follow the distribution of the motor nerves.

- k. Incontinence. This is only important in previously continent patient.

- l. Traumatic seizures:

- (1) Occurs in 10 percent of head injuries.
- (2) Incidence is much higher with depressed fracture or penetrating wounds of brain.

- 6. Monitors vital signs, LOC, and pupils every 15 minutes (q15min), at a minimum.

- a. Progressive deterioration in LOC is the hallmark of increased ICP.

NOTE: You must be especially concerned with assessment of increased ICP as this is manageable if handled promptly; if not promptly corrected, after a certain point it is irreversible and death will follow.

- b. An improving mental status after unconsciousness is associated with concussion.

- c. Vital sign changes in increased ICP.

- (1) Blood pressure (BP) increases as a result of pressure on the vasomotor regulatory centers of the brain.
- (2) Pulse rate decreases to compensate for increased BP.
- (3) Temperature rises.
- (4) Respiratory rate falls. If respiratory rate increases, look for thoracic trauma.

NOTE: Use the following key words in determining a worsening patient from an established baseline.

Progression--deteriorating with worsening pupil, motor, and reflex parameters.

Lateralization--asymmetry of motor strength. Lateralization means any situation in which there is a difference in motor findings; for example, right side of the body has normal strength and tone, and left side is weak. It is important to recognize lateralization, because that suggests a cerebral hemispheric focal lesion (contusion or hematoma), and many of these patients will require neurosurgical intervention.

- 7. Perform any lab tests or X rays to confirm or rule out the presence of a serious head injury.

- 8. Reacts immediately to changes in the patient status and initiates appropriate treatment.

- a. Manage an open head injury in accordance with (IAW) task 081-833-4155, Manage a Casualty With an Open Head Injury.

- b. Manage closed head injury IAW task 081-833-4153, Manage a Casualty With a Closed Head Injury.

- c. Manage a skull fracture IAW task 081-833-4361, Manage Skull Fracture.

- 10. Record all findings in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must evaluate a casualty with a head injury.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Knew the types of injuries involving the head.	_____	_____
2. Took a detailed history from the patient or witnesses.	_____	_____
3. Established a baseline neurological evaluation after first contact with patient.	_____	_____
4. Established baseline vital signs.	_____	_____
5. Examined patient for signs of serious or internal injury to the head.	_____	_____
6. Monitored vital signs, LOC, and pupils q15min, at a minimum.	_____	_____
7. Performed any lab tests to confirm or rule out the presence of a serious head injury.	_____	_____
8. Reacted immediately to changes in the patient status and initiated appropriate treatment.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
BATES PE, 8TH ED. 2002

Manage Hemothorax

081-833-4178

Conditions: Given a casualty with an injury to the chest, a Special Forces (SF) tactical medical equipment set, an individual combat laboratory (lab) set, and a surgical environment. All other injuries have been treated.

Standards: Correctly evaluate the casualty to determine the presence or absence of a hemothorax and, if present, the type of hemothorax, and manage the hemothorax correctly.

Performance Steps

Hemothorax is caused by the bleeding from lacerated blood vessels in the chest cavity and/or lungs. It results in the accumulation of blood in the chest cavity but outside of the lungs.

1. Assess casualty in accordance with (IAW) 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient.

NOTE: The protocols established in task 081-833-4149 establish the overall trauma sequence. The management measures covered here apply only to the management of hemothoraces and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vitals (A2 through F).

2. Look for the signs and symptoms of a hemothorax.

NOTE: Signs and symptoms will vary according to the size of the hemothorax.

- a. Penetrating injury to the chest, upper abdomen, or neck.
- b. Respiratory distress.
- c. Cyanosis.
- d. Absence of breath sounds over affected area.
- e. Tightness in the chest.
- f. Dullness to percussion.
- g. Shock and hypotension with no obvious external blood loss.
- h. Mediastinal shift may produce deviated trachea away from the affected side (with massive hemothorax only).

3. Know the factors that affect the severity of the hemothorax.

- a. The seriousness of the hemothorax and the treatment indicated will depend on the volume of blood that is lost into the pleural cavity.
- b. Hemothorax is most frequently caused by bleeding from lung parenchymal injuries. (Parenchymal is essential parts of the organ.) Other sources for bleeding include major blood vessels of the chest and the intercostal vessels.
- c. Factors that assist hemorrhage control are as follows:
 - (1) Compressing effect of the shed blood.
 - (2) Large concentration of thromboplastin in the lungs.
 - (3) Low pulmonary arterial pressure.
- d. Factors that interfere with hemorrhage control:
 - (1) Severe lung injuries.
 - (2) Injury to major blood vessels.
 - (3) Damage to intercostal vessels, because all the intercostal vessels (except the first two) arise directly from the aorta, bleeding from them may be brisk and persistent.

4. Know the possible complications of hemothoraces.

- a. Possibility of hypovolemic shock.
- b. Frequently accompanied by a pneumothorax.

5. Try to determine the type of hemothorax by the signs and symptoms and X ray.

- a. Minimal hemothorax 0 to 350 milliliters (ml).
 - (1) Minimal signs and symptoms.
 - (2) Chest film is usually necessary for diagnosis.

Performance Steps

- (3) Fluid collections greater than 200 to 300 ml can usually be seen on a good upright X ray of the chest. Occasionally, however, blood may collect between the lung and the diaphragm. This so-called subpulmonic hemothorax may not be appreciated on routine upright films.
- b. Moderate hemothorax 350 to 1,500 ml.
 - (1) Total accumulations of up to 1,500 ml will produce shortness of breath because of lung compression.
 - (2) Upper levels of blood accumulation may produce shock because of circulatory blood volume.
 - (3) Physical signs, which include dullness and distant breath sounds, will depend upon the amount of bleeding and the position of the patient. Diagnostic confirmation can be obtained by aspiration.
 - (4) X ray in the upright position will show a shadow (meniscus) curving upward laterally on the involved side. (In the supine position, only diffuse opacification of the hemithorax may be observed.)
- c. Massive hemothorax at 1,500 ml or more.
 - (1) Following the trauma, if the breath sounds are reduced and the chest is dull to percussion on the involved side and accompanied by vital signs consistent with hypovolemia, suspect a massive hemothorax.
 - (2) Each side of the chest can hold up to 3,000 ml of blood. (Class III shock is 1,500 ml; Class IV is more than 2,000 ml.) If the chest cavity is half filled with blood, at least 1,500 ml of blood is present, perform a thoracotomy.
 - (3) Patient will show signs of shock as a result of hypovolemia, dullness to percussion, absent breath sounds, and flat neck veins. Also, distended neck veins may be secondary to mechanical effects of a chest cavity full of blood.
6. Manage a casualty with a hemothorax.
 - a. Establish and maintain an airway.
 - b. Administer oxygen, if available.
 - c. Assist the casualty's breathing, as necessary.
 - d. Manage a minimal hemothorax.
 - (1) With blood loss of less than 350 ml, treatment is unnecessary since resorption is rapid.
 - (2) Close observation, because occasionally, bleeding will continue and go on to a moderate or even massive hemothorax within hours or days.
 - (3) A chest film is usually clear within 10 to 14 days.
 - e. Manage moderate and massive hemothoraces.
 - (1) Massive hemothorax is initially managed by the simultaneous restoration of volume deficits and decompression of the chest cavity.
 - (a) Intravenous (IV) fluid and blood replacement.
 - (b) In a hospital or clinical setting, you can perform a transfusion or autotransfusion with blood evacuated from the pleural cavity being citrated and re-injected into the IV (K citrate). You must first determine there is no contamination of the blood by bile or intestinal fluid. Air embolism can be a very serious complication.
 - (2) Insert a chest tube IAW task 081-833-4524, Perform a Closed Tube Thoracostomy.
 - (3) Remove blood in the pleural cavity as completely and rapidly as possible. The hemothorax not only restricts ventilation and venous return, but the clots also release fibrinolytic and fibrinogenolytic substances. These substances may cause troublesome continuing bleeding from relatively small vessels. Such bleeding often stops rapidly if the clot is removed.
 - (4) Replace a chest tube that is not functioning properly. If hemothorax persists and there is minimal chest tube drainage, the chest tube is either occluded by clots or is not inserted into the proper area. Irrigation to remove clots is seldom successful for more than a few minutes and may introduce serious contamination.
 - (5) Perform a thoracotomy in the following situations:
 - (a) Continuing blood loss of more than 200 milliliters per hour (ml/hr) for 4 hours.

Performance Steps

- (b) More than 1,500 ml of blood is drained.
 - (6) Inform surgeons at definitive care centers of the presence or absence of complete pleural space evacuation and reexpansion of the lung.
- WARNING: Open thoracotomy is contraindicated in the absence of a surgeon.
- f. Transport the patient on injured side if not contraindicated by other wounds.
- 7. Record all treatments given.
 - 8. Evacuate casualty, if necessary.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage hemothorax.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assess casualty IAW 081-833-4149, Perform Initial Assessment and Management of the Trauma Patient.	_____	_____
2. Looked for the signs and symptoms of a hemothorax.	_____	_____
3. Knew the factors that affected the severity of the hemothorax.	_____	_____
4. Knew the possible complications of hemothoraces.	_____	_____
5. Tried to determine the type of hemothorax by the signs and symptoms and X ray.	_____	_____
6. Managed a casualty with a hemothorax.	_____	_____
7. Recorded all treatments given.	_____	_____
8. Evacuated casualty when required.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED

Manage Pneumothorax

081-833-4184

Conditions: Given a patient or casualty with or without an injury to the chest, a Special Forces (SF) tactical medical equipment set, an individual combat laboratory (lab) set, and a surgical environment. All other injuries have been treated.

Standards: Correctly evaluate the patient or casualty to determine the presence or absence of a pneumothorax and, if present, the type of pneumothorax, and correctly manage the pneumothorax.

Performance Steps

Pneumothoraces may result from blunt or penetrating trauma or from medical conditions. Every casualty with trauma to the abdomen, chest, or neck and every patient who presents with chest pain and difficulty breathing should be assessed for pneumothorax.

1. Assess trauma casualties in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient.
 - a. Take a history to determine if there is a possibility of a pneumothorax.
 - (1) Know the etiologies of pneumothoraces.
 - (a) Lung laceration from blunt trauma. This is the most common cause.
 - (b) Penetrating injuries.
 - (c) Spontaneous.
 - (2) Know the physiological factors that affect casualties with pneumothoraces.
 - (a) Air may gain access from a number of different sources, many of which are internal.
 - (b) Seriousness depends upon level of respiratory and circulatory dysfunction, which is relative to total volume of air that accumulates and whether or not it is under tension.
 - (c) Massive accumulations, especially under tension, may lead to rapid respiratory and/or circulatory failure if not relieved promptly.

NOTE: If at any time during the trauma assessment or physical examination you suspect a tension pneumothorax, it must be assessed and treated immediately. Delays in treating a tension pneumothorax will result in the death of the casualty.

- b. Know the three types of pneumothoraces.
 - (1) Simple pneumothorax is the result of air entering the potential space between visceral and parietal pleuras and causing the partial or complete collapse of the lung.
 - (2) Open pneumothorax (sucking chest wound) is a penetrating injury to the thorax associated with air passing in and out through the opening on each respiratory effort (Figure 1).

Performance Steps

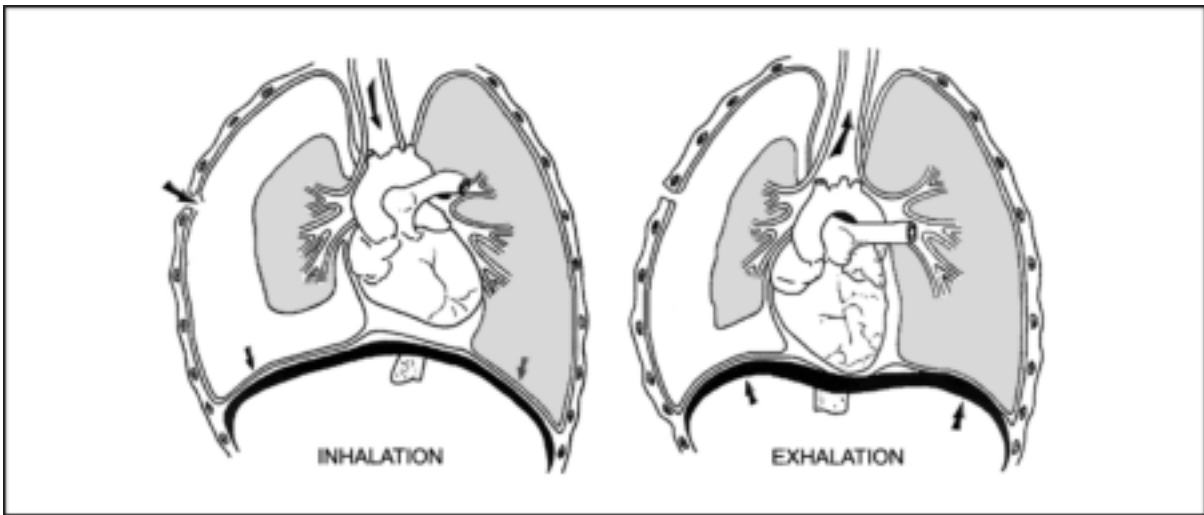


Figure 1. Open Pneumothorax

- (3) Tension pneumothorax is caused by an opening in lung, bronchus, or chest wall that acts as a valve to allow air to enter the pleural cavity on inspiration, but not to escape during expiration. Pressure builds up--especially when the patient coughs. The lung collapses because of intrathoracic pressure. The collapsed lung displaces the mediastinum and significantly compresses the contralateral lung. Venous return to the heart is greatly diminished (Figure 2).

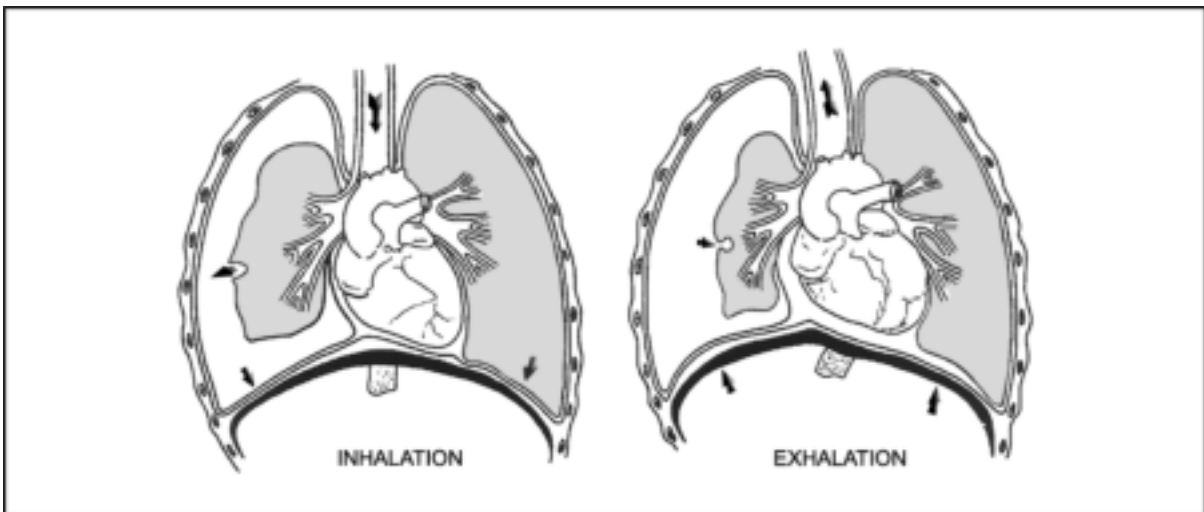


Figure 2. Tension Pneumothorax

2. Identify the presence and type of pneumothorax by its signs and symptoms.
 - a. Signs and symptoms of a simple pneumothorax.
 - (1) Dyspnea.
 - (2) Decreased breath sounds over affected area.
 - (3) Slight hyperresonance over affected area.
 - (4) Cyanosis (not common in healthy patients).
 - b. Signs and symptoms of open pneumothorax.
 - (1) Penetrating injury to chest.

Performance Steps

- (a) The size of the opening dictates the seriousness of the injury. Open pneumothorax physiology requires that a full-thickness hole in the chest wall be present, usually at least the size of a nickel in diameter.
- (b) If the opening is larger than the glottis, two-thirds the diameter of the trachea, air will enter through the chest wall in preference to the trachea. Underlying lung usually completely collapses. However, the danger is not because of the collapsed lung but because of the ineffective ventilation that results from the open wound. As the patient lowers his diaphragm to take a breath in, air preferentially moves into the pleural space through the open wound rather than down the trachea. As no gas exchange takes place with pleural space air, the patient essentially suffocates.
- (2) Frothy blood from wound.
- (3) Sucking sound from wound with each breath.
- (4) Dyspnea.
- (5) Cyanosis.
- (6) Decreased breath sounds over affected area.
- (7) Hyperresonance over affected area.
- c. Signs and symptoms of tension pneumothorax.
 - (1) Patient becomes cyanotic, air hungry, and has violent agitation as a result of the rapid development of severe hypoxia.
 - (2) Unilateral rise and fall of the chest with use of accessory muscles.
 - (3) Unilateral absence of breath sounds
 - (4) The affected side will be tympanitic.
 - (5) Late signs are:
 - (a) Distended neck veins.
 - (b) Trachea that deviates to the opposite side.
 - (c) Point of maximal impulse (PMI) shifted to the contralateral side.
 - (6) Diagnostic aspiration test for tension pneumothorax.
 - (a) Attach an 18-gauge needle to a moistened 10-ml syringe (glass works best) and insert it into any intercostal space on the affected side. As soon as the thorax is entered, the plunger will be pushed outward.
 - (b) Insert the needle into the 2d intercostal space (ICS) in the midclavicular line on the affected side (Figure 3).

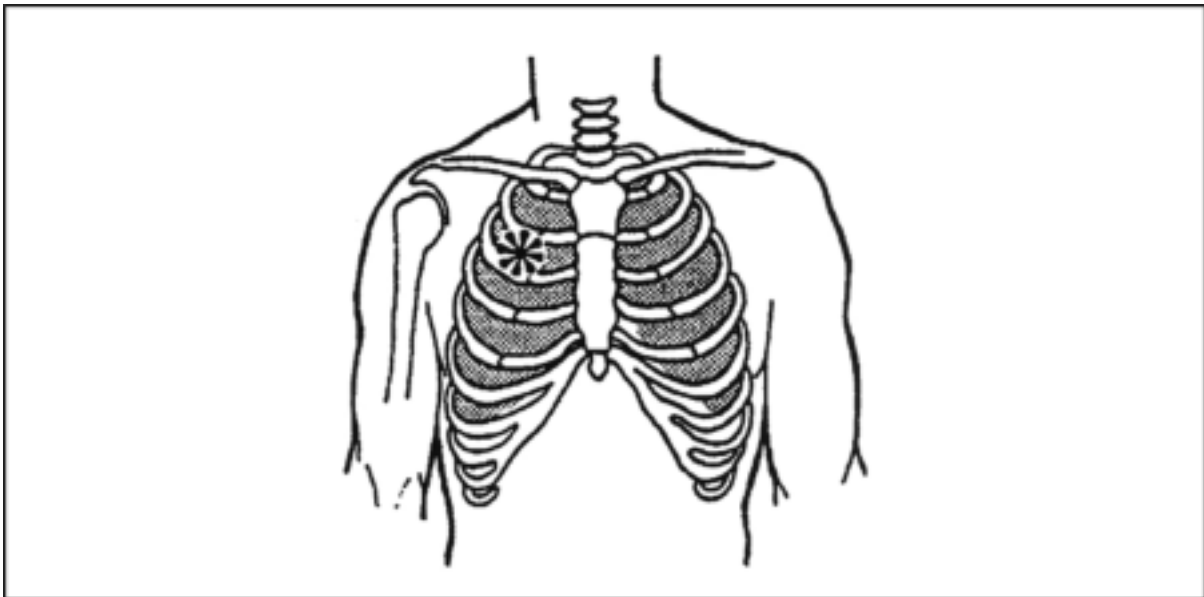


Figure 3. Site for Diagnostic Aspiration Test

Performance Steps

(c) As soon as the thorax is entered, the plunger will be pushed outward.

3. Provide initial management for a casualty with a pneumothorax.

NOTE: The protocols established in task 081-833-4149 establish the overall trauma sequence. The management measures covered here apply only to the management of pneumothoraces and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

- a. Establish and maintain an airway.
- b. Treat all possible open pneumothoraces immediately in first sequence of breathing (B1).
 - (1) Seal any wounds that may be causing an open pneumothorax. Initially, use an open hand or IV bag.
 - (2) Seal all wounds with a four-sided occlusive dressing.
 - (3) Ask patient to cough or strain as occlusive dressing is applied, forcing air out of the pleural space.
- c. Assess any suspected tension pneumothorax in B1, after all openings in the chest wall are sealed, or immediately upon noticing signs and symptoms of a tension pneumothorax.
 - (1) Check casualty for the signs and symptoms of tension pneumothorax. If a patient has two or more of the signs and symptoms, immediately initiate emergency treatment for a tension pneumothorax.
 - (2) Perform a needle thoracentesis IAW task 081-833-3007, Perform a Needle Chest Compression.

NOTE: If patient is face down, do decompression at 5th ICS midaxillary line (MAL).

- (a) If the needle thoracentesis relieves the tension, leave catheter in place until definitive management (chest tube) is completed.
- (b) Monitor patient closely for development of additional tension pneumothoraces.
- d. Assist ventilations or provide oxygen, if possible, to any casualty with a pneumothorax.
- e. Continue with the trauma assessment.

4. Transport casualty with a pneumothorax.

- a. Position the casualty for evacuation.
 - (1) If the casualty is conscious, transport in a comfortable position.
 - (2) If the casualty is unconscious, transport on the injured side.
- b. If the patient has a catheter from a needle decompression, perform one of the following:
 - (1) May attach finger cot to the end of the catheter for flutter valve effect.
 - (2) May need to secure (tape) catheter in place.
- c. Assist the casualty's respirations, as needed.
- d. Monitor the casualty's respiratory effort and status on a regular rate.
 - (1) Airway remains clear.
 - (2) Ease of respirations.
 - (3) Change in respiratory rate.
 - (4) Signs of cyanosis.
 - (5) Treatments remain effective.

5. Provide definitive management for pneumothoraces.

- a. Definitive treatment is chest tube with suction or underwater-seal drainage (task 081-833-4524, Perform a Closed Tube Thoracostomy).

NOTE: If lung fails to expand following continuous, effective tube drainage, air is probably coming from a lacerated trachea or main stem bronchus.

- b. Assist ventilations and oxygen therapy.
- c. Wound care
 - (1) Clean and debride wounds

CAUTION: Do not try emergency closure of chest wounds by sutures because the procedure can cause subcutaneous emphysema and promote infection.

- (2) Apply an airtight bandage to wounds.
- d. Administer pain medications (task 081-833-4690, Manage Pain).

Performance Steps

e. Administer appropriate antibiotic therapy in accordance with the most current edition of The Sanford Guide to Antimicrobial Therapy.

6. Record all treatment given.

7. Evacuate casualty as soon as possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage pneumothorax.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed trauma casualties IAW task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient.	—	—
2. Identified the presence and type of pneumothorax by its signs and symptoms.	—	—
3. Provided initial management for a casualty with a pneumothorax.	—	—
4. Transported casualty with a pneumothorax.	—	—
5. Provided definitive management for pneumothoraces.	—	—
6. Recorded all treatment given.	—	—
7. Evacuated casualty as soon as possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED
SANFORD, 1999
VT 587

Manage a Nonpenetrating Injury to the Chest

081-833-4194

Conditions: Given a patient who has suffered a nonpenetrating injury to the chest and the following supplies and equipment: M-5 medical set, field jacket, poncho, blanket, or similar material, and oxygen. All other more serious injuries have been treated.

Standards: Manage the casualty, minimizing the effects of the injury, without causing additional injury to the casualty.

Performance Steps

1. Manage patient in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient.
2. Examine patient for signs and symptoms of closed chest injuries.
 - a. Pleuritic pain that is increased by or occurs with respirations and is localized around the injury site.
 - b. Labored or difficult breathing.
 - c. Diminished or absent breath sounds.
 - d. Cyanosis.
 - e. Rapid, weak pulse and low blood pressure.
 - f. Coughing up blood or bloody sputum.
 - g. Failure of one or both sides of the chest to expand normally upon inhalation.
 - h. Paradoxical respirations.
 - i. Distended neck veins.
 - j. Bulging tissue between the ribs and/or above the clavicles.
 - k. Tracheal deviation.
 - l. Mediastinal shift.

WARNING: Evidence of tracheal or mediastinal shift indicates excessive pressure within the chest cavity. Compression of the heart and great vessels will impair blood flow through the heart. Immediate chest decompression must be accomplished or death will result.

3. Determine the type of injury.
 - a. Pulmonary contusion.
 - (1) History of blunt trauma.
 - (2) Signs and symptoms.
 - (a) Decreased respiratory effort because of pain.
 - (b) Contusion on chest wall.
 - (c) Presence of cyanosis. Cyanosis is dependent on severity of contusion and result of poor perfusion of affect areas.
 - b. Rib fracture.
 - (1) Etiology.
 - (a) Direct blow to the chest.
 - (b) Compression of the chest.
 - (c) Severe coughing.
 - (2) Signs and symptoms.
 - (a) Pain is aggravated by respirations and coughing.
 - (b) Point tenderness.
 - (c) Crepitus.
 - (d) Splinting of the affected side.
 - (e) Possible chest wall deformity.
 - c. Flail chest.
 - (1) History of blunt trauma to the chest.
 - (2) Signs and symptoms.
 - (a) Severe pain at the site.

Performance Steps

- (b) Rapid, shallow breathing.
- (c) Deformity.
- (d) Paradoxical respirations.

NOTE: If three or more adjoining ribs or their cartilage are broken in more than one place, the paradoxical respiration of flail chest is often present from the start. If a relatively small segment of the rib cage has lost its continuity, paradoxical respiration may not be evident until several hours postinjury.

- (e) Splinting of injured side.
- (f) Cyanosis.

d. Hemothorax.

- (1) History of blunt or penetrating trauma to the chest.
- (2) Signs and symptoms vary according to the size of the hemothorax.
 - (a) Respiratory distress.
 - (b) Cyanosis.
 - (c) Absence of breath sounds over affected area.
 - (d) Dullness to percussion that shifts.
 - (e) Shock with massive hemothorax.

e. Pneumothorax.

- (1) Etiology.
 - (a) Lung laceration from blunt trauma (most common cause).
 - (b) Penetrating injuries.
 - (c) Spontaneous.
- (2) Signs and symptoms.
 - (a) Dyspnea.
 - (b) Cyanosis.
 - (c) Decreased breath sounds over affected area.
 - (d) Slight hyperresonance over affected area.
 - (e) If tension pneumothorax develops, point of maximal input (PMI) may shift away from the affected side.

NOTE: PMI shift, tracheal deviation, and jugular venous distension (JVD) are all late signs of a tension pneumothorax.

f. Injuries to the posterior chest or spinal injury should be suspected.

- (1) History of direct blow to the posterior chest.
- (2) Signs and symptoms.
 - (a) Rib fracture.
 - (b) Lacerations on the back.
 - (c) Respiratory distress.
 - (d) Fractured scapula.
 - (e) Spinal injury.

g. Traumatic aortic rupture.

- (1) Etiology.
 - (a) Falling from a great height or sustaining a penetrating injury.
 - (b) High index of suspicion of any injury with great enough force to fracture the first or second rib or the sternum.
- (2) Signs and symptoms.

- (a) Acute hypotension with uncontained rupture.

NOTE: Acute hypotension with uncontained rupture is a grave sign.

- (b) X ray the widened mediastinum.

h. Tracheobronchial tree injuries.

- (1) Signs and symptoms of fracture of the larynx.
 - (a) Bony crepitus.
 - (b) Subcutaneous emphysema.
 - (c) Hoarseness.
 - (d) Respiratory difficulty or cyanosis.
- (2) Signs and symptoms of tracheal injury.
 - (a) Noisy breathing.

Performance Steps

- (b) Apnea.
 - (c) Labored respiratory effort.
 - (3) Signs and symptoms of bronchial injury.
 - (a) Hemoptysis.
 - (b) Subcutaneous emphysema.
 - (c) Possibility of a tension pneumothorax.
 - (d) Pneumothorax even after chest tube insertion.
 - i. Esophageal trauma.
 - (1) Etiology.
 - (a) Usually penetrating trauma.
 - (b) If from blunt trauma, caused by blow to upper abdomen and forceful expulsion of gastric contents into esophagus, which tears. Results in mediastinitis and immediate or delayed rupture into the pleural space, which causes empyema.
 - (c) Consider in any patient with left pneumothorax or hemothorax without rib fracture, history of severe blow to lower sternum or epigastric region causing pain or shock out of proportion to injury, or particulate matter or continuous bubbles in the chest tube.
 - (2) Signs and symptoms.
 - (a) History of trauma to the epigastrium.
 - (b) Pain and shock.
 - j. Traumatic diaphragmatic rupture.
 - (1) Etiology.
 - (a) Blunt trauma produces large, radial tears with abdominal contents possibly located in thoracic cavity.
 - (b) Penetrating injury results in small perforations.
 - (2) Signs and symptoms.
 - (a) Depends on side of rupture, severity, and amount of displacement. With large ruptures, may have respiratory distress, impairment of ventilation, and bowel sounds in the chest. Smaller lacerations may be extremely difficult to detect.
 - (b) X ray findings occasionally show abdominal organs in thoracic cavity.
 - 4. Manage the injury.
 - a. Pulmonary contusion.
 - (1) If severe, administer 100 percent oxygen.
 - (2) Administer pain medications (task 081-833-4690, Manage Pain).
 - b. Rib fractures.
 - (1) Examine and monitor for complications.
- NOTE: Rib fractures are frequently complicated by an underlying injury.
- (a) A significant number of patients will have lung contusion.
 - (b) One-third of patients will have an associated pneumohemothorax.
 - (c) One-fourth of patients will have a pneumothorax.
 - (d) One-fifth of patients will have a hemothorax.
 - (e) Pneumonia, atelectasis, or abdominal visceral injury may develop.
- (2) Treatment. Where no underlying complication can be found by repeated examinations, including X ray, the main problem is relief of pain, since such fractures normally heal satisfactorily.
- NOTE: Hemispheric chest wraps are contraindicated.
- (a) Give the patient a pillow or other object to hold against himself as a splint as he coughs, which he should be encouraged to do.
 - (b) Analgesics: Tylenol 3 with codeine, darvon 65 milligrams (mg) by mouth (PO) every 4 hours (q4h), demerol 50 to 150 mg PO every 3 to 4 hours (q3/4h), oxycodone (percocet or tylox) 1 or 2 tablets four times a day (q.i.d.).
 - (c) Intercostal nerve block is quick and sure and eliminates muscle splinting that limits respiratory efforts. (Usually only 1 or 2 blocks are required.) Use .5 percent marcain or lidocaine.

Performance Steps

- (d) Very severe cases may be given narcotics and intubated, if necessary.
- c. Flail chest.
 - (1) Complications will depend upon the number of ribs involved and whether the injury is unilateral or bilateral.
 - (a) Respiratory insufficiency results from hypoxia and ventilatory inadequacy.
 - (b) Primary problem is the underlying pulmonary contusion, not the abnormal mechanics of the flail segment.
 - (2) Treatment of flail chest involving just the ribs.
 - (a) Secure the airway.
 - (b) Give ventilatory assistance immediately.

NOTE: In patients with flail chest and significant associated injuries, early ventilatory assistance was associated with a mortality rate of 7 percent. In similar patients where ventilatory assistance was delayed, the mortality rate was 69 percent.

- (c) External traction methods are only used in an emergency when assisted respirations and external compression are unavailable or ineffective.
- (d) Where a relatively small segment of the chest wall is involved, efforts should be directed to the relief of pain (intercostal nerve block). This is mainly to decrease the accumulation of secretions in the lower airways by improving the ability to cough.
- (e) Turn the patient on his uninjured side if it will not aggravate other injuries.
- (3) Treatment of flail sternum.

WARNING: A flail sternum requires a surgical procedure, which must be performed in a hospital setting.

- (a) Use a uterine tenaculum to grasp and elevate the sternum.
- (b) Pass a Kirschner wire behind the sternum. This procedure is extremely effective for stabilizing an anterior flail chest.
- d. Posterior injuries.
 - (1) Complications.
 - (a) Spinal Injury.
 - (b) Hemothorax.
 - (c) Pneumothorax.
 - (2) Treatment.

NOTE: The main concern with this injury is the spine.

- (a) Establish and maintain an airway.
- NOTE: Use the jaw-thrust technique if a spinal injury is suspected.
 - (b) Administer oxygen, if necessary.
 - (c) Assist the casualty's respirations, as needed.
 - (d) Treat suspected spinal injuries.

- e. Traumatic aortic rupture.
 - (1) Complications. Usually sudden death occurs. However, sometimes the adventitial layer remains intact for awhile and the patient will survive if the condition is promptly diagnosed and treated.
 - (2) Management.
 - (a) Treat for shock (task 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock).
 - (b) Evacuate or refer for surgical intervention.

- f. Fracture of the larynx.
 - (1) Maintain or provide airway. This may require a cricothyroidotomy (task 081-833-4528, Perform a Cricothyroidotomy).
 - (2) Prompt evacuation for surgical repair.
- g. Tracheal injury. Treatment is to provide an airway and evacuate patient to a surgical hospital.
- h. Bronchial injury treatment.
 - (1) Maintain an airway.
 - (2) Refer or evacuate patient for surgical intervention.
- i. Esophageal trauma. Treatment is surgical intervention.
- j. Traumatic diaphragmatic rupture. Treatment is surgical intervention.

5. Record the care provided on the appropriate form.

Performance Steps

- 6. Evacuate the casualty.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as the casualty.

Brief Soldier: Tell the soldier, "You have just completed an initial trauma assessment of a casualty, and all life-threatening airway and circulatory injuries have been addressed. You are starting the second sequence of breathing (B2) of your survey and the area is secure." Give the soldier the history, if known, and provide appropriate feedback of the signs and symptoms of at least one of the above injuries.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Managed patient IAW task 081-833-4149.	_____	_____
2. Checked the casualty for signs and symptoms of chest injuries.	_____	_____
3. Determined the type of injury on the basis of the history and signs and symptoms.	_____	_____
4. Managed the injury appropriately.	_____	_____
5. Recorded the care provided on the appropriate form.	_____	_____
6. Evacuated the casualty.	_____	_____

NOTE: Although not evaluated, the soldier would continue to survey and monitor the casualty.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage a Penetrating Injury to the Chest

081-833-4196

Conditions: As a special operations medic in a field environment and given the M-5 medical kit. A patient has a penetrating injury to the chest.

Standards: Solicit a patient history, conduct an examination, recognize significant injury, and treat the injury so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Manage patient in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of nonpenetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and a second sequence of airway through full set of vital signs (A2 through F).

2. Solicit a patient history to determine the cause of the injury.
 - a. Blast injury.
 - b. Missile wound.
 - c. Handheld weapon.
3. Examine patient for signs and symptoms of penetrating injury to the chest.
 - a. Entry and exit wounds in the chest, neck, or upper abdomen.

NOTE: If entry or exit wounds are found, they should be immediately covered with a stopgap bandage (such as a gloved hand) until a more definitive bandage can be applied.

- b. Labored or difficult breathing.
- c. Diminished or absent breath sounds.
- d. Rapid, weak pulse and low blood pressure.
- e. Coughing up blood or bloody sputum.
- f. Failure of one or both sides of the chest to expand normally upon inhalation.
- g. Distended neck veins.
- h. Tracheal deviation.
- i. Mediastinal shift.

WARNING Evidence of tracheal or mediastinal shift indicates excessive pressure within the chest cavity. Compression of the heart and great vessels will impair blood flow through the heart. Immediate chest decompression must be accomplished or death will result.

4. Manage the injury.
 - a. Definitively bandage the wound with a four-sided occlusive dressing.
 - b. Managed pneumothorax (task 081-833-4184, Manage Pneumothorax).
 - c. Manage hemothorax (task 081-833-4178, Manage Hemothorax).
 - d. Manage flail chest or rib fractures (task 081-833-4194, Manage a Nonpenetrating Injury to the Chest).
 - e. If the patient develops a tension pneumothorax, perform a thoracentesis (task 081-833-3007, Perform a Needle Chest Compression).
5. Perform supportive care for the patient.
 - a. Administer supplemental oxygen, if available.
 - b. If not contraindicated by other injuries, position patient so that blood or air does not cross to affected side of chest.
 - c. Administer pain medications to allow patient to breathe more deeply.
6. Record all treatment given.
7. Evacuate the casualty for surgical intervention.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Managed patient IAW task 081-833-4149.	_____	_____
2. Solicited a patient history.	_____	_____
3. Examined patient for signs and symptoms of penetrating injury to the chest. a. Looked for entry and exit wounds in the chest, neck, or upper abdomen. b. Immediately covered wounds with a stopgap bandage until a more definitive bandage can be applied. c. Noted any signs or symptoms of respiratory or circulatory compromise.	_____	_____
4. Took immediate action to relieve a suspected tension pneumothorax.	_____	_____
5. Managed any injuries found. a. Definitively bandaged the wound with a four sided occlusive dressing. b. Managed pneumothorax IAW task 081-833-4184. c. Managed hemothorax IAW task 081-833-4178. d. Managed flail chest or rib fractures IAW task 081-833-4194. e. Managed a tension pneumothorax IAW task 081-833-4526.	_____	_____
6. Performed supportive care for the patient. a. Administered supplemental oxygen, if available. b. Positioned patient so that blood or air does not cross to affected side of chest, if not contraindicated by other injuries. c. Administered pain medications.	_____	_____
7. Recorded all treatment given.	_____	_____
8. Evacuated the casualty for surgical intervention.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Inhalation/Aspiration Injuries

081-833-4197

Conditions: As a special operations medic in a field environment and given M-5 medical kit, patient's medical record, oxygen tank, face mask, nasal prongs, nasogastric tube, endotracheal tube, sphygmomanometer, and stethoscope.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory (lab) studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149, establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of inhalation/aspiration injuries and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Assess the severity of the specific injury.
 - a. Check for symptoms of inhalation burns.

NOTE: Inhalation burns are potentially one of the most lethal types of injuries--especially when there is a cutaneous injury associated with the respiratory tract burn.

- (1) Edema of the face and neck.
- (2) Singed nasal hairs.
- (3) Carbonaceous sputum (caused by subglottic soot particles).
- (4) Burned mucosa in the mouth and throat (redness and swelling).
- (5) Dyspnea.
- (6) Hoarseness.
- (7) Depressed mentation.
- (8) Stridor (harsh, high-pitched respiratory sound, indicating laryngeal obstruction).

CAUTION: The presence of stridor is considered a medical emergency.

- b. Check for symptoms of aspiration injury. Signs and symptoms usually occur within 1 to 2 minutes of aspiration and include the following:
 - (1) Dyspnea.
 - (2) Cough and bronchospasm.
 - (3) Wheezing, rhonchi, crackles, and frothy sputum.

3. Maintain the casualty's airway (task 081-833-4167, Maintain a Patient's Airway).

CAUTION: Intubate the casualty if he or she is unconscious or has severe burns of the face and neck. Perform a cricothyroidotomy if the airway is obstructed and attempts at intubation are unsuccessful or intubation equipment is unavailable.

4. Administer humidified oxygen, if available (task 081-833-4485, Administer Oxygen Therapy).
5. Administer an intravenous (IV) infusion to keep the vein open (TKO) for the administration of medications (task 081-833-0033, Initiate an Intravenous Infusion in Soldier Training Publication [STP] 31-18-SM-TG, Soldier's Manual, Skill Levels 3/4 and Trainer's Guide, CMF 18, Special Forces Basic Tasks.)

NOTE: Avoid excessive hydration of the patient, as any amount of pulmonary edema will exacerbate the patient's condition.

6. Maintain the casualty in an upright position if he or she is alert and the blood pressure is adequate.

NOTE: On the basis of the principles of gravity, maintaining a casualty in the upright position helps decrease edema in the head and neck area.

Performance Steps

7. Monitor the patient closely for signs and symptoms of worsening respiratory failure (tachypnea, dyspnea, and cyanosis). The development of respiratory failure may be insidious in patients with both aspiration and inhalation injury and must be anticipated. Impending respiratory failure is an indication for endotracheal intubation.

8. Perform pulmonary nursing care (task 081-833-4175, Perform Pulmonary Nursing Care).

9. Manage atelectasis (task 081-833-4174, Manage Atelectasis).

NOTE: Pulmonary atelectasis is a major problem with patients who have experienced inhalation or aspiration injuries. These patients should be evacuated to a higher level medical facility at the earliest opportunity.

10. Record all treatment in the patient's medical record.

11. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage inhalation or aspiration injuries.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty.	—	—
2. Assessed the severity of the specific injury.	—	—
3. Maintained the casualty's airway.	—	—
4. Administered humidified oxygen, if available.	—	—
5. Administered an IV infusion TKO for the administration of medications.	—	—
6. Maintained the casualty in an upright position when he or she was alert and the blood pressure was adequate.	—	—
7. Performed pulmonary nursing care.	—	—
8. Managed atelectasis.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Trauma to the Ear, Nose, and Throat

081-833-4211

Conditions: Given The Merck Manual, a scalpel with blades, sutures of various size, benzoin, cotton balls, oral penicillin V 250 milligrams (mg), 2 percent acetic acid, phenylephrine 0.25 percent, cotton applicators, otic atropine solution, chemical cold and heat packs, silk sutures, saline solution, a cervical collar, elastic bandage, and 1 1/4-inch tape.

Standards: Manage trauma to the ear, nose, and throat without causing further injury to the patient.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of trauma to the ear, nose, and throat and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Manage trauma to the ear.
 - a. Assess the ear to determine the extent of the injury.
 - (1) Obtain a history of the injury.
 - (2) Perform an examination (exam) of the ear IAW 081-833-4002, Perform a Complete Physical Examination.
 - b. Determine the type of injury on the basis of the history, signs and symptoms, and examination.
 - (1) Hematoma of pinna.
 - (a) History of blunt trauma to the ear.
 - (b) Swelling of external ear.
 - (c) Pocket of blood (possibly).
 - (d) Painful.
 - (2) Laceration of the pinna.
 - (a) History of trauma.
 - (b) Visible injury or wound to the pinna.
 - (3) Perforation of tympanic membrane (TM).
 - (a) History of diving, exposure to blast shock waves, and blows to the head with cupped hand.
 - (b) Severe pain initially.
 - (c) Tinnitus.
 - (d) Hearing loss, sometimes.
 - (e) Rupture readily visualized with Valsalva maneuver. Rupture may be straight tear or flap tear.
 - (4) Abrupt loss of hearing or onset of tinnitus.

NOTE: There are a variety of medical reasons for the loss of hearing or onset of tinnitus in addition to trauma.

- (a) History of exposure to loud noise, explosions, and head injury.
- (b) History of starting a medication with ototoxic side effects.

NOTE:

1. Streptomycin damages the vestibular portion of the inner ear.
2. Neomycin has the greatest cortitoxic effect of any antibiotic.
3. Kanamycin and amikacin are close to neomycin in cortitoxic effects.
4. Viomycin shows both cochlear and vestibular toxicity.
5. Vancomycin causes hearing loss--especially in the presence of renal insufficiency.
6. Gentamicin and tobramycin have vestibular toxic properties.
7. Salicylates produce hearing loss and tinnitus that is usually reversible.
 - (c) Physical exam reveals no signs of trauma or damage to the TM.
 - (d) Perform neurological exam to try to pinpoint source of problem.

Performance Steps

c. Manage specific injuries to the ear.

(1) Hematoma of pinna.

- (a) Main complication is pressure necrosis of the ear cartilage.
- (b) Remove the blood by aspiration or excision with a scalpel blade. If a scalpel is used, reapproximate the skin and perichondrium to the cartilage and monitor the blood supply. Failure to provide proper therapy can result in "cauliflower ear."
- (c) Cold compresses.
- (d) Pressure dressing to prevent recurrence of hematoma.
- (e) Observe for recurrence.

(2) Laceration of pinna.

- (a) Suture in layers. Reapproximate the perichondrium, only if necessary, with absorbable sutures. Reapproximate and suture the skin margins.

NOTE: The preceding steps are recommended for a laceration that penetrates the cartilage and skin on both sides of the cartilage.

CAUTION: Skin sutures should not extend into the cartilage.

- (b) Apply protective pressure dressing.
- (c) Check tetanus status, and administer booster or vaccine, as required.

(3) Perforation of TM.

- (a) Do not administer medications in the ear.
- (b) Apply external dressing to keep ear dry and clean. Do not use packing in ear.
- (c) Restrict patient from flying, swimming, and coming in contact with loud noises.
- (d) Administer systemic antibiotics only if infection occurs. Administer oral penicillin V 250 mg every 6 hours (q6h) over 7 days.

NOTE: Analgesia (oral) is usually not necessary.

- (e) Ensure spontaneous closure occurs within 2 months.
- (f) Evacuate patient when flap tear is present or closure does not occur within 2 months. In these cases, tympanoplasty is indicated and evacuation is necessary.
- (g) Monitor patient for complications, which include failure to heal spontaneously, ear infection (otitis media), and impairment of hearing caused by scarring.

(4) Abrupt loss of hearing or onset of tinnitus.

- (a) Protect the ear from further damage.
- (b) If possible, switch to medication without ototoxic affects.

3. Manage trauma to the nose.

a. Assess the nose to determine the extent of the injury.

- (1) Obtain a history of the injury.
- (2) Examine the nose IAW 081-833-4002, Perform a Complete Physical Examination.

b. Determine the type of injury on the basis of the signs and symptoms and exam.

- (1) Assess epistaxis IAW 081-833-4229, Manage Epistaxis.
- (2) Assess fractures of the nose.
 - (a) History of trauma to the nose.
 - (b) Bridge of nose may no longer be straight or may be swollen.
 - (c) Probable epistaxis.
 - (d) Painful.
 - (e) Usually the dorsum of the nose is deviated to one side, with depression of the nasal bone and ascending process of the maxilla on the other side.
 - (f) Gently palpate dorsum of nose for deformity, crepitus, and point tenderness.
 - (g) Confirm suspected diagnosis by X ray.

(3) Assess septal deviation and perforations.

- (a) Obvious deviation found on exam with nasal speculum.
- (b) Obstruction of the ostium of a paranasal sinus.

c. Manage specific traumas to the nose.

- (1) Manage epistaxis IAW 081-833-4229.
- (2) Manage fractures of the nose.
 - (a) Reduce the fracture under anesthesia--local for adults and general for children.

Performance Steps

WARNING: Children should be evacuated to provide proper care.

- (b) Manipulate the fracture into a good position by internal and external traction. Lift with a blunt elevator placed under nasal bone to bring the nasal dorsum to the midline while applying pressure to other side of nose to bring nasal dorsum to midline.
 - (c) Stabilize the fracture internally by packing the nostril with antibiotic-impregnated gauze for 48 to 72 hours and externally by splinting with tape.
 - (d) Incise and drain septal hematomas immediately.
 - (e) Septal fractures are difficult to hold in position and often require evacuation or referral for nasal septal surgery.
 - (3) Manage septal deviation and perforation.
 - (a) Symptomatic treatment is all that can be accomplished in a field environment.
 - (b) Evacuate for any condition which may result, such as nasal obstruction, ulcers, or perforations.
4. Manage trauma to the throat.
- a. Assess the throat to determine the extent of the injury.
 - (1) Obtain a history of the injury.
 - (2) Examine the throat IAW 081-833-4002.
 - b. Determine the type of injury on the basis of the signs and symptoms and exam.
 - (1) Fracture of the larynx.
 - (a) Bony crepitus.
 - (b) Subcutaneous emphysema.
 - (c) Hoarseness.
 - (d) Respiratory difficulty or cyanosis.
 - (2) Tracheal injury.
 - (a) Noisy breathing.
 - (b) Apnea.
 - (c) Labored respiratory effort.
 - (3) Blunt trauma to the throat.
 - (4) Penetrating trauma to the throat.
 - (a) Signs and symptoms will vary greatly depending on mechanism of injury and exact structures involved in the injury.
 - (b) Possible problems range from lacerations to immediate death.
 - c. Manage specific traumas to the throat.
 - (1) Manage fracture of the larynx.
 - (a) Maintain or provide airway.
 - (b) Evacuate for surgical intervention.
 - (2) Manage tracheal injury.
 - (a) Provide airway
 - (b) Evacuate as soon as possible.
 - (3) Manage a patient for blunt trauma to the throat.
 - (a) Rapidly assess the injury.
 - (b) Palpate the cervical spine for injury.
 - (c) Apply a cervical collar with full spinal immobilization.
 - (d) Administer pain medications, as needed.
 - (e) Obtain an X ray, if possible.
 - (f) Evacuate for further evaluation if the possibility of cervical spine fracture exists.
 - (4) Penetrating trauma.
 - (a) Rapidly assess injury for signs of airway compromise such as bubbles or frothy blood coming from wound, subcutaneous emphysema, or air passing in and out of wound.
 - (b) Rapidly assess injury for signs of vascular compromise such as gross hemorrhage, spurting blood, and swelling of the soft tissues.
 - (c) Assess for involvement of the cervical spine.
 - (d) If airway is compromised, secure airway.
 - (e) Control hemorrhage by digital pressure or hemostats and ligatures.

Performance Steps

- (f) Apply a cervical collar with full spinal immobilization.
- (g) Evacuate immediately if airway, blood vessels, or cervical spine are involved.
- (h) If no involvement of the airway, blood vessels, or cervical spine, manage wound IAW 081-833-4531, Manage Penetrating Trauma.

5. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage trauma to the ear, nose, and throat.

Performance Measures**GO** **NO GO**

1. Assessed casualty IAW task 081-833-4149.	_____	_____
2. Managed trauma to the ear.	_____	_____
3. Managed trauma to the nose.	_____	_____
4. Managed trauma to the throat.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required**

MERCK MANUAL 17TH ED

Related

Manage Eye Trauma

081-833-4223

Conditions: Given topical ophthalmic anesthetic, a flashlight, an ice or chemical cold pack, eye patches, small sterile dressings, fluorescein sodium, proparacaine 0.5 percent, meperidine, field dressings, cotton-tipped applicators, sterile water or normal saline, and a sedative.

Standards: Carefully evaluate the patient during the eye examination. Avoid causing further damage to the patient's eye during the exam, and manage or provide appropriate care or referral.

Performance Steps

1. Assess casualty in accordance with (IAW) 081-833-4149, Perform Initial Assessment and Management of Trauma Patient.
 - a. The protocols established in task 081-833-4149 establish the overall trauma sequence.
 - b. The management measures covered here apply only to the management of eye trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through a full set of vital signs (A2 through F).
 2. Obtain a detailed history of the injury.
 - a. Find out what the patient was doing immediately before or during the event or onset of symptoms.
 - b. Intraocular hemorrhage may follow a bout of sneezing, coughing, or vomiting and trauma.
 - c. Burns can result from ultraviolet light exposure, arc welding, and snow blindness.
 - d. Small objects can penetrate the eye with almost no pain, but patient may have a history of pounding metal on metal and mine, rocket, or shell explosions.
 3. Determine the cause of the injury to the eye, and determine if it requires immediate treatment to save the eyesight of the casualty.
- NOTE: Loss of sight is in the same evacuation priority as loss of life or limb.
- a. Burn injuries can come from several sources. (See task 081-833-4225, Manage Burns to the Eye.)
 - (1) Chemical and phosphorous burns require immediate treatment.
 - (2) Thermal and radiant burns do not require immediate treatment.
 - b. Penetrating injuries that result in trauma to the globe, avulsion of the eye, or impaled objects require immediate treatment.
 - c. Nonpenetrating trauma generally does not require immediate treatment.
 - d. Spontaneous events with no associated trauma usually do not require immediate treatment.
- CAUTION: As soon as any ophthalmic emergencies are suspected or discovered, proceed to step 8 and initiate the appropriate emergency treatment.
4. Position the casualty.
 - a. If conscious, position him sitting up.
 - b. If unconscious, position him lying on his back with his head slightly elevated.
 5. Examine the eyes IAW 081-833-4002, Perform a Complete Physical Examination.
 - a. Examine the eyes for the following:
 - (1) Objects protruding from the globe.
 - (2) Swelling of or lacerations on the globe.
 - (3) Bloodshot appearance of the sclera.
 - (4) Bleeding.
 - (a) Surrounding the eye.
 - (b) Inside the eyeball.

Performance Steps

- (c) Coming from the eyeball.
- (5) Contact lenses. Ask the casualty if he is wearing contact lenses, but do not force the eyelids open. Record a positive or negative reply.
- (6) Extrusion of the eye from the socket.
- b. As abnormalities are observed, make note of them and continue with the examination (exam) unless emergency treatment is indicated.
- c. Once emergency treatment is given, continue with the exam until complete. Patients may have more than one problem.

6. Identify the type of eye injury on the basis of the patient history, signs and symptoms, and physical exam.

- a. Injury to the tissue surrounding the eye.
 - (1) Periorbital hematoma (black eye).
 - (a) History of trauma.
 - (b) Swelling of soft tissue.
 - (c) Bruising.
 - (d) No damage to the eye itself.
 - (2) Eyelid lacerations.
 - (a) History of trauma.
 - (b) Lacerations of the eyelid and immediate area are visible.
 - (c) Ensure that laceration does not go completely through eyelid and into the eye.
 - (3) Eyelid contusions.
 - (a) History of trauma.
 - (b) Swelling of soft tissue.
 - (c) Bruising.
 - (d) No damage to the eye itself.
- b. Nonpenetrating injury to the eye.
 - (1) Nonpenetrating foreign bodies to the eye and corneal abrasions are assessed and managed IAW task 081-833-4221, Manage a Corneal Abrasion and/or Foreign Body in the Eye.
 - (2) Conjunctival injuries.
 - (a) History of trauma to the eye itself.
 - (b) The patient will complain of a feeling of something in the eye or something not feeling right.
 - (c) Other symptoms are headache, excessive lacrimation, eye pain, photophobia, slight to severe pain, blurred vision, and redness.
 - (d) Small abrasions or complete tears in the conjunctiva visible.
 - (e) May need to use fluorescein sodium to detect small abrasions and tears.
- c. Penetrating injuries to the eye
 - (1) Intraocular foreign bodies.
 - (a) History of pounding metal on metal and mine, rocket, or shell explosions. Patient may have associated eyelid injuries.
 - (b) Pain is variable. A tiny object can penetrate with almost no pain.
 - (c) Blurred vision.
 - (d) Visible intraocular foreign body (small objects often not visible).
 - (e) Visible tear in globe.
 - (f) Extruding intraocular contents.
 - (g) Irregular pupil.
 - (2) Protruding (impaled) objects.
 - (a) Same history and signs and symptoms as intraocular foreign bodies, but the object is generally larger and easily visible.
 - (b) More damage to the eye and associated structures.
- d. Extrusion or avulsion.
 - (1) History of severe trauma.

Performance Steps

- (2) The eye may be completely missing or it may be attached by the optic nerve and blood vessels.
- (3) Severe pain.
- (4) Loss of vision or distorted view.

7. Treat the injury.

- a. Periorbital hematoma (black eye).
 - (1) Assess the patient for underlying fractures.
 - (2) Apply cold pack for 24 to 36 hours.
 - (3) Administer oral analgesics.
 - (4) Evacuate the patient if facial fractures are present or suspected.
- b. Eyelid lacerations.
 - (1) Clean the injury with a sterile isotonic saline solution.
 - (2) Place petrolatum gauze or an antimicrobial ointment on the injury.
 - (3) Repair minor lacerations with fine silk sutures or steri-strips if evacuation is not possible.
 - (4) Close the lid of the affected eye.
 - (5) Cover the injury with an eye pad or a small, sterile dressing.
 - (6) Apply a dressing held in place by an elastic bandage or stockinet until the wound has healed.

CAUTION: Do not put pressure on the eyeball.

- c. Eyelid contusions.
 - (1) Place ice packs on the injury during the first 24 hours.
 - (2) Apply hot compresses the following day to aid in the absorption of the hematoma.
- d. Conjunctival and corneal injuries.
 - (1) Manage foreign bodies and abrasions IAW task 081-833-4221.
 - (2) Manage conjunctival tears.
 - (a) Minor, straight tears will close themselves, while large or irregular tears will need to be evacuated for care by an optometrist.
 - (b) Approximate the edges of the conjunctiva with a sterile, moist cotton-tipped applicator.

NOTE: May need to anesthetize the eye before approximating the edges of the conjunctiva.

- (c) Cover the injured eye with an eye pad.
- (d) Place a field dressing over the eye pad.
- (e) Cover the uninjured eye to prevent sympathetic eye movement.

NOTE: In hazardous conditions, leave the good eye uncovered long enough to ensure the casualty's safety.

- (f) Tell the casualty not to squeeze the eyelids together.

- e. Intraocular foreign bodies.
 - (1) Dilate the pupil with 2 drops of 1- to 4-percent atropine solution.
 - (2) Antimicrobials are indicated, both systemic and topical. Administer gentamicin 2 milligrams per kilogram per day (mg/kg/day) in combination with methicillin 1 gram (g) intravenously (IV) every 6 hours (q6h) and gentamicin 0.3 percent ophthalmic solution 1 drop hourly.
 - (3) Place a patch and a metal shield, if possible, over the eye to avoid inadvertent pressure that could extrude ocular contents through the penetration site.
 - (4) Evacuate as soon as possible.
- f. Trauma to the globe.
 - (1) Alleviate the pain with meperidine 50 milligrams (mg) intramuscularly (IM) every 3 hours (q3h).
 - (2) Dilate the pupil with 2 drops of 1- to 4-percent atropine solution.
 - (3) Place protective dressing on both eyes.
 - (4) Combat infection with local and systemic antimicrobials.

CAUTION: Ointment should be avoided if the globe is lacerated.

- (5) Evacuate patients with injuries that involve disruption of the eye structures.
- (6) If evacuation is impossible, keep the patient in a head-elevated (30-degrees) position.

Performance Steps

- (7) Do not move unless necessary, and protect the eye from drying, dirt, and further damage.
- g. Impaled objects.
 - (1) Stabilize object by using a cage, gauze, or cup.
 - (2) Remove dirt, sand, and so on from associated facial wounds, where possible.
 - (3) Use bilateral eye patches so that neither eye moves.

NOTE: In hazardous conditions, leave the good eye uncovered long enough to ensure the casualty's safety.

- (4) Do not manipulate foreign body.
- (5) Do not put medicine in eye.
- (6) Administer systemic ampicillin 1 g IV q6h.
- (7) If patient has been previously immunized, administer tetanus toxoid at 0.5 cubic centimeters IM.
- (8) Stabilize head in the supine position, other injuries permitting.
- (9) Administer an analgesia. Demerol is best, but you can use morphine.
- (10) Instruct patient to have nothing by mouth.
- (11) Evacuate patient for surgery.
- h. Extrusion or avulsion.

CAUTION: Do not try to reposition the eyeball or replace it in the socket.

- (1) Position the casualty face up.
- (2) Clean the eye socket and eye as aseptically as possible.
- (3) Cut a hole in several layers of dressing material, and then moisten it. Use sterile liquid, if available.
- (4) Place the dressing so the injured globe protrudes into the hole in the dressing. The dressing should be built up higher than the globe.

NOTE: If available, place a paper cup or cone-shaped piece of cardboard over the eye. Do not apply pressure to the injury site. Apply roller gauze to hold the cup in place.

- (5) Cover the uninjured eye to prevent sympathetic eye movement.

NOTE: In hazardous conditions, leave the good eye uncovered long enough to ensure the casualty's safety.

- (6) Evacuate the casualty.

8. Record the treatment given.

9. Seek the advice and assistance of a higher medical authority whenever possible.

10. Evacuate the casualty, if necessary.

- a. Transport the casualty on his back, with his head elevated and immobilized.
- b. Evacuate eyeglasses with the casualty, even if they are broken.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must identify the specific problem and manage that problem correctly.

Performance Measures

GO **NO GO**

1. Placed a conscious patient in a comfortable sitting position and an unconscious one in supine position with his head slightly elevated.
2. Assessed the etiology of the trauma.
3. Examined the eyes and adjacent tissues.
 - a. Blood staining the sclera.
 - b. Periorbital hemorrhage.
 - c. Hyphema (or blood in the anterior chamber of the eye).
 - d. Foreign body:
 - (1) Obtain visual acuity of the involved versus the uninvolved eye.
 - (2) Apply topical anesthetic onto the injured eye.
 - (3) Examine the eyes to locate any foreign bodies present.

____ ____
 ____ ____
 ____ ____

Performance Measures**GO** **NO GO**

NOTE: Injuries which involve disruption of the eye structures should be evacuated. Remember that loss of sight is in the same evacuation priority as loss of life or limb. If evacuation is impossible, keep the patient in a head-elevated (30-degrees) position, do not move patient unless necessary, and protect the eye from drying, dirt, and further damage.

4. Treated the eye.	_____	_____
a. If there is blood staining of the sclera but vision, eye movement, and surrounding structures are intact, observe and reassure the patient. No further treatment is required.		
b. Periorbital hemorrhage.		
(1) Cover the eye with an eye pad or a small sterile dressing.		
(2) Place a field dressing over the eye pad.		
(3) Apply ice or chemical cold pack, if available.		
(4) Monitor for further hemorrhage.		
(5) Evacuate the patient if facial fractures are present.		
c. Hyphema.		
(1) Prescribe complete bedrest.		
(2) Apply binocular bandaging.		
(3) Sedate the patient.		
(4) Evacuate the patient as soon as possible.		
d. Foreign body.		
(1) Moisten the tip of a cotton-tipped applicator with sterile water or normal saline, and gently lift the foreign body from the eye.		
(2) Place a patch over the affected eye once the foreign body has been removed.		

NOTE: If there is difficulty in lifting the foreign body, evacuate the patient (if possible) for treatment by a physician. Imbedded foreign bodies should only be removed by a physician.

5. Recorded the treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Burns to the Eyes

081-833-4225

Conditions: Given a patient who has suffered a burn injury to the eye, irrigation equipment, irrigation solution, and field dressings.

Standards: Treat burns of the eyes, stabilizing the casualty without causing further injury to the casualty.

Performance Steps

1. Assess casualty in accordance with (IAW) 081-833-4149, Perform Initial Assessment and Management of Trauma Patient.
 - a. The protocols established in task 081-833-4149 establish the overall sequence for a trauma patient.
 - b. The management measures covered here apply only to the management of burns to the eye and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Determine the cause of the burn.

- a. Determine if the burn requires immediate treatment to save the eyesight of the casualty.

NOTE: Loss of sight is in the same evacuation priority as loss of life or limb.

- (1) Chemical and phosphorous burns require immediate treatment.
 - (2) Thermal and radiant burns do not require immediate treatment.
- b. If chemical burn or splash injury is suspected, find out the chemical involved.
- c. As soon as any of the ophthalmic emergencies are suspected or discovered, proceed to the appropriate step and initiate emergency treatment, after life-threatening conditions have been addressed.

3. Identify the type of burns on the basis of signs and symptoms.

- a. Chemicals such as acid, alkali, or petroleum.

CAUTION: The chemical may stick to the eye.

- (1) Pain and redness.
 - (2) Watering or tearing.
 - (3) Possible erosion of the corneal surface.
- b. Phosphorus burns.

NOTE: White phosphorus is used in incendiary weapons. It ignites when exposed to air and burns at 34 degrees Celsius.

- (1) Following explosion of weapon, flaming particles of phosphorus may become embedded in soldier's eye.
 - (2) Phosphorus can be identified by its glow in the dark.
- c. Radiant burns.
 - (1) Ultraviolet (UV) light burns such as electric welding processor, snow blindness, and desert blindness.

NOTE: These burns often do not appear until several hours after exposure.

- (a) Gritty feeling.
 - (b) Severe pain.
 - (c) Inability to tolerate light.
 - (d) Redness and swelling.
 - (e) Watering or tearing.
 - (f) Immediate decrease in vision.
- (2) Laser burns or infrared.
 - (a) Immediate decrease in vision.
 - (b) No pain immediately, but painful 6 to 12 hours after exposure.
- d. Thermal burns.

Performance Steps

NOTE: The main complication is burn to the eyelid. Skin contracture leads to loss of lid-covering tissue, which can cause corneal exposure, subsequent keratitis, ulceration, and possible corneal perforation. Burned eyelids swell to protect the underlying eyes. Flying, hot particles of ash or metal may strike cornea before blink can occur.

- (1) Lid becomes edematous, reddened, and charred.
- (2) Blisters may form over lid, forehead, and face.
- (3) Singed eyelashes.
- (4) Pain or irritation.
- (5) The globe and cornea are rarely involved because of blink reflex and rapid reflexive turning away of head (Bell's phenomenon) with inward rotation of eye as lids close.

4. Provide emergency management for a patient with chemical and phosphorous burns.

a. Chemical burns.

- (1) For both alkali and acid burns, immediately flush both eyes with water or saline.

NOTE: Irrigate the eye(s) with sterile water or sterile normal saline, if available. If not available, use any potable water.

CAUTION: Do not try to neutralize the chemical.

- (2) Tilt the casualty's head toward the affected side if only one eye is involved.
- (3) Irrigate the eye(s) for 5 minutes for any chemical and for 1 hour or longer for caustic chemicals such as an alkali. Intravenous (IV) tubing can be sutured to the lateral canthus of the eye to permit continuous irrigation for many hours, if necessary. Prompt, thorough irrigation is the cornerstone of management for these injuries.

b. Phosphorus burns.

- (1) Immerse eyes in cold water.
- (2) If unable to cut off oxygen supply to phosphorous particles, position patient so that phosphorous will not burn further into tissue.
- (3) Wash eyes with 3 percent copper sulfate 5 percent sodium solution by saline irrigation before it is absorbed.
- (4) Remove large, visible corneal phosphorus implants with a spud or a sterile needle (25 gauge).

5. Provide definitive management for a patient with burns to the eyes.

a. Chemical burn.

- (1) Apply 1 drop of 1 percent proparacaine hydrochloride to anesthetize the eye, if available.
- (2) Apply an antibiotic ointment, and place a clean, sterile dressing (patch) over the affected eyes.
- (3) To prevent posterior synechiae (adhesion of iris to lens and cornea) with severe burns, use mydriatics.

WARNING: Try to obtain an ophthalmic consult before using mydriatics.

- (4) Evacuate the patient as soon as possible.

b. Phosphorus burns.

- (1) Administer analgesics, topical antibiotics, appropriate dressings, and eye patches.
- (2) Evacuate patient.

c. Thermal burn.

- (1) Remove particles by flushing the eye or lifting them out as with other foreign bodies.
- (2) Apply silver sulfadiazine cream or ointment to burn areas.
- (3) Apply moist, fine mesh dressings with sterile saline.
- (4) Administer an analgesia.
- (5) Protect the casualty from exposure to light.

WARNING: Casualties with severe burns to the eyes may have additional respiratory burns as a result of spontaneous inhalation.

- (6) Evacuate the patient immediately for definitive or surgical care.

d. Radiant energy burn.

- (1) Bandage the eyes with sterile, moist pads.

Performance Steps

NOTE: In a combat environment, the eyes may have to remain uncovered so the casualty can see to get away from danger.

- (2) Give analgesics for the relief of pain.
- (3) Avoid further light exposure.
- (4) Evacuate the casualty for further examination.

NOTE: Prevent UV blindness by requiring soldiers to wear 100 percent UV-blocking glasses or goggles when working in snow or desert conditions during all levels of illumination. Never work with or observe arc welding without proper eye protection. Wear laser protective goggles when engaged in activities that involve high-energy lasers.

6. Reassure the casualty
7. Record the treatment given on the appropriate forms.
8. Evacuate the casualty.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage burns to the eyes.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW 081-833-4149.	—	—
2. When taking the history, determined the cause of the burn.	—	—
3. Identified the type of burns on the basis of signs and symptoms.	—	—
4. Provided emergency management for a patient with chemical and phosphorous burns.	—	—
5. Provided definitive management for a patient with burns to the eyes.	—	—
6. Reassured the casualty.	—	—
7. Recorded the treatment given on the appropriate forms.	—	—
8. Evacuated the casualty.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any steps are failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

MERCK MANUAL 17TH ED

Manage Pelvic Fractures

081-833-4359

Conditions: Given M-5 medical kit, oxygen administration equipment, long spine board, and pneumatic antishock garment.

Standards: Manage a patient with a fractured pelvis without causing further injury to the patient.

Performance Steps

1. Obtain a rapid history of the trauma event.
 - a. Record the time and description of the trauma.
 - b. Obtain a present complaint status from the patient, if possible.
 - c. Obtain urological data.
 - (1) Record any recent fluid intake.
 - (2) Record the patient's last voiding.
 - (3) Ask the patient about present bladder sensation.
 - d. Obtain gastrointestinal (GI) data (interval since the last food intake).
 - e. Obtain gynecological data.
 - (1) Note date of patient's last menstrual cycle.
 - (2) Note if the patient is pregnant.
2. Record patient's vital signs, and chart them regularly.
3. Perform a physical examination (exam).
 - a. Survey the patient rapidly for all potential sites of injury.
 - b. Remove all clothing, and thoroughly examine the patient front and back.
 - c. Inspect the perineum and pelvic area for the following:
 - (1) Swelling.
 - (2) Open fracture.
 - (3) Urine or blood extravasation.
 - (4) Tenderness and ecchymosis.
 - (5) Lacerations.
 - (6) Deformities.
 - d. Inspect the vagina for bleeding or lacerations.
 - e. Feel for irregularities of the pubic symphysis.
 - (1) Crepitus.
 - (2) Movements at the iliac crest.
 - f. Observe for signs that indicate a fracture.
 - (1) Destot's sign: a large hematoma that becomes superficial above the inguinal ligament on the scrotum.
 - (2) Roux's sign: in lateral compression fractures, the distances from the greater trochanter to the pubic spine is diminished on the affected side.
 - (3) Earle's sign: during rectal exam, bony prominence or large hematoma can be palpated, and there is definite tenderness along the lines of the fracture.
4. Perform a compression test.
 - a. Direct downward pressure on the symphysis pubis.
 - b. Compress the pelvic ring by placing your hands on the lateral aspect of the pelvis and pressing on the iliac ring in a lateral to medial direction.
 - c. Stop pressing if the patient feels or reacts to pain.
5. Perform a rectal exam.
 - a. Palpate the prostate for displacement or boggy hematoma.
 - b. Check rectal sphincter tone.
 - c. Palpate the coccyx for fracture.

Performance Steps

6. Observe the range of motion of the hip.
 - a. Passive.
 - b. Active.
7. Perform radiographic evaluation (if available).
 - a. Ensure the pelvis is stable before the X ray.
 - b. Obtain plain views of the pelvis.
 - c. Obtain special views of the pelvis.
 - (1) Internal and external rotation.
 - (2) Inlet and outlet views.
 - d. Read films, which may provide information on the fracture and fracture complications.
 - (1) If air is present in soft tissues, suspect an open fracture.
 - (2) Infer presence and size of a retroperitoneal hematoma from the following:
 - (a) Obliteration of the psoas shadows.
 - (b) Localized ileus.
 - (c) Displacements of inferior gas patterns.
 - (d) Obliteration or clouding of details of the lumbosacral spine.
8. Manage the injury.
 - a. Maintain monitoring of the patient's vital signs.
 - b. Administer high-flow oxygen, if available (task 081-833-4485, Administer Oxygen Therapy).
 - c. Administer appropriate fluid therapy (task 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock).
 - d. Apply the pneumatic antishock garment (PASG), if available, to stabilize the fracture.
 - e. Immobilize the casualty on a well-padded, long spine board.

WARNING: Patients with a ruptured abdominal or pelvic viscera require immediate evacuation or referral for surgical intervention.

 - f. Stabilize pelvic fractures by using the following:
 - (1) Skeletal traction.
 - (2) Pelvic slings.
 - (3) Plaster spicas.
9. Assess complications of a pelvic fracture.
 - a. Assess for hemorrhage.
 - (1) Substantial internal hemorrhage is common, particularly if there is disruption of the pelvic ring.
 - (2) Bruising appearing in the scrotum or buttocks or spreading diffusely along the line of the inguinal ligament are indicative of a major internal hemorrhage.
 - (3) Large retroperitoneal hemorrhage may be felt as a discrete mass on palpation.
 - (4) Ischemia in one leg may be the result of the rupture of, or internal damage to, an iliac artery.

NOTE: Injuries to the bowel and/or a tear of the rectum in compound fractures may be suspected. Persistent symphyseal instability is a rare complication and an indication for referral for internal fixation.

 - b. Assess damage to urethra and bladder. Consider the following signs and symptoms:
 - (1) Highly suggestive is the presence of perineal bruising.
 - (2) Presence of blood at the tip of the penis.
 - (3) Ask the patient to urinate. If clear urine is passed, no further treatment is required.

WARNING: Catheterization carries the risk of converting a partial urethral tear into a complete one and of introducing infection.
10. Manage complications symptomatically.
11. Evacuate or refer patient to orthopedics for possible surgical repair and rehabilitation.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated casualty and a scenario in which he must manage pelvic fractures.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained a rapid history of the trauma event.	_____	_____
a. Recorded the time and description of the trauma.		
b. Obtained a present complaint status from the patient, if possible.		
c. Obtained urological data.		
d. Obtained GI data.		
e. Obtained gynecological data.		
2. Recorded the patient's vital signs and charted them regularly.	_____	_____
3. Performed a physical exam.	_____	_____
a. Surveyed the patient rapidly.		
b. Exposed the patient and injured area.		
c. Inspected the perineum and pelvic area.		
d. Inspected the vagina.		
e. Felt for irregularities of the pubic symphysis.		
f. Observed for Destot's, Roux's, and Earle's signs.		
4. Performed a compression test of the pelvis.	_____	_____
5. Performed a rectal exam.	_____	_____
6. Observed the range of motion of the hip.	_____	_____
7. Performed radiographic evaluation (if available).	_____	_____
a. Ensured the pelvis is stable before the X ray.		
b. Obtained plain views of the pelvis.		
c. Obtained special views of the pelvis, as needed.		
8. Managed the injury.	_____	_____
a. Monitored the patient's vital signs.		
b. Administered high-flow oxygen, if available.		
c. Administered IV fluid to maintain systolic blood pressure greater than 90.		
d. Applied the PASG, if available, to stabilize the fracture.		
e. Immobilized the casualty on a well-padded, long spine board.		
f. Stabilized the pelvic fractures.		
9. Assessed for complications of a pelvic fracture.	_____	_____
10. Managed complications symptomatically.	_____	_____
11. Evacuated for possible surgical repair and rehabilitation.	_____	_____
WARNING: Ruptured abdominal or pelvic viscera requires immediate evacuation or referral for surgical intervention.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Skull Fracture

081-833-4361

Conditions: Given M-5 medical kit.

Standards: Solicit a patient history, perform a physical examination, determine the severity of the injury, provide basic life support, and request evacuation of the casualty without causing further harm to the patient.

Performance Steps

1. Evaluate patient IAW task 081-833-4159, Evaluate Casualty With a Head Injury.
 2. Identify common indications of a skull fracture.
 - a. Diffused or localized scalp edema without a laceration suggests the possibility of an underlying fracture
 - b. If a skull fracture is associated with a laceration, it is then a compound fracture by definition.
 - (1) Risk of infection or meningitis is great.
 - (2) Usually is accompanied by a tear in the dura that can extend into the arachnoid space through which cerebrospinal fluid (CSF) can potentially leak out.
 3. Identify the type of fracture on the basis of physical characteristics.
 - a. Linear: fracture through the cranium with no displacement of bone fragments. If fracture crossed an artery; for example, middle meningeal artery or a venous sinus, an epidural hematoma may form.
 - b. Depressed: cranial bones broken, comminuted, and depressed or pushed into the cranial vault. Severity of cerebral injury and neurological deficits depend on extent and location of the damage.
 - c. Penetrating: foreign object fractures the skull and enters the cranial vault.
 - d. Perforating: foreign object, like a bullet, fractures the skull, enters the cranial vault, and then fractures the skull again by exiting the cranial vault. Treat as in penetrating fracture.
 4. Identify a fracture of the vault, which is any part of the skull other than the base.
 - a. Prominence of parietal bone makes it most common site of fractures, followed by temporal, frontal, and least often, the occipital bone.
 - b. Critical when fracture crosses artery or venous sinus since an epidural hematoma can be easily produced.
 - c. If cortex of brain is injured, cranial nerves (CNs) III, IV, and VI will cause eyes to turn toward side of injury.
 5. Identify a basilar fracture of the skull, and identify the type on the basis of signs and symptoms.
- NOTE:** A basilar fracture of the skull is difficult to assess because of location. Any cranial nerve damage may occur in all types of basilar skull fractures.
- a. Possible signs of basilar fracture of anterior fossa.
 - (1) Fracture of frontal sinuses.
 - (2) Blood and/or CSF leaking from nose (rhinorrhea) in 2 to 9 percent of injuries.
 - (3) Bilateral bleeding into medial eyelids (raccoon's eyes sign) when a fracture extends into the roof of the eye orbit. Bleeding occurs in absence of direct trauma 24 to 36 hours postinjury.
 - b. Possible signs of basilar fracture of middle fossa.
 - (1) Frequently, fracture through the petrous portion of the temporal bone extending to sella turcica or foramen magnum.
 - (2) Blood and/or CSF leaking from ear or building up behind tympanic membrane (otorrhea or hemotympanum).
 - (3) Blood and/or CSF leaking into pharynx or cause mastoid discoloration (Battle's sign).
 - (4) Deficits of affected CNs.
 - (a) CN I: olfactory disturbances.

Performance Steps

- (b) CN II: visual disturbances.
- (c) CNs III, IV, and VI: eyes turn away from side of injury. (Injury then causes a brain stem squeeze.)
- (d) CN VII: ipsilateral facial paralysis.
- (e) CN VIII: hearing and balance disturbances.
- (f) CN XI: trapezius muscle weakness.
- c. Possible signs of posterior fossa fracture. When temporal or occipital bone is fractured, mastoid discoloration from bleeding (Battle's sign) occurs in absence of direct trauma to mastoid area.

NOTE: You must carefully observe for any CSF drainage from nose, ear, or posterior pharynx. Test via ring test, or use glucose dipstix (since CSF glucose is two-thirds of blood glucose level). CSF may not initially be present if fracture line is very fine because of slow leakage. Similarly, Raccoon's eyes and Battle's sign may not appear immediately, as they depend on the rate of blood diffusion under the scalp to areas of thin, transparent skin.

6. Manage skull fractures.

- a. Linear: No specific management for fracture is needed other than close observation for 24 to 48 hours and periodic neurological examinations to exclude a developing hematoma.
- b. Depressed: refer or evacuate patient for surgical intervention with elevation of the fracture fragments.
- c. Penetrating and perforating:
 - (1) Stabilize foreign object if still in place. Stabilization limits further brain damage.
 - (2) Administer antibiotics ceftriaxone (rocephin) 500 milligrams (mg) to 1gram (g) IV every 8 to 12 hours (q8/12h).
 - (3) Refer or evacuate patient for definitive surgery and long-term management of complications (abscesses, meningitis, and so on).
- d. Basilar:
 - (1) Evacuate as soon as possible.
 - (2) Begin antibiotic therapy (step 6c.(2)).

7. Record the treatment.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated casualty and a scenario in which he must manage pelvic fractures.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Evaluated patient IAW task 081-833-4159, Evaluate Casualty With a Head Injury.	—	—
2. Identified common indications of a skull fracture.	—	—
3. Identified the type of fracture on the basis of physical characteristics.	—	—
4. Identified a fracture of the vault.	—	—
5. Identified a basilar fracture of the skull.	—	—
6. Managed skull fractures.	—	—
7. Recorded the treatment.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage an Open or Closed Fracture

081-833-4362

Conditions: Given splinting materials, roller bandages, cravats, lidocaine, patient's medical record, and muscle relaxants.

Standards: Perform initial management of the fracture to include immobilization, assess the severity of the fracture, and perform traction, alignment, and/or semipermanent immobilization, as indicated, without causing further harm to the patient.

Performance Steps

1. Understand the definitions and general terminology associated with fractures.
 - a. Fracture is a break in the continuity of bone, epiphyseal plate, or cartilage.
 - b. Terminology.
 - (1) Closed fracture does not communicate with outside environment.
 - (2) Open fracture communicates with the outside environment through a break in the skin.
 - (a) Open from within: The bone breaks, and the jagged end punctures the overlying skin.
 - (b) Open from without: External trauma causes a break in the continuity of the skin in the area of a fracture. The same force may or may not cause the fracture.
 - (3) Complete fracture occurs when bone is completely broken through both cortices.
 - (4) Incomplete fracture occurs when cortice of the bone may be buckled or cracked, but continuity is not destroyed.
 - (5) Pathological fractures.
 - (a) Pathological fractures occur through an area of previously diseased bone.
 - (b) Pathological fractures are caused by generalized bone disease, tumors or secondary deposits, bone cysts and fibrous dysplasia, chronic osteomyelitis, and avascular necrosis.
2. Solicit a patient history.
 - a. Determine the mechanism of injury.
 - (1) Direct trauma occurs when bone breaks at point of impact.
 - (2) Indirect trauma occurs when bone breaks at a distance from where the force is applied.
 - b. Determine the approximate amount of force involved with the injury.
 - (1) With a fall, determine distance, landing position, and body surface injured.
 - (2) With a vehicular accident, driver, passenger, use of seat belts, broken windshield or dashboard, ejection from the vehicle, and miles per hour.
 - (3) With a falling object, determine weight of object, amount of body surface injured, and how far object fell.
 - c. Description of event and subsequent course.
 - (1) Did the patient hear or feel a snap, pop, or tearing sensation?
 - (2) Was there immediate pain, loss of function, or swelling? Were any of these absent or delayed?
 - (3) Have the symptoms been delayed in onset or intermittent only?
 - (4) Is the injury getting better, worse, or staying the same?

NOTE: Pain may precede a pathological fracture. In a child with a fracture, think of child abuse if there is a history of other fractures.

3. Recognize life-threatening injuries associated with fractures.
 - a. Massive, open fractures with ragged, dirty wounds.
 - b. Bilateral femoral shaft fractures--open or closed.
 - c. Vascular injuries, with or without fractures, proximal to the knee or below.
 - d. Crush injuries of the abdomen and pelvis and major pelvic fractures.
 - e. Traumatic amputations of the arm or leg.
4. Recognize limb-threatening injuries associated with fractures.

Performance Steps

- a. Fracture or dislocation of the ankle with or without vascular compromise.
- b. Tibial fractures with vascular impairment.
- c. Dislocation of the knee or hip.
- d. Wrist and forearm fractures with circulatory interruption.
- e. Fractures or dislocations about the elbow.
- f. Crush injury.
- g. Amputations--complete or incomplete.
- h. Open fractures.

5. Recognize the signs and symptoms of a fracture.

- a. Pain or tenderness is the cardinal symptom.
- b. Loss of limb function or joint motion.
- c. Soft tissue swelling.
- d. Abnormal mobility at the fracture site.
- e. Deformity--angulation, rotation, or shortening.
- f. Crepitus.
- g. Ecchymosis--discoloration.
- h. Attitude--way the patient guards the injured part.

6. Perform a physical examination.

- a. Always compare the injured extremity with the uninjured extremity.
- b. Estimate the associated blood loss. The following figures should serve as a guide. Always base resuscitative efforts on the patient's condition. Hemorrhage into a fracture site and soft tissue may exceed the following:
 - (1) Two units in a closed femoral fracture.
 - (2) Two to four units in an unstable pelvic fracture.
 - (3) Two units in a tibia fracture.

NOTE: Blood loss secondary to open fracture is unpredictable, and depends on the bone involved and the amount of vascular compromise.

- c. Exclude anatomical complications of fracture.
 - (1) Vascular complications.
 - (a) Note skin color and temperature.
 - (b) Test for sensation and movement.
 - (2) Neurological complications. Test for sensation and movement.
 - (3) Visceral lesions occur in pelvic, spine, or chest fractures.
- d. Examine for associated fractures.
 - (1) Calcaneus fracture. Also look for compression fractures of the spine.
 - (2) Hip dislocations or fracture. Also look for knee injury--especially if the mechanism of injury is an automobile accident.
 - (3) Head injury. Look for associated cervical spine injuries.
- e. Do not move the extremity to check for crepitus.
- f. Do not turn a closed fracture into an open fracture.
- g. Check active motion. Ask the patient to move the extremity.

NOTE: Range of motion should be measured by a goniometer, if available.

- h. Gentle, passive motion.

NOTE: Do not passively move obvious fracture or dislocation on an extremity that the patient refuses to move actively.

7. Request or perform a radiographic examination.

- a. Radiologic studies are much more likely to yield the correct diagnosis if they are based on a complete history and a thorough physical examination rather than instant clinical impressions or even a strong hunch.
- b. Once you have established a presumptive diagnosis, stop. Consider whether the films you are about to request are going to give you all the information you expect from them. Be certain at all times to request exactly what you want.
- c. Understand the purpose of X rays.

Performance Steps

- (1) Detect fractures.
- (2) Evaluate seriousness of the fracture.
- (3) Indirectly assess ligamentous integrity.
- (4) Evaluate for possible complications.
- (5) Follow results of treatment.
- d. Apply the "rule of twos," which is compare left to right.
 - (1) Two views. A fracture or dislocation may not be seen on a single X ray but at least two views (anteroposterior and lateral) must be seen.
 - (2) Two occasions. If no fracture is visible on X ray but the patient has positive clinical findings, repeat X rays in 10 days.
 - (3) Two joints. In long bone injury, there is often associated injuries to the joint. The X ray must show the joint above and below the fracture site.
 - (4) Two limbs. Comparison views of the normal side may be helpful--especially in children with open epiphysis.

8. Describe a fracture.

NOTE: When consulting by phone, the orthopedic surgeon will want to know the specific information about the fracture.

- a. Open versus closed (how much soft tissue injury).
- b. Complete or incomplete.
- c. Anatomic location.
- d. Bone involved.
- e. Type of fracture--spiral, oblique, and so on.
- f. Angulation, displacement, or impacted.
- g. Percentage of joint surface involved.

NOTE: Types of fracture are closed, transverse, mid shaft, right femur fracture, without displacement, or angulation.

9. Manage a fracture.

NOTE: All life-threatening injuries take precedence over any fracture or dislocation.

- a. Gentle handling. Do not turn a closed fracture into an open fracture..
- b. Evaluate soft tissue, and splint extremity.
- c. Leave open wounds open, and apply a sterile dressing.
- d. Manipulative realignment of a limb before diagnostic radiograph is warranted if there is severe neurovascular compromise from the angulated fracture.
- e. Splinting is the cornerstone of first-line treatment for orthopedic injuries. Splinting is important for the following reasons:
 - (1) Relieve pain.
 - (2) Protect against further injury.
 - (3) Prevent fracture displacement.

NOTE: In many cases, splinting will be the only needed treatment.

10. Perform definitive fracture treatment. Remember the three Rs of fracture treatment.

- a. Reduction--only if the fracture is displaced. Three methods of fracture reduction are:
 - (1) Three methods of fracture reduction are manipulation, traction, and operation.
 - (2) General rules for reduction.
 - (a) Reduction should be done as soon as possible.
 - (b) Apply traction in the long axis of the limb.
 - (c) Reverse the mechanism that produced the fracture.
 - (d) Align the fragment that can be controlled with the one that cannot.
 - (e) Never forcefully manipulate a fracture to attain anatomic alignment.
 - (f) Ensure accurate apposition of fragments.
 - (g) Prevent angular or rotational deformities.
 - (h) Restore normal function of the joints above and below the fracture site.
 - (i) Reposition nearly perfectly articular fractures.
- b. Retention--though not necessarily with total rigidity.

Performance Steps

- (1) Sling.
- (2) Plaster (task 081-833-4365, Apply a Cast).
- (3) Traction (task 081-833-4364, Improvise Common External Traction Devices).
- (4) Internal or external fixation. Refer or evacuate the patient for surgery.
- c. Rehabilitation--until maximum function has returned.
 - (1) Immobilization of a joint is always associated with some degree of stiffness.
 - (2) Splints and casts lead to loss of muscle tone and strength.
 - (3) Rehabilitation should begin when the splint or cast is applied.
 - (4) Active exercise should be encouraged for all unsplinted joints.
 - (5) Prescribe isometric or isotonic muscle exercises.
 - (6) Teach crutch ambulation.
 - (7) All patients with casts or splints should have an orthopedic referral and/or physical therapy consult.
 - (8) Other modalities are heat, massage, or orthotics.
11. Record all treatment in the patient's medical record.
12. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage an open or closed fracture.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions and general terminology associated with fractures.	_____	_____
2. Solicited a patient history.	_____	_____
3. Recognized life-threatening injuries associated with fractures.	_____	_____
4. Recognized limb-threatening injuries associated with fractures.	_____	_____
5. Recognized the signs and symptoms of a fracture.	_____	_____
6. Performed a physical examination.	_____	_____
7. Requested or performed a radiographic examination.	_____	_____
8. Described a fracture.	_____	_____
9. Managed a fracture.	_____	_____
10. Performed definitive fracture treatment.	_____	_____
11. Recorded all treatment in the patient's medical record.	_____	_____
12. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Improvise Common External Traction Devices

081-833-4364

Conditions: You are in a field environment. Given moleskin, elastic bandage, felt pads or cotton, rope or cord, a spreader bar, soap, water, and razor and blades.

Standards: Apply the correct amount of traction to the extremity without causing further injury to the patient.

Performance Steps

1. Inspect the skin of the lower extremity to determine the scope of injury.
 2. Check the pulse in the lower extremity to ensure blood circulation.
NOTE: If none, assess the neurovascular status before, after, and at intervals during the procedure. If pulses continue to be absent, continue with this task and evacuate as soon as possible.
 3. Clean the lower extremity as best as possible under the circumstances.
 4. Shave the extremity, if possible.
 5. Pad the bony prominences to prevent further injury.
 6. Apply moleskin to the extremity, as needed, to aid in wound protection and extra padding.
 7. Wrap the extremity with elastic bandage from the ankle to the thigh.
 8. Attach a rope through the elastic bandage to a spreader bar in line with the long axis of the extremity.
 - a. Rope can be any of the following:
 - (1) Twisted vines.
 - (2) Belts tied together.
 - (3) Torn clothing.
 - b. Spreader bar can be any of the following:
 - (1) Stiff branch.
 - (2) Canteen cup with a hole drilled in the center.
 - (3) Unopened abdominal bandage tapped to the device.
 9. Align the rope over a pulley or pivot point so that tension is pulled in line with the long axis of the extremity.
 - a. A pulley consists of a wheel with a grooved rim in which pulled rope or chain is run.
 - b. A pivot is a short rod or shaft about which a related part rotates or swings.
 10. Attach 5 pounds of weight to the rope.
CAUTION: The device used to attach the weight to the extremity must not be so tight as to restrict the blood flow. The force applied by the weight must not exert uneven pressure that would cause skin necrosis.
- NOTE: Add additional weight until the patient experiences relief of pain. The relief will often be dramatic by adding as little as 2 or 3 pounds. Weight may then be reduced over the following days as the muscle spasm (that the traction device is designed to overcome) diminishes.
11. Perform a postreduction examination of the extremity to evaluate the following:
 - a. Reduction efficacy.
 - b. Neurovascular status.
 CAUTION: Pain in traction indicates the possibility of compartment syndrome.
 12. Check the pulse in the extremity hourly.

Performance Steps

13. Record the procedure.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must improvise common external traction devices.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined the scope of injury.	_____	_____
2. Checked the pulse in the lower extremity.	_____	_____
3. Washed the lower extremity.	_____	_____
4. Shaved the extremity, if possible.	_____	_____
5. Padded the bony prominences.	_____	_____
6. Applied moleskin to the extremity.	_____	_____
7. Wrapped the extremity with elastic bandage from the ankle to the thigh.	_____	_____
8. Attached a rope through the elastic bandage to a spreader bar so that tension is pulled in line with the long axis of the extremity.	_____	_____
9. Aligned the rope over a pulley or pivot point so that tension is pulled in line with the long axis of the extremity.	_____	_____
10. Attached 5 pounds of weight to the rope.	_____	_____
11. Increased the weight incrementally until pain noticeably decreased.	_____	_____
12. Performed a postreduction examination.	_____	_____
13. Checked hourly the pulse in the extremity.	_____	_____
14. Recorded the procedure.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage a Cervical Fracture/Dislocation
081-833-4372

Conditions: Given M-5 medical kit.

Standards: Manage a cervical spine fracture or dislocation so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Manage the cervical fracture in the field setting. (See task 081-833-0092, Transport a Casualty With a Suspected Spinal Injury.)
2. Estimate the severity of the cervical spine injury on the basis of the mechanism of injury and the kinematics of trauma.
 - a. Flexion.
 - (1) The force is dissipated through compression of the cancellous portion of the vertebral body. Flexion injuries are commonly seen in car accidents.
 - (2) In the common flexion-type injury, the energy is dissipated with the production of a flexion compression deformity of the anterior portion of the vertebral body. This deformity is an exterior-anterior wedge flexion compression fracture
 - (3) Flexion injury is not associated with a neurological deficit, since the spinal cord is not injured.
 - (4) Examples of flexion injuries are as follows:
 - (a) Subluxation (potentially unstable).
 - (b) Bilateral facet dislocation (always unstable).
 - (c) Wedge fracture (stable).
 - (d) Flexion teardrop fracture (extremely unstable).
 - (e) Clay-Shoveler's fracture (stable).
 - (f) Odontoid fracture with lateral displacement fracture (unstable).
 - b. Extension.
 - (1) The posterior ligamentous complex remains intact.
 - (2) The force may produce disruption of the anterior longitudinal ligament, with or without associated avulsion fracture from the anterior superior portion of the vertebral body.
 - (3) There is no neurological deficit.
 - (4) In the arthritic spine with osteophyte formation, a fracture may occur with the presence of a neurological deficit.
 - (5) Examples of extension injuries are as follows:
 - (a) Posterior neural arch fracture of the first cervical vertebrae (C1) (unstable)
 - (b) Extension teardrop fracture (usually stable in flexion and unstable in extension).
 - (c) "Hangman's fracture," which involves the second cervical vertebrae (C2) (unstable). This injury is common in rear-end automobile accidents.
 - c. Vertical compression (axial load).
 - (1) Occurs when the top of the head strikes a firm object, producing an axial load without a flexion component. Common in diving and automobile accidents.
 - (2) The axial load is transmitted to and produces a fracture through the central portion of the vertebral body with an anterior displacement of the anterior portion of the vertebral body and a posterior displacement of the posterior portion of the body.
 - (3) The posterior ligamentous complex remains intact.
 - (4) There may be a neurological deficit secondary to the posterior displacement of the vertebral body into the spinal cord.
 - (5) Examples of vertical compression are as follows:
 - (a) Burst fracture of the vertebral body (stable).
 - (b) Jefferson fracture of the vertebral body (extremely unstable).
 - (c) Isolated fractures of articular pillar and vertebral body (stable).
 - d. Lateral bending.

Performance Steps

- (1) This injury is produced by forced lateral bending of the cervical spine.
- (2) The abnormal loading of the lateral masses may produce a fracture through the pedicles or facet joints.
- (3) A peripheral nerve entrapment syndrome may occur (stable).
- e. Rotation.
 - (1) The rotation component disrupts the posterior ligament complex, producing an unstable spine.
 - (2) The capsule of the facet joint may be disrupted, producing a unilateral dislocation of the facet joint.
 - (3) Both facet joints may be dislocated, producing anterior displacement of the vertebrae of 50 percent or more of the corresponding lower vertebrae.
 - (4) Fracture may occur through the facet joints, pedicle, lamina, or vertebral body.
 - (5) Examples of rotation injuries are as follows:
 - (a) Unilateral facet dislocation (stable).
 - (b) Rotary atlantoaxial dislocation (unstable).
 - (6) Neurological deficit may be produced if there is posterior displacement of the remainder of the body into the spinal canal.
- f. Flexion (axial load). This injury may produce incomplete disruption of the posterior ligamentous complex (unstable).
- g. Extension (axial load). This injury disrupts the posterior elements and an avulsion fracture of the anterior superior portion of the vertebral body (unstable).

3. Solicit a patient history.

4. Recognize significant subjective findings for cervical fracture or dislocation.

NOTE: As a general rule, all patients with serious injuries to the cervical spine will complain of significant pain in the cervical area. This symptom should not be taken lightly (given the history that the patient was involved in an accident).

- a. Pain usually is localized over the spinous process.
- b. Loss of movement and/or sensation is possible.
- c. A feeling of neck instability is possible.

5. Perform a physical examination.

6. Recognize significant objective findings for a cervical fracture or dislocation.

- a. Edema over the affected area.
- b. Ecchymosis or discolorations--bruising or abrasions--in the region of the forehead and face, and along the temporal region, occipital region, neck, shoulders, or scapular regions.
- c. Visible deformity or prominence of the spinous processes.
- d. Loss of consciousness. Evaluation of the level of consciousness, orientation, and cranial nerve function is mandatory (task 081-833-4150, Assess Nervous System Disorders).
- e. Respiration. Observance of the patient's respiratory status may reveal abdominal breathing only.
- f. Head position. Postural attitude of the head on the trunk; patient trying to support his head or neck.
- g. Eye movements. Note whether the patient can follow an object with his eyes only or if he moves the entire head.
- h. Sensory examination.
 - (1) Discrimination between superficial (pin prick) and deep discrimination indicates preservation of the lateral spinal cord columns.
 - (2) Anterior column function is usually evaluated by the presence or absence of light touch.
 - (3) Posterior column function is indicated by the presence or absence of deep pain sensation, vibration, and proprioception (position sense).
 - (4) Dermatome patterns should be carefully tested to determine discrimination between a sharp and a dull sensation; may indicate an incomplete lesion.

NOTE: Paralysis and loss of sensation may mask intra-abdominal and lower extremity injuries.

Performance Steps**i. Motor examination.**

- (1) Spinal lesions above the fourth cervical vertebrae (C4) usually result in immediate death because of paralysis of all respiratory muscles and diaphragm paralysis.
- (2) Lesions below the fifth cervical vertebrae (C5)--both intercostal and abdominal musculature--will be flaccid, leaving only the phrenic innervated diaphragmatic muscle functioning.
- (3) C5 function is indicated by activity in the deltoid, biceps, and brachialis muscles.
- (4) Sixth cervical vertebrae (C6) function is indicated by activity in the abductor pollicis longus, (wrist) the extensores pollicis brevis and longus, and the extensores carpi radialis longus and brevis.
- (5) Seventh cervical vertebrae (C7) function is indicated by activity in the triceps, finger extensors, flexor carpi radialis, and ulnaris.
- (6) Eighth cervical vertebrae (C8) function is indicated by activity of the flexors digitorum sublimis or profundis.
- (7) First thoracic vertebrae (T1) function is indicated by activity in the lumbricals or interossei.

NOTE: Preservation of sacral sensory and motor functions may be the only sign of an incomplete lesion and may indicate significant recovery with time.

j. Reflexes.

- (1) Deep tendon reflexes (DTRs) depend on level and severity of injury.
- (2) Cremasteric reflex is the retraction of testis when skin is stroked on front, inner side of thigh. This reflex occurs if injury is below first lumbar vertebrae (L1).
- (3) Abdominal reflexes are present if injury is below eleventh thoracic vertebrae (T11).
- (4) Babinski reflex is the dorsiflexion of the great toe on stimulating the sole of the foot (normal). If the toe extends instead of flexes and the outer toes spread out, Babinski's reflex is present. This is a pathologic reflex in any serious injury at any level. (Normal in infants under the age of 6 months.)
- (5) Bulbocavernosus reflex (normal reflex) is the contraction of the anal sphincter around the gloved finger when the glans penis is squeezed, when pressure is applied to the clitoris, or a urethral catheter is tugged.
- (6) Rectal examination.
 - (a) Absence of sensation around the anal area or immediately within the rectum indicates a complete sensory lesion.
 - (b) Absence of voluntary contraction of the anal sphincter during rectal examination and no voluntary motor control below the upper extremities indicates complete motor paralysis.

k. Range of motion.

NOTE: Do not perform if the cervical spine is possibly unstable (that is, posttraumatic).

- (1) Flexion (extension).
 - (a) Patient nods "yes."
 - (b) Fifty percent of motion demonstrates occipital and C1 articulation.
- (2) Lateral flexion.
 - (a) Ear to shoulder.
 - (b) Normal range is 40 degrees.
- (3) Rotation.
 - (a) Patient shakes head "no."
 - (b) Fifty percent of rotation demonstrates C1 to C2 articulation.
 - (c) Normal range is 70 degrees.

l. Strength. Test the following:

- (1) Sternocleidomastoid (SCM) in the following:
 - (a) Flexion.
 - (b) Extension.
 - (c) Lateral rotation.
- (2) Paravertebral extensor muscles.
- (3) Trapezius.
- (4) Scalene muscles (tested by lateral bending).

Performance Steps

- m. Special maneuvers.
 - (1) Compression test.
 - (a) Cervical spine is compressed.
 - (b) Positive, if the pain is increased.
 - (c) Causes of increased pain, such as increased neural foramen narrowing, increased facet joint pressure with inflamed joint, and muscle spasm.
 - (2) Valsalva test.
 - (a) Patient asked to perform Valsalva maneuver.
 - (b) Pain after Valsalva maneuver is caused by herniated nucleus pulposus (HNP) or tumor.
 - (3) Swallowing test.
 - (a) Pain with or difficulty in swallowing.
 - (b) Usually caused by some sort of pathology in the anterior portion of the cervical spine such as bony protuberances, bony osteophytes, or soft tissue swelling as a result of hematoma, infection or tumor.
 - (4) Adson test. Tests for compression of the subclavian artery.
 - (a) Take patient's radial pulse.
 - (b) Abduct, extend, and externally rotate the arm at the shoulder.
 - (c) Have the patient take a deep breath and rotate the head toward the arm being tested.
 - (d) Repeat with the other arm.
 - (e) Note if pain is relieved or absent; if yes, test is positive.
 - (5) Distraction test. Tests mainly for narrowed neural foramen.
 - (a) Apply traction to the head and neck.
 - (b) Note if pain is relieved; if it is, test is positive.
 - (c) Pain is caused by nerve root compression as a result of narrowing foramen, facet joint capsule pressure reduction, or alleviation of muscle spasm.

- 7. Recognize significant radiographic findings for cervical spine abnormalities.
 - a. Maintain cervical immobilization until X rays are examined to ensure no fractures are present.
 - b. All seriously injured patients must have a portable, lateral X ray of the cervical spine, if available.
 - c. If portable X rays are not available, it is imperative that the examiner accompany the patient to the X ray department to supervise the movement of the patient during the X rays of the cervical spine.
 - d. Never accept an X ray examination of the cervical vertebrae without seeing all seven cervical vertebrae.

NOTE: Patients will frequently elevate their shoulders in a reflex protective muscle spasm. As a result, the shoulder shadow will interfere with visualization of C6, C7, and T1, which are common sites for fracture or dislocation. Gentle downward traction on the upper extremities can usually overcome the poor visualization of the C6 and C7. If the C6, C7, and T1 interval is still not well visualized, a "swimmer's view" may be helpful. The X ray is taken while one arm is abducted 180 degrees with the opposite arm along the side. The X ray beam is then directed at a 60-degree, oblique angle.

- e. First X ray should be a straight, lateral view of the cervical spine.
- f. If the lateral view is negative, obtain the following:
 - (1) Open mouth (odontoid) view.
 - (2) Anteroposterior view.
 - (3) Oblique views.
- g. Remember the ABCS of spinal diagnosis.
 - (1) A: alignment. Consider anterior-posterior and lateral.
 - (2) B: bony changes. Examine the circumference of each bone.
 - (3) C: cartilage space assessment.
 - (4) S: soft tissue deformity.
- h. Recognize X ray findings for specific cervical fractures or dislocations.
 - (1) Atlas (C1) fracture:

Performance Steps

- (a) Lateral fracture of the posterior arch.
- (b) Open mouth view. Lateral displacement of lateral masses.
- (2) Explosion fracture or bursting fracture:
 - (a) Anterior to posterior (AP). Decrease in height and increase in width of the vertebral body (crush).
 - (b) Lateral. Decreased height with an increased anteroposterior diameter.

NOTE: The major vertebral body displacement is usually anterior and lateral.

- (3) Odontoid (C2) fracture:
 - (a) Type I. Fracture throughout the upper portion of the dens.
 - (b) Type II. Fracture at the junction of the dens with the vertebral body.
 - (c) Type III. Fracture through the vertebral body.
 - (d) Odontoid view. Diagnostic.
 - (e) Lateral view of a flexion injury. Shows C1 and dens displaced anteriorly.
 - (f) Lateral view of an extension injury. Shows the dens displaced posteriorly.
- (4) Pedicle fracture of C2 vertebra.
 - (a) Retropharyngeal space may be widened on the lateral view (normal is 4 to 6 millimeters (mm) at C4 and 8 to 10 mm at C6).
 - (b) Rule out fracture of the lower vertebra.
- (5) Fracture spinous process C7 or T1 (clay shoveler's fracture).
 - (a) Lateral view. Avulsion fracture of the spinous process.
 - (b) Differential diagnosis. Cervical dislocation with fracture.
- (6) Hyperextension injury (whiplash). X rays are normal.

NOTE: Never use the term "whiplash" as a medical diagnostic term; it is more of a legal diagnosis.

8. Manage specific cervical fractures or dislocations.

- a. Atlas (C1) fracture.
 - (1) In the field setting, apply a cervical collar with upper spinal immobilization for 6 to 8 weeks. A plaster body jacket, or Kedrick extraction device, or similar vest-type device would work to immobilize the upper spine.
 - (2) If possible, evacuate the patient for skull traction and immobilization and possible fusion surgery.
- b. Explosion fracture or bursting fracture:
 - (1) If possible, evacuate the patient.
 - (2) Bedrest until asymptomatic.
 - (3) Plaster body jacket for 3 months and then a corset for 2 to 3 months.
 - (4) Physical therapy.
- c. Odontoid (C2) fracture.
 - (1) Type I. Cervical collar.
 - (2) Type II. Evacuation or referral for reduction and application of a halo apparatus without distraction 3 to 4 months or an operative fixation.
 - (3) Type III. Traction 10 to 14 days and cervical collar 18 to 20 weeks.
- d. Pedicle fracture of C2 vertebra (hangman's fracture).
 - (1) Protection of the airway. Retropharyngeal edema often develops, requiring cricothyrotomy or tracheostomy.
 - (2) Evacuation or referral for application of a halo apparatus for 3 months.
- e. Fracture spinous process C7 or T1 (clay shoveler's fracture). Cervical collar 2 to 3 weeks.
- f. Hyperextension injury.
 - (1) Cervical collar for 10 to 14 days.
 - (2) Physical therapy.

9. Record all treatment in the patient's medical record.

10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must manage a cervical spine fracture or dislocation.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Managed the cervical fracture in the field setting.	—	—
2. Estimated the severity of the cervical spine injury on the basis of the mechanism of injury and the kinematics of trauma.	—	—
3. Solicited a patient history.	—	—
4. Recognized significant subjective findings for cervical fracture or dislocation.	—	—
5. Performed a physical examination.	—	—
6. Recognized significant objective findings for a cervical fracture or dislocation.	—	—
7. Recognized significant radiographic findings for cervical spine abnormalities.	—	—
8. Managed specific cervical fractures or dislocations.	—	—
9. Recorded all treatment in the patient's medical record.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
EMT-P, BRADY 3RD ED. 1997

Manage Common Dislocations

081-833-4390

Conditions: You are in a field environment. An assistant is available. Given an SF Tactical Medical Equipment Set, x-ray equipment (if possible), analgesics, muscle relaxants, splinting materials, iodophor solution, fine mesh gauze, loosely woven roller bandage, sterile normal (0.9 percent) saline solution, broad spectrum antimicrobials, and tetanus antitoxin.

Standards: Identify and manage a common dislocation without causing further injury to the patient.

Performance Steps

1. As a minimum, elicit a history using the "AMPLE" format: A for allergies, M for medications (taken at present), P for previous injury, L for last meal, and E for events preceding the injury.

NOTE: In addition, include information such as duration of symptoms, onset of the problem, mechanism of the injury, and the extent of involvement.

2. Perform a thorough physical examination (PE).
 - a. Ascertain the degree of involvement and extent of the injury but not at the cost of increasing the trauma to the patient. Orthopedic injuries, by their nature, tend to be quite painful.
 - b. Assess neurovascular function before and after treatment and/or reduction. The importance of this assessment cannot be overemphasized.
 - c. Determine the extent of soft tissue damage. It should also be stressed that there is always soft tissue involvement. Often there will be ligament, tendon, lymphatic, vascular, and neurological trauma (or a combination of them).

NOTE: X ray capability is a vital aspect of diagnosis, treatment, and follow-up care. Accessibility and proximity to X ray and other definitive care facilities should be anticipated in the planning stages of operations.

3. If an open wound is located with the dislocations, clean it as aseptically and atraumatically as possible.

NOTE: If facilities are available, culture the wound before debridement.

- a. After hemorrhaging is controlled, perform a minimal debridement as soon as possible.

NOTE: Once treated in the field, the wound should preferably not be subjected to further uncovering or examination (exam) except in a stabilized (sterile) environment, for example, the operating room of a definitive care facility.

- b. Irrigate the wound with copious amounts of sterile normal (0.9 percent) saline solution. Dress with an iodophor solution impregnated fine mesh gauze and protect with a loosely woven roller gauze bandage.
 - c. Immediately institute broad spectrum antimicrobials (covering both gram-positive and gram-negative organisms, for example, cefazolin, 1 gm IV) every 6 to 8 hours in addition to tetanus prophylaxis.

4. Administer analgesics and muscle relaxants as necessary to facilitate reduction and decrease posttrauma pain. IV administration of a narcotic analgesic provides prompt pain relief for splinting, X rays, and movement of the patient.

CAUTION Remember that coexisting head, chest, or abdominal injuries may contraindicate the use of narcotic analgesics.

5. Perform reduction and immobilize as indicated. Correct deformities due to a dislocation as soon as possible. Minimize skin tension, compression, or excessive stretching of soft tissues.

CAUTION Deformities close to or involving a joint are not forcibly corrected without X ray confirmation of the diagnosis and technical expertise in reduction maneuvers. NOTE: The splint must be adequately padded to prevent further soft tissue compromise.

Performance Steps

- a. Shoulder Dislocations. Resistance to the exam (involving passive movement and active abduction) should be expected with a shoulder dislocation. The acromion is prominent and the humeral head can usually be palpated anteriorly. Neurovascular status assessment and documentation is mandatory to evaluate axillary nerve injury. Anterior dislocation is seen in 95 percent of shoulder dislocations. Reduction is accomplished by the following actions:
 - (1) Achieve muscle relaxation via the administration of either 50 mg meperidine HCL IV or 5 mg diazepam IV.
 - (2) Place the patient in a prone position with the involved arm and shoulder hanging dependently over the edge of a litter, stretcher, or table.
 - (3) Secure a 10-pound weight in the patient's hand with adhesive tape.

NOTE: 20 to 30 minutes is usually sufficient time to bring about reduction. If not, it may be achieved by placing the hands under the axilla and lifting laterally using 5 to 10 pounds of force with gently internal and external rotation. Reduction may be performed under general anesthesia if previous steps are unsuccessful. Traction is applied to the arm in 30 to 40 degrees of abduction and 15 to 20 degrees of flexion with the elbow at 90 degrees. If necessary, an assistant may place a hand under the axilla to provide lateral traction. Obtain a postreduction X ray.

- (4) After reduction, external rotation and abduction are avoided for 6 weeks. gradual circumduction and range of motion exercises (at 2 - 3 days and 2 to 3 weeks, respectively) are employed as tolerated by the patient. A sling and swathe, powdered liberally with talc, are recommended. In adults, the redislocation rate is high. For recurrent dislocation, refer to an orthopedic surgeon for evaluation for surgical repair.
- b. Elbow Dislocations. The mechanism of an elbow dislocation is usually a fall on the hyperextended arm.
 - (1) Take a history and perform a thorough PE including mechanism of injury, effusion, past history of elbow injury, ecchymosis, range of motion, stability (as compared to the opposite side), and comparison of the epicondyle with the top of their respective olecranon processes. They should form an isosceles triangle. Evaluate and document ulnar nerve function.
 - (2) Reduce immediately. Reduction can usually be achieved by gentle traction on the slightly flexed elbow. It is advisable to place pressure over the olecranon and lift it distally and anteriorly. Providing some of the collateral ligaments remain intact and reduction is complete, the resultant relative joint stability should allow early mobilization. If reduction is incomplete, soft tissue interposition (especially neurovascular structures) indicate open reduction and, hence, evacuation.
 - (3) If the elbow is relatively stable, place it in a posterior splint long enough to support the wrist and maintain elevation until swelling subsides, at which point active flexion is initiated to minimize flexion contracture.

CAUTION Passive range of motion is contraindicated.

- (4) Discontinue the splint after full extension is achieved. If the elbow is unstable, splint it in flexion 2 to 3 weeks with elevation to control swelling and then employ active exercises to regain range of motion.
 - (5) If any doubt exists in regard to reduction, stability, or degree of involvement, evacuate the patient for orthopedic referral.
- c. Lunate or Perilunate Dislocation. It is the result of hyperextension with the lunate pushed volarly.
 - (1) Examine for fullness on the volar aspect of the wrist with tenderness and infrequent signs and symptoms of median nerve compression.
 - (2) Reduce early under regional or general anesthesia to provide adequate muscle relaxation. Manipulative reduction is accomplished under prolonged heavy traction or by hyperextension of the wrist in traction with pressure directed dorsally over the volarly dislocated lunate.
 - (3) While pressure is maintained, bring the wrist into flexion, immobilize the wrist in a dorsal splint, and place the hand in a compression dressing for the first 24 to 72 hours.
 - (4) Remove the hand dressing and initiate active exercise of the fingers.
 - (5) Maintain the wrist in a splint for 4 to 6 weeks.

Performance Steps

- d. Metacarpal Phalangeal (MCP) Joint Dislocation. This injury is usually surgically reduced because of the soft tissue problems that tend to arise. Hence, immobilize the injury and refer to an orthopedic surgeon for further disposition.
- e. Proximal Interphalangeal (PIP) and Distal Interphalangeal (DIP) Joint Dislocation.
 - (1) Reduce by gently closed manipulation with or without local anesthesia.
 - (2) Use a splint until acute swelling and pain resolve. It should be removed within 10 days to begin range of motion exercises.

NOTE: Advise the patient to expect stiffness, tenderness, and in some cases, permanent thickening about the joint.

- f. Hip Dislocation. Anterior and posterior dislocation of the femoral head must be diagnosed and reduced as quickly as possible, preferably within 12 hours. The more time elapses between injury and the reduction, the greater the likelihood of posttrauma complications, especially a vascular necrosis of the femoral head and sciatic nerve trauma. Anterior dislocations (10 percent) present with mechanism of injury of forced abduction. On PE, there is usually little or no shortening of the limb; the leg is flexed, abducted, and externally rotated. Posterior hip dislocation accounts for 90 percent of hip dislocations. The mechanism of injury in posterior hip location is force against the flexed lines with the hip in flexion. Clinical manifestations include the following: the leg is flexed, abducted, internally rotated at the hip and shortening of the limb, with the greater trochanter and buttock usually more prominent.
 - (1) As with a fracture, assess neurovascular status before reduction.
 - (2) With the patient lying on his back on the floor, administer IV analgesics using Valium and morphine.
 - (3) An assistant makes downward pressure on the iliac spine to provide countertraction.
 - (4) Grasp the affected limb and flex the hip and knee to a right angle. The great toe on the foot of the affected limb should be positioned so as to be just under the medic's buttocks and between the legs.
 - (5) Rotate the limb to a neutral position.
 - (6) Make steady traction on the leg directly upward, lifting the head into the acetabulum.
 - (7) With the head in proper position, extend the thigh and leg carefully.
 - (8) In the event reduction is unsuccessful after two attempts, immobilize and evacuate for orthopedic consultation.
 - (9) After reduction, keep the patient in 5 to 8 pounds of skin traction. Begin isometric exercises of the hip musculature as soon as the pain subsides enough.
 - (10) Maintain traction until the patient is pain free and has established sufficient muscle strength to accomplish near normal abduction and extension. Protective ambulation with crutches is allowed until he is able to walk pain free and without antalgic limp.
 - (11) Follow-up postreduction to minimize complications.
- g. Central Acetabular Dislocations. They result from a blow to the femoral head on the long axis of the femur with the hip in abduction. This injury is often seen in conjunction with other trauma. PE reveals only slight shortening but considerable muscle spasms. For this injury, the patient should be immobilized in a femur traction splint and evacuated for orthopedic surgeon referral since X rays are essential for correct diagnosis.
- h. Anterior Dislocation of the Knee. It is a serious injury that results in a 50-percent amputation rate due to the popliteal artery injury. This injury must be reduced immediately. After reduction, neurovascular status is assessed and documented. The patient should be immobilized and evacuated for evaluation of further trauma by an orthopedic surgeon.

Performance Steps

- i. Impaction of Posterior Dislocation of the Ankle. This injury is usually associated with a fall from a great height or a sudden deceleration injury in a vehicle. This is not usually a single injury but rather accompanied by other pathology. An impaction fracture is usually comminuted and involves the roof of the mortise joint and sometimes an oblique fracture of the medial malleolus. The classic trimalleolar fracture is a fracture dislocation involving fracture of the posterior malleolus, of the tibia, fracture of the medial and lateral malleolus and disruption of the anterior capsule of the ankle joint. On PE, joint tenderness is pathognomonic for injury to the immediately underlying structures. In these injuries, X ray confirmation is essential for diagnosing the degree of involvement or extent of injury. Unstable fractures or those involving both sides of the ankle should be immobilized and the patient evacuated for orthopedic consultation. If only one side of the joint is involved, the injury may be managed by closed reduction and cast immobilization (long leg cast) for 6 to 8 weeks. A-P, lateral and mortise X rays 6 to 8 weeks out of plaster are indicated to assess fracture union. Complications of this injury include chronic ankle instability, nonunion, and avascular necrosis of talus. Often a second surgical procedure to "fuse" the joint is necessary. As always, assessment and documentation of neurovascular status prereduction and postreduction are mandatory. Injuries managed by open reduction have a 30 percent infection rate.
6. If reduction or alignment is difficult or impossible to attain or there is a neurovascular deficit, splint the injury as well as possible and evacuate the patient for an orthopedic surgeon's consultation.
7. Be sure all findings and treatments rendered are documented.
8. Obtain postreduction X rays, if possible.
9. Refer for follow-up care by an orthopedic surgeon, when possible.
10. Always indicate evacuation when any doubt whatsoever exists in regard to the degree of involvement, stability, or reduction of a dislocation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Elicit a patient history.	_____	_____
2. Perform a physical examination.	_____	_____
3. Administer pretreatment medication.	_____	_____
4. Perform reduction and/or immobilization, as required.	_____	_____
5. Continuously assess and document neurovascular status.	_____	_____
6. Obtain prereduction and post reduction X rays, if facilities permit.	_____	_____
7. Recommend evaluation by an orthopedic surgeon.	_____	_____
8. Evacuate, if indicated.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

EMT-P, BRADY 3RD ED. 1997

Manage Common Soft Tissue Injuries of the Extremities

081-833-4411

Conditions: Given splinting material, rolled elastic bandages, ice, and nonsteroidal anti-inflammatory drugs (NSAIDs).

Standards: Manage common soft tissue injuries of the extremities so that the life function of the limb is preserved and restored without causing further harm.

Performance Steps

1. Understand the general characteristics of tendinitis.
 - a. Definition: inflammation of a tendon or tendon muscle attachment.
 - b. Tenosynovitis: inflammation of the synovium surrounding a tendon.
 - c. Etiology:
 - (1) Overuse.
 - (2) Direct trauma.
 - (3) Degenerative changes.
 - (4) Occupation.
 - (5) Infection.
2. Recognize the signs and symptoms of tendinitis.
 - a. In acute phase, pain with tendon function.
 - b. Crepitation is felt with tendon movement.
 - c. Erythema.
 - d. In chronic phase, initial pain may disappear during activity.
 - e. Impaired function of the involved tendon.
 - f. Common locations are as follows:
 - (1) Rotator cuff (supraspinatus).
 - (2) Long head of biceps.
 - (3) Radial aspect of the wrist (de Quervain's tenosynovitis).
 - (4) Insertion of the hand extensors on the lateral epicondyle (tennis elbow).
3. Recognize significant X ray findings for tendinitis.
 - a. Soft tissue swelling.
 - b. Calcification may be found in the affected soft tissue.
4. Manage tendinitis.
 - a. Directed toward etiology.
 - b. Rest until pain resolves.
 - c. Acute phase (ice).
 - d. Chronic phase (heat).
 - e. NSAID.
 - f. Ultrasound.
 - g. Rehabilitation (do not exceed pain threshold).
 - h. Referral to orthopedics if conservative management fails.
5. Recognize possible complications of tendinitis.
 - a. Chronic tendinitis.
 - b. Tendon rupture.
 - c. Adhesive tenosynovitis (adherence between tendon and sheath).
 - d. Constrictive tenosynovitis (thickening of the tendon sheath wall).
 - e. Calcific deposits common in supraspinatus.
 - f. Repeated local steroid injection may cause tendon rupture.
6. Educate patients in prevention of tendinitis.
 - a. Warm up before activity; cool down afterwards.

Performance Steps

- b. Vary training with avoidance of repetitive movements.
- c. Gradual adaptation to new conditions.
- d. Good general conditioning.

7. Understand the general characteristics of a strain.

- a. Definition: damage of some part of the muscle or tendon (muscle tendon unit or attachment).
- b. Etiology:
 - (1) Overuse (excessive forcible stretch).
 - (2) Overstress (violent contractions).
 - (3) Direct trauma (impact).
- c. Categories:
 - (1) First degree (mild).
 - (2) Second degree (moderate).
 - (3) Third degree (severe).

8. Recognize the signs and symptoms of a strain.

- a. First degree (spasm, swelling, local tenderness, and minor loss of function).
- b. Second degree (swelling, ecchymosis, muscle spasm, and loss of strength).
- c. Third degree (marked pain and spasm, ecchymosis, swelling and may hear or feel a sudden "pop" or "snap," soreness or knifelike pain at moment of injury, and palpable defect).

NOTE: Test for muscle function with and without resistance (task 081-833-4374, Assess Common Orthopedic Diseases and Conditions).

9. Request X rays, if available, to rule out avulsion fracture.

10. Manage a strain.

- a. Success of treatment depends on accurate diagnosis of the location and extent of injury.
- b. Incomplete tear:
 - (1) RICE (rest, ice, compression, and elevation).
 - (2) Splint the injured muscle in the shortest position.
 - (3) Rehabilitation (do not massage).
 - (4) Limit activities to pain 4 to 6 weeks.

NOTE: Complete tear requires evacuation or referral for surgical repair before 2 weeks have elapsed postinjury.

11. Recognize complications of a strain.

- a. Compartment syndrome (lower limb).
- b. Myositis ossificans (secondary to early heat and massage and passive range of motion).
- c. Scar tissue (causes weakness of the involved muscle).
- d. Tenosynovitis.

12. Understand the general characteristics of a sprain.

- a. Definition: an injury to a ligament resulting from overstress which causes some degree of damage to the ligament or its attachment.
- b. Fracture-sprain: ligament attachment pulls loose with a fragment of bone.
- c. Etiology: sudden, twisting injury that is excessive to the normal range of motion of the joint.
- d. Categories:
 - (1) Mild (first degree) (Grade I): stretching or microscopic tearing of the ligament fibers.
 - (2) Moderate (second degree) (Grade II): severe stretching and partial tearing of ligament fibers.
 - (3) Severe (third degree) (Grade III): complete rupture of the ligament.

13. Recognize the signs and symptoms of a sprain.

- a. Mild (first degree).
 - (1) Possible swelling.
 - (2) Local tenderness.
 - (3) Weight-bearing is possible.

Performance Steps

- b. Moderate (second degree).
 - (1) Marked tenderness.
 - (2) Swelling.
 - (3) Pain with weight-bearing.
 - (4) Localized discoloration (ecchymosis).
 - c. Severe (third degree).
 - (1) Severe pain.
 - (2) Unable to bear weight.
 - (3) Marked abnormal motion.
 - (4) Joint deformity.
 - (5) Marked swelling.
14. Manage a sprain.
- a. First degree.
 - (1) Administer RICE.
 - (2) Ice, alternating with range-of-motion exercises and then four times a day.
 - (3) Weight-bearing is possible up to pain tolerance.
 - b. Second degree.
 - (1) Administer RICE.
 - (2) For extensive edema, use posterior splint and ice and elevate injured extremity until swelling diminishes).
 - (3) Immobilize for 4 to 6 weeks with a cast or brace.
 - c. Third degree.
 - (1) Refer for orthopedic consultation.
 - (2) Immobilize versus performing surgical repair.
 - d. In all sprains, rehabilitation is the key to recovery.
15. Record all treatment in the patient's medical record.
16. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage common soft tissue injuries of the extremities.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the general characteristics of tendinitis.	—	—
2. Recognized the signs and symptoms of tendinitis.	—	—
3. Recognized significant X ray findings for tendinitis.	—	—
4. Managed tendinitis.	—	—
5. Recognized possible complications of tendinitis.	—	—
6. Educated patients in prevention of tendinitis.	—	—
7. Understood the general characteristics of a strain.	—	—
8. Recognized the signs and symptoms of a strain.	—	—
9. Requested X rays, if available, to rule out avulsion fracture.	—	—
10. Managed a strain.	—	—
11. Recognized complications of a strain.	—	—
12. Understood the general characteristics of a sprain.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
13. Recognized the signs and symptoms of a sprain.	_____	_____
14. Managed a sprain.	_____	_____
15. Recorded all treatment in the patient's medical record.	_____	_____
16. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
EMT-P, BRADY 3RD ED. 1997

Manage Contusions

081-833-4412

Conditions: Given a patient with a nonpenetrating injury to soft tissue that damages skin and underlying tissue and M-5 medical set.

Standards: Assess patient for underlying injuries, and manage patient without causing further harm.

Performance Steps

1. Take patient's history.
2. Assess injury for underlying complications.
 - a. Underlying fracture. Forceful impact of objects creating injury can result in fractures.
 - b. Vascular involvement (extensive bleeding into tissue).
 - (1) Check distal circulation.
 - (2) Measure or mark the outline of the contusion.
 - (3) Measure circumference of injured extremity, and compare measurement to uninjured extremity.
 - c. Neurological involvement. Test the sensation and movement of the injured part. Any signs of neurologic deficit indicates a serious complication.
3. Treat the contusion.
 - a. Ensure that there is no underlying fracture, neurological involvement, or vascular involvement.
 - b. Pad and splint injury, if needed.
 - c. Manage complications appropriately.
 - (1) Apply splint or cast to fractures.
 - (2) Refer vascular or neurologic injury to appropriate care level.
 - d. Prescribe rest, ice, compression, and elevation (RICE).
4. Record all treatment given.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage contusions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Took patient's history.	_____	_____
2. Assessed injury for underlying complications.	_____	_____
3. Treated the contusion.	_____	_____
4. Recorded all treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Abrasions

081-833-4416

Conditions: Given a patient with an abrasion, patient's medical record, and the following medical supplies and equipment: normal saline, sterile water, gauze, exam gloves, forceps, number 11 blade, cream or injectable anesthetic, intravenous (IV) materials, dressing materials, and tape.

Standards: Assess patient for underlying injuries, and manage the abrasion without causing further harm.

Performance Steps

1. Take a patient's history.
2. Assess patient for complications.
 - a. Depth of wound (relates to method of anesthesia and cleaning).
 - b. Amount of body surface (fluid loss can be significant in children).
 - c. Amount of contamination (precursor to infection).
3. Manage the injury.
 - a. Principles of management are as follows:
 - (1) Prevention of infection.
 - (2) Promotion of rapid healing.
 - (3) Prevention of "tattooing" from retained foreign bodies.
 - b. Local anesthesia or IV sedation may be needed depending on the extent of the injuries.
 - c. Wound must be gently but thoroughly scrubbed with normal saline.
 - d. Remove all foreign matter that cannot be scrubbed out by using a needle, number 11 blade, or tissue forceps.
4. Apply dressing with antibiotic ointment.
5. Administer antibiotic therapy, if needed. Antibiotic therapy may be indicated for prophylaxis. Refer to the most current edition of The Sanford Guide to Antimicrobial Therapy.
6. Give patient instructions on wound care and signs and symptoms of infection
 - a. Topical antibiotic ointment applied three times or four times a day.
 - b. Dressing changed every 2 to 3 days with gentle cleaning.
 - c. Monitor abrasion for signs and symptoms of infection.
7. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage abrasions.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Took patient's history.	—	—
2. Assessed injury for complications.	—	—
3. Managed the injury.	—	—
4. Applied dressing with antibiotic ointment.	—	—
5. Administered antibiotic therapy, if needed.	—	—
6. Explained signs and symptoms of infection and wound care instructions to patient.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
7. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required SANFORD, 1999	

Manage Crush Syndrome

081-833-4421

Conditions: Given a patient who has suffered a crush or long-term compression injury, intravenous (IV) fluids, an IV infusion set, splinting material, medications for pain, antibiotics, tetanus prophylaxis, bandages for open wounds, a minor surgical set, and a urinary catheter set.

Standards: Manage crush syndrome so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Identify a patient with risk of developing crush syndrome on the basis of the patient's history.

NOTE: Crush syndrome is the systemic effects (oliguria and edema) of myonecrosis on the renal and cardiovascular systems. Crush syndrome follows severe local injuries--especially involving crushing of the lower extremities. Patient is fine until weight is removed from compressed limb, and then wastes and toxins that have built up in injured extremity flood circulatory system.

- a. Prolonged compression of patient's limb (more than 12 hours).
 - b. Usually associated with patients who have suffered from a long-term compression injury of an extremity; for example, earthquake victims.
2. Know and prepare for the possible complications of crush syndrome.
 - a. Necrotic muscle and tissue.
 - b. Acidosis and hyperkalemia.
 - c. Hypotension and shock.
 - d. Renal failure as a result of myoglobin occluding the distal convoluted tubules.
 - e. Potassium is released from damaged muscle, which leads to hyperkalemia. Hyperkalemia results in cardiac arrhythmias.
 3. Identify the signs and symptoms of crush syndrome.
 - a. Patient may have signs and symptoms of compartment syndrome.
 - b. Hyperkalemia.
 - c. Acidosis.
 - d. Disorientation.
 - e. Coma.
 - f. Possibly cardiac arrhythmias.
 - g. Hypotension.
 - h. Renal failure.
 - i. Swollen, tense limbs may have pressure sores.
 4. Identify the laboratory (lab) values (serum levels) that indicate crush syndrome.
 - a. Creatinine phosphokinase is greater than 10,000 international units (IU).
 - b. Serum creatinine, blood urea nitrogen, and potassium are elevated.
 - c. Dark red- or brown-colored urine that is dipstick positive for blood. However, no red blood cells seen on urine microscopy is a presumptive confirmation of the diagnosis. Sending urine for quantitative myoglobin is usually not necessary (and takes too long).
 5. Manage crush syndrome and complications from crush syndrome.
 - a. Shock (task 081-833-4073, Manage Shock).
 - b. Respiratory depression. Adequately oxygenate and ventilate the patient.
 - c. Renal failure. Administer normal saline by IV to maintain urine output.
 - d. Hyperkalemia. Administer sodium bicarbonate by IV.
 - e. Evacuate or refer the patient to a higher level medical facility for definitive treatment as soon as possible.
 6. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage crush syndrome.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified a patient with risk of developing crush syndrome on the basis of the patient's history.	_____	_____
2. Knew and prepared for the possible complications of crush syndrome.	_____	_____
3. Identified the signs and symptoms of crush syndrome.	_____	_____
4. Identified the lab values (serum levels) that indicate crush syndrome.	_____	_____
5. Managed the crush syndrome and complications of crush syndrome.	_____	_____
6. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Traumatic Amputations

081-833-4424

Conditions: As a special operations medic in a field environment and given M-5 medical kit, and patient's Department of Defense (DD) Form 1380, Field Medical Card.

Standards: Manage traumatic amputations so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of nonpenetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2-F).

2. Assess the severity of the specific injury.

WARNING: The most important concern in the initial management of traumatic amputations is shock. Shock may be present initially or develop later.

- a. Elicit a patient history.
 - (1) Which area was traumatized.
 - (2) When the trauma occurred. Very important to know if the possibility exists that the patient may reach definitive care in time for reattachment surgery.
- b. Inspect the wound for degree of amputation.
 - (1) Complete amputation: Affected body part is completely severed from the body.
 - (2) Partial amputation: Affected body part is still attached to the body by some amount of tissue.

NOTE: Partial amputations should never be turned into complete amputations in the field unless absolutely necessary (for example, for extraction).

3. Perform emergency management for traumatic amputations.
 - a. Combat environment (under fire).
 - (1) Immediately apply a tourniquet.
 - (2) Move the casualty to a covered and concealed location.
 - b. Noncombat environment (not under fire).
 - (1) Implement airway, breathing, and circulation.
 - (2) Control bleeding by the following means:
 - (a) Direct pressure.
 - (b) Pressure point.

NOTE: With either of the above methods, consider the time to definitive care and the severity of blood loss. A tourniquet that prevents excessive blood loss and that will be removed within a few hours at a definitive care facility is preferable to excessive blood loss while trying other methods.

- (c) Tourniquet as close to amputation as possible.
 - (3) Manage shock (task 081-833-4073, Manage Shock).
4. Care for the amputated part.
 - a. Clean only gross dirt or debris from part.
 - b. Wrap part with gauze or other material soaked with 0.9 percent normal saline.
 - c. Keep part cool at about 5 degrees Celsius (40 degrees Fahrenheit), and do not freeze part. Part is viable for about 4 to 6 hours at room temperature or up to 18 hours, if kept cool.
 - d. Transport part to hospital for possible re-implantation or skin graft.
5. Record all treatment in patient's DD Form 1380.
6. Evacuate the patient to a definitive care facility as soon as possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage traumatic amputations.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149. The protocols established in task 081-833-4149 establish the overall trauma sequence.	_____	_____
2. Assessed the severity of the specific injury.	_____	_____
3. Performed emergency management for traumatic amputations.	_____	_____
4. Cared for the amputated part.	_____	_____
5. Recorded all treatment in the patient's DD Form 1380.	_____	_____
6. Evacuated the patient to a definitive care facility as soon as possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	EMT-P, BRADY 3RD ED. 1997

Manage Maxillofacial Trauma

081-833-4449

Conditions: Given M-5 medical kit and patient's medical record.

Standards: Assess and manage maxillofacial trauma without causing further injury to the patient.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of maxillofacial trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2-F).

2. Assess the face and mouth to determine the extent of the injury.
 - a. If time, circumstances, and equipment allow, perform an examination (exam) IAW task 081-833-4002, Perform a Complete Physical Examination.

NOTE: Exam is difficult when edematous distortion and muscular trismus are present. For a thorough clinical exam, you should include inspection and palpation of the oral regions.

- b. Inspect the face for abnormalities.
 - (1) Facial asymmetry.
 - (2) Wounds, swelling, and discoloration.
 - (3) Abnormal mandibular excursions.
 - (4) Cerebrospinal fluid leaking from the ears or nose.
 - c. Palpate the face for pain, tenderness, crepitus, and mobility at suspected fracture sites.
 - d. Perform an oral exam for the following:
 - (1) Lacerations.
 - (2) Salivary duct trauma.
 - (3) Altered biting relationships of the upper and lower teeth.
 - (4) Segmental alveolar fractures. Exert pressure on each individual tooth to determine the integrity of the underlying alveolar bone.
 - e. Evaluate the neurological condition (task 081-833-4150, Assess Nervous System Disorders).

3. Identify fractures, dislocations, and injuries that can result from maxillofacial trauma on the basis of signs and symptoms.

- a. Trauma to the soft tissue. Open wound or discoloration is visible.
 - b. Midface fractures present the following:

NOTE: Fractures of the midface are classified according to the location of the fracture. Lefort I fracture involves the maxilla up to the level of the nasal fossa. Lefort II fracture involves the nasal bones and medial orbits (shaped like a pyramid). Lefort III fracture involves all the bones of the face (craniofacial dysjunction).

- (1) Midfacial edema.
 - (2) Unstable maxilla.
 - (3) Epistaxis.
 - (4) Numb upper teeth.
 - (5) Lengthening of the face.
 - (6) Nasal flattening.
 - (7) Compromised airway possible with Lefort II and III.
 - (8) Cerebrospinal fluid (CSF) leakage and vision impairment possible with Lefort III.
 - c. Zygomatic arch fracture.

NOTE: Is usually associated with orbital fractures.

- (1) Flatness of the cheek.
 - (2) Numbness of the cheek, nose, and upper lip.
 - (3) Epistaxis.

Performance Steps

- (4) Altered vision.
 - d. Orbital fractures.
 - (1) Blowout fractures of the orbit occur when an object strikes the eye and the force is transmitted to the floor of the orbit, resulting in a fracture and possible herniation of the ocular contents into the maxillary sinus.
 - (a) Periorbital edema.
 - (b) Subconjunctival ecchymosis.
 - (c) Diplopia.
 - (d) Enophthalmos (recessed globe).
 - (e) Epistaxis.
 - (f) Anesthesia in the region of the infra orbital nerve (anterior cheek).
 - (g) Impaired extraorbital movements.
 - (2) Other orbital fractures may occur by themselves or with other fractures such as zygomatic arch and LeFort II and III.
 - (a) Pain.
 - (b) Deformity.
 - (c) Periorbital edema.
 - e. Signs and symptoms of mandibular fracture.
 - (1) Pain.
 - (2) Malocclusion.
 - (a) Patient may state that teeth do not "feel right" when mouth is closed.
 - (b) Teeth may not touch on one side when mouth is closed.
 - (3) Crepitus and tenderness to palpation.
 - (4) Gross displacement of segments of the jaw.
 - (5) Possible inability to open mouth.
 - (6) Possible difficulty swallowing.
 - (7) Possible increased salivation.
 - f. Fractures of mandibular condyle.
 - (1) Unilateral fractures present with preauricular pain and swelling and deviation toward affected side when trying to open mouth.
 - (2) Bilateral fractures can produce an anteriorly opened bite.
 - g. Signs and symptoms of a mandibular dislocation.
 - (1) The most common dislocation is bilateral, and the condyles are displaced anteriorly.
 - (2) The mouth is locked open with the chin protruded.
 - (3) Presents in markedly open position, with only most posterior teeth contacting. Midline deviation indicates unilateral dislocation.
 - (4) Trismus may be present, and speech is difficult.
4. Obtain an X ray of suspected fractures, if possible.
5. Manage a patient with a maxillofacial injury.
- a. General management considerations for all types of maxillofacial trauma.
 - (1) Use spinal precautions.
 - (2) Assess the airway for obstructions caused by blood, vomitus, bone fragments, broken teeth, and damage to the anterior neck.
 - (a) Use suction as needed.
 - (b) Turn patient to allow drainage from airway.
 - (3) Secure and maintain airway through oral or nasal adjuncts, tracheal intubation, or cricothyroidotomy.
 - (4) Ensure adequate ventilation and oxygenation.
 - (5) Manage hemorrhage.
 - (a) Digital pressure.
 - (b) Pressure dressings.
 - (c) Clamping or ligature.
 - b. Manage maxillofacial soft tissue injuries.

Performance Steps

- (1) Evaluate the injuries.
 - (a) Examine the head for contusions, swelling, subcutaneous emphysema, tenderness, areas of analgesia, and distension of body landmarks.
 - (b) Check the level of the eyeballs.
 - (c) Check the ear for otorrhea and the nose for rhinorrhea.
 - (d) Palpate the distorted areas for movement.
 - (e) Inspect open wounds for bleeding.
- (2) Apply dressings to open wounds as temporary applications to prevent edema and hematoma.
- (3) Control the pain.

CAUTION: If cerebral injury is present, do not use narcotics.

- (4) Assess neurological functions.
- (5) Debride the wound.
- (6) Perform primary closure on clean wounds that are not at risk for infection and do not involve any underlying structures.

NOTE: Contaminated wounds, wounds associated with fractures (open fractures), and those involving nerve or salivary damage should not be closed by primary closure. They should be bandaged and referred/evacuated for surgery.

- (7) Prescribe antibiotics if the following apply:
 - (a) There were foreign bodies in the wound.
 - (b) There will be a delay between first treatment and definitive care.
 - (c) The wound involves open fractures or open cavities.
- (8) Record the treatment.
- (9) Recommend evaluation by a physician or oral surgeon, as appropriate.
- c. Manage midface, zygomatic arch, and orbital fractures.
 - (1) Manage airway, cervical spine, and hemorrhage, as required.
 - (2) Stabilize the fracture.
 - (3) Protect the eyes, as required.
 - (4) Evacuate the casualty for surgical intervention.
- d. Manage mandibular fractures.
 - (1) Reassess the airway patency, and maintain cervical spine stabilization.
 - (2) Control hemorrhage.
 - (3) Administer local anesthesia and/or analgesics to control pain.
 - (4) Close lip lacerations.
 - (5) Stabilize the jaw with a Barton bandage, and evacuate the patient.
 - (a) Jaw fractures require surgical fixation.
 - (b) The patient with a mandibular fracture should be evacuated in a face down or side position, or sitting upright to prevent aspiration of blood, saliva, or vomitus.
 - (6) Fractures through tooth sockets require antibiotic prophylaxis (penicillin V, erythromycin, or cephalosporins) (task 081-833-4456, Manage Fractured and Avulsed Teeth).
- e. Manage dislocation of the temporomandibular joint.
 - (1) Administer 2 to 5 milliliters (ml) of 1percent lidocaine injected in joint area and in area of insertion of the lateral pterygoid muscle, which may allow spontaneous reduction.
 - (2) Premedicate with diazepam 5 milligram (mg) intravenously (IV) and meperidine 25 mg IV.
 - (3) Stabilize patient's head.

NOTE: Position patient with his back and head against a wall to keep them from pulling away.

- (4) Perform manual reduction by manually sliding the joint posteriorly and inferiorly across the articular eminence back into the fossa.
 - (a) Place thumbs on the occlusal surface of the lower molars bilaterally.
 - (b) Firm pressure is exerted on the thumbs in an inferior direction; the temporomandibular joint (TMJ) will relocate as the condyle slides back into place.
 - (c) Stabilize with Barton-type bandage.
- (5) Tell the patient to avoid opening the mouth excessively for several weeks. If he feels a yawn coming on, he should place one fist under his chin to avoid opening his mouth wide.
- (6) Prescribe a soft diet.

Performance Steps

- (7) Prescribe an analgesic to control pain.
 - f. Manage nasal fractures IAW 081-833-4211, Manage Trauma to the Ear, Nose, and Throat.
- NOTE: If there are CSF leaks or other facial fractures capable of compromising vital functions, evacuate the patient to a higher medical authority.
- g. Manage fractured teeth and avulsed teeth IAW 081-833-4456, Manage Fractured and Avulsed Teeth.
6. Recorded all treatment given in the patient's medical record.
7. Recommended evaluation by a dentist or oral surgeon, as appropriate.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage maxillofacial trauma.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed the casualty.	_____	_____
2. Assessed the face and mouth to determine the extent of the injury.	_____	_____
3. Identified fractures, dislocations, and injuries that can result from maxillofacial trauma on the basis of signs and symptoms.	_____	_____
4. Obtained an X ray of suspected fractures, if possible.	_____	_____
5. Managed a patient with a maxillofacial injury.	_____	_____
6. Recorded all treatment given in the patient's medical record.	_____	_____
7. Recommended evaluation by a dentist or oral surgeon, as required.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Nonpenetrating Injuries to the Abdomen

081-833-4508

Conditions: As a special operations medic in a field environment and given field dressings, Kerlix rolled gauze, 0.9 percent normal saline, pain medications, a selection of broad-spectrum antibiotics, and The Sanford Guide to Antimicrobial Therapy.

Standards: Manage nonpenetrating injuries to the abdomen so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of nonpenetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Assess the severity of the specific injury.

- a. Elicit a patient history.

- (1) Area traumatized.

NOTE: Consider the anatomy of the abdomen in determining possible damage to underlying organs.

- (2) Type of trauma.

- (a) Direct impact: severity of injury estimated by knowing the force and duration of impact, the mass of the patient, and the surface area of the point of contact. Common injuries resulting from direct impact include splenic rupture and liver fractures.

- (b) Deceleration: most often associated with high-speed motor vehicle accidents and falls from heights. As body impacts, organs continue to move forward at decreasing velocity, tearing vessels and tissues from points of attachment. Common injuries include duodenal and aortic rupture.

- (c) Rotary forces: cause tearing injuries resulting from a tumbling type of action.

- (d) Shear forces: common in degloving injuries or when the victim is run over by a heavy vehicle. The skin and subcutaneous tissues are pushed forward, tearing nutrient blood vessels. Extensive soft tissue loss is common.

- (3) When the trauma occurred.

- (4) Prior injuries.

- (5) Onset of symptoms.

- (6) Radiation of pain.

- (7) Type of pain.

- (8) Nausea.

- (9) Hematuria (if the patient has previously voided).

- b. Inspect the abdomen for the following:

- (1) Swelling or distention.

- (2) Bulges.

- (3) Bruises.

- (4) Bloody discharge from rectum or penis.

- c. Auscultate bowel sounds.

- (1) Hyperactive.

- (2) Decreased.

- (3) Absence.

- d. Palpate for the following:

- (1) Abdominal rigidity.

CAUTION: A boardlike rigid abdomen is an ominous sign. These patients should be evacuated as soon as possible for surgical intervention.

Performance Steps

- (2) Guarding or tenderness. (Watch the patient's face during palpation to check for grimace.)
- (3) Rebound tenderness.
- e. Perform a rectal examination.
 - (1) Palpate the sphincter (loss of sphincter tone indicates associated spinal injury).
 - (2) Palpate the integrity of the rectal wall.
 - (3) Palpate the position, mobility, size, and consistency of the prostate.
 - (4) Observe the examining finger for blood. (If possible, perform a stool guaiac test at this time to check for occult blood.)

NOTE: The use of peritoneal lavage as a diagnostic tool in the field is controversial. Patients with progressive signs of shock in the absence of external hemorrhage should be assumed to have internal hemorrhage. These patients should be evacuated for surgical intervention as soon as possible.

3. Manage nonpenetrating injuries to the abdomen.

- a. Patient positioning: supine and knees flexed with minimal movement.
- b. Oral medications: Give nothing by mouth (NPO). Vomiting, perforations, or ileus may occur. Patient should not have anything on his stomach because of the possibility of surgery.
- c. Administer appropriate fluid therapy.
 - (1) If the patient is demonstrating signs of hypovolemic shock, administer blood, if available (task 081-833-4069 Administer Blood Transfusion). If blood is not available, administer hetastarch 500 milliliters (ml) intravenously (IV) bolus and then titrate to patient response up to a total of 1,500 ml.
 - (2) If the patient is not in hypovolemic shock, initiate an IV on 0.9 percent normal saline titrated to urine output.
- d. Consider the use of pneumatic antishock garment (PASG). Abdominal bleeding may be diminished by application of a pneumatic antishock garment and inflation of the extremity and abdominal compartments to at least 40 millimeters (mm) mercury (Hg) (task 081-833-3011, Apply the Pneumatic Antishock Garment).
- e. Administer pain medications (task 081-833-4690, Manage Pain).

NOTE: Injuries to the abdomen can be extremely painful. Narcotic analgesics may be indicated.

- f. Insert a nasogastric tube (task 081-833-4496, Perform Nasogastric Intubation).

NOTE: The nasogastric tube is secured and left in place. The nasogastric aspirate should be examined frequently for blood.

- g. If a patient cannot void following nonpenetrating injury to the abdomen, consider insertion of a urinary catheter (task 081-833-4495, Perform Urinary Catheterization).

CAUTION: A high-riding prostate, blood at the urethral meatus, or scrotal hematoma indicate a possible urethral compromise and contraindicate urinary catheterization. These patients should be evacuated for surgical intervention, if possible.

- h. Monitor the patient's fluid intake and output (task 081-833-4099, Monitor a Patient's Intake and Output).
- i. Administer appropriate antibiotics on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. The following modalities are acceptable as of this writing:
 - (1) Cefoxitin 2 grams (g) every 6 hours (q6h) intravenously (IV).
 - (2) Cefotetan 2 g every 12 hours (q12h) IV.
 - (3) Ticarcillin/clavulanate (timentin) 3.1 g q6h IV.
- j. Evacuate patients who have the following:
 - (1) Oliguria or anuria in the presence of a fluid challenge.
 - (2) Signs of urethral compromise.
 - (3) Signs of internal organ rupture.
 - (4) Signs of hemorrhagic shock in the absence of external hemorrhage.
 - (5) Other signs of an acute abdomen (task 081-833-4105, Manage Acute and Nonacute Abdomen).

4. Record all treatment in the patient's medical record.

5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage nonpenetrating injuries to the abdomen.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149. The protocols established in task 081-833-4149 establish the overall trauma sequence.	_____	_____
2. Assessed the severity of the specific injury.	_____	_____
3. Managed nonpenetrating injuries to the abdomen.	_____	_____
4. Recorded all treatment in the patient's medical record.	_____	_____
5. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required
SANFORD, 1999

Related

Manage Penetrating Injuries to the Abdomen

081-833-4512

Conditions: As a special operations medic in a field environment and given field dressings, Kerlix rolled gauze, 0.9 percent normal saline, pain medications, a selection of broad-spectrum antibiotics, and The Sanford Guide to Antimicrobial Therapy.

Standards: Manage penetrating injuries to the abdomen so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of penetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Assess the severity of the specific injury.

WARNING The most important concern in the initial management of abdominal injuries is shock. Shock may be present initially or develop later. Neither the presence or absence of a wound nor the size of the external wound are safe guidelines for judging the severity of the wound.

- a. Elicit a patient history.

- (1) Area traumatized.

NOTE: Consider the anatomy of the abdomen in determining possible damage to underlying organs.

- (2) Type of injury.

- (a) Stab.

- (b) Missile: low velocity.

- (c) Missile: high velocity.

- (d) Estimate path of missile or stab, if possible, and always look for an exit wound.

- (3) When the trauma occurred.

- (4) Prior injuries.

- (5) Prior abdominal surgery.

- (6) Onset of symptoms.

- (7) Radiation of pain.

- (8) Type of pain.

- (9) Nausea.

- b. Inspect the abdomen for the following:

- (1) Entry and exit wounds.

- (2) Swelling or distention.

- (3) Bulges.

- (4) Bruises.

- (5) Bloody discharge from rectum or penis.

- c. Auscultate bowel sounds.

- (1) Hyperactive.

- (2) Decreased.

- (3) Absence.

- d. Perform a rectal examination.

- (1) Palpate the sphincter (loss of sphincter tone indicates associated spinal injury).

- (2) Palpate the integrity of the rectal wall.

- (3) Palpate the position, mobility, size, and consistency of the prostate.

- (4) Observe the examining finger for blood. (If possible, perform a stool guaiac test at this time to check for occult blood.)

3. Manage penetrating injuries to the abdomen.

Performance Steps

NOTE: Assessment and management will occur at the same time.

- a. Control hemorrhage by ligation or clamping, if necessary (task 081-833-4534, Perform Ligation or Clamping to Control Hemorrhage).
- b. Apply a bandage to the open abdominal wound.

CAUTION Do not try to replace protruding internal organs or remove any protruding foreign objects.

- (1) Stabilize any protruding objects with the abdominal dressing. Impaled objects should be moved as little as possible.
- (2) Using the sterile side of the dressing, or other clean material, place any protruding organs near the wound.
- (3) Ensure that the dressing is large enough to cover the entire mass of protruding organs or area of the wound.
- (4) If large enough to cover the affected area, place the sterile side of the plastic wrapper directly over the wound.
- (5) Place the dressing directly on top of the wound or plastic wrapper, if used.

NOTE: Keep protruding abdominal organs moist to prevent the tissue from drying out. A moist, sterile dressing should be applied, if available.

- (6) Tie the dressing tails loosely at the casualty's side.

CAUTION Do not apply pressure on the wound or exposed internal parts.

- (7) If two dressings are needed to cover a large wound, repeat steps 5a through 5e. Ensure the ties of additional dressings are not tied over each other.
- (8) If necessary, loosely cover the dressing with cravats. Tie the cravats on the side of the casualty opposite that of the dressing ties.

- c. Administer appropriate fluid therapy.

- (1) If the patient is demonstrating signs of hypovolemic shock, administer blood if available (task 081-833-4069, Perform Blood Transfusion). If blood is not available, manage hypovolemic shock in accordance with task 081-833-4072, Manage Hemorrhagic/Hypovolemic shock.
- (2) If the patient is not in hypovolemic shock, initiate an IV of 0.9 percent normal saline titrated to urine output.

- d. Administer pain medications (task 081-833-4690, Manage Pain).

NOTE: Injuries to the abdomen can be extremely painful. Narcotic analgesics may be indicated.

- e. Insert a nasogastric tube (task 081-833-4496, Perform Nasogastric Intubation).

NOTE: The nasogastric tube is secured, and left in place. The nasogastric aspirate should be examined frequently for blood.

- f. Insert a urinary catheter (task 081-833-4495, Perform Urinary Catheterization).

CAUTION: A high-riding prostate, blood at the urethral meatus, or scrotal hematoma indicate a possible urethral compromise and contraindicate urinary catheterization. These patients should be evacuated for surgical intervention, if possible.

- g. Monitor the patient's fluid intake and output (task 081-833-4099, Measure a Patient's Intake and Output).

- h. Administer appropriate antibiotics on the basis of the treatment modality in the most current edition of The Sanford Guide to Antimicrobial Therapy. One of the following modalities are acceptable as of this writing:

- (1) Cefoxitin 2 grams (g) every 6 hours (q6h) intravenously (IV).
- (2) Cefotetan 2 g every 12 hours (q12h) IV.
- (3) Ticarcillin/clavulanate (timentin) 3.1 g q6h IV.

- i. Evacuate the patient for surgical intervention.

NOTE: Perform steps 3e, f, and g, as time permits, pending evacuation of the patient for surgical intervention.

4. Record all treatment in the patient's medical record.

5. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage penetrating injuries to the abdomen.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149. The protocols established in task 081-833-4149 establish the overall trauma sequence.	_____	_____
2. Assessed the severity of the specific injury.	_____	_____
3. Managed penetrating injuries to the abdomen.	_____	_____
4. Recorded all treatment in the patient's medical record.	_____	_____
5. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

SANFORD, 1999

Related

Perform Venous Cutdown

081-833-4514

Conditions: As a special operations combat medic in a field environment and given a curved Kelly hemostat; a scalpel with a number 10 or 15 blade; a small mosquito hemostat; 3-0 or 4-0 silk suture; 3-0 or 4-0 nylon suture with cutting needle; single-sided, sharp scissors; antibiotic ointment; gauze sponges; 1-inch tape; intravenous (IV) catheter; IV administration set; IV fluids; and splinting materials.

Standards: Perform a venous cutdown so IV fluids and medications can be administered without causing further harm.

Performance Steps

1. Recognize the indications for a venous cutdown.
 - a. Requirement for rapid access to the vascular system.
 - b. Failure to obtain access via peripheral IVs.
 - c. Severe burns, preventing access by normal means.
2. Recognize the relative contraindications for venous cutdown.
 - a. Less invasive alternatives exist.
 - b. Presence of coagulation disorders.
 - c. Impaired healing.
 - d. Injuries proximal to the cutdown site.
 - e. Immunocompromise.

NOTE: Carefully weigh the need to perform a cutdown against all potential contraindications.

3. Choose an appropriate site for a venous cutdown on the basis of the patient's anatomy.
 - a. Greater saphenous vein (Figure 1).

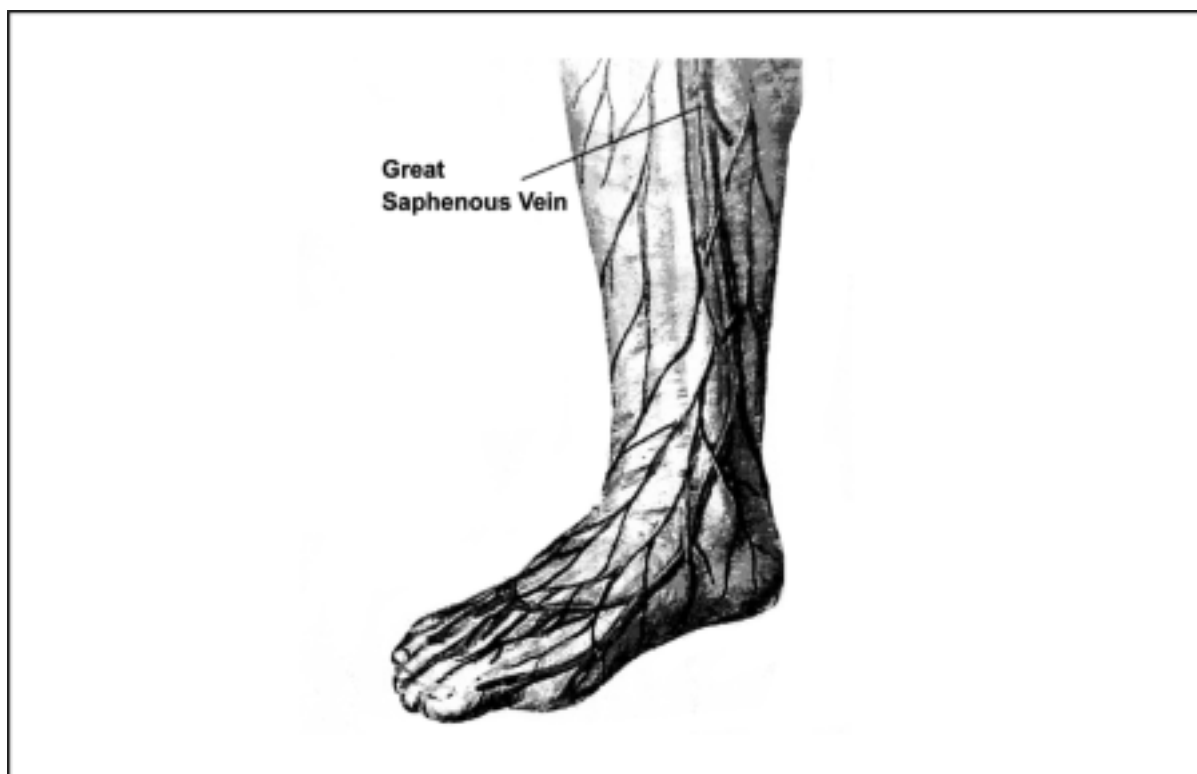


Figure 1. Saphenous Vein

Performance Steps

- b. Basilic vein (Figure 2).

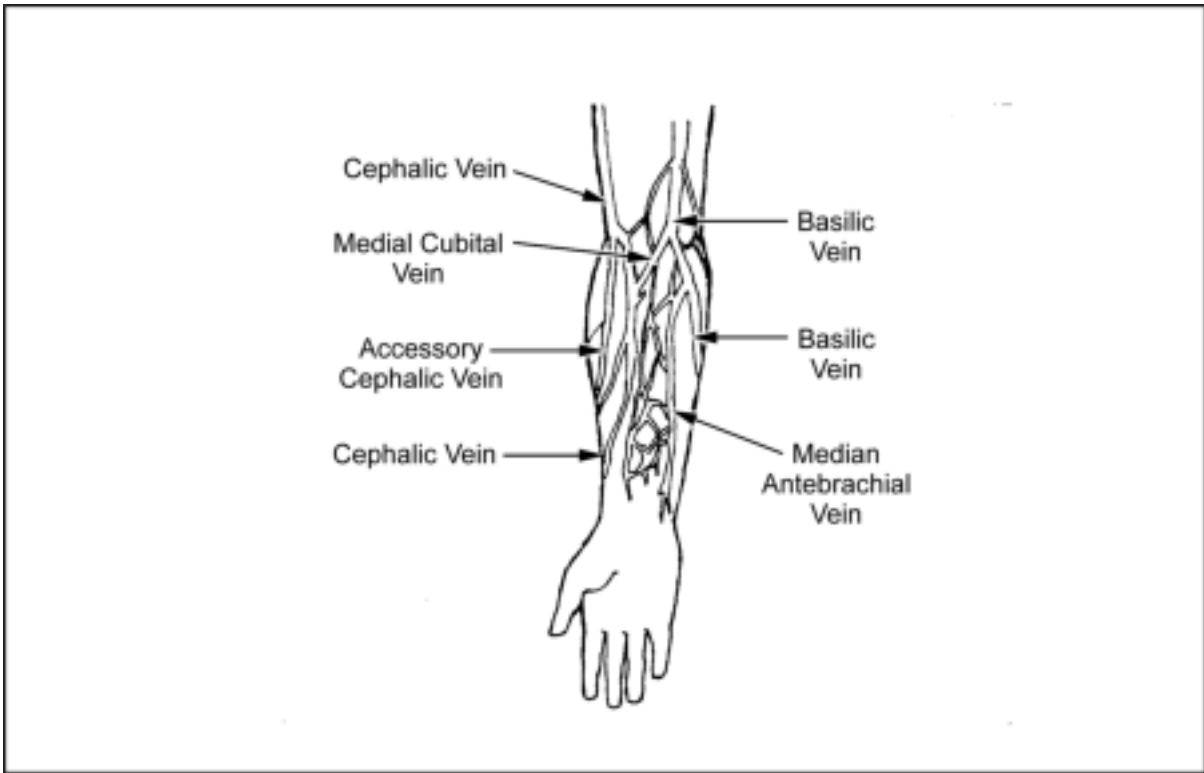


Figure 2. Basilic Vein

4. Select and inspect the equipment for defects, expiration date, and contamination.
 - a. IV fluid of choice. Discard containers that have cracks, scratches, leaks, sedimentation, condensation, or fluid that is not crystal clear and colorless.
 - b. IV injection set.
 - (1) Discard spike, drip chamber, tubing, and needle adapter when cracks, holes, or discoloration is present.
 - (2) Ensure tubing clamp releases and catches.
 - c. Discard 16- or 18-gauge catheter-over-needle that has barbs or nicks.
5. Prepare the equipment.
 - a. Clamp the tubing 6 to 8 inches below the drip chamber.
 - b. Remove the protective covers from the spike and from the outlet of the IV container.

CAUTION: Do not touch the spike or the outlet of the IV container.

 - c. Insert the spike into the container.
 - (1) If using a bag, push the spike firmly into the container's outlet tube.
 - (2) If using a bottle, push the spike firmly through the container's diaphragm.

CAUTION: If no vacuum release sound is heard when puncturing bottled solution, discard the solution. Bagged solution makes no vacuum release sound.
 - d. Hang the container at least 2 feet above the level of the patient's heart, if possible.

NOTE: An IV bag container may be placed under the patient's body if there is no way to hang it.

 - e. Squeeze the drip chamber until it is half full of the IV fluid.
 - f. Prime the tubing.

NOTE: Ensure that all air is expelled from the tubing.

 - (1) Hold the tubing above the level of the bottom of the container.
 - (2) Loosen the protective cover from the needle adapter to allow the air to escape.

Performance Steps

- (3) Release the clamp on the tubing.
- (4) Gradually lower the tubing until the solution reaches the end of the needle adapter.
- (5) Clamp the tubing.
- (6) Retighten the needle adapter's protective cover.
- (7) Loop the tubing over the IV stand or holder.
- g. Cut several pieces of tape, and hang them in a readily accessible place.

6. Perform the cutdown.

- a. Clean the area with antiseptic as you would for venipuncture.
- b. Consider local anesthesia if the patient is conscious.
- c. Apply a constricting band proximally to the cutdown site.
- d. With a number 10 blade, make a transverse, full-thickness skin incision over the anatomical location of the vein. The incision should be about 2.5 centimeters (cm) in width.

NOTE: Try to stay within the margins of the anesthesia, if applicable.

- e. Bluntly dissect down to the vein by using a small, curved hemostat.
- f. Identify the vein, and dissect it free from any accompanying structures.
- g. Elevate the dissected vein about 2 cm to free it from its bed (Figure 3).



Figure 3. Cutdown

- h. Pass a ligature under the distal portion of the vein.
- i. Tie the ligature tightly enough to stop the blood flow. Leave the tails of the ligature in place to use as traction while cannulating.
- j. Pass another ligature under the proximal portion of the vein.

Performance Steps



Figure 4. Cutdown Ligature

NOTE: Do not tie the proximal ligature (Figure 4).

7. Cannulate the vein.

- a. Position the needle point, bevel up, parallel to the vein and just below the site of venipuncture.
- b. Hold the needle at a 10- to 20-degree angle, and insert it through the vein wall.
- c. Decrease the angle, and insert the needle down the vein until the catheter tip is inside the vein.

CAUTION: Do not push the needle through the other side of the vein.

- d. Thread the catheter down the needle and into the vein.
 - (1) The catheter should thread easily down the vein without resistance.
 - (2) If resistance is felt or the catheter is kinking, stop advancing the catheter, withdraw the catheter and needle, and try to recannulate the vein, if the vein is still usable.
 - (3) Ensure the catheter is placed into the vein far enough to prevent dislodging.
- e. Remove the needle and dispose of it IAW unit standing operating procedure.

8. Remove the protective cover from the needle adapter on the tubing. Quickly and tightly connect the adapter to the catheter.

9. Remove the proximal tourniquet.

10. Unclamp the IV tubing, and check for flow.

NOTE: Usually, it is not possible to get a "backflash" from a cutdown.

- a. If there is flow in the drip chamber, check the infusion site to ensure that the fluid is not flowing back out of the vein. If the fluid is flowing and not backing up, continue with the procedure (step 11).
- b. If there is no drip in the chamber or the fluid is flowing back out of the vein, check for the following:

Performance Steps

- (1) Constricting band has not been removed.
 - (2) Slightly reposition the catheter to ensure the problem is not positional.
 - (3) IV tubing is unclamped and not twisted or kinked.
 - (4) Vein was not isolated well, and the catheter is between the vein wall and the subcutaneous fascia.
 - c. If unable to obtain flow, withdraw the catheter and try to recannulate the same vein or move to a different site and try again.
 11. Set the drip rate.
 12. Secure the cutdown.
 - a. Secure the catheter in place by tying the proximal ligature around the vein and catheter.
 - b. Secure the hub of the catheter to the cutdown site by tying the distal ligature around the hub at the point where the tubing is connected.
 - c. Sandal wrap the tails of the distal ligature around the IV tubing, and tape it in place.
 13. Recheck IV flow and that the catheter is secure.
 14. Dress and bandage cutdown site.
 - a. Close the incision with simple, interrupted sutures.
- NOTE: Do not suture the incision in the field.
- b. Apply a topical antibiotic and sterile dressing.
 - c. Apply a bulky dressing, and splint the site to prevent articulation, if near a joint, and to prevent accidental dislodgement of the catheter.
15. Recheck IV flow.
 16. Be aware of and check for possible complications associated with venous cutdown.
 - a. Infection.
 - b. Hematoma.
 - c. Phlebitis.
 - d. Perforation through the posterior wall of the vein.
 - e. Venous thrombosis.
 - f. Injury to other structures.
- NOTE: Since cutdowns performed under emergency conditions are prone to infection discontinue use soon as percutaneous IV access can be obtained and no more than 24 hours after the emergency.
17. Record the procedure on the appropriate form.
 - a. Date and time the IV infusion was initiated.
 - b. Type and amount of IV solution initiated.
 - c. Drip rate and total volume to be infused.
 - d. Type and gauge of needle or cannula.
 - e. Location of the infusion site.
 - f. Patient's condition.
 - g. Name of the person initiating the IV.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform a venous cutdown.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Identified the indications for a venous cutdown.	—	—
2. Identified the relative contraindications for venous cutdown.	—	—
3. Chose an appropriate site for a venous cutdown on the basis of the patient's anatomy.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Selected and inspected the IV equipment for defects, expiration date, and contamination.	_____	_____
5. Aseptically prepared the equipment.	_____	_____
6. Performed the venous cutdown.	_____	_____
7. Cannulated the vein.	_____	_____
8. Aseptically connected the IV tubing to the catheter.	_____	_____
9. Removed the proximal tourniquet.	_____	_____
10. Unclamped the IV tubing and checked for flow.	_____	_____
11. Set the drip rate.	_____	_____
12. Secured the cutdown.	_____	_____
13. Rechecked IV flow, and ensured the catheter is secured.	_____	_____
14. Dressed and bandaged the cutdown site.	_____	_____
15. Rechecked IV flow.	_____	_____
16. Checked for possible complications associated with venous cutdown.	_____	_____
17. Recorded the procedure on the appropriate form.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform a Closed Tube Thoracostomy

081-833-4524

Conditions: You are in a field environment. Given a patient with a pneumothorax, hemothorax, or a pneumo-hemothorax; a 36 to 40 French chest tube; suction device or flutter valve; a scalpel with a number 10 blade; a large, curved Kelly clamp; syringe and needle with anesthetic; suture material with swagged needle; gauze; and tape.

Standards: Safely and properly place the chest tube so the patient's breathing is restored without causing further injury to the patient.

Performance Steps

1. Ensure, if possible, a patient who has a pneumothorax, hemothorax, or combination of the two is positioned supine with his arm over his head.
2. Ensure the equipment is available and in working order.
 - a. Chest tube 36 to 40 French with suction device or a flutter valve. Clamp distal end of chest tube with hemostat, and apply large, curved Kelly clamp to the end that is going to be inserted.
 - b. Scalpel with a number 10 blade.
 - c. Syringe 10 cubic centimeters (cc) or 5 cc with small-gauge needle and lidocaine with epinephrine.
 - d. Suture 2-0 with swagged needle and needle drivers.
 - e. Tape 3 inches wide and 4 to 6 inches of 4 x 8-inch gauze.
3. Determine the technique of incising through the skin.
 - a. Pulling traction on the skin is the preferred method.
 - b. Tunnelling through the skin can cause additional complications.
4. Locate the site of insertion, 5th or 6th intercostal space (ICS) anterior axillary line (AAL) or midaxillary line (MAL) 1 rib below incision site on the affected side.
 - a. Pull traction on skin, toward head, until site of incision is over ICS where chest tube is going to be placed.
 - b. If using the tunnelling technique, site of incision is 2 intercostal spaces below 5th or 6th ICS.
5. Prepare the site with antiseptic solution and drape.
6. Anesthetize the skin and periosteum of the rib.

NOTE: An intercostal nerve block can be performed between the MAL and the spine.

 - a. Anesthetize skin and subcutaneously with a 25-gauge, 1-inch needle.
 - b. Use a 20-gauge, 1.5-inch needle to anesthetize periosteum of the rib underlying the interspace that the chest tube will enter.
7. Make a 3-centimeter (cm) transverse skin incision directly over the rib below the insertion site.
8. Place the Kelly clamp, jaws closed, on the rib and pointed toward the ICS above the rib.

NOTE: The blood vessels and nerves run in a groove under the ribs. Riding the tip of the clamp over the rib avoids these structures.

 - a. Perform a blunt dissect through the soft tissue passing over the superior aspect of the rib and into the chosen intercostal space, and puncture the parietal pleura.
 - b. Listen for and feel a "pop" as the points go into the cavity.
9. Spread the Kelly clamp, forcing the tissue apart.
10. With the jaws of the clamp holding the hole open, carefully insert a gloved finger through the incision and into the pleural space to verify position.
 - a. Once the finger is in place, remove the clamp.
 - b. Widen the pleural opening, and ensure there are no adhesions.

Performance Steps

- c. Feel for lung tissue.
- d. Be sure there is air and the pink, spongy lung is immediately inside the chest. If not, you may be in the abdominal cavity.

NOTE: Do not remove finger from hole until tube has been inserted.

11. Insert the curved Kelly and the chest tube into the hole in the chest. Once the tube has entered the chest cavity, release the tube from the grasp of the clamp and advance it until all holes in the tube are well inside the chest.

NOTE: Fogging of the tube indicates it is in the proper place.

- a. Aim toward the apex of the lung, superior and posterior, for air.
- b. Aim toward the base of the lung, inferior and posterior, for fluid.

12. Remove the hemostat, and connect the tube to Heimlich valve, Thoraclex, underwater seal apparatus, or whatever is being used.
 - a. Check for flutter of Heimlich valve or bubbles in pneumothorax.
 - b. Check for blood draining in hemothorax.

13. Suture the tube in place by using a purse-string suture and sandle wrap technique.

14. Place sterile petrolatum gauze and then 4 x 8-inch gauze pads over the incision and around the base of the tube. Tape securely.

15. Tape or suture tube to patient depending on situation.

16. Tape connection of tube and apparatus.

17. Obtain X ray, if possible, to confirm placement.

18. Record all treatment given.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform a closed tube thoracostomy.

Performance Measures**GO NO GO**

1. Ensured, when possible, patient has a pneumothorax, hemothorax, or combination of the two is positioned supine with his arm over his head.	—	—
2. Ensured the equipment is available and in working order.	—	—
3. Determined the technique of incising through the skin.	—	—
4. Located the site of insertion, 5th or 6th ICS AAL or MAL 1 rib below incision site on the affected side.	—	—
5. Prepared the site with antiseptic solution and drape.	—	—
6. Anesthetized the skin and periosteum of the rib.	—	—
7. Made a 3-cm transverse skin incision directly over the rib below the insertion site.	—	—
8. Placed the Kelly clamp, jaws closed, on the rib and pointed toward the ICS above the rib.	—	—
9. Spread the Kelly clamp, forcing the tissue apart.	—	—
10. With the jaws of the clamp holding the hole open, carefully inserted a gloved finger through the incision and into the pleural space to verify position.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
11. Inserted the curved Kelly and the chest tube into the hole in the chest. Once the tube has entered the chest cavity, released the tube from the grasp of the clamp and advanced it until all holes in the tube were well inside the chest.	_____	_____
12. Removed the hemostat and connected the tube to a Heimlich valve and suction apparatus.	_____	_____
13. Sutured the tube in place by using a purse-string suture and sandle wrap technique.	_____	_____
14. Placed sterile petrolatum gauze and then 4 x 8-inch gauze pads over the incision and around the base of the tube. Tape securely.	_____	_____
15. Taped or sutured tube to patient depending on situation.	_____	_____
16. Taped connection of tube and apparatus.	_____	_____
17. Obtained X ray, if possible, to confirm placement.	_____	_____
18. Recorded all treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform a Cricothyroidotomy

081-833-4528

Conditions: Given a casualty with a totally obstructed airway that cannot be cleared or a casualty in respiratory arrest who cannot be intubated, cutting instrument (scalpel, knife blade), airway tube (endotracheal [ET] tube, cannula, or any noncollapsible tube), hemostats, needle holders, suture material, suctioning apparatus, povidone-iodine, knife handle, blanket, gloves, and tape. A cricothyroidotomy needle is unavailable, or performing a needle cricothyroidotomy is not effective.

Standards: Establish an emergency airway without causing unnecessary injury to the casualty. Complete steps 3 through 10 in order.

Performance Steps

CAUTION: Consider only casualties with a total upper airway obstruction or casualties with inhalation burns for a surgical cricothyroidotomy.

1. Gather cricothyroidotomy kit or minimum essential equipment.

NOTE: Because of the need for speed, every medic should have an easily accessible cricothyroidotomy kit that contains all required items. Do no delay getting an airway established for lack of nonessential equipment.

- a. Cutting instrument: Number 10 or 11 scalpel or knife blade.
- b. Airway tube: ET tube, cannula, or any noncollapsible tube that will allow enough airflow to maintain oxygen saturation.

NOTE: In a field setting, an ET tube is preferred because it is easy to secure. Use a size 6 or 7 ET tube, and ensure the cuff will hold air.

2. Hyperextend the casualty's neck.

WARNING: Do not hyperextend the casualty's neck if a cervical injury is suspected.

- a. Place the casualty in the supine position.
- b. Place a blanket or poncho rolled up under the casualty's neck or between the shoulder blades so the airway is straight.

3. Put on gloves.

4. Locate the cricothyroid membrane.

- a. Place a finger of the nondominant hand on the thyroid cartilage (Adam's apple), and slide the finger down to the cricoid cartilage.
- b. Palpate for the "V" notch of the thyroid cartilage.
- c. Slide the index finger down into the depression between the thyroid and cricoid cartilage.
- d. Prepare the skin over the membrane with povidone-iodine.
- e. Raise the skin to form a tentlike appearance over the cricothyroid space, using the index finger and thumb.

5. With a cutting instrument in the dominant hand, make a 1 1/2-inch horizontal incision through the raised skin to the cricothyroid space.

CAUTION: Do not cut the cricothyroid membrane with this incision.

6. Relocate the cricothyroid space by touch and sight.

7. Stabilize the larynx with one hand and cut or poke through the cricothyroid membrane.

NOTE: A rush of air may be felt through the opening.

- a. If using a number 10 blade or knife blade, make a 1/2-inch horizontal incision through the elastic tissue of the cricothyroid membrane.
- b. If using the number 11 blade, poke through the cricothyroid membrane.

8. Insert the tips of a hemostat or needle holder through the opening, and open the jaws to make a larger opening.

Performance Steps

9. Insert the end of the ET tube or cannula between the jaws. The tube should be in the trachea and directed toward the lungs. Inflate the cuff with 5 to 10 cubic centimeters (cc) of air.

NOTE: Do not advance the tube more than 2 to 3 inches, as this could result in the intubation of only 1 main stem bronchus.

10. Check for air exchange and placement of the tube.
 - a. Air exchange.
 - (1) Listen and feel for air passing in and out of the tube.
 - (2) Look for bilateral rise and fall of the chest.
 - b. Placement of the tube.
 - (1) Connect the Ambu bag to the tube or have someone perform mouth-to-tube respirations.
 - (2) As someone pumps or blows air into the tube, auscultate the abdomen and both lung fields while observing for bilateral rise and fall of the chest.
 - (3) If there are bilateral breath sounds and bilateral rise and fall of the chest, the tube is properly placed and may be secured.
 - (4) If there is unilateral rise and fall of the chest, absent or unilateral breath sounds, epigastric gurgling, air escaping from the casualty's mouth or from around the tube, or air infiltrating into the tissues of the neck or chest, the tube is improperly placed and corrective action must be initiated immediately.
 - (a) Unilateral breath sounds and unilateral rise and fall of the chest indicate that the tube is past the carina. Deflate the cuff, retract the tube 1 to 2 inches, and recheck air exchange and placement.
 - (b) Air coming out of the casualty's mouth indicates the tube is pointed away from the lungs. Remove the tube, reinsert, and recheck for air exchange and placement.
 - (c) Any other problem is indicative of the tube not being in the trachea. Remove the tube, reinsert, and recheck for air exchange and placement.
 11. If the tube is correctly placed but the casualty is not breathing, direct someone to perform rescue breathing.
 - a. Connect the tube to an Ambu bag, with oxygen if available, and have the casualty ventilated at the rate of about 20 breaths per minute.
 - b. If no Ambu bag is available, have someone perform mouth-to-tube resuscitation at 20 breaths per minute.
 - c. Once rescue breathing has started, secure the tube.
 12. Suction the casualty's airway, as necessary.
 - a. Insert the suction catheter 4 to 5 inches into the tube.
 - b. Apply suction only while withdrawing the catheter.
 - c. Administer 1 cc of saline solution into the airway to loosen secretions, and help facilitate suctioning.
- NOTE: Allow the casualty to take several breaths between suctionings.
13. Apply a dressing to further protect the tube and incision by using one of the following techniques.
 - a. Cut two 4- x 4-inch or 4- x 8-inch gauze pads halfway through. Place them on opposite sides of the tube so that the tube comes up through the cut and the gauze overlaps. Tape securely.
 - b. Apply a sterile dressing under the casualty's tube by making a V-shaped fold in a 4- x 8-inch gauze pad and placing it under the edge of the cannula to prevent irritation to the casualty. Tape securely.
 14. Monitor casualty's respirations on a regular basis.
 - a. Reassess air exchange and placement every time the casualty is moved.
 - b. Assist respirations if respiratory rate falls below 12 or rises above 20 per minute.

Evaluation Preparation: Setup: For training and evaluation, use a mannequin or have another soldier act as the casualty. Under no circumstances will the skin be incised. Have the soldier demonstrate and explain what he or she would do.

Brief soldier: Tell the soldier to perform a surgical cricothyroidotomy.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Gathered cricothyroidotomy kit or minimum essential equipment.	_____	_____
2. Hyperextended the casualty's neck.	_____	_____
3. Put on gloves.	_____	_____
4. Located the cricothyroid membrane.	_____	_____
5. With a cutting instrument in the dominant hand, made a 1 1/2-inch horizontal incision through the raised skin to the cricothyroid space.	_____	_____
6. Relocated the cricothyroid space by touch and sight.	_____	_____
7. Stabilized the larynx with one hand and cut or poked through the cricothyroid membrane.	_____	_____
8. Inserted the tips of a hemostat or needle holder through the opening and opened the jaws to make a larger opening.	_____	_____
9. Inserted the end of the ET tube or cannula between the jaws. The tube should be in the trachea and directed toward the lungs.	_____	_____
10. Checked for air exchange and placement of the tube.	_____	_____
11. When the tube was correctly placed but the casualty was not breathing, had someone perform rescue breathing.	_____	_____
12. Suctioned the casualty's airway, as necessary.	_____	_____
13. Applied a dressing to further protect the tube and incision	_____	_____
14. Monitored casualty's respirations on a regular basis.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
EMT-P, BRADY 3RD ED. 1997

Manage Penetrating Trauma

081-833-4531

Conditions: Given a trauma patient with a penetrating injury, a Special Forces (SF) tactical medical equipment set, an individual combat laboratory set, and a surgical environment. All other injuries have been treated.

Standards: Provide initial and definitive management of a penetrating injury without causing further injury to the patient.

Performance Steps

1. Assess casualty in accordance with (IAW) task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient. The protocols established in task 081-833-4149 establish the overall trauma sequence.

NOTE: The management measures covered here apply only to the management of nonpenetrating abdominal trauma and should be placed in the proper sequence of airway through circulation (A1 through C1) and second sequence of airway through full set of vital signs (A2 through F).

2. Obtain a history, if possible, from patient or witnesses to determine the following:
 - a. What type of weapon was used.
 - (1) Handheld weapons such as knives, needles, ice picks, and so on are classified as low-energy weapons.
 - (2) Pistols, shotguns, and firearms with ammunition velocity of less than 1,500 feet per second and fragments from grenades, mines, bombs, and secondary missiles are classified as medium-energy weapons.
 - (3) Rifles, machine guns, and firearms with muzzle velocity of more than 1,500 feet per second are classified as high-energy weapons.
 - b. The range from weapon or distance from explosion.
 - (1) Direct contact is the most devastation.
 - (2) Close range is 7 yards or less.
 - c. Angle of entry and path of the object(s) in or through the body.
 - (1) For low-energy weapons, also consider length and type of blade; for example, serrated or smooth.
 - (2) Missiles do not always travel at straight lines through tissue.
3. If unable to determine the energy level of the weapon from the history, examine the wound(s).
 - a. Low-energy weapons.
 - (1) Bladed weapons such as knives, machetes, and so on produce two types of injuries--slice and stab wounds.
 - (a) Slices are long, narrow, straight lacerations, usually not very deep. If the blade is sharp, the weapon causes almost no damage to the surrounding skin. If the blade is dull, the weapon tears the skin.
 - (b) Stab wounds are short, narrow lacerations that can be very deep. Stab wounds produce very little damage to the surrounding skin.
 - (2) Puncture-type weapons such as screwdrivers, ice picks, needles, and so on produce small lacerations (punctures) to the skin without much damage to the surrounding tissue. Usually only an entrance wound.
 - (3) Edged weapons such as machetes, hatchets, and axes produce long, deep, and possibly jagged lacerations. These weapons cause significant damage (bruising) to skin and surrounding tissue.
 - b. Medium-energy weapons.
 - (1) Medium-energy firearms (pistols) produce a small entrance and small exit wound, if any.
 - (a) If the bones are involved, the missile causes a clean break without shattering the bone.

Performance Steps

- (b) Generally, wounds will be punched-out holes in the tissue, and damage is confined to the missile tract.
 - (2) Medium-energy firearms (shotguns, mines, and explosions).
 - (a) Pellets produce multiple, small punctures of the skin in a pattern. At close range, may result in large, gaping wounds.
 - (b) Fragments result in irregularly shaped entrance wounds of various sizes.
 - c. High-energy weapons.
 - (1) Produce a small entrance wound and a large exit wound.
 - (2) May be significant distance and deviation between entrance and exit wounds.
 - (3) The higher the velocity, the more likely the projectile will fragment. There may be no exit wound.
 - (4) If bone is involved, bone is fragmented by the force of the missile and fragments become secondary missiles.
- 4. Consider the possible complications of penetrating injuries on the basis of the type of weapon.

NOTE: Any penetrating injury may appear benign, but cause serious internal damage such as internal hemorrhage and fractures.

 - a. Low-energy complications.
 - (1) Foreign bodies are retained.
 - (2) Slices are usually not life-threatening unless severe hemorrhage occurs.
 - (3) Stab wounds may cause severe internal injuries depending on the length of the blade.
 - (4) Machetes, hatchets, and axes will have underlying trauma and fractures.
 - b. Medium-energy complications.
 - (1) Rupture of the blood vessels or nerves, if directly hit.
 - (2) Damage is confined to the missile tract.
 - (3) May have many pellets and fragments in various parts of the body.
 - (4) Explosions may result in rupture or damage of hollow organs even if there are no visible injuries.
 - c. High-energy complications.
 - (1) Bone is fragmented by the force of the missile, and fragments become secondary missiles. Severe tissue destruction occurs.
 - (2) Missile may fragment into multiple pieces. Each piece crushes or tears its own path through tissue.
 - (3) Stretching and tearing of vessels even if the missile does not come in direct contact with the vessels.
 - (4) Formation of temporary cavity. Severe injury and injury to tissue at a distance from the actual path of the missile.
 - (a) Solid organs will be extensively damaged by the cavitation process.
 - (b) Hollow organs can withstand the stretching and tearing and, therefore, will not be as extensively damaged.
- 5. Consider the possible complications of penetrating injuries on the basis of the location of the injury on the casualty.
 - a. Head injuries.
 - (1) Direct brain tissue damage and subsequent swelling.
 - (2) Severe face and neck injuries.
 - (3) Large blood loss.
 - (4) Compromised airway.
 - b. Thoracic injuries.
 - (1) Severe cardiovascular system injury.
 - (a) Hemothorax, pneumothorax, and tension pneumothorax.
 - (b) Combination cardiac and pulmonary injuries.
 - (2) Spinal or spinal cord injury.
 - (3) Rib fractures.
 - c. Abdominal injuries.

Performance Steps

- (1) Multiple organ systems (air-filled and solid).
- (2) Vascular injury or internal hemorrhage.
- (3) Spinal or spinal cord injury.
- (4) Injury of digestive or urinary tract may result in secondary infection.
- (5) Maintain high suspicion even if patient appears normal. Abdominal injuries that have penetrated the peritoneum always requires surgical evaluation.

NOTE: Abdominal and/or thoracic penetrating injuries should be evaluated as having entered the other cavity.

d. Pelvic injuries.

- (1) Fractures.
- (2) Damage to the genital urinary system.
- (3) Large blood vessel in an area that is difficult to apply dressings.

e. Extremity injuries.

- (1) Tend to result in gaping exit wounds.
- (2) Damage blood vessel lining and muscle tissue, producing hemorrhage.
- (3) Damage to nerves.
- (4) Unstabilized fractures may cause further damage to blood vessels and nerves.
- (5) Occasionally life-threatening and may result in lifelong disability.

6. Provide initial management for penetrating injuries until patient arrives at a definitive care facility or a secure area where the injury can be definitively managed.

NOTE: Steps a through e will be performed simultaneously with assessment.

a. Gain hemorrhage control by using the following techniques:

- (1) Apply dressing or bandage, direct pressure, pressure points, and elevation.
- (2) Hemostats and ligatures.
- (3) Tourniquet.

NOTE: Depending on the situation and the type of injury, the tourniquet may be the first hemorrhage control technique used.

b. Assess distal neurovascular status of injured extremities before dressings and splints are applied.

c. Stabilize all fractures or suspected fractures.

d. Protect the wound and damaged tissue with a dressing.

- (1) Clean out or irrigate out gross contamination, if possible.
- (2) Apply a secure dressing that covers the entire wound and any exposed tissue.
 - (a) Apply appropriate dressings for specific injuries; for example, abdominal eviscerations, avulsed eye, stump dressings, impaled objects, and so on.
 - (b) If no dressing is specified, apply a good, secure dressing that protects the wound and achieves hemostasis.

e. Assess distal neurovascular status of injured extremities after each dressing and splint is applied.

7. Transport patient to definitive care facility or area or evacuation area.

- a. During transport, monitor patient and all treatments rendered.
- b. Initiate all treatments and antibiotic therapies as soon as practical.
- c. Any casualty who can be evacuated should be evacuated. Even casualties whose injuries can be definitively managed at the definitive care facility should be evacuated to conserve supplies, time, and bed space.

8. Determine the appropriate technique for managing the casualty and the wound(s).

- a. Consider the casualty's overall status and the specific wounds to be managed.
 - (1) Stabilized casualty before he's placed on general anesthesia.
 - (2) Manage minor injuries at the same time or immediately after managing more serious wounds or conditions. Remember the 8-hour window for suturing.
- b. Penetrating injuries with the below-listed complications will require surgical intervention (task 081-833-4518, Perform Wound Debridement).
 - (1) Penetrating injury with associated fracture.

Performance Steps

- (2) Severe internal hemorrhage.
- (3) Gross contamination.
- (4) Compromised neurovascular status.
- c. Uncomplicated medium- and high-energy penetrating injuries can occasionally be managed without surgery by performing basic wound care with pharmacological prophylaxis. (See step 9.)
- d. Most low-energy injuries can be managed with minor surgery and local anesthetic. (See step 10.)
- e. Begin definitive management of penetrating wounds once all life-threatening injuries and resuscitative measures have been addressed.

CAUTION: Treatment for penetrating injuries varies according to location of injury, what caused the injury, and signs of infection.

9. Manage a casualty with an uncomplicated medium- or high-energy penetrating wound at the definitive care facility.
 - a. Perform a physical examination.
 - b. Perform diagnostic laboratory work.
 - (1) X ray, if available.
 - (2) Complete blood count (CBC) (type and crossmatch).
 - (3) Urinalysis (myoglobinuria).
 - c. Surgical measures.
 - (1) Prepare and anesthetize the wound.
 - (2) Debride and excise the wound edges. Remove the missile, if accessible.
 - (3) Perform copious irrigation with saline.
 - (4) If the wound heals normally, perform delayed primary closure in 3 to 5 days (task 081-833-4516, Perform a Delayed Primary Closure).
10. Manage uncomplicated, low-energy penetrating injuries.
 - a. General management considerations
 - (1) Anesthesia may be required before cleaning and suturing.
 - (2) Thoroughly clean the wound before performing primary closure or bandaging.
 - b. Treatment for lacerations.
 - (1) Treatment for lacerations is primary closure, but not all lacerations can be closed this way.
 - (a) Straight lacerations have wound edges that can be easily approximated and sutured.
 - (b) Jagged lacerations have uneven, irregular wound edges, which are harder to suture.
 - (c) Avulsed lacerations (unable to complete anatomical approximation as a result of missing or lost tissue).
 - (d) Do not close if more than 8 hours postinjury, or if heavily contaminated because of increased possibility of infection.
 - (2) Suture the wound IAW task 081-833-4530, Perform Suturing.
 - (3) For wound that cannot be sutured, must be allow to close through secondary intent.
 - (4) Tetanus and antibiotic therapy as per steps 11 and 12.
 - c. Treatment for puncture wounds.
 - (1) Two ways or techniques for managing puncture wounds. The technique to be used depends on the amount of contamination or presence of retained foreign bodies.
 - (a) The conservative technique is to just gently irrigate the wound and dress it.
 - (b) The aggressive technique is to trim epidermal edges with Iris scissors, explore the wound to remove any debris, perform high-pressure irrigation, and bandage the wound.
 - (2) Prophylactic antibiotics are not recommended for puncture wounds. Higher incidence of osteomyelitis among those who received antibiotics prophylactically.
 - (3) Antibiotics used (if signs of infection) include: dicloxacillin or a first-generation cephalosporin or erythromycin if the patient is allergic to penicillin. Ciprofloxacin is also used for penicillin allergies when pseudomonas aeruginosa (P. aeruginosa) is suspected.

WARNING: Never close a puncture wound. Allow the wound to close by secondary intent.

Performance Steps

11. Evaluate casualty's tetanus prophylaxis status, and administer tetanus toxoid and tetanus immune globulin, as needed.
 - a. Wounds with the following characteristics are considered tetanus-prone.
 - (1) Older than 6 hours.
 - (2) Avulsed or jagged.
 - (3) Greater than 1 centimeter (cm) deep.
 - (4) Result of a missile, crush, burn, or frostbite.
 - (5) Contains devitalized tissue.
 - (6) Contaminated.
 - b. Only casualties who have had three tetanus toxoid injections and a booster within 10 years are considered immunized. Anything less than that is considered inadequately immunized.
 - c. Administer tetanus toxoid and tetanus immune globulin on the basis of whether or not the wound is tetanus-prone or not and the immunized status of the casualty.
 - (1) Wound is tetanus-prone, and casualty is not adequately immunized.
 - (a) Absorbed tetanus toxoid at .5 milliliters (ml).
 - (b) Tetanus immune globulin at 250 to 500 units (u).
 - (c) Tetanus toxoid injection once a month for 3 months.
 - (2) Wound is not tetanus-prone, and casualty is not adequately immunized.
 - (a) Absorbed tetanus toxoid at .5 ml.
 - (b) Tetanus toxoid injection once a month for 3 months.
 - (3) Wound is tetanus-prone, and booster was given 5 to 10 years ago. Administer tetanus toxoid at .5 ml.
 - (4) Wound is tetanus-prone, and booster was given less than 5 years ago. No immunization is required.
 - (5) Wound is not tetanus-prone, and booster was given less than 5 years ago. No immunization is required.
12. Provide antibiotic therapy.
 - a. Extremity: cefazolin (ancef) 1 to 2 grams (g) intravenously (IV) every 4 to 6 hours (q4/6h).
 - b. Abdominal: impenem-cilastatin (primaxin) 250 milligrams (mg) to 1g IV every 6 to 8 hours (q6/8h).
 - c. Head: ceftriaxone (rocephin) 500 mg to 1g IV every 8 to 12 hours (q8/12h).
13. Properly monitor and care for the wound, or instruct the patient on proper wound care.
 - a. Inpatient.
 - (1) Check wound daily for signs and symptoms of infection without removing the bandage and dressing.
 - (a) Excessive swelling.
 - (b) Erythema or lymphangitis spreading away from the wound.
 - (c) Foul odor.
 - (2) Monitor patient's vital signs for signs of infection.
 - (a) Increased temperature.
 - (b) Increased pulse.
 - (c) Decreased blood pressure.
 - (3) Ask patient about pain in wound and areas distal.
 - (4) Order CBC with differential to monitor for signs of infection.
 - b. Outpatient.
 - (1) Brief the casualty on proper wound care and on when to return for checkup and follow-up care.
 - (2) Instruct patients to return at the first sign of infection.
 - (3) Explain the signs and symptoms of infection.
 - (4) Provide patient with necessary material for wound care.
14. Record all treatment given and all actions and results involving the management of the wound.

Performance Steps

15. Evacuate the patient as soon as possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage penetrating injuries.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assessed casualty IAW task 081-833-4149. The protocols established in task 081-833-4149 establish the overall trauma sequence.	—	—
2. Obtained a history, if possible, from patient or witnesses.	—	—
3. When unable to determine energy level of weapon from the history, examined the wound(s) to determine it.	—	—
4. Considered the possible complications of penetrating injuries on the basis of the type of weapon.	—	—
5. Considered the possible complications of penetrating injuries on the basis of the location of the injury on the casualty.	—	—
6. Provided initial management for penetrating injuries until patient arrived at a definitive care facility or a secure area where the injury could be definitively managed.	—	—
7. Transported patient to definitive care facility or area or evacuation area.	—	—
8. Determined the appropriate technique for managing the casualty and the wound(s).	—	—
9. Managed a casualty with an uncomplicated medium- or high-energy penetrating wound at the definitive care facility.	—	—
10. Managed uncomplicated low-energy penetrating injuries.	—	—
11. Evaluated casualty's tetanus prophylaxis status and administered tetanus toxoid and tetanus immune globulin, as needed.	—	—
12. Provided antibiotic therapy.	—	—
13. Monitored and cared for the wound or instructed the patient on proper wound care.	—	—
14. Recorded all treatment given and all actions and results involving the management of the wound.	—	—
15. Evacuated the patient as soon as possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Ligation or Clamping to Control Hemorrhage

081-833-4534

Conditions: As a special operations combat medic in a field environment and given small, curved hemostats; patient's medical record; 4-0 to 6-0 absorbable suture; and gauze sponges.

Standards: Perform ligation or clamping to control hemorrhage so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Recognize the indications for vessel ligation.
 - a. Hemorrhage from an artery or large vein that cannot be controlled by direct pressure or packing material combined with elevation.
 - b. When multiple urgent problems do not allow enough time to control hemorrhage by other means.
 - c. When wound closure will be hampered by hematoma formation caused by hemorrhage.
 - d. When application of bulky dressings and direct pressure may interfere with the airway or cerebral circulation because of the location of the hemorrhage.
2. Recognize the contraindications of vessel ligation.
 - a. When hemorrhage can be easily controlled by direct pressure.
 - b. When unable to directly visualize the causative vessel.
3. Perform the ligation.
 - a. With one hand, place a gauze sponge over the approximate area of the bleeding.
 - b. Slowly roll or slide the gauze to one side of the wound.
 - c. Try to visualize the vessel causing the bleeding.
 - d. Try to isolate the vessel so that only the vessel is grasped with the hemostat.

NOTE: Remember that nerves, arteries, and veins tend to run together. Injudicious clamping of soft tissue adjacent to a bleeding vessel can easily result in nerve injury.

- e. With the free hand, using the tips of the hemostats, grasp the most distal portion of the vessel.

NOTE: Ensure that the tip of the hemostat protrudes beyond the side of the vessel to prevent the ligature from sliding off.

- f. Slide the ligature under the hemostat (See Figure 1).

Performance Steps

Figure 1. Ligature Placement

- g. Tie a surgeon's knot, and allow the knot to slide under the tip of the hemostat.
- h. Use your fingertips to tighten the knot, being careful not to break the ligature (Figure 2).

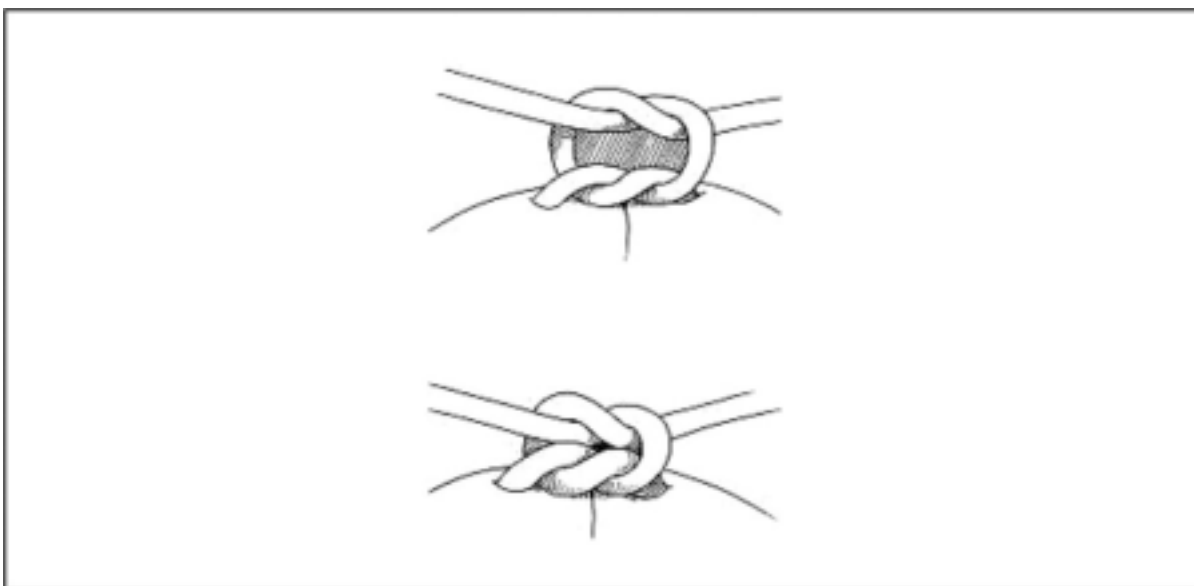


Figure 2. Ligature Tie

- i. Cut the tails of the ligature as close to the knot as possible.
- j. Slowly open the hemostats to ensure the ligation is effective.
- k. Repeat the procedure, as needed, until all significant hemorrhage is controlled.

Performance Steps

- l. Reassess the patient, as needed.
- m. Cover the wound with a sterile dressing.
4. Recognize possible complications of vessel ligation.
 - a. Ligation is ineffective, and patient continues to hemorrhage.
 - b. Damage to nerve tissue.
 - c. Damage to adjacent tissue, causing necrosis inside the wound.
 - d. Infection (phlebitis).
 - e. Allergic reaction to absorbable suture material.
5. Record the procedure in the patient's medical record.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform ligation or clamping to control hemorrhage.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the indications for vessel ligation.	—	—
2. Recognized the contraindications of vessel ligation.	—	—
3. Performed the ligation.	—	—
4. Recognized possible complications of vessel ligation.	—	—
5. Recorded the procedure in the patient's medical record.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Tactical Combat Casualty Care

081-833-4679

Conditions: Given a combat casualty under tactical conditions and M-5 medical kit.

Standards: Tactically manage a casualty to prevent additional injuries to the casualty or additional casualties without endangering the mission.

Performance Steps

1. Performs care under fire (tactical initial assessment).

Note: Care under fire is care rendered at the scene of the injury while the medic and the casualty are still under effective hostile fire.

- a. Return fire as directed or required before providing medical treatment.
 - b. Determine if casualty is alive or dead.
 - (1) Render aid to live patient tactically.
 - (a) Suppress enemy fire.
 - (b) Use cover or concealment (smoke).
 - (c) Direct casualty to return fire, move to cover, and administer self-aid.
 - (d) If patient is unresponsive, move patient and his equipment to cover.
 - (e) Keep the casualty from sustaining additional wounds.
 - (2) Recover obviously dead casualties as situation permits (task 081-833-4014, Determine Death).
 - c. Administer only emergency aid while still under fire.
 - (1) Identify and control life-threatening hemorrhage with a tourniquet.
- NOTE: The medic rendering care decides treatment on the basis of the relative risk of further injury versus that of exsanguination.
- (2) Identify and manage airway compromise with a nasopharyngeal airway.
 - (3) Consider cervical spine immobilization only if the method of injury dictates and the situation permits.
- d. Communicate medical situation to team leader.
 - e. Tactically transport patient, his weapon, and mission-essential equipment.
 - f. Reassess patient every 5 minutes.

2. Performs tactical field care (tactical rapid trauma assessment) when at a semisecured location.

NOTE: Tactical field care is care rendered by the medic when no longer under effective hostile fire. Tactical field care also applies to situations in which an injury has occurred on a mission but there has been no hostile fire. Available medical equipment is limited to that carried into the field by mission personnel.

- a. In the following situations, communicate medical situation to patrol leader:
 - (1) Upon determining that casualty will not be able to continue mission.
 - (2) Before initiating any medical procedures (ensure tactical situation allows for time required).
 - (3) Upon any significant change in casualty's status.
- b. Note general impression of the patient by determining responsiveness or level of consciousness.
- c. Assess and secures airway.
 - (1) If the patient is conscious and not in respiratory distress, do not administer airway intervention.
 - (2) If the patient is unconscious, use a chin-lift or jaw-thrust to open the airway. Use a nasopharyngeal airway (NPA) to maintain the airway.
 - (3) If the NPA does not correct the airway compromise of the unconscious patient, perform either one of the following:
 - (a) Perform an endotracheal intubation (task 081-833-3016, Intubate a Patient).
 - (b) Perform a cricothyroidotomy (task 081-833-4528, Perform a Cricothyroidotomy).

Performance Steps

NOTE: The decision to perform an endotracheal intubation or a cricothyroidotomy is based on the situation, condition of the patient, and skill and ability of the medic.

- d. Assess the chest and perform appropriate management to correct deficiencies of breathing or respiration.

- (1) Immediately seal any injuries to the chest with a three-sided occlusive dressing.
- (2) Monitor patient for signs and symptoms of a tension pneumothorax.
 - (a) Method of injury (MOI).
 - (b) Progressive respiratory distress.

NOTE: Because of tactical conditions, symptoms such as absent breath sounds, hyperresonance to percussion, and tracheal shift may be difficult to appreciate.

- (3) Decompress affected hemithorax with a 14-gauge needle inserted at second intercostal space (ICS) at midclavicular line (MCL). Leaves catheter in place with a stopcock or flutter valve to prevent reoccurrence (task 081-833-3007, Perform Needle Chest Compression).
- (4) Position or transport casualty with affected side down, if possible.

Note: Chest tubes are not recommended during the tactical field care phase.

- e. Identify and control major bleeding

- (1) Apply field or pressure dressings, as appropriate.
- (2) If a tourniquet was previously applied, consider converting it to a pressure dressing. (If you leave tourniquet, loosen it but do not remove it.)
- (3) Assess pulses or palpate for BP.

- f. Initiate 1 or 2 intravenous (IV) fluids, depending on the patient's hemodynamic (task 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock).

NOTE: An 18-gauge catheter is preferred in the field setting.

- (1) Do not start on extremity distal to a significant wound.
- (2) If the patient does not require immediate fluid resuscitation, apply a saline lock to the catheter.
 - (a) Whenever a medication is given through a saline lock, the lock should be flushed with 5 cubic centimeters (cc) of normal saline.
 - (b) Flushing the lock with normal saline about every 2 hours will usually suffice to keep it open
- (3) Select an appropriate location.
 - (a) Upper extremity is first choice.
 - (b) Saphenous or external jugular vein next option.
 - (c) Cutdowns are a last-resort treatment (task 081-833-4514, Perform a Venous Cutdown).
- (4) Initiate fluid resuscitation IAW task 081-833-4072, Manage Hemorrhagic/Hypovolemic Shock.)
 - (a) Do not administer fluids when hemorrhage is controlled and patient is not in shock.
 - (b) Administer fluids when hemorrhage is controlled and patient is not in shock.
 - (c) Administer fluids when hemorrhage (intra-abdominal or thoracic) is uncontrolled. Administering fluids maintains a palpable pulse.

- g. Expose wound.

- (1) Remove minimum of clothing required to expose and treat injuries.
- (2) Protect patient against the environment.

- h. Initiate medical evacuation/ close air support evacuation request lines 1 through 5 (lines 6 through 9, as appropriate)

- i. Administer analgesics, as necessary. (Administer morphine 5 mg IV, and repeat every 10 minutes to 15 mg every 4 hours.)

- j. Splint obvious long-bone fractures.

- k. Administer prophylactic antibiotics. (Administer cefoxitin 2 grams, slow IV push, initiated within 2 hours.)

- l. Complete Department of Defense (DD) Form 1380, Field Medical Card.

- m. Transport the patient to the site where extraction is anticipated. (See task 081-833-4680, Prepare a Patient for Transport.)

Performance Steps

- n. Conduct detailed trauma examination as tactical situation allows.
 - 3. Perform combat casualty evacuation care.
- NOTE: Combat casualty evacuation care is care rendered once the casualty, and usually the rest of the mission personnel, are awaiting pickup or have been picked up by a aircraft, vehicle, or boat.
- a. Provide definitive management of the airway.
 - b. Ensure patient's respirations are adequate, or provide assisted ventilations.
 - c. Ensure hemostasis has been achieved and maintained.
 - d. Ensure patient has at least 1 patent IV or IV access and that pulse and BP are maintained.
 - e. Check disability level.
 - f. Obtain and monitor vital signs.
 - g. Conduct detailed physical examination.
 - h. Perform necessary resuscitative procedures. These may be conducted at the same time as the physical examination or after.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform tactical combat casualty care.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Performed care under fire.	_____	_____
2. Performed tactical field care when at a semisecured location. Treated injuries that could possibly compromise airway or breathing.	_____	_____
3. Performed combat casualty evacuation care.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Prepare a Patient for Transport

081-833-4680

Conditions: As a special operations medic in a field environment and given M-5 medical kit, a poncho or folding litter, and a Department of Defense (DD) Form 1380, Field Medical Card.

Standards: Prepare a patient for transport by assessing the patient's condition, using all life-saving means, and recording all treatment and findings without causing further injury to the patient.

Performance Steps

1. Ensure the patient has a secure airway.
 - a. Recheck airway before and after any movement--especially if the patient is intubated.
 - b. Consider using an exhaled carbon dioxide detector for verifying tube placement (task 081-833-3053, Perform Exhale Carbon Dioxide Monitoring).
2. Reinforce all bandages, as needed.
3. Secure splinted arms to the body trunk.
4. Secure splinted legs together, if fractured or dislocated.
5. Reinforce intravenous (IV) sites by wrapping the catheter site and a 4- to 6-inch loop of tubing with an elastic bandage. Wrap the site and the tubing in a spiral fashion.
6. Assess the patient's vital signs to include pulse, respirations, and blood pressure.
7. Document the patient's condition and treatments on DD Form 1380, if available.
 - a. List all of the patient's injuries.
 - b. List all treatments given to include the amount of fluid, medications, and procedures given.
 - c. Include vital signs.
 - d. Include location and time any tourniquets were applied.
 - e. Attach DD Form 1380 to the patient.
8. Just before pickup, clamp off the IV infusion set and secure the IV bag around the casualty's neck with a cravat.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must prepare a patient for transport.

Brief soldier: All life-threatening injuries have been addressed, and the transport vehicle or aircraft is en route.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured the patient had a secure airway. Checked before and after any movement.	—	—
2. Reinforced all bandages.	—	—
3. Secured splinted arms to the body trunk.	—	—
4. Secured splinted legs together.	—	—
5. Reinforced IV sites.	—	—
6. Assessed the patient's vital signs.	—	—
7. Documented the patient's condition and treatments on DD Form 1380, if available.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
8. Just before pickup, clamped off the IV infusion set and secured the IV bag around the casualty's neck with a cravat.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 24: Anesthesia

Prepare a Patient for General Anesthesia

081-833-4522

Conditions: You are in a hospital environment. Given a document to record the patient's history, rubber gloves, Phisohex, providone-iodine soap, a razor, a blood pressure (BP) cuff, a thermometer, a stethoscope, and a urinary catheter.

Standards: Prepare a patient for an operative procedure by using a general anesthetic and without violating aseptic technique.

Performance Steps

1. Conduct a thorough history of the preoperative patient.
2. Prepare the patient psychologically.
 - a. Allow the patient to ventilate his fears.
 - b. Inform patient about surgical procedure. Explain what he can expect before, during, and after surgery.
3. Explain to patient postoperative actions.
 - a. Instruct the patient to do the following:
 - (1) Turn.
 - (2) Cough.
 - (3) Breathe deeply.
 - (4) Do complete range-of-motion exercises.
 - b. Instruct the patient in the use of blow bottles.

NOTE: Anxiety and fear are significant barriers to learning. Therefore, it is better to start preoperative teaching 1 to 2 days before surgery when possible.

4. Ensure the following items are removed from the patient:
 - a. Jewelry.
 - b. Glasses.
 - c. Dentures
 - d. Hairpins.
 - e. Watches.
5. Prepare the patient's skin for the procedure.
 - a. Bathe the patient with Phisohex or providone-iodine soap.
 - b. Shave and prepare the site.
6. Prepare the patient gastrointestinally.
 - a. Place the patient on nothing by mouth (NPO) except water from midnight the day before the operation.
 - b. Place the patient on NPO and without water at least 4 to 7 hours before surgery except for oral medications with a small amount of water.
 - c. Protect against acid aspiration pneumonitis by one of the following methods:
 - (1) Administer 30 milliliters (ml) of 1/3 molar sodium bicitrate (Alka Seltzer Gold).
 - (2) Administer a hydrogen (H₂) receptor antagonist such as cimetidine 300 milligrams (mg) or ranitidine 150 mg by mouth (PO) the night before and 1 to 2 hours before the surgery.
 - (3) Administer metoclopramide 20 mg PO 1/2 to 2 hours before induction of anesthesia.
 - d. Insert gastric tubes, if required. In emergency surgery, where the status of the patient's gastric emptying is unknown, a nasogastric tube should be passed and the stomach emptied.
7. Have the patient urinate, and document color and amount of output.

Performance Steps

8. Insert a urinary catheter if required, to do the following:
 - a. Ensure the bladder is empty.
 - b. Decrease chances of incidental injury to the bladder during surgery.
 - c. Prevent contamination during surgery.
9. Take vital signs before surgery, and record them.
10. Intubate all trauma patients who will undergo general anesthesia to prevent aspiration of gastric contents.
11. Record all procedures performed for the patients.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must prepare a patient for general anesthesia.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Conducted a thorough history.	—	—
2. Prepared the patient psychologically.	—	—
3. Explained the postoperative actions that would be required by the patient.	—	—
4. Ensured jewelry, glasses, dentures, and hairpins were removed from the patient.	—	—
5. Prepared the patient's skin for the procedure.	—	—
6. Prepared the patient gastrointestinally.	—	—
7. Had the patient urinate and documented color and amount of output.	—	—
8. Inserted a urinary catheter, if required.	—	—
9. Took and recorded vital signs before surgery.	—	—
10. Intubated all trauma patients who would undergo general anesthesia.	—	—
11. Recorded all procedures performed for the patients.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Record Surgical and Anesthetic Procedures

081-833-4542

Conditions: Given Standard Form (SF) 516, Operation Report--Medical Record.

Standards: Transcribe the appropriate patient information and procedural findings and descriptions in the correct blocks of Standard Form 517, Clinical Record--Anesthesia.

Performance Steps

NOTE: The preanesthetic visit and the clinical record of anesthesia are recorded on Standard Form 517.

1. Record the preanesthetic visit.
2. Identify physical characteristics that may cause difficulties during tracheal intubation.
NOTE: Although tracheal intubation may not be planned for the anesthetic, these areas should be examined in case of emergency.
 - a. Short or very thick neck
 - b. Diseases of the pharynx or larynx
 - c. Small mouth
 - d. Inability to visualize the uvula
3. Identify other conditions that may complicate anesthesia.
 - a. The presence of chips or cracks on tooth enamel, loose teeth, dentures, and crowns.
 - b. Known drug allergies.
 - c. Patient's history of previous exposure to anesthesia and any adverse reactions.
 - d. Other illnesses that could complicate anesthesia
4. Record other information pertinent to the procedure (Figure 1).

Performance Steps

PREANESTHETIC SUMMARY			
OPERATION PROPOSED	AGE	WEIGHT	SPECIAL INFORMATION
	PHYSICAL STATUS 1 2 3 4 5 6 7		
URINALYSIS NORMAL _____ ABNORMAL AND WHY?	HEMATOLOGY HGB _____ RBC _____ HCT _____ OTHER _____		FECAL _____
RESPIRATORY SYSTEM (X RAY, ASTHMA, OTHER PATHOLOGY)	CIRCULATORY SYSTEM BP _____ PULSE _____ ECG IF PERTINENT	CENTRAL NERVOUS SYSTEM (CEREBROVASCULAR, FOCAL, NEUROLOGICAL)	OTHER SYSTEMS (ABDOMEN)
PREVIOUS ANESTHETICS AND COMPLICATIONS		PRESENT DRUG THERAPY: E.G. STEROIDS, TRANQUILIZERS	
PREOPERATIVE DIAGNOSIS		PREMEDICATIONS	
		SIGNATURE OF EVALUATING PHYSICIAN	DATE
POST ANESTHETIC VISIT			
RECORD ALL PERTINENT COMPLICATIONS			
TIME OFF ANESTHESIA: AVPU:			
TIME EXTUBATED: V/S			
TIME STANDING: XII CN:			
TIME DRINKING:			
TIME EATING:			
TIME VOIDING:			
TIME DEFECATING:			
ANESTHESIA SF FORM 517 Prescribed by OSHA/CMR FORM 141 (CFR) 201-48.505 OCTOBER 1975			

Figure 1. Form 516

a. Operation proposed.

Performance Steps

- b. Patients age.
 - c. Patients weight in pounds.
 - d. Patients physical status category.
 - (1) Class 1: normal healthy patient.
 - (2) Class 2: a patient with mild systemic disease.
 - (3) Class 3: a patient with a severe systemic disease that limits activity but is not incapacitating.
 - (4) Class 4: a patient with an incapacitating systemic disease that is a constant threat to life.
 - (5) Class 5: a moribund patient who is not expected to survive more than 24 hours with or without surgery.
 - (6) Emergency cases are designated by the addition of a suffix E to the classification number.
 - e. Special information.
 - f. Urinalysis results.
 - g. Hematology results.
 - h. Fecal analysis results.
 - i. Respiratory system findings.
 - j. Circulatory system findings.
 - k. Central nervous system findings.
 - l. Other system findings that may affect the procedure.
 - m. Previous anesthetic complications.
 - n. Present drug therapy.
 - o. Preoperative diagnosis.
 - p. Premedications given.
 - q. Signature of evaluating surgeon.
 - r. Date.
5. Record the clinical record of anesthesia. Record each event that occurs promptly in the manner described (Figure 2).

Performance Steps

- a. Annotate the time at the top of each column, beginning with the time the baseline vitals are taken.
- b. Annotate anesthetics used during the procedure in the upper left corner of the form. Other spaces may be used to annotate necessary items (ambu bag, suction, and so on).
- c. Annotate the use of the above items by marking an X in the appropriate column corresponding to the time the item was administered.
- d. Mark the four lines for the level of anesthesia as stage II, stage III plane 1, stage III plane 2, and stage III plane 3.
- e. Record the level of anesthesia every 5 minutes with an X.
- f. Mark the pulse every 5 minutes with a dot (.) in the appropriate place.
- g. Mark the respirations every 5 minutes with a circle (o) in the appropriate place.
- h. Connect the dots and circles with a straight line.
- i. Record the blood pressure in the appropriate time column. Mark the systolic pressure as V and the diastolic pressure as ^.
- j. Record the remarks sequentially. These correspond to the remarks column on the right side of the sheet. The remarks should contain everything that is given to or done to the patient that is not recorded elsewhere on the sheet.

NOTE: More than one remarks number can be recorded in any given time frame.

- k. Record a step by step account of the surgical procedure in the remarks unless there is a separate recorder assigned to this task.
- l. Record the patient's temperature in the remarks at least every 30 minutes.
- m. Record any patient fluid loss in the remarks (emesis, blood loss, and so on).
- n. Record the administration of IV fluids by placing a diagonal line in the time column when the container of fluid was started and another diagonal line in the time column when the container of fluid was stopped. These lines are then connected by a straight line. Label the line with the type of solution administered. At the end of the procedure, the total amount of fluid is recorded at the bottom center of the sheet.

NOTE: If more than one container of fluid is being run at the same time, each one will be indicated with a separate line.

- o. Record the patient's position in the same manner as the IV fluids.
- p. Record the anesthetic agents, doses, routes, and method of administration in the agents and techniques block. DO NOT record the preanesthetic agent here.
- q. Fill in all blanks of the endotracheal line if the patient was intubated.
- r. Record the initial induction in the upper right corner of the sheet.
- s. Fill in the remaining blocks as indicated.
- t. Sign the SF 517 and all continuation sheets.

NOTE: The anesthesia report is not valid until signed by the anesthetist.

6. Record the post-anesthetic visit.
 - a. Neurologic evaluation.
 - b. Evaluation of the patient's general response to anesthesia with emphasis on the patient's respiratory condition.
 - c. Any complications (patient stayed under anesthesia longer than expected, etc.)

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must record surgical and anesthetic procedures.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recorded the preanesthetic visit.	—	—
2. Identified physical characteristics that may cause difficulties during tracheal intubation.	—	—
3. Identified other conditions that may complicate anesthesia.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Recorded other information pertinent to the procedure.	_____	_____
5. Recorded the clinical record of anesthesia. Recorded each event that occurred promptly in the manner described.	_____	_____
6. Recorded the postanesthetic visit.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Administer Regional Anesthesia

081-833-4547

Conditions: You are in a field environment. An assistant is available. Given anesthesia administration equipment, a laryngoscope with an ET, suction equipment, syringes, an antiseptic solution, and a local anesthetic solution.

Standards: Administer regional anesthesia by performing the digital block, intercostal nerve block, or IV regional method.

Performance Steps

1. Review the patient's medical history.
 - a. Allergies.
 - b. Previous surgery.
 - c. Previous general or regional anesthesia.
 - d. Patient's age, physical condition, and life-style (to include alcohol, tobacco, and drug usage).
 - e. Health history.
2. Perform a "screening" physical examination.
 - a. Vital signs and patient's weight.
 - b. Respiratory system.
 - c. Cardiovascular system.
 - d. Central nervous system.
 - e. Genitourinary system.
3. Explain the anesthetic procedures to the patient.
4. Administer an IV to provide an access line when administering IV regional anesthesia.
5. Assess vital signs.
6. Record the preanesthetic preparations (task 081-833-4543, Record Anesthetic and Surgical Procedures).
7. Perform the required procedure.
 - a. Perform a digital block.

CAUTION Digital block anesthesia is inadvisable in patients with a history of Raynaud's disease.

- (1) Clean the digit to be anesthetized with an appropriate antiseptic solution.
- (2) Using a small gauge needle (25 to 27 gauge by 1 inch), raise an intradermal wheal on the dorsum of the digit, near its base, using 1- or 2-percent lidocaine.

CAUTION The use of lidocaine with epinephrine is inadvisable in this procedure. Also due to peripheral nerve toxicity, marcaine should not be considered as the agent of choice.

- (3) With the tip of the needle still between the bone and skin, pass the needle across the dorsum of the digit until palpable on the contralateral side.

NOTE: Do not pierce the skin.

- (4) Inject 1.0 to 1.5 ml of solution as the needle is withdrawn to just before the amount is released.

NOTE: The amount depends on the size of the patient.

- (5) With the tip of the needle just under the puncture site, rotate it toward the palmar aspect of the digit and pass the needle until it is again palpable but does not pierce the skin on the palmar side.

NOTE: Injection of anesthetic solution beneath the skin of the palmar surface is usually not necessary.

- (6) Inject 1.0 to 1.5 ml of the solution as the needle is withdrawn.
- (7) Puncture the dorsum of the digit on the contralateral side and pass the needle in a palmar direction until the tip of the needle is through the previously anesthetized area.
- (8) Inject 1.0 to 1.5 ml of solution as the needle is withdrawn in a dorsal direction.

Performance Steps

NOTE: Use of a digital tourniquet to control bleeding and prolong anesthesia is usually not necessary.

- (9) Assess the degree of analgesia or anesthesia before starting the procedure.

NOTE: After depositing the solution, 15 minutes may be required to establish sufficient analgesia for the procedure.

- (10) Periodically test the area for sensation during the procedure.
 - (11) Record all information, such as amount and strength of solution injected, type of solution injected, and effectiveness of anesthesia.
- b. Perform intercostal nerve block, as required.
- (1) Determine the area or rib to be anesthetized.
 - (2) Locate anatomical landmarks of the injection site.

NOTE: Intercostal nerves are best anesthetized in the region of the costal angles lateral to the outer border of the sacrospiral muscle. This line runs from a point approximately 6 cm lateral to the spinous process of T1 vertically to a point approximately 10 cm lateral to the spinous process of T12.

CAUTION Since trauma is usually a predisposing factor, patient safety is paramount, but try to position the patient as comfortably as possible. An assistant may be necessary to support the patient.

- (3) Draw the patient's arms upward and forward to achieve the best possible scapular displacement.

- (4) Palpate the lower margin of the rib and draw the overlying skin cephalad.

CAUTION If the rib is not easily palpated, an intercostal block is not attempted.

- (5) Raise an intradermal wheal over the lower border of the rib approximately 4 finger breadths from the midline.
- (6) Insert a small gauge needle (25 gauge by 1 inch) until contact is made with the lower border of the rib.
- (7) Withdraw the needle partially and "walk" the tip down until it slips past the lower border of the ribs to a depth of approximately 3 mm.
- (8) Inject 3 to 5 ml of 1-percent lidocaine (or the longest lasting local anesthetic agent available, preferably), as the needle is slightly advanced.

CAUTION Absolute control of the needle is essential to minimize pleural puncture. The needle should be mounted on a syringe so that no air will enter the pleural cavity in the event of puncture. Do not inject more than the maximal dose of anesthetic.

- c. Perform IV regional anesthesia, as required.

WARNING This procedure is contraindicated in patients with a history of peripheral vascular or neurological disease. Due to risks involved, this procedure should be performed only in an environment where resuscitation can be performed and the patient closely monitored.

- (1) Test the pneumatic tourniquet apparatus (or BP cuff) to be used.

CAUTION The accidental release of anesthetic through the tourniquet may precipitate seizure activity.

NOTE: If neither apparatus will retain 100 mm Hg pressure above the patient's systolic blood pressure, this procedure cannot be attempted because of the safety risk to the patient. Another choice of anesthesia must be made.

- (2) Calculate the amount of anesthetic required based on a dosage requirement of approximately 3 mg/kg lidocaine and then add sterile normal saline to expand the volume to approximately 3.0 times that of 1-percent lidocaine (to 60 cc total).

- (3) Loosely place two tourniquets to the upper arm, but do not inflate.

NOTE: This block should be restricted to use in procedures below the elbow. Anesthesia of the lower extremity is difficult to achieve due to the large amounts of solution required. Additionally, this may unnecessarily predispose the patient to a compartment syndrome.

- (4) Initiate an IV catheter (16-, 18-, or 20-gauge) with stopcock apparatus into a peripheral vein as distally as possible.

- (5) Elevate the limb, if possible, to decrease blood content.

NOTE: If a bloodless field is required, apply a tightly wrapped ace wrap using a figure-of-8 technique from distal to proximal (ES march bandage).

- (6) Inflate the proximal tourniquet to 100 mm Hg over the patient's systolic blood pressure.

CAUTION A piece of latex rubber tubing should be applied above the proximal tourniquet in case of pressure loss.

Performance Steps

- (7) Inject the anesthetic solution via IV catheter after it has been flushed with sterile normal saline.

CAUTION This solution must not contain epinephrine.

- (8) Wait 3 minutes, then inflate the distal tourniquet on an anesthetized area of skin (same pressure as proximal tourniquet) and apply a second latex tourniquet between the two pneumatic tourniquets as a safety backup.
- (9) Release the proximal tourniquet and upper latex tourniquet from the unanesthetized skin.
- (10) Assess anesthesia before starting the procedure.
- (11) Periodically (every 3 to 5 minutes), assess the inflation of the tourniquet to prevent accidental premature and potentially toxic release of anesthetic.
- (12) Continuously monitor vital signs throughout the procedure.
- (13) Release the tourniquet as follows:

NOTE: The tourniquet should be left inflated for a minimum of 30 minutes before beginning the deflation procedure to increase the amount of free anesthetic released back into systemic circulation.

- (a) Reduce tourniquet pressure to systolic blood pressure and release the latex tourniquet completely.
- (b) Release pressure by opening the valve on the blood pressure cuff to allow 5 mm Hg pressure to escape every 30 seconds until completely deflated.

WARNING Be prepared to manage anaphylaxis or other toxic (seizure) reactions.

- (14) Monitor the patient for signs of toxicity.
 - (a) Seizure activity.
 - (b) Drowsiness.
 - (c) Bradycardia.
 - (d) Hypotension.
 - (e) Arrhythmia.

8. Record the procedure.

Performance Measures

1. Prepared the patient.
2. Administered the anesthesia.
3. Recorded the procedure.

GO **NO GO**

_____	_____
_____	_____
_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Administer Parenteral General Anesthesia
081-833-4548

Conditions: You are in a field environment, where you must assist a surgeon during an operation by administering anesthesia. Given anesthesia administration equipment, parenteral anesthesia, an IV setup, airway management equipment, barbiturates, narcotics, benzodiazepine, succinylcholine chloride, ketamine, and Pavulon.

Standards: Administer the anesthesia in such a manner that the patient is maintained at the appropriate surgical plane during the surgery. Ensure the patient safely recovers and alert the physician of any problem areas.

Performance Steps

1. Review the patient's medical history.
 - a. Allergies.
 - b. Previous surgery.
 - c. Previous general or regional anesthesia.
 - d. Patient's age, physical condition, and life-style (to include alcohol, tobacco, and drug usage).
 - e. Health history.
2. Perform a "screening" physical examination and required laboratory work.
 - a. Vital signs and patient's weight.
 - b. Respiratory system.
 - c. Cardiovascular system.
 - d. Central nervous system.
 - e. Genitourinary system.
 - f. Laboratory tests, if possible.
 - (1) CBC with differential.
 - (2) Urinalysis.
3. Explain the anesthetic procedures to the patient, if possible.
4. Keep the patient NPO 12 to 24 hours before surgery.
5. Remove jewelry, dentures, glasses, etc.
6. Record vital signs every 3 to 5 minutes.
7. Calculate and administer sufficient dosage of preoperative medication.
8. Administer an IV setup to rehydrate the patient and to provide an access line.
9. Record the preanesthetic preparations as they are performed.
10. Inspect and assemble equipment needed to perform anesthesia.
11. Select the appropriate parenteral general anesthetic based on the procedure and the patient's condition.
12. Calculate the amount to be administered based on product information and the patient's condition.

NOTE: Patients with a history of chronic alcohol use or abuse or other drug abuse may have a highly active liver metabolism producing a tolerance to otherwise normal amounts of anesthetic medication and may thus require a large dosage. Conversely, patients with significant liver damage due to alcohol abuse may remain under anesthesia longer due to decreased liver metabolism of normal dosages.
13. Check and record the vital signs before administering anesthesia.
14. Administer anesthesia according to product information.

Performance Steps

NOTE: Dosages listed in product literature are based on normovolemic, otherwise healthy patients.

- a. Check backflow of the IV line.
- b. Clean the injection site of the IV line.
- c. Pinch the IV line to stop the flow.
- d. Inject the anesthesia.

15. Administer anesthesia according to product information until the plane of anesthesia is reached.

16. Intubate and ventilate the patient.

17. Monitor vital signs continuously throughout the procedure.

CAUTION When using central nervous system (CNS) depressant drugs, particular attention must be paid to the respiratory depressant effect of the medication. Narcotics reversal medication (Naloxone) must be on hand, if using narcotics.

18. Record results and reactions to anesthesia.

- a. Use the correct form.
- b. Record all entries in the appropriate location legibly and correctly.

19. Provide postoperative care.

- a. Ensure the patient's safety.
- b. Monitor vital signs every 5 minutes.
- c. Extubate the patient after the gag reflex returns.

CAUTION During extubation, suction equipment should be on hand to manage vomiting, if needed.

- d. Assess CNS status for complete patient recovery.
- e. Record any postoperative complications on the anesthesia record.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Completed preanesthetic procedure.	_____	_____
2. Administered the appropriate anesthetic.	_____	_____
3. Maintained the patient at the appropriate surgical plane.	_____	_____
4. Provided postoperative care.	_____	_____
5. Recorded the results and reactions.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Administer Local Anesthesia**081-833-4550**

Conditions: You are in a field environment. Given needles, an antiseptic solution, syringes, a local anesthetic, and a laryngoscope with endotracheal (ET) tube to manage allergic reactions to anesthetic agents.

Standards: Anesthetize the patient so the sharp point of a needle cannot be felt and without causing the patient further injury.

Performance Steps

1. Explain the procedure to the patient.
2. Obtain the patient's history, to include pertinent medical and surgical history. (Obtain history of procedures requiring anesthesia and any problems encountered.)
3. Assemble the equipment.
 - a. Equipment and supplies for administering the local anesthetic, such as syringe, needle, anesthetic agent, alcohol, betadine preparation pads, and gloves.
 - b. Materials required for performing the procedure that is to be performed after administering the local anesthetic.
 - c. Materials and equipment needed to manage allergic reactions to anesthetic agents.
4. Prepare the area to be anesthetized.
 - a. Remove any garments covering the wound or anticipated sites of injection.
 - b. Scrub area with sterilizing agent from the center outward.

NOTE: If the purpose of anesthesia is to provide enough pain relief to properly clean and debride the wound, clean only the injection site.

5. Draw up the anesthetic agent.
6. Infiltrate the area with local anesthetic.
 - a. Withdraw the plunger each time after the needle is moved to ensure that the anesthetic is not being injected intravenously.
 - b. Ensure that contamination is not dragged into the needle tract.

NOTE: Running the needle under the skin its full length along the edge of a laceration and injecting while withdrawing can decrease the number of needle sticks required to infiltrate the area. One can also inject as the needle is advanced and, if done slowly, can often eliminate the pain of the needle being advanced.

7. Assess anesthesia before starting the procedure.

NOTE: The patient will still feel pressure if the area is properly anesthetized but will not feel the sharp point of the needle.

8. Periodically test the area for anesthetic effect until the procedure is completed.
9. Record all actions taken.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must administer local anesthesia.

Performance Measures

1. Explained the procedure to the patient.
2. Obtained the patient's history, to include pertinent medical and surgical history.
3. Assembled equipment.
 - a. Equipment and supplies for administering the local anesthetic.

GO NO GO

_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
b. Materials required for performing the procedure that is to be performed after administering the local anesthetic. c. Anaphylactic kit.		
4. Prepared the area to be anesthetized.	_____	_____
5. Drew up the anesthetic agent.	_____	_____
6. Infiltrated the area with local anesthetic.	_____	_____
a. Aspirated each time. b. Ensured that contamination was not dragged into the needle tract.		
7. Assessed anesthesia before starting the procedure.	_____	_____
8. Tested the area for anesthetic effect until the procedure was completed.	_____	_____
9. Recorded all actions taken.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage a Patient Through Recovery Following General Anesthesia

081-833-4551

Conditions: You are in a hospital environment. Given elastic bandages of various sizes, intravenous (IV) equipment, Ringer's lactate, oxygen, stethoscope, blood pressure cuff, blood plasma, antibiotics, analgesics, sterile dressings, drains for wounds, and sedatives.

Standards: Receive a patient from the operating room, and prevent or manage any complications.

Performance Steps

1. Manage circulatory conditions.
 - a. Apply prevention therapy.
 - (1) Change the position of the patient every 2 to 4 hours.
 - (2) Perform range-of-motion exercises.
 - (3) Perform ambulation of the patient.
 - (4) Maintain elevation of the lower extremities.

NOTE: Wrap the legs of the patient with elastic bandages to prevent stasis, if necessary.

- b. Manage circulatory complications, if required.
 - (1) Oversee conditions of hemorrhaging.
 - (a) Take vital signs every 15 minutes until stable.
 - (b) Check dressings when taking the vital signs.
 - (c) Apply pressure dressings to stop bleeding.
 - (d) Record the color and amount of drainage noted on the dressing.
 - (e) Administer appropriate fluid therapy.
 - (f) Give blood transfusion, if required.
 - (g) Administer oxygen therapy.
 - (2) Manage shock.
 - (3) Manage thrombophlebitis.

WARNING: Do not massage the affected limb.

- (a) Avoid prolonged pressure on the patient's leg.
 - (b) Elevate the affected limb.
 - (c) Order strict bedrest.
 - (d) Apply warm, moist packs to the affected limb.
 - (e) Apply elastic bandages from toes to groin and remove twice daily.
 - (f) Observe for pulmonary embolism.

2. Manage respiratory conditions.
 - a. Apply prevention therapy.
 - (1) Change the position of the patient every 2 hours.
 - (2) Perform deep breathing and coughing every 2 hours.
 - (3) Begin early ambulation.
 - (4) Perform range of motion exercises.
 - b. Manage respiratory complications, if required.
 - (1) Pneumonia.
 - (2) Atelectasis.
 - (3) Pulmonary embolism.
 - (a) Keep the patient on bedrest.
 - (b) Keep the patient in semi-Fowler's position.
 - (c) Give oxygen 6 to 8 liters per minute by mask.
 - (d) Take vital signs every 4 hours when stable.
 - (e) Give analgesics to relieve pain.

3. Manage conditions of the skin.
 - a. Apply prevention therapy.
 - (1) Keep wound covered with sterile dressings.

Performance Steps

- (2) Use strict aseptic technique when changing dressings.
- (3) Check wound site for signs of infection when changing the dressings.
- b. Manage complications of the skin, if required.
 - (1) Manage infections.
 - (a) Take vital signs every 4 hours.
 - (b) Remove sutures.
 - (c) Culture the wound.
 - (d) Give antibiotic therapy on the basis of the results of culture and sensitivity.
 - (e) Perform wound care frequently.
 - (f) Insert drain for deep infection when needed.
 - (2) Manage decubitus ulcers by using aseptic technique on any broken skin areas.

NOTE: Prevention is the best management.

4. Manage urinary conditions.
 - a. Apply prevention therapy.
 - (1) Ensure early ambulation.
 - (2) Ensure adequate fluid intake.
 - (3) Perform urinary catheter care every 8 hours.
 - (4) Remove urinary catheter as soon as possible.
 - b. Manage complications of the urinary tract, if required.
 - (1) Push fluids--especially warm drinks.
 - (2) Check for bladder distention 8 hours after the surgical procedure.
 - (3) Record the time, color, odor, consistency, and amount of the first voiding.
5. Manage gastrointestinal conditions.
 - a. Treat patients that are nauseated or vomiting.
 - (1) Keep the patient on his side or with his head tilted to the side.
 - (2) Give IV fluids to replace electrolytes.
 - (3) Keep the patient in a quiet, cool, and odor-free environment.
 - (4) Avoid abrupt position changes.
 - (5) Give antiemetics.
 - b. Manage constipation.
 - (1) Give stool softener.
 - (2) Provide a laxative.
 - (3) Give an enema as a last resort.
 - c. Manage distention.
 - (1) Insert a rectal tube for 5 to 10 minutes to relieve flatus.
 - (2) Perform gastric intubation and suction.
 - (3) Give IV fluids.
 - (4) Keep the patient on nothing by mouth (NPO) until the patient is able to pass flatus.
 - (5) Monitor the bowel sounds.
 - (6) Give neostigmine 1 cubic centimeter (cc) 1:1,000 or 1:2,000 solution intramuscularly (IM) to stimulate peristalsis as a last resort.
 - d. Manage evisceration.
 - (1) Cover exposed organs with dry, sterile gauze.
 - (2) Give IV fluids.
 - (3) Perform nasogastric intubation.
 - (4) Keep the patient on NPO.
 - (5) Keep the patient on bedrest.
 - (6) Keep the patient's legs flexed to relieve tension on the abdomen.
6. Maintain all patients on NPO until the following occur:
 - a. Patient has active bowel sounds.
 - b. Patient passes flatus.

NOTE: Begin the patient's diet with clear liquids and progress, as he tolerates it, to full liquids, to soft diet, and to regular diet.

Performance Steps

- Record all actions taken, and complete an input and output sheet.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a patient through recovery following general anesthesia.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Applied preventive therapy for the circulatory system.	—	—
2. Managed circulatory complications, if required.	—	—
3. Applied preventive therapy for the respiratory system.	—	—
4. Managed respiratory complications, if required.	—	—
5. Applied preventive therapy for the skin.	—	—
6. Managed conditions of the skin, if required.	—	—
7. Applied preventive therapy for the urinary tract.	—	—
8. Managed complications of the urinary tract, if required.	—	—
9. Managed gastrointestinal conditions.	—	—
10. Maintained all patients NPO until the patient has active bowel sounds or passes flatus.	—	—
11. Began the patient's diet with clear liquids and progressed, as patient tolerates it, to full liquids, soft diet to regular diet.	—	—
12. Recorded all actions taken and completed an input and output sheet.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 25: Surgical Procedures

Perform Amputations

081-833-4425

Conditions: You are located at an unconventional warfare hospital. Given a Special Forces tactical medical equipment set, patient's medical record, and a surgical environment.

Standards: Perform an extremity amputation by completing all necessary steps.

Performance Steps

1. Recognize the indications for an amputation.
 - a. Massive injuries in which the components of an extremity are so badly mangled that the extremity is obviously nonviable.
 - b. Extremities with severe involvement of skin, muscles, and bone with an anesthetic terminus and irreparable nerve damage.
 - c. Overwhelming local infection, which, despite adequate surgical measures and antibiotic therapy, endangers life.
 - d. Established death of a limb (vascular gangrene), where vascular repair has failed or has proven to be impractical.
 - e. Massive septic gangrene (clostridial myositis) is a most compelling indication for amputation. Anaerobic cellulitis or myositis confined to a single muscle group can be managed by resection and is not an indication for amputation.
 - f. Secondary hemorrhage in the presence of severe infection, even though initial wound surgery apparently may have been adequate. Included in this group are patients for whom the tactical situation precluded adequate early surgical intervention.
 2. Perform the amputation by using the open circular technique.
- NOTE: The open circular amputation, as described below, is the most acceptable type for combat conditions.
- a. Make a circumferential incision through the skin and deep fascia at the lowest viable level. This layer is allowed to retract without dissecting or undermining (Figure 1).

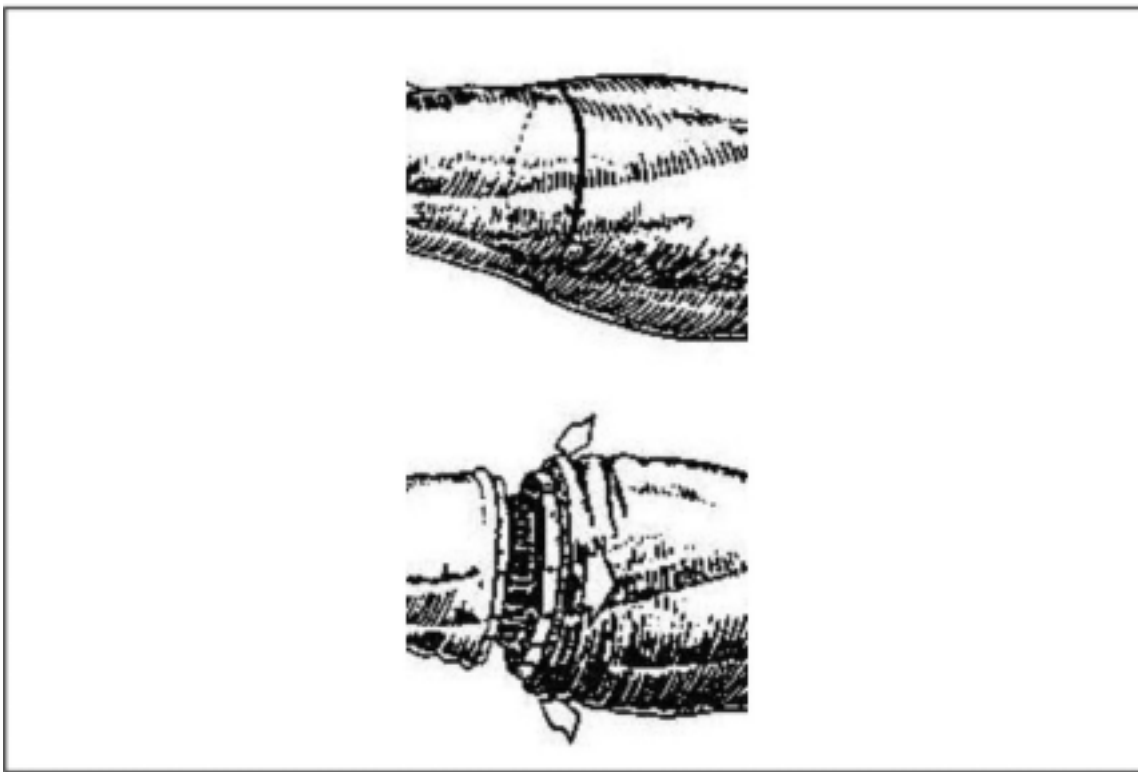
Performance Steps

Figure 1. Circumferential Incision

- b. Circumferentially divide the exposed muscle bundles at the new proximal level of retracted skin edge. The incised muscle bundles will promptly retract, proximally exposing the bone beneath. The goal is for the muscle flaps to be much longer than the stump of bone (Figure 2).

Performance Steps

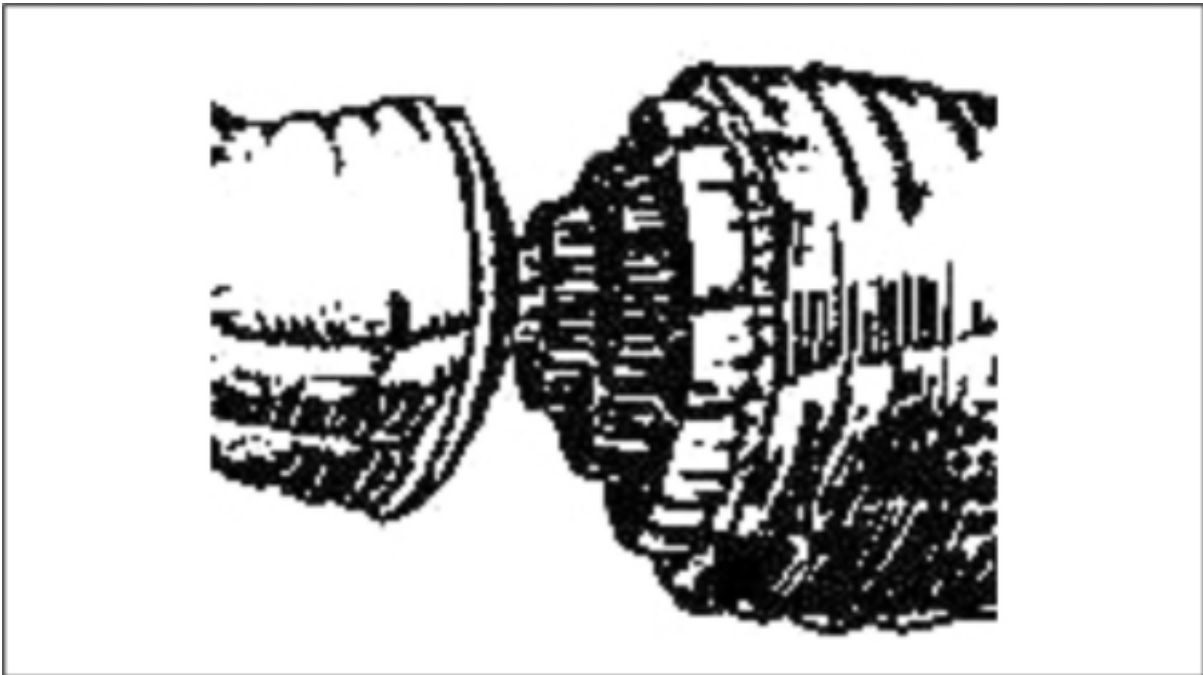


Figure 2. Circumferential Division of Exposed Muscle Bundles

- c. Manually retract the soft tissues proximally to facilitate bone transection at a still higher level. Strip periosteum with an osteotome or other device, going no higher up the bone than the amputation site will be (Figures 3 and 4).

Performance Steps



Figure 3. Manual Retraction of Soft Tissue

Performance Steps



Figure 4. Periosteum Stripping

- d. Use a Gigli saw or hand saw to cut bone, taking care not to injure muscle, skin, or the assistant's hands. Cut the bone much shorter than the muscle, and smooth the edges of the bone with a rasp.
- e. Do not cut blindly through muscle. Deliberately seek out the blood vessels, divide them between clamps, and ligate them as they are encountered. In addition, add a transfixing suture to the cuff of large arteries. The artery supplying the sciatic nerve may require separate ligation. Apply temporary pressure, bone wax, or thromboplastin to the open medullary cavities of large bones to control hemorrhage, as necessary.
- f. Transact major nerves 2 to 3 inches above the amputation at the highest possible level without resorting to traction. Do not ligate nerve stumps or inject them with alcohol or other chemical agents. However, you may inject the nerve stumps with a long-acting, local anesthetic agent to reduce pain during the postoperative recovery period.
- g. Since the amputation has been performed because of irreparable damage to a contaminated, if not grossly septic, extremity, the stump primarily.
- h. Loosely pack stump with fluffed gauze.
- i. Apply a stockinette to the skin proximal to the open stump, and secure it with liquid adhesive to prevent slippage.
- j. Apply 5 to 6 pounds of traction to the stockinette by using weights and pulleys or with a self-contained traction device. Avoid constrictive wrapping. Continuously maintain traction, and reapply traction after each dressing change.
- k. After amputation through the femur to prevent flexion contracture of the hip, keep the patient prone as much as possible until he has become familiar with active corrective exercises. If he lies supine, use sandbags or weight devices to hold the stump in position.

Performance Steps

- I. Keep a tourniquet readily available for emergency use for the first 5 to 7 days. Loosely attach the tourniquet to the bed or litter.
NOTE: Delayed primary closure may not be indicated in open circular amputations. Continued traction will often result in the skin's eventually closing over the end of the stump.
- 3. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a simulated patient and a scenario in which he must perform an amputation.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the indications for an amputation.	_____	_____
2. Performed the amputation by using the open circular technique.	_____	_____
3. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 8-74

Perform an Escharotomy

081-833-4493

Conditions: As a special operations combat medic in a field environment and given a scalpel, antiseptic swabs, and patient's medical record.

Standards: Perform an escharotomy so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the indications for an escharotomy.
 - a. Circumferential, full-thickness burns of the chest that impair respiratory excursion by preventing expansion of the chest wall, compromising inspired tidal volume, and causing hypoxia.
 - b. Circumferential, full-thickness burns that cause circulatory embarrassment of an extremity.

2. Perform a patient assessment to determine the need for an escharotomy.

CAUTION: With severe burns involving the chest, give first priority to securing the airway. Inhalation injuries are often associated with burns of the chest. Consider any impaired respirations an airway injury. Only after securing an airway and ruling out inhalation injuries should you consider escharotomy.

- a. Assess the quality and depth of the patient's respirations. Shallow respirations with obvious distress and the appearance of gasping retractions of the accessory muscle groups may be indication alone for escharotomy.
- b. Obvious circumferential, full-thickness burns of the chest that produce a nonmobile, leathery eschar that obviously prevents expansion of the chest.
- c. Evaluate the need for escharotomy in the extremities by doing the following:
 - (1) Removing all jewelry.
 - (2) Assessing nonburned distal tissue (if any) for cyanosis and impaired capillary filling.
 - (3) Evaluating the extremity for progressive neurologic signs, such as paresthesia and deep tissue pain.
 - (4) Assess for distal pulses.

NOTE: Absence of distal circulation with associated neurologic deficit is an indication for escharotomy.

3. Perform the escharotomy.
 - a. Clean the incision line with an antiseptic swab or betadine scrub.
 - b. Consider general anesthesia if the patient is conscious. You can perform this procedure without anesthesia if the incisions are limited to the insensate, full-thickness burn tissues.

NOTE: If a care provider that is inexperienced in escharotomy technique is to perform the procedure, anesthesia is recommended.

- c. Begin and end the incision at the margins of the eschar, and extend them across the entire length of the eschar in the lateral and/or medial lines of the chest or limbs to include the joints.

NOTE: Bilateral escharotomy incisions of the thorax in the anterior axillary lines. Additional incisions across the distal margins of the rib cage, around the anterior shoulders, and over the clavicles may be required to facilitate respirations.

- d. Incise only until adequate respirations or distal circulation are restored.

NOTE: Fasciotomy is seldom required. However, you may need to restore circulation for patients with associated skeletal trauma, crush injury, high-voltage electrical injury, or burns involving tissue beneath the investing fascia.

4. Recognize the possible complications of escharotomy.
 - a. Infection.
 - b. Neurovascular transection.

5. Record all treatment in the patient's medical record.

Evaluation Preparation: This task is best evaluated by simulated performance of the steps. Give the soldier a simulated patient, a marker, and a scenario in which he must perform a simulated escharotomy. Instruct the soldier to use the marker instead of a scalpel.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the indications for an escharotomy.	_____	_____
2. Performed a patient assessment to determine the need for an escharotomy.	_____	_____
3. Performed the escharotomy.	_____	_____
4. Recognized the possible complications of escharotomy.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform a Delayed Primary Closure

081-833-4516

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given medical equipment set, SF tactical medical equipment set medical laboratory, and SF medical book set.

Standards: Perform a delayed primary closure so that the life of the patient is preserved without causing further harm.

Performance Steps

NOTE: If there are no signs of infection, a delayed primary closure will be performed, if at all, 5 to 7 days after a wound debridement. All procedures are done in the operating room under sterile conditions.

1. Remove the dressing. Moisten the dressing to aid in removing it.

NOTE: A dressing that is stuck to the wound is a good sign that there is no infection. Moisten the dressing to aid in removing it.

2. Examine the wound in accordance with (IAW) task 081-833-4492, Assess Wound Healing.
 - a. If there is active infection, do not close the wound. It must be cleaned, irrigated, and redressed.
 - b. If there is no infection, you can close the wound.
3. Irrigate the wound.
4. Excise skin edges if they are inverted.
5. Close the wound.
 - a. Close the underlying tissues first.
 - b. Close the skin loosely with monofilament sutures, leaving room for drainage between the sutures.

NOTE: Small wounds may be closed with wound closure tapes. Even smaller wounds may not require closure.

6. Dress the wound.
7. Change dressings every other day for 7 to 10 days.
8. Remove sutures in 7 to 10 days (in the back and extremities).

CAUTION: If the wound becomes infected, remove the sutures and leave them out. Irrigate and dress the wound daily. Do not try to reclose it.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform a delayed primary closure.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Removed the dressing.	_____	_____
2. Examined the wound.	_____	_____
3. Determined if the wound was healing normally or was infected.	_____	_____
4. Irrigated the wound.	_____	_____
5. Excised skin edges when they were inverted.	_____	_____
6. Closed the wound.	_____	_____
7. Dressed the wound.	_____	_____

Performance Measures

8. Changed dressings every other day for 7 to 10 days.

GO

NO GO

9. Removed sutures in 7 to 10 days (in the back and extremities).

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Wound Debridement

081-833-4518

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and SF medical book set.

Standards: Perform a wound debridement so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Prepare the patient for surgery (task 081-833-4545, Prepare a Patient for Surgery).

2. Drape the surgical area (task 081-833-0007, Establish a Sterile Field).

3. Incise the skin and subcutaneous tissue. Incise longitudinally in extremities.

NOTE: Depending on the extent of damage, the wound may have to be extended to allow exposure. Longitudinal incisions tend to parallel vessels and nerves, helping to avoid their injury.

4. Excise around the entrance and exit wound.

NOTE: If debridement of skin will be lengthy, you may leave it for last after debridement of the inside of the wound. Therefore, in case of emergency, for example, loss of lights or anesthesia, the important part of the operation is already done.

5. Incise the fascia with scissors in the direction of its fibers.

a. Avoid rough handling of the tissues, especially those that will not be excised.

b. Use rake retractors for skin.

c. Use Army/Navy, or other gentle retractor, on muscle. Muscle tears and bleeds easily.

6. Identify the involved muscle.

7. Excise fat and devitalized muscle in the direction of its fibers.

NOTE: Remember the four Cs when evaluating the viability of muscle (color, contractility, consistency, and capillary refill.) Loose strands of tissue and those separated from their blood supply are considered nonviable and will serve as a source of infection.

8. Relieve tension within the wound. Opening the tissue planes and removing clots is an important element in wound debridement.

9. Remove foreign matter as it is encountered.

NOTE: Do not expect to remove every metallic object seen on X ray. These objects can and will remain in the body without causing infection or injury. The goal is to stop bleeding and repair or debride injuries and not to "find the bullet." Do not probe the tract of the wound. Do not try to pry a projectile out of the tissue.

10. Irrigate the wound with copious amounts of normal saline (10 liters is recommended, if available.)

11. Dry the wound with sterile gauze.

12. Achieve hemostasis with direct pressure or ligation. Use absorbable suture for small vessels. It will not be a lasting foreign body to be a nidus of infection.

13. Dress the wound loosely with sterile, fluffed gauze and a bulky dressing.

14. Administer antibiotic and tetanus therapy, as needed, on the basis of the severity of wound contamination. Current war wound therapy is as follows:

a. Extremity gunshot wound (GSW): cefazolin (anasef), 1 to 2 grams (g), intravenously (IV) every 4 to 6 hours (q4/6h).

Performance Steps

- b. Abdominal GSW: impenem-cilastatin (primaxin) 250 milligrams (mg) to 1g IV every 6 to 8 hours (q6/8h).
- c. Head GSW: ceftriaxone (rocephin) 500 mg to 1 g IV every 8 to 12 hours (q8/12h).

NOTE: If the administration of antibiotics is delayed for more than 6 hours after the wounding, the development of bacterial resistance and/or superinfection is potentially dangerous. Therefore, administration of antibiotics should not be undertaken. The wound should then be debrided, with a delayed primary closure, and antibiotics administered only with signs and symptoms of infection after culture and sensitivity tests (or at least gram staining).

- 15. Follow up the surgical procedure with the following:
 - a. Elevation of the extremity.
 - b. Good nutrition and hydration (by IV, if necessary).
 - c. Ambulate as soon as possible.
 - d. Dressing change 5 to 7 days postoperatively if there are no signs of infection or bleeding.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must perform wound debridement.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Prepared the patient for surgery.	—	—
2. Draped the surgical area.	—	—
3. Incised the skin and subcutaneous tissue (longitudinally in extremities).	—	—
4. Excised around the entrance and exit wound.	—	—
5. Incised the fascia with scissors in the direction of its fibers.	—	—
6. Identified the involved muscles.	—	—
7. Excised fat and devitalized muscle in the direction of its fibers.	—	—
8. Relieved tension within the wound.	—	—
9. Removed foreign matter, clots, and devitalized tissue as it was encountered.	—	—
10. Irrigated the wound with copious amounts of normal saline.	—	—
11. Dried the wound with sterile gauze.	—	—
12. Achieved hemostasis with direct pressure or ligation.	—	—
13. Dressed the wound loosely with sterile, fluffed gauze and a bulky dressing.	—	—
14. Administered antibiotic and tetanus therapy, as needed, on the basis of the severity of wound contamination.	—	—
15. Followed up the surgical procedure with the following: a. Elevation of the extremity. b. Good nutrition and hydration (by IV, if necessary). c. Ambulate as soon as possible. d. Dressing change 5 to 7 days postoperatively if there are no signs of infection or bleeding.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Suturing

081-833-4530

Conditions: You are in a field environment. Given a large Kelly's clamp, a needle holder, tissue forceps, a mosquito clamp, suture needles, four towel clamps, gloves, 4- by 8-inch gauze pads, four hand towels, suture strand packs, antiseptic solution, a needle with syringe, and anesthesia.

Standards: Suture the patient's wound without any contamination and complete the closure.

Performance Steps

1. Gather the appropriate equipment.
 2. Prepare the wound site.
 - a. Protect the wound with sterile gauze.
 - b. Shave the skin 3 to 5 inches around the wound.
 - c. Perform a surgical scrub.
 - (1) Clean the wound area with circular motions, making sure not to let antiseptic solution wash into the wound.
 - (2) Go from the wound edges toward the outside area.
 - (3) Dispose of the sponges.
 - (4) Repeat, as needed.
 - d. Irrigate the wound with sterile solution.
 - (1) Irrigate from one end toward the other, usually from the proximal to distal.
 - (2) Avoid "suck back" with the syringe.
 3. Drape the patient appropriately with hand towels.
 4. Check the patient for allergy.
 5. Administer the anesthesia.
 - a. Inject anesthetic into the subcutaneous layer.
 - b. Insert the needle full length.
 - c. Aspirate for blood.
 - d. Inject anesthesia upon withdrawal of the needle.
 - e. Wait for 3 minutes and then tested for pain.
- WARNING Lidocaine with epinephrine is contraindicated in the fingers, nose, ears, toes, and penis.
6. Select the proper suture.
 - a. Use 6-0 to 7-0 for the face, 4-0 to 5-0 for the arms, legs, and trunk.
 - (1) Chronic suture.
 - (a) Use for the bowel, muscle, and peritoneum.
 - (b) Healing occurs within 14 to 21 days.
 - (2) Plain suture.
 - (a) Use for subcutaneous tissue and ligation of small vessels.
 - (b) Healing occurs within 7 to 14 days.
 - b. Use wire sutures on bone and tendons.
 7. Suture the patient.
 - a. Simple interrupted suture.
 - (1) Thread the needle from the back of the needle, and puncture the skin.
 - (2) Insert the needle through the skin only.
 - (3) Pull the needle through the skin only.
 - (4) Tie a knot.
 - (5) Clip excessive suture material.
 - b. Vertical mattress.
 - (1) Thread the needle from the back of the needle away from the point.

Performance Steps

- (2) Insert the needle through the subcutaneous tissue.
- (3) Pull the needle through the skin only.
- (4) Reverse the position of the needle.
- (5) Point the sharp tip away from the medic.
- (6) Insert the needle away from the medic.
- (7) Make the return suture either--
 - (a) Subcutaneous.
 - (b) Skin closure.
- (8) Tie a knot.
- (9) Clipped the excessive suture material.
- c. Continuous suture.
 - (1) Thread the needle.
 - (2) Insert the needle through the subcutaneous tissue.
 - (3) Tie the knot but do not clip the suture.
 - (4) Suture continuously the entire length of the wound.
 - (5) Tie the knot on the opposite side of the wound.
 - (6) Clip the excessive material.
8. Eliminate the dead space by rolling the wound proximally to distally.
9. Place the bandage over the wound.
10. Tell the patient to return to have the sutures removed or earlier if the wound showed signs of infection.

Performance Measures**GO** **NO GO**

1. Gathered the appropriate equipment.	_____	_____
2. Prepared the wound site.	_____	_____
a. Protected the wound with sterile gauze.		
b. Shaved the skin 3 to 5 inches around the wound.		
c. Performed a surgical scrub.		
(1) Cleaned the wound area with circular motions, making sure not to let antiseptic solution wash into the wound.		
(2) Went from the wound edges toward the outside area.		
(3) Disposed of the sponges.		
(4) Repeated, as needed.		
d. Irrigated the wound with sterile solution.		
(1) Irrigated from one end toward the other, usually from the proximal to distal.		
(2) Avoided "suck back" with the syringe.		
3. Draped the patient appropriately with hand towels.	_____	_____
4. Checked the patient for allergy.	_____	_____
5. Administered the anesthesia.	_____	_____
a. Injected anesthetic into the subcutaneous layer.		
b. Inserted the needle full length.		
c. Aspirated for blood.		
d. Injected anesthesia upon withdrawal of the needle.		
e. Waited for 3 minutes and then tested for pain.		
WARNING Lidocaine with epinephrine in the fingers, nose, ears, toes, and penis must always be avoided.		
6. Selected the proper suture.	_____	_____
a. Used 6-0 to 7-0 for the face, 4-0 to 5-0 for the arms, legs, and trunk.		

Performance Measures

GO NO GO

- (1) Chronic suture.
 - (a) Used for the bowel, muscle, and peritoneum.
 - (b) Healing occurs within 14 to 21 days.
 - (2) Plain suture.
 - (a) Used for subcutaneous tissue and ligation of small vessels.
 - (b) Healing occurs within 7 to 14 days.
 - b. Used wire sutures on bone and tendons.
7. Sutured the patient.
- a. Simple interrupted suture (Figure 1).



Figure 1. Simple Interrupted Suture

- (1) Threaded the needle from the back of the needle and punctured the skin.
- (2) Inserted the needle through the skin only.
- (3) Pulled the needle through the skin only.
- (4) Tied a knot (Figure 2).

Performance Measures

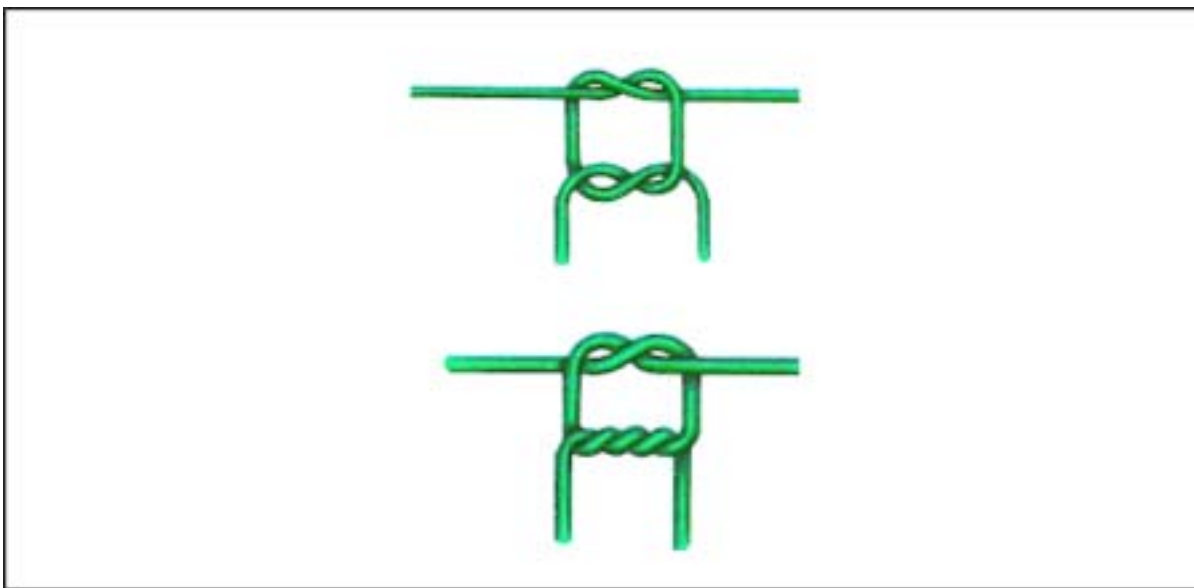
GO NO GO

Figure 2. Surgeons Knot

- (5) Clipped excessive suture material.
 b. Vertical mattress (Figure 3).

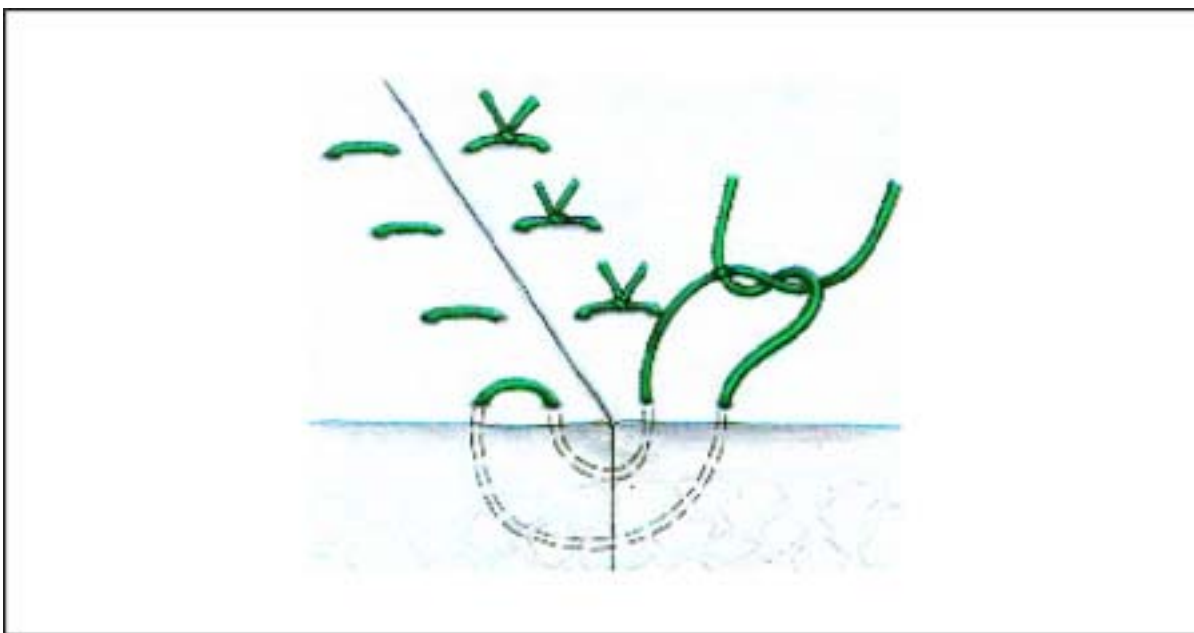


Figure 3. Vertical Mattress

- (1) Threaded the needle from the back of the needle away from the point.
- (2) Inserted the needle through the subcutaneous tissue.
- (3) Pulled the needle through the skin only.
- (4) Reversed the position of the needle.
- (5) Pointed the sharp tip away from the medic.
- (6) Inserted the needle away from the medic.

Performance Measures

GO NO GO

- (7) Made the return suture either--
 - (a) Subcutaneous.
 - (b) Skin closure.
- (8) Tied a knot.
- (9) Clipped the excessive suture material.
- c. Continuous suture (Figure 4).



Figure 4. Continuous Suture

- (1) Threaded the needle.
 - (2) Inserted the needle through the subcutaneous tissue.
 - (3) Tied the knot but did not clip the suture.
 - (4) Sutured continuously the entire length of the wound.
 - (5) Tied the knot on the opposite side of the wound.
 - (6) Clipped the excessive material.
- | | | |
|--|---|---|
| 8. Eliminated the dead space by rolling the wound proximally to distally. | — | — |
| 9. Placed the bandage over the wound. | — | — |
| 10. Told the patient to return to have the sutures removed at the appropriate time or when signs of infection developed. | — | — |

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Drain Abscesses

081-833-4537

Conditions: You are located at an aid station. Given intravenous (IV) equipment, normal saline, a scalpel handle, scalpel blades of various sizes, and gauze for packing the area.

Standards: Provide drainage for a patient's cutaneous and subcutaneous (SQ) abscesses without causing further injury to the patient.

Performance Steps

1. Obtain a history of the patient's complaint.
2. Gather the materials for the procedure.
3. Perform a hand wash.
4. Explain the procedure to the patient.
5. Remove the cutaneous abscess.
 - a. Infiltrate around the base of the abscess with 1percent lidocaine.
 - b. Make an incision of the fluctuant area.
 - c. Remove the pus from the abscess with careful probing to remove loculations. If the abscess is enclosed in a sac, ensure that the sac is removed.
 - d. Irrigate the cavity with normal saline.
 - e. Pack the cavity loosely with an iodofoam gauze wick, which is removed 24 to 48 hours later.
 - f. Apply heat to the affected area, and elevate.

NOTE: Gram stain, culture, and antibiotic therapy are unnecessary unless the patient shows signs of systemic infection, compromised host defenses, or facial abscesses.

6. Provide care for SQ abscess.
 - a. Signs and symptoms.
 - (1) Patients skin overlying the infected area is tender, red, hot, and swollen.
 - (2) Violaceous discoloration, bullae, crepitus, and dermal gangrene may develop.
 - (3) Fevers are nearly always present.
 - (4) Evidence of intravascular volume depletion, including hypotension, may be present.
 - b. Findings during laboratory examination.
 - (1) Polymorphonuclear leukocytosis is usually found.
 - (2) Blood glucose in diabetics is elevated and ketoacidosis may occur.
 - (3) Radiographs of the affected area often demonstrate soft-tissue gas.

NOTE: Decreased intravascular volume causes concentrated urine and increased serum creatinine.

- (4) Perform a gram stain of the pus.

NOTE: Aerobes and anaerobes are usually present.

- c. Subcutaneous infection treatment.
 - (1) Give gentamicin combined with clindamycin or chloramphenicol alone.
 - (2) Give large quantities of IV fluids to replace losses in the tissues.
 - (3) Perform extensive incision and debridement.

NOTE: The mortality rate is about 30 percent. Factors associated with the mortality rate are old age, presence of other medical problems, delayed diagnosis, and insufficiently extensive surgery.

7. Record all treatment given.
8. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a simulated patient and a scenario in which he must drain an abscess.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained a history of the patient's complaint.	_____	_____
2. Gathered the materials for the procedure.	_____	_____
3. Performed a hand wash.	_____	_____
4. Explained the procedure to the patient.	_____	_____
5. Managed cutaneous abscess.	_____	_____
6. Identified subcutaneous abscesses.	_____	_____
7. Managed subcutaneous abscesses.	_____	_____
8. Recorded all treatment given.	_____	_____
9. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK MANUAL 17TH ED
SANFORD, 1999

Manage Compartment Syndrome Surgically

081-833-4539

Conditions: Given a patient with a suspected compartment syndrome, intravenous (IV) fluids, an IV infusion set, splinting material, medications for pain, antibiotics, tetanus prophylaxis, bandages for open wounds, a minor surgical set, and a urinary catheter set.

Standards: Correctly manage compartment syndrome (CS) while monitoring the patient for crush syndrome.

Performance Steps

1. Identify a suspected compartment syndrome on the basis of patient's history.

NOTE: CS is any condition in which a structure such as a muscle, vessel, nerve, or tendon is being constricted in a space. The structure may, due to disease or inflammation, be enlarged and no longer able to move freely in the compartment. CS results when internal or external pressure reduces capillary perfusion below the level necessary for tissue viability in a closed fascial space or muscle compartment.

NOTE: There are three main physiological reactions that can cause compartment syndromes-- increased accumulation of fluid, decreased volume (constriction of compartment), or external compression.

- a. Fractures or open fracture with improper closure.
 - b. Severe contusion with no fracture.
 - c. Recently applied splint, cast, or bandage.
 - d. Injury to a major blood vessel (three mechanisms).
 - (1) Bleeding in the compartment.
 - (2) Partial occlusion of the artery secondary to spasm or initial tear with inadequate collateral circulation.
 - (3) Postischemic swelling if circulation is not restored within 6 hours.
 - e. Extreme exertion such as from long-distance running with no work up. Recurrent with mild pain in the anterior compartment of lower leg with muscle hernia.
 - f. Burns.
 - (1) Decreases compartment size with massive edema.
 - (2) Coalesces the skin, subcutaneous tissue, and fascia into one tight, constricting eschar.
 - (3) Underlying compression of nerves or muscles.
 - (4) May require escharotomy.
 - g. Other causes are as follows:
 - (1) Anticoagulant therapy.
 - (2) Arterial puncture.
 - (3) Hemophilia.
 - (4) Infiltration of IV fluid.
 - (5) Snakebites.
2. Identify a suspected CS on the basis of signs and symptoms.
 - a. The most important symptom of an impending CS is pain that is out of proportion to the primary problem or injury.
 - b. The six P's:
 - (1) Pressure, which is the earliest finding. Compartment is swollen and palpably tense.
 - (2) Pain on stretch. Passive movement of the digits may produce pain in the involved ischemic muscles.
 - (3) Paresis, which is muscle weakness as a result of primary nerve involvement, muscle ischemia, or guarding secondary to pain.
 - (4) Paresthesia or anesthesia. The most reliable physical finding in a conscious and cooperative patient is a sensory deficit. Must perform a nerve (sensory) examination to find affected compartment.
 - (5) Pulses present. Peripheral pulses are palpable in 90 percent patients.
 - (6) Pink in color. Capillary refill is routinely present.

Performance Steps

3. Rule out other probable causes because of severity of treatment.
 - a. Diagnosis of CS.
 - (1) Peripheral pulses are intact; rule out arterial injury.
 - (2) Nerve injuries cause little pain.
 - b. Diagnosis for arterial injury.
 - (1) Usually absent pulses.
 - (2) Poor skin color.
 - (3) Decreased skin temperature.
 - c. Diagnosis for nerve damage (neurapraxia).
 - (1) Remarkable paresis or paresthesia.
 - (2) Nerve damage (neurapraxia) associated with a fracture or contusion.
4. Assess the patient.
 - a. Monitor and maintain vital signs and urinary output to minimize hypotension.
NOTE: Insert a urinary catheter, as necessary. (See task 081-833-4495, Perform Urinary Catheterization.)
 - b. Administer suitable medications.
 - (1) Analgesic to alleviate pain and anxiety.
 - (2) Antibiotic therapy and tetanus prophylaxis for open wounds.
 - c. Monitor the patient for crush syndrome. If signs and symptoms of CS develop, manage patient IAW task 081-833-4421, Manage Crush Syndrome.
5. Decompress the affected compartments.
 - a. Loosen or remove volume-restricting plaster casts and circular dressings.
 - (1) Splitting and spreading a plaster cast may result in a 65 percent decrease in intracompartmental pressure.
 - (2) If symptoms of neurologic deficit persist for more than 1 hour after cast splitting, the top half of the cast and all circular dressings must be removed and the limb examined.
 - b. There is no satisfactory nonsurgical method for treating CS. Surgical decompression, which allows the volume of the compartments to increase, is the primary means of relieving pressure.
 - c. Treatment is adequate decompression with a long dermatomy and fasciotomy.
 - (1) Skin is incised along the lateral and medial side to allow expansion or drainage.
 - (2) May need to incise sheath if swelling is inside the muscle.
 - (3) Only cut what is needed.
6. Perform postoperative care.
 - a. Leg and arm wounds are cared for in the same manner.
 - b. Without fractures.
 - (1) Closure in a week without skin grafting.
 - (2) Necrotic muscle is debrided once or twice a week until a satisfactory granulation bed is present.

CAUTION: Skin grafting or closure before granulation bed is present may lead to infection and the need for subsequent amputation.

 - (3) Prevent development of contractures by splinting the ankle in a neutral position and the forearm in position of function.
 - c. Fracture present.
 - (1) Closed fractures require referral for internal fixation, using either intramedullary rods or plates.
 - (2) Open fractures require referral for external fixation. Major disadvantage with external fixation device is that mobilization of skin for delayed primary closure is not feasible, and skin grafting is required.
 - d. If renal insufficiency develops, reduce fluid administration and evacuate the patient.
7. Record all treatment given.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a simulated patient and a scenario in which he must drain an abscess.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Identified a suspected compartment syndrome on the basis of patient's history.	_____	_____
2. Identified a suspected compartment syndrome on the basis of signs and symptoms.	_____	_____
3. Ruled out other probable causes because of severity of treatment.	_____	_____
4. Assessed the patient.	_____	_____
5. Decompressed the affected compartments.	_____	_____
6. Performed postoperative care.	_____	_____
7. Recorded all treatment given.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Prepare a Patient for Surgery

081-833-4545

Conditions: You are in a field environment. Given preoperative medications, phisohex or providone-iodine soap, razor, gastrointestinal (GI) tubes, a thermometer, a stethoscope, and a blood pressure cuff.

Standards: Correctly prepare a patient for surgery without causing further injury to the patient.

Performance Steps

1. Take a thorough history.

WARNING Take a thorough history from the preoperative patient because there are many medications and illnesses that may affect anesthesia and recovery.

2. Prepare the patient psychologically.

- a. Allow the patient to ventilate his or her fears.

- (1) Death.
- (2) Pain.
- (3) Financial loss.
- (4) Permanent disability.
- (5) Disfigurement.

- b. Let the patient know what will happen before and during surgery and what is expected during the recovery period after surgery.

3. Inform the patient of the physical activities that he must perform after surgery.

- a. Instruct the patient on the proper way to turn, cough, deep breathe, and do range-of-motion exercises.
- b. Teach patients to splint a suture line with a pillow, folded blanket, or laced fingers so they may do the exercises without fear of breaking open a suture line.
- c. Use blow bottles to aid in deep breathing.

NOTE: Anxiety and fear are significant barriers to learning, so it is better to start preoperative teaching 1 to 2 days before surgery, if possible.

4. Prepare the patient for the operating room.

- a. Prepare the patient's skin.

- (1) Bathe or shower the patient with phisohex or providone-iodine soap.
- (2) Shave and prepare the operative site according to the surgeon's orders.

NOTE: Women and children have fine hair and require shaving. Shave only the area required for the surgery.

- b. Prepare the GI tract.

- (1) Keep patients who will undergo surgery on nothing by mouth (NPO) for 12 hours.
- (2) Give cleansing enemas, if required.
- (3) Insert gastric or intestinal tubes, if required.

- c. Prepare the urinary tract.

- (1) Have the patient urinate, and document the amount and color of the urine.
- (2) Insert a Foley catheter, if ordered.
 - (a) Ensure the bladder is empty.
 - (b) Prevent contamination during surgery (incontinence).

- d. Take vital signs.

- (1) Take vital signs the morning of surgery, no matter how minor the surgery may be.
- (2) Provide the anesthesiologists and recovery room personnel with baseline vital signs for later comparison.

- e. Ensure materials are removed before surgery.

- (1) Remove jewelry.
- (2) Remove all makeup and nail polish.
- (3) Remove all dentures, eyeglasses, contact lenses, hairpins, and prosthesis.

Performance Steps

- (4) Ensure all patients have an identification band on their wrists.
- 5. Prepare preoperative medications that provide the following treatment:
 - a. Relieve anxiety.
 - b. Decrease the flow of pharyngeal secretions.
 - c. Decrease the amount of anesthesia to be given.
- 6. Record all actions taken with the preoperative patient.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a simulated patient and a scenario in which he must prepare a patient for surgery.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Took a thorough history.	_____	_____
2. Prepared the patient psychologically.	_____	_____
3. Informed the patient of the physical activities that must be performed after surgery.	_____	_____
4. Prepared the patient for the operating room.	_____	_____
5. Administered preoperative medications.	_____	_____
6. Recorded all actions taken with the preoperative patient.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 26: CMS

Operate a Steam Sterilizer**081-825-0007**

Conditions: This task is performed in the CMS environment when items are ready for sterilization. Necessary materials and equipment: a wire basket, Bowie-Dick Test Pack, steam indicator, 24-inch wrappers, and a steam biological proof vial.

Standards: All the steps necessary to operate a steam sterilizer are done without causing damage to the sterilizer, instruments, or equipment.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ran a Bowie-Dick Test Pack at the beginning of each day.	_____	_____
a. Selected an appropriate test in accordance with local SOP.		
b. Placed the test pack, alone, on the rack over the drain.		
c. Exposed the test pack to a normal sterilization cycle.		
d. Examined the test pack after the completion of the sterilization cycle.		
e. Recorded the results in accordance with local SOP.		
f. Notified the NCOIC/OIC of a positive test result.		
2. Grouped the items according to the time, temperature, and cycle required.	_____	_____
a. Gravity displacement steam sterilizer (autoclave).		
(1) Grouped together double-wrapped basins, prep and instrument sets, drapes, linens, sponges, dressing, tubing, rubber and thermoplastic items together for the sterilization cart.		
NOTE: Although minimum exposure times may be different, various items will make up a sterilization load.		
(2) Grouped flask solutions.		
b. Prevacuum sterilizer--grouped together double-wrapped basins, prep and instrument sets, drapes, linens, sponges, and dressing items for the sterilization cart.		
NOTE: Rubber, thermoplastics, and tubing are generally not sterilized in the prevacuum sterilizer because it deteriorates the materials and the life of the equipment. Solutions are not sterilized in a prevacuum because of boil-over potentials. Some prevacuum sterilizers have an automatic selector for solutions. This turns the sterilizer into a gravity displacement steam sterilizer.		
3. Loaded the sterilizer.	_____	_____
a. Placed flat packages on the perforated shelf on their sides, so the flat surfaces are vertical.		
b. Placed large packages, one layer tall, on the perforated shelf with the packages slightly touching one another.		
c. Placed smaller packages on the shelf above.		
d. Criss-crossed smaller packages if they are placed on top of each other.		
e. Placed rubber goods on the edge, loosely arranged, one layer deep.		
f. Placed basins or any solid containers on their side.		
NOTE: If fabrics were combined with the load, placed the basins on the lowest shelf.		
g. Sterilized solutions separately. Allowed the temperature to drop to 212 degrees Fahrenheit (100 degrees Celsius) before opening the exhaust to prevent the solutions from boiling over.		
h. Wrapped six folded hand towels with one steam indicator and one steam biological proof vial in two 24-inch muslin wrappers or 24-inch disposable wrappers.		
(1) Secured the test pack with steam sterilization tape.		

Performance Measures**GO** **NO GO**

- (2) Placed the test pack on the bottom shelf in the autoclave.
- i. Arranged all the items to provide the least amount of resistance to the free passages of air from all areas.
- j. Sterilized other rubber goods separately unless the manufacturer's instructions indicated otherwise.

4. Set the controls on the sterilizer.

- a. Gravity displacement sterilizer.
 - (1) Set the temperature gauge to the correct setting.
 - (2) Set the timer to the required number of minutes.

NOTE: The pressure used is 15 to 17 lbs psi. Timing begins when the correct temperature has been reached.

- (a) Sterilized metal instruments in an unwrapped perforated tray for three minutes at 270 degrees Fahrenheit or fifteen minutes at 250 degrees Fahrenheit.
- (b) Sterilized metal instruments combined with porous instruments or materials in an unwrapped perforated tray for 10 minutes at 270 degrees Fahrenheit or 20 minutes at 250 degrees Fahrenheit.
- (c) Sterilized instruments wrapped in two double thickness wrappers for 15 minutes at 270 degrees Fahrenheit or 30 minutes at 250 degrees Fahrenheit.
- (d) Sterilized all linen packs for 30 minutes at 250 degrees Fahrenheit.
- (3) Sterilized flask solutions for 20 minutes at 250 degrees Fahrenheit (121 degrees Celsius).
- b. Prevacuum steam sterilizer. Sterilized heat-resistant items for up to 4 to 5 minutes at 270 degrees to 272 degrees Fahrenheit (132 degrees Celsius).
 - (1) Set the drying cycle control to 20 minutes or local SOP.
 - (2) Cooled and dried untouched wrapped packages.

NOTE: When the steam autoclave did not have a drying cycle, cooled and dried the items for 15 to 60 minutes on the carriage with the autoclave opened.

5. Recorded the sterilization information.

- a. Recorded the temperature attained.
- b. Recorded the length of the cycle including drying time.
- c. Recorded the change of color to the chemical-physical indicators (sterilization tape) or no change.
- d. Checked the record of each load before unloading to be certain the required temperature had been achieved.
- e. Reported unreach temperature to the NCOIC.

6. Unloaded the steam sterilizer.

- a. Left the load on the loading carriage for about 15 minutes or until cool for a sterilizer with a load carriage.
- b. For a sterilizer without a load carriage--
 - (1) Removed the items from the sterilizer.
 - (2) Placed the packages on a wire-mesh or slatted wooden surface covered with several layers of muslin.
 - (3) Allowed the air to circulate freely by placing the packages several inches apart from one another for about 15 minutes or until cool.
- c. Dated and stored the packages.
- d. Recorded the items in the logbook.
- e. Removed the vial from the test pack after the sterilization cycle was completed.
 - (1) Checked the vial indicator stripe. (Black for steam.)

Performance Measures

GO **NO GO**

- (2) Depressed the vial cap and inverted the vial to wet the spore disk with the culture media.
- (3) Stamped the vial with the appropriate load control number.
- (4) Selected another vial that had not been sterilized. (This vial will be the control vial.)
- (5) Repeated steps 5e(2) and 5e(3) for the control vial.
- (6) Marked the top of the control vial with the letter "C" and dated it.
- (7) Placed the control and the test vials in the appropriate steam incubator.

NOTE: Read the result at 48 hours. Checked the color, which should be pink, for the test vial. Checked the control vial for a yellow color.

- (8) Logged the date and loaded control number in the steam sterilizer logbook.

- 7. Dated the items with the sterilizer number, Julian date, sterilizer cycle number, load control number, and expiration date.

NOTE: Did not place warm packages on a solid cold surface. (Steam condensation will create dampness and cause contamination. Any item that falls to the floor is considered contaminated.)

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

FM 8-38

FM 8-73

Establish a Sterile Field

081-833-0007

Conditions: You have performed a patient care handwash. Necessary materials and equipment: sterile packs, sterile drapes and towels, small solution basin, sterile liquids, sterile needles and syringes, sterile gloves, and a flat, clean, dry surface.

Standards: Establish a sterile field. Add items and liquids without violating aseptic technique.

Performance Steps

1. Obtain sterile equipment and supplies IAW local SOP.

2. Select a flat, clean, dry surface.

NOTE: Choose a surface away from drafts, if possible.

3. Create a sterile field with a double-wrapped sterile package.

- a. Lift the top flap of the sterile pack away from the body without crossing the hand or arm over the sterile field.
- b. Lift the remaining flaps, one at a time, away from the center without crossing the hand or arm over the sterile field.

4. Add sterile items to the sterile field.

NOTE: The outer one-inch border of the sterile field is considered contaminated. Items that fall in that area are considered contaminated and should not be used. If an item rolls from the one-inch border onto the sterile field, the sterile field is considered contaminated and the procedure must be stopped immediately. The procedure must be repeated using a new sterile pack.

a. Commercially prepacked items.

- (1) Keeping the hands on the outside of the sterile wrapper, grasp the opening edge of the package.
- (2) Carefully fold each end of the wrapper back toward the wrist.
- (3) Without contaminating the contents, drop them onto the sterile field.

NOTE: If the wrapper has been punctured or torn, the item is no longer sterile.

b. Centralized Materiel Section (CMS) items (wrapped in double muslin wrappers).

- (1) Remove the outer wrapper.
- (2) Grasp the edge of the item being unwrapped, keeping the hand on the outside of the inner wrapper.
- (3) Fold each edge of the wrapper slowly back over the wrist of the hand holding the item.
- (4) Drop the item onto the sterile field.

5. Open sterile liquids.

NOTES: 1. Liquids prepared in CMS are considered sterile if a vacuum release sound is heard when the bottle is opened. If there is no sound, the bottle is considered unsterile, and a new bottle must be obtained before continuing the procedure. 2. Some commercially prepared bottles of sterile solution may not make a vacuum release sound.

- a. Remove the outer protective bottle seal, if necessary, and remove the cap.
- b. Hold the cap in one hand, or place the cap so the top rests on the table.

NOTE: The bottle rim and inside of the cap are considered sterile. CAUTION: Discard the sterile solution under any of the following conditions: 1. Anyone touches the bottle rim. 2. The lip of the bottle touches nonsterile items. 3. Someone touches the inside of the cap, or the part of the cap that touches the container is placed on the table.

6. Pour sterile liquids.

- a. Hold the bottle with the label against the palm.
- b. Pour a small amount of the liquid from the bottle into a waste receptacle.
- c. Hold the bottle about 6 inches above the container into which the liquid is to be poured.
- d. Slowly pour a steady stream to avoid splashing, thus preventing contamination.

Performance Steps

- e. Replace the cap without contaminating the bottle.
- f. Write the date and time the bottle was opened and your initials on the label. Return the bottle to the storage area or discard it IAW local SOP.

NOTE: If the sterile field is contaminated at any time, the procedure must be stopped immediately. Repeat all steps using new sterile equipment.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish a sterile field.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained sterile equipment and supplies IAW local SOP.	_____	_____
2. Selected a flat, clean, dry surface.	_____	_____
3. Created a sterile field with a double-wrapped sterile package.	_____	_____
4. Added sterile items to the sterile field.	_____	_____
5. Opened sterile liquids.	_____	_____
6. Poured sterile liquids.	_____	_____
7. Did not violate aseptic technique.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Perform Field Expedient Sterilization or Disinfection

081-833-4486

Conditions: This task is performed in the central materiel supply (CMS) when thoroughly cleansed items must be disinfected or sterilized in a chemical solution. Given sterile soak pans, glutaraldehyde (Cidex), instrument table, sterile towels, sterile gloves, tape, sterile distilled water, and sterile, stiff-bristle bottlebrush.

Standards: Disinfect or sterilize instruments and equipment without contamination.

Performance Steps

1. Disassemble and inspect the instruments and equipment to be disinfected or sterilized.
 - a. Disassemble the items, as necessary.
 - b. Check for cracked or cloudy lenses, as applicable.
 - c. Check for defects or scratches on metal, as applicable.
 - d. Check for improperly fitting connectors, as applicable.
 - e. Ensure all organic debris is removed.

NOTE: A dried piece of organic or protein-type residue trapped in a channel of an endoscope may render the scope useless.

CAUTION: Pay particular attention to the cleaning of the lenses or viewing will be obstructed because of lens damage. Remove the debris from around the lenses with a fine toothpick.

- f. Ensure all parts are present.

2. Place the items in the chemical solution.
 - a. Open a sterile soak pan on the instrument table.
 - b. Place the items into the soak pan, starting with the largest items.
 - c. Cover the items with glutaraldehyde (Cidex).

NOTE: Alkalinized glutaraldehyde (Cidex) solution changes potential of hydrogen (pH) and gradually loses effectiveness after the date of activation. Mark an expiration date on the container when the solution has been activated. The solution is reusable until the expiration date is reached.

- d. Place the lid on the soak pan.
- e. Record the start soak time, soak time, date, and your initials on a piece of tape, and place the tape on the soak pan lid.
- f. Soak the items for 10 hours to sterilize them.

NOTE: Disinfects the items according to the manufacturer's directions on the container.

3. Open another sterile soak pan, and pour sterile distilled water into it without causing contamination.
4. Rinse and dry the items.
 - a. Put on sterile gloves.

NOTE: If already gloved, an extra pair of sterile gloves should be put on before removing the items from the chemical solution. These gloves should be removed after the items have been rinsed with sterile distilled water.

- b. Remove the items from the chemical solution, and immerse them in sterile distilled water, ensuring that all hollow spaces are filled.
- c. Rinse the items.
 - (1) Rinse the items with a forward and backward movement in the sterile distilled water.
 - (2) Ensure that all crevices and channels have no glutaraldehyde (Cidex) residue remaining.
 - (3) Use a small, sterile, nylon-bristle bottlebrush to ensure that the lumens and tubes have been rinsed thoroughly.
 - (4) Repeat the rinse to ensure proper flushing.

5. Dry the items.
 - a. Drain the excess water from the items, and dry them with sterile towels or gauze.
 - b. Place the items on the instrument table.
 - c. Reassemble the items, as necessary.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Disassembled and inspected the instruments and equipment to be disinfected or sterilized.	_____	_____
2. Opened a sterile soak pan on the instrument table.	_____	_____
3. Placed the items into the soak pan, starting with the largest items.	_____	_____
4. Covered the items with glutaraldehyde (Cidex).	_____	_____
5. Placed the lid on the soak pan.	_____	_____
6. Recorded the start soak time, soak time, date, and initials on a piece of tape and placed the tape on the soak pan lid.	_____	_____
7. Soaked the items for 10 hours to sterilize them.	_____	_____
8. Opened another sterile soak pan and poured sterile distilled water into it without causing contamination.	_____	_____
9. Sterilely rinsed the items.	_____	_____
a. Donned sterile gloves.		
b. Removed the items from the chemical solution and immersed them in sterile distilled water, ensuring that all hollow spaces were filled.		
c. Rinsed the items.		
10. Sterilely dried the items.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Prepare Items For Sterilization

081-833-4487

Conditions: Given items that require sterilization.

Standards: Thoroughly clean, dry, and properly wrap or otherwise prepare all items for sterilization.

Performance Steps

1. Put on a pair of disposable gloves.
2. Sort soiled items into groups with common characteristics.
 - a. Heat sensitive--submergible.
 - b. Heat resistant--submergible.
 - c. Heat sensitive--not submergible.
3. Sort the groups with common characteristic into major categories of construction.
 - a. Sharps, including scissors and cutting-edge instruments.
 - b. Delicate, including plastic instruments.
 - c. Regular, including retractors and clamps.
 - d. Special, including any electrical instruments.
4. Manually clean heat-sensitive submergible instruments.
 - a. Prepare the basins.
 - (1) Fill the first basin with a warm detergent solution.
 - (2) Fill the second basin with warm water 27 to 44 degrees Celsius (80 degrees to 110 degrees Fahrenheit).
 - b. Disassemble the instruments, as necessary, according to manufacturer's instructions.
 - c. Wash the instruments.
 - (1) Submerge the instruments in the detergent solution.
 - (2) Use a fairly stiff brush on instruments that are hinged, with a ratchet and box lock, and with a serrated edge.

NOTE: Keep the brush submerged during the scrubbing process.

- (3) Support delicate, nonsharp instruments with the fingers and clean them with a small, soft brush.
- (4) Clean delicate instruments that are sharp or pointed with a cotton-tipped applicator.
- (5) Disassemble and clean the inner and outer surfaces of endoscopic equipment with a soft brush.
- (6) Use a pipe cleaner to clean the small diameter, tubular inner areas of the endoscopic equipment.
- d. Rinse the instruments.
 - (1) Rinse nondelicate instruments in a basin of warm water.
 - (2) Rinse delicate and endoscopic instruments by the following means.
 - (a) Transferring the instruments into a basin of warm water.
 - (b) Emptying the basin and refilling it with fresh, warm water.
 - (c) Repeating steps 4d(2)(a) and 4d(2)(b) until all the detergent has been removed.
- e. Air-dry the heat-sensitive instruments in a warm area on an instrument tray, and blow-dry cannulated and rubber tubing.
- f. Place the instruments in an instrument tray.
 - (1) Open all ratchet and box lock instruments.
 - (2) Place large, bulky instruments in the bottom of the tray.
 - (3) Place sharp and delicate instruments on top.

NOTE: Do not let the sharp points or edges contact other surfaces, points, or edges.

5. Manually clean nonsubmergible instruments.
 - a. Wipe the instruments with a damp cloth that has been soaked with a detergent or disinfectant.
 - b. Wipe the instruments again with a damp cloth soaked in clean water.

Performance Steps

NOTE: If the instrument has an optic lens, wipe the lens with a cotton-tipped applicator dipped in alcohol.

6. Lubricate hinged and box lock instruments.
7. Wrap the instrument sets.
8. Assemble the instrument set.
 - a. Place an open towel in the bottom of the perforated tray.
 - b. Wrap sharp and cutting edges together.
 - c. String ringed instruments on a string.
 - d. Group clamps together. They are counted and strung, ranging from small to large.
 - e. Place large or heavy instruments in the bottom of the tray.
 - f. Disassemble multipart instruments before sterilization, as necessary.
 - g. Protect delicate tips with commercial protectors or by placing them in a hand towel.
 - h. Place a sterilization indicator in the center of the set.
9. Wrap the instrument set.
 - a. Inspect the wrapper for holes, foreign materials, and size.
 - b. Place the wrapper on a flat surface with the point of the corner toward yourself.
 - c. Place the perforated tray containing the instruments in the center of the wrapper.

NOTE: The instrument set should be parallel to you.

- d. Ensure a sterilization indicator is in the middle of the set.
- e. Make the first fold.
 - (1) Fold the corner nearest self over the instrument set until it is completely covered.
 - (2) Fold back the corner of the top layer about 2 to 2 1/2 inches toward self without uncovering any portion of the instrument set.
- f. Make the second fold.
 - (1) Fold one side of the wrapper firmly, without changing the shape of instrument set, over and parallel to the instrument set.
 - (2) Fold the end of the corner obtained from step 5f(1) about 2 to 2 1/2 inches while maintaining tension on the wrapper.
- g. Fold the opposite side of the wrapper (step 5f) firmly, overlapping the second fold at least 2 inches at the center.
- h. Make the final fold.
 - (1) Slightly tuck in the top layer of the material of the fourth corner by using the material located along and just in front of the instrument set.
 - (2) Fold the remaining side up and over the package, and tuck the corner underneath the other folds while maintaining tension on the package.
- i. Repeat steps 5a through 5h with the second wrapper.
- j. Secure the double-wrapped package with the appropriate pressure-sensitive sterilization tape.
- k. Write the name of the set and your initials on the sterilization tape before sterilizing the package.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a group of items that he must prepare for sterilization.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Put on a pair of disposable gloves.	—	—
2. Sorted soiled items into groups with common characteristics.	—	—
3. Sorted the groups with common characteristics into major categories of construction.	—	—
4. Manually cleaned heat-sensitive submergible instruments.	—	—
5. Manually cleaned nonsubmergible instruments.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Lubricated hinged and box lock instruments.	_____	_____
7. Wrapped the instrument sets.	_____	_____
8. Assembled the instrument set.	_____	_____
9. Wrapped the instrument set.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 8-38
	FM 8-73

Store Sterile Supplies

081-833-4497

Conditions: Given properly sterilized items with various packaging, a dry and covered storage area, metal storage racks, and pencil and paper.

Standards: Store sterile supplies so that they are protected from contamination and in a manner that ensures items with the nearest expiration date are used first.

Performance Steps

1. Ensure sterile items are properly stored to prevent contamination.
 - a. The storage area must provide shelter from moisture and excessive dust.
 - b. Storage racks should be made of open wire mesh, if possible. Solid racks may allow freshly sterilized items to draw moisture, rendering them contaminated.
2. Ensure the package is properly identified before it is stored. Identification must include the following:
 - a. Package contents; for example, catheterization pack or minor surgery pack.
 - b. Initials of the individual who wrapped the pack.
 - c. Date that the pack was sterilized.
3. Ensure that sterilized items do not exceed their shelf life.
 - a. Items which are double-wrapped are good for 72 hours.
 - b. Items which are wrapped in plastic but not hermetically sealed are good for 30 days.
 - c. Items which are wrapped in plastic and hermetically sealed are good for 6 months.
 - d. Commercially prepared items are normally good for 5 years or on expiration date on package, or until the integrity of the package is broken.
4. Disassemble, reprocess, and resterilize items that have reached their expiration date.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must store sterile supplies.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Properly stored sterile items to prevent contamination.	_____	_____
2. Labeled the package with the proper data before it was stored. a. Package contents. b. Initials of the individual who wrapped the pack. c. Date that the pack was sterilized.	_____	_____
3. Ensured sterilized items did not exceed their shelf life.	_____	_____
4. Disassembled, reprocessed, and resterilized items that have reached their expiration date.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Establish a Sterile Operating Room

081-833-4544

Conditions: Given water, cleaning supplies, surgical soft soap, surgical scrub brushes, sterile surgical gloves, gowns, masks, head coverings, shoe coverings, and sterile surgical drapes and instrument sets.

Standards: Establish a sterile operating room, and enforce aseptic technique so patient remains free of nosocomial infections.

Performance Steps

1. Select the site for the operating room (OR).
 - a. Choose an interior room in a building with no doors or windows that communicate with the outside, if possible.
 - b. Choose a location that is or can be easily wired for electricity, if possible.
 - c. Choose a location that can easily be blocked off from traffic without blocking movement of personnel to other parts of the facility.
2. Clean the OR.
 - a. Obtain the supplies and equipment.
 - (1) Disposable cloths.
 - (2) Detergent-disinfectant solution.
 - (3) Cleaning container.
 - (4) Sprinkling can or spray bottle.
 - (5) Broom and mop.
 - b. Put on disposable gloves.
 - c. Use a damp cloth soaked in a detergent-disinfectant solution to dust the ceiling and walls from the top to the bottom.
 - d. Use a damp cloth soaked in a detergent-disinfectant solution to dust all furniture and light fixtures from the top to the bottom.
 - e. Clean the floor.
 - (1) Move all equipment and furniture to the center of the room.
 - (2) Sweep the outer area with a broom soaked in a detergent-disinfectant solution.
 - (3) Move the equipment and furniture to the outer area of the room.
 - (4) Sweep the center area with a broom soaked in a detergent-disinfectant solution.
 - (5) Mop the floor with a mop soaked in clean detergent-disinfectant solution, leaving the floor as dry as possible.
 - (6) Reposition the furniture.

3. Open sterile supplies for a surgical procedure.

NOTE: This task may be performed while operating as the circulator or the scrub. It is not necessary to be sterilely gowned and gloved at this time.

- a. Open large linen packs.
 - (1) Place the large pack in the center of the table.
 - (2) Pull off the security tape that holds the pack closed.
 - (3) Unfold the first fold to the left or right of the table. Unfold the second fold to the opposite side of the table.

NOTE: Do not extend your hand and arm over the sterile area. Hand and arm motions are always from unsterile to unsterile objects.

CAUTION: If a sterile barrier is permeated, it is considered contaminated and the items must not be used.

- (4) Open the center linen fold by grasping the edge of the fold and pulling it to your edge of the table.

NOTE: Open the edge nearest your body last to avoid potential contamination of the inner pack.

- (5) Work on the opposite side of the table stand.
 - (a) Walk around to the opposite side of the table or stand, or turn the table or stand around.

Performance Steps

- (b) Open the second fold by grasping the edge of the fold and pulling it to your edge of the table.

CAUTION: Do not reach across the sterile field.

- b. Open small packages wrapped envelope style.

NOTE: If the item or tray is too heavy to hold in your hand, place it on a flat surface and open.

- (1) Check the indicator tape to ensure the package has been sterilized.
- (2) Hold the package in one hand, and remove the tape with the other hand.
- (3) While holding the package with one hand, pull the first tab out toward you and fold the flap away from you.
- (4) Grasp the remaining corners of the outer wrapper, and fold them away from the pack.

NOTE: The items will be double-wrapped.

- (5) Repeat steps 2a through 2d for the second wrap.

- c. Open peel-back packages.

- (1) Grasp the end of the package with both hands, and gently peel back the package without touching the sterile item within the package.
- (2) Hold on to both ends of the wrappers, and gently toss the item on to the sterile field.

- d. Pour bottle solutions.

- (1) Open the liquid container.
- (2) Hold the liquid container about 6 to 10 inches above the edge of the sterile basin.
- (3) Pour the liquid in the basin.

CAUTION: Ensure the solution does not splash or drip down the container onto the sterile field.

NOTE: The receptacle can either be held by the scrub or placed near the edge of the table so that the solution can be poured without reaching over any portion of the sterile field. The entire solution must be poured. If any solution is left in the bottle, its contents must be discarded.

4. Perform a surgical hand and arm scrub.

- a. Check for adequate supplies and equipment.

- (1) Ensure the surgical detergent dispenser has enough surgical detergent.
- (2) Ensure there are enough brushes and nail cleaners.
- (3) Ensure the water supply is adequate.
- (4) Ensure the water control valves are operable.
- (5) Open the scrub brush and nail cleaner packages, and place them to the side in an accessible location.

- b. Prepare for the surgical scrub.

- (1) Remove any rings, bracelets, or other jewelry from your hands and arms, and secure these items.
- (2) Trim fingernails, as necessary.

NOTE: The nails should not be visible when looking at the palm side of the hand.

- (3) Remove nail polish, as applicable.

NOTE: Nail polish can have minor cracks that could harbor microorganisms.

- (4) Roll the sleeves of the scrub shirt to about 4 inches above the elbow.
- (5) Position the soap dispenser foot control on the floor near the sink where it is easily accessible.

- c. Turn on the water.

- (1) Adjust the temperature to a comfortable degree of warmth.
- (2) Adjust the water flow so that it is fast enough to allow expeditious rinsing but not so fast as to splash clothing.

NOTE: If the scrub suit becomes damp, it will dampen and contaminate the sterile gown.

- d. Wash your hands and arms.

- (1) Bend your body slightly at the waist.
- (2) Do not allow any part of your body to touch the sink.
- (3) Keep your hands above elbow level.

NOTE: Do not allow your hands, arms, and elbows to touch other parts of your body.

- (4) Wet your hands and arms by making a smooth, gliding motion through the water flow.
- (a) Wet one arm at a time.

Performance Steps

(b) Begin at the fingertips, and continue up to about 2 inches above the elbow.

NOTE: Perform all washing, scrubbing, rinsing, and drying actions beginning at the fingertips and ending above the elbows.

- (5) Dispense a few drops of the antimicrobial soap into the palms of your hands.
- (6) Make a lather by adding a small amount of water.
- (7) Using your palms, wash your hands and arms to 2 inches above the elbows.
- (8) Clean your fingernails.
 - (a) Remove the fingernail cleaner from the opened package.
 - (b) Clean your fingernails by scraping under each one while holding the hands under the running water.
 - (c) Drop the fingernail cleaner in the bottom of the sink or trash can.
- (9) Rinse your hands and arms one at a time.
 - (a) Hold your hands higher than your elbows.
 - (b) Pass each hand and arm through the water, starting at the fingertips and rinsing to 2 inches above the elbow.

NOTE: The first hand and arm is completely rinsed before proceeding to the other hand and arm.

(c) Repeat step 4i if additional rinsing is required to remove all the soap.

e. Scrub your hands and arms.

- (1) Pass the scrub brush under the running water.
 - (a) If using a disposable brush, squeeze it until the lather forms.
 - (b) If using a nondisposable brush, apply antimicrobial soap to the bristles.

NOTE: Each finger, thumb, hand, and arm is considered a four-sided object. Each side must be scrubbed. The disposable brush is turned from the bristle side to the sponge side to apply the lather and back to the bristle side to scrub. This rotation is repeated for each of the four sides. Additional soap will probably need to be added during the scrub to maintain enough lather.

- (2) Scrub your fingertips.
 - (a) If using a disposable brush, apply the soap by using the sponge portion of the brush.
 - (b) If using a nondisposable brush, apply the soap by using the bristle side of the brush.
 - (c) Scrub your fingernails vigorously for 30 strokes by using the bristle side of the brush.
- (3) Scrub your fingers, thumbs, and web spaces.
 - (a) Apply soap to each anatomical section to be scrubbed.
 - (b) Scrub each anatomical section by using 30 strokes on each section.
- (4) Scrub the palm, backside, and heel of your hand.
 - (a) Apply soap to each anatomical section to be scrubbed.
 - (b) Scrub each anatomical section by using 20 strokes on each section.
- (5) Scrub the first arm.
 - (a) Scrub 3-inch areas with the brush.
 - (b) Use a small, circular motion.
 - (c) Make 20 strokes per 3-inch area.
 - (d) Systematically scrub from the wrist to 2 inches above the elbow.
 - (e) Scrub all four sides of your arm as you progressively move up the arm.
 - (f) Keep the hand and arm above the level of the elbow at all times.

NOTE: This will allow the water to flow away from the scrubbed area.

- (6) Repeat steps 5e(1) through 5e(6) to scrub the other arm.
- (7) Repeat steps 4i(1) through 4i(3) to rinse both hands and arms.

f. Discard the scrub brush.

- (1) Leave nondisposable brushes in the designated area in accordance with (IAW) local standing operating procedure (SOP) for later collection.
- (2) Discard disposable brushes in the trash receptacle.

g. Turn off the water IAW sink design and local SOP.

CAUTION: Avoid touching unsterile items during the scrub. If the scrubbed area is touched by an unsterile object, the entire scrub must be repeated.

h. Enter the sterile area (OR).

- (1) Keep your hands and arms above elbow level.
- (2) Position your hands and arms in front of your body.

Performance Steps

NOTE: Maintain your hands and arms in this position to prevent touching contaminated objects and to allow water to drip from the elbows rather than run down the forearms toward the hands.

i. Dry your hands and arms.

- (1) Lift a sterile hand towel from the top of the gown pack straight up without touching the sterile gown under the towel or any unsterile item.

NOTE: Take care to avoid dripping water onto the sterile field. If the sterile field is contaminated, a new gown pack must be obtained.

- (2) Step back from the sterile field and bend forward slightly at the waist.
- (3) Turn the hand to be dried palm up.
- (4) Place the end of the towel on the palm surface of the hand to be dried.
- (5) Use a rotating and blotting motion to dry the hand and arm, starting at the fingertips.

NOTE: Do not retrace over areas that have been dried.

- (6) Grasp the dry end of the towel with the hand that has been dried, and repeat steps 9c through 9e to dry the other hand and arm.

NOTE: Do not allow the towel to contact your scrub suit.

j. Discard the towel by either placing it in the laundry hamper or allowing the circulator to take it.

NOTE: Do not allow the circulator to touch you.

5. Assist surgical team members in the gown and glove procedure.

NOTE: This will only be performed when working as the circulator.

a. Open the gown pack.

- (1) Ensure the table is clean and dry.
- (2) Remove the plastic outer wrapper from the gown pack and discard the wrapper in the appropriate receptacle.
- (3) Position the gown pack on the table.
- (4) Open the first fold to the back of the table.

CAUTION: Do not allow the gown pack to slide around on the table while opening.

NOTE: The first fold opens away from the circulator.

- (5) Open the first side fold by using the appropriate hand, right to right and left to left.

CAUTION: Do not touch the gown.

- (6) Open the other side fold by using the appropriate hand, right to right and left to left.
- (7) Open the front fold by pulling the tab toward you.

b. Open the glove package.

- (1) Peel open the glove wrapper to a fully flat position.
- (2) Gently toss the inner glove package onto the sterile field by using an up and out motion.

CAUTION: Do not cover the hand towel. If the gloves cannot be delivered to the sterile field without covering the hand towel or becoming contaminated, perform this step after the team member has taken the gown and moved aside to another sterile field.

c. Take the towel from the team member.

- (1) Stand behind the team member.
- (2) Grasp the towel at the distal end, and remove it from the team member's hand.
- (3) Dispose of the towel by placing it in the proper receptacle.

d. Assist the team member in the gowning procedure.

NOTE: The team member has already worked his or her hands into the gown sleeves.

- (1) Stand behind the team member and insert each hand inside the gown to grasp the shoulder seams.
- (2) Pull the gown over the team member's shoulders.

NOTE: This must be done gently so that the cuffs remain extended over the team member's hands if the team member gloves himself or herself.

- (3) Fasten the waist ties of the gown.
 - (a) Gather and hold the excess back of the gown.
 - (b) Grasp the distal end of one tie and bring it to the back of the gown.
 - (c) Repeat steps 4c(1) and 4c(2) for the other tie.
 - (d) Tie a vertical bow, and tuck the ends of the bow inside the gown.
 - (e) Tie the neck ties, or snap the fasteners.

Performance Steps

NOTE: If using a disposable gown, refer to the manufacturer's instructions.

- (4) Adjust the gown by pulling it downward by the bottom edges.
- e. Help the team member remove the gown and gloves.

NOTE: The gown should be removed first.

- (1) Put on disposable gloves.
- (2) Unfasten the gown.
 - (a) Stand behind the team member.
 - (b) Do not touch the soiled portion of the gown.
 - (c) Unfasten the necktie or fasteners, starting at the top and proceeding downward.
 - (d) Unfasten the waist tie or fasteners.
- (3) Grasp the inside back of the gown at the shoulder as it hangs away from the body, and drape it forward over the team member's shoulders without touching his or her upper arms or shoulders.
- (4) Face the team member.
- (5) Bring the neck of the gown and sleeve forward over one gloved hand, turning the gown inside out and inverting the cuff of the glove.
- (6) Touching only the inside of the gown, repeat step 5e for the other side of the gown.
- (7) With the team member's arms fully extended, pull the gown off of his or her arms.
- (8) Fold the gown inside out.

CAUTION: Do not allow the gown to touch the clothing of the team member or circulator.

- (9) Discard the gown into a linen hamper or appropriate waste receptacle.
- (10) Remove the first glove.
 - (a) Grasp the inner portion of the glove where it has been turned inside out.
 - (b) Do not touch the outer portion of the glove or any portion of the scrub's hand or arm.
 - (c) Pull off the glove, keeping the glove inverted.
 - (d) Discard the glove in the appropriate waste receptacle.
- (11) Repeat steps 5j(1) through 5j(4) to remove the other glove.

6. Put on sterile gown and gloves.

- a. Prepare the gown.
 - (1) Lift the gown directly upward by grasping it so that all layers are held in one hand.
 - (a) Touch only the gown and not the wrapper.
 - (b) Touch only the inside of the gown.
 - (2) Step back from the sterile field while keeping your hands above waist level in front of and away from your body.
 - (3) Open the gown halfway by holding it at arms length and at eye level and allowing it to gently unfold.

NOTE: Disposable gowns are folded and packaged differently. Follow the manufacturer's instructions for opening them.

- (4) Turn the gown so that the inside is toward you.
- b. Put on the gown.
 - (1) Slide your hands and arms into the arm openings.
 - (a) Move your hands to the sleeve openings.
 - (b) At the same time, slip both hands into the armholes while keeping your hands at eye level and your elbows slightly flexed.
 - (2) Grasp the inside seam of each sleeve between the gown sleeve and the cuff with your thumb and index finger to prevent your hands from being exposed.

NOTE: This prevents the circulator from pulling the gown sleeves too far.

- (3) Bend at your waist until the circulator brings both waist ties to the back of the gown in preparation for tying.
- c. Step up to and face the sterile field.
- d. Position the glove package without allowing your bare fingers to protrude from the gown cuff.
 - (1) Turn the package so the gloves are right side up and the arrow on the paper package is pointing toward you.
 - (2) Ensure the gloves are the correct size by checking the wrapper.

Performance Steps

NOTE: If the gloves are not the correct size, ask the circulator to obtain the right size.

- e. Put on the first glove.
 - (1) Remove the first glove.
 - (a) Lift the glove compartment flap with one hand.
 - (b) With the other hand, pick up the folded cuff edge of the glove and remove it from the wrappers.

NOTE: Do not allow your hands to come out of the sleeve.

- (2) Place the glove on the palm side of the opposite hand, palm of the glove down, with the fingers of the glove pointing toward your elbow.
 - (3) Grasp the rolled edge of the glove cuff with your thumb and fingers that are in the sleeve cuff and stretch the glove up and over the gown cuff while working your fingers out of the cuff of the gown into the glove.
- f. Put on the second glove.
 - (1) Remove the second glove from the other side of the wrapper with your gloved hand.
 - (2) Place it on the sleeve of the gown with the fingers pointing towards your elbow.
 - (3) Grasp the rolled edge of the glove cuff with your thumb and fingers that are in the sleeve cuff without allowing your hand to come out of the sleeve.
 - (4) Stretch the glove up and over the gown cuff while working your fingers out of the cuff of the gown into the glove.
- g. Adjust the gloves so the fingers fit snugly.
- h. Stand erect to allow the circulator to make the final adjustments on the neck, waist closures, and the hem of the gown.

7. Arrange the preparation set, linen pack, basin set, gowns, and gloves.

- a. Checks the sterilization indicators of all sets.
 - (1) Inspect the indicator for color change.
 - (2) If the indicator has not changed, do the following:
 - (a) Have the circulator obtain a new preparation set.
 - (b) Reglove and/or regown.

NOTE: Regown if the gown has been contaminated.

- (c) Repeats step 1a through 1b(2).
 - (3) Discard the sterilization indicator in the kick bucket.
- b. Arrange the preparation set.
 - (1) Place the sponge bowl near the right back edge of the preparation table.
 - (2) Place the preparation cup near the left back edge of the preparation table.
 - (3) Place the fluffs between the sponge bowl and the preparation cup.
 - (4) Mount a folded fluff in each of the sponge forceps, and place them on the left front edge of the preparation table.
 - (5) Place the gloves palm up, cuffs toward the front edge of the preparation table, and right glove on right and left glove on left.
 - (6) Place one hand towel lengthwise across the cuffs of the gloves.
 - (7) Place the other towels to the right front edge of the table.
- c. Arrange the basin set.

- (1) Place the basin set in the right side of the double ring stand.

NOTE: Do not push the basin down into the ring.

- (2) Remove the hand towel from the basin.
 - (3) Fold and place the hand towel to the left of the basin.

NOTE: Ensure the hand towel does not extend beyond the top edge of the double ring stand.

- (4) Place Asepto in the sponge bowl.
- d. Take the Mayo stand cover from the linen pack.

8. Drape Mayo stands and trays.

NOTE: The sterile Mayo tray, sterile Mayo stand cover, and all other sterile supplies must already be in place with the wrappers opened, or the circulator must open them for the scrub.

- a. Place the wrapped Mayo tray on the back table without extending it over the edge of the table.

Performance Steps

- b. Remove the Mayo stand cover from the opened linen drape pack.
 - (1) Extend both arms with hands palms up.
 - (2) Insert the hands into the opened Mayo linen drape pack, and place both hands under the cuff border.
 - (3) Draw out the folded drape without contaminating it.

CAUTION: The scrub's hands should never touch the top of the folded Mayo stand cover.

- (4) Support the folded Mayo stand cover with the elbows bent about 90 degrees.
- (5) Protect the gloved hands from being contaminated by the Mayo stand by keeping both hands in the cuff of the drape.

NOTE: Turn the Mayo stand cover so the printed instructions can be read.

- c. Unfold the Mayo stand cover by reaching under the cuff and locating and pulling the end of the cover.
- d. Support the Mayo stand cover on the forearms and in the bend of the elbows.

CAUTION: Do not flip, fan, or shake the drapes. Do not allow the Mayo cover to fall below waist level.

- e. Securely grasp the cover under the cuff at the outer edges, and spread both hands and arms outward to fit the cuff snugly over the hands.
- f. Position the Mayo stand cover on the front edge of the stand.
 - (1) Place a foot on the base of the stand without letting the front of the sterile gown touch the Mayo stand.
 - (2) Direct the circulator to the backside of the Mayo stand and to place his or her foot on the base of the stand.
 - (3) Place the Mayo stand cover on the front edge of the stand.
 - (4) Guide the Mayo stand cover onto the stand.
 - (5) Hold the Mayo stand cover above waist level.

NOTE: The scrub does not touch the circulator or the Mayo stand.

- g. Fold the excess Mayo stand cover lengthwise over the top of the stand.
- h. Position the Mayo tray on the sterile, draped stand lengthwise so that it fits snugly.
- i. Drape the Mayo tray with the hand towels.
 - (1) Prepare a cover towel, and place it on the Mayo tray.
 - (2) Prepare the instrument roll towel, and place it on the right side of the Mayo tray.
 - (3) Leave enough room to place the instruments on the roll towel.
- j. Arrange drapes and towels in order of use on the left side of the double-ring stand.
- k. Place the gloves in packages on top of the draping linen on the double-ring stand.
- l. Place a folded gown on top of each set of gloves.

9. Arrange instrument sets and supplies on the sterile field.

- a. Arrange the instruments on the instrument table.
 - (1) Check the internal sterilization indicator of the instrument set for color change to a solid color, and discard it.

CAUTION: If the sterilization indicator is missing or the color has not changed properly, the instrument set must be replaced and the scrub must regown and reglove.

- (2) Roll a sterile towel lengthwise to form a long, narrow cushion.
- (3) Place the rolled towel on the right side of the back table, perpendicular to the front edge.
- (4) Remove the strung ringed instruments from the pan, and place them on the rolled towel. Place the instruments by size with the smallest toward the front and the largest toward the back.
- (5) Remove the stringer from the rings of the instruments, and place the stringer in the instrument pan.
- (6) Close the small and large towel clips, and place them on the double-ring stand.
- (7) Arrange the retractors on the back table, ranging from small to large.

NOTE: Retractors also can be left in the pan to leave more room on the back table.

- (8) Arrange the tissue and dressing forceps at the front of the back table. Arrange them from small to large and short to long.
- (9) Arrange the scissors at the front of the back table. Arrange them from small to large, short to long, and curved to straight.

Performance Steps

- (10) Place the needle rack on a folded hand towel near the front left-hand side of the back table.
- (11) Place the needle holders near the needle rack. Arrange them from small to large and short to long.
- (12) Place any special instruments and/or instrument sets in a separate area on the top of the back table.

NOTE: Larger specialty instrument sets may have to be left on the single ring stand on which they were opened. This depends on the size of the instrument table and the circumstances of the case.

b. Arrange the instruments and supplies on the Mayo tray.

- (1) Roll a sterile towel lengthwise to form a long, narrow cushion.
- (2) Place a rolled towel on the right side perpendicular to the front edge.
- (3) Arrange the instruments in order of use.
- (4) Place the clamps and hemostats on the rolled towel.
- (5) Place instruments needed for each phase of the operation on the Mayo tray.
- (6) Place the suction tubing through the rings of a linen clamp and pulls 6 to 8 inches of tubing through the ring.
- (7) Attach a suction tip to the shorter end of the tubing extending from the towel clip.
- (8) Recoil the suction tubing, and place it on the Mayo tray.

c. Arrange the sterile supplies.

- (1) Place the surgeon's gown and gloves on top of the drapes.

NOTE: Do not open the inner glove package at this time.

- (2) Place the drape stack on the ring stand.
- (3) Set aside the disposable towel.
- (4) Place the suture packets in the emesis basin, and ensure that the correct sutures were obtained.
- (5) Place the sponges on the Mayo tray.
- (6) Receive the knife blades (scalpels) from the circulator.
- (7) Attach a number 10 blade to a needle holder.
 - (a) Work from the dull side of the blade.
 - (b) Grasp the blade at its widest part, on the dull side, at a 45-degree angle above the opening or slot.
 - (c) Do not obstruct the opening or slot with the needle holder.
 - (d) Remove fingers from the rings of the needle holder, and grasp the shaft.
- (8) Attach the number 10 blade to a number 3 knife handle.
 - (a) Hold the needle holder with the blade in the primary hand with the blade number showing.
 - (b) Hold the knife handle in the other hand with the number of the knife handle showing.
 - (c) Position both hands at eye level.
 - (d) Start to slide the blade into the groove of the knife handle.
 - (e) Point the tip of the blade downward and in one smooth upward movement, slide the remainder of blade into the handle.
 - (f) Remove the needle holder from the knife blade.

NOTE: Do not touch the cutting edge with the needle holder.

- (9) Repeat steps 3g(1) through 3h(4) until the required number of scalpels have been prepared.
- (10) Place the scalpels on the Mayo tray.
- (11) Prepare the sutures.

10. Do not allow anyone to enter the OR who is not scrubbed.

11. Ensure all surgical team members are properly gowned, gloved, and masked and are wearing head nets and booties.

12. Strictly enforce aseptic technique on all personnel.

13. Ensure the OR is cleaned and reset after each surgical procedure.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must establish a sterile operating room.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Selected the site for the OR.	_____	_____
2. Cleaned the OR.	_____	_____
3. Opened sterile supplies for a surgical procedure.	_____	_____
4. Performed a surgical hand and arm scrub.	_____	_____
5. Assisted surgical team members in the gown and glove procedure.	_____	_____
6. Put on sterile gown and gloves.	_____	_____
7. Arranged the preparation set, linen pack, basin set, gowns, and gloves.	_____	_____
8. Draped Mayo stands and trays.	_____	_____
9. Arranged instrument sets and supplies on the sterile field.	_____	_____
10. Did not allow anyone to enter the OR who was not scrubbed.	_____	_____
11. Ensured all surgical team members were properly gowned, gloved, and masked and wearing head nets and booties.	_____	_____
12. Strictly enforced aseptic technique on all personnel.	_____	_____
13. Ensured the OR was cleaned and reset after each surgical procedure.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required FM 8-73	

Perform the Surgical Hand and Arm Scrub

081-837-0001

Conditions: This task is performed by the scrub in scrub greens, cap, and mask prior to gowning and gloving. The sterile packs, gown, and gloves are in place inside the operating room with the wrappers opened. Necessary materials and equipment: nail trimmers, detergent dispenser, surgical detergent, sterile hand towel, scrub brush, nail cleaner, scrub sink with running water and faucet knee control or automatic control, trash receptacle, and a restricted area designated for the purpose of scrubbing.

Standards: Perform the surgical hand and arm scrub without contamination.

Performance Steps

1. Check for adequate supplies and equipment.
 - a. Ensure that the surgical detergent dispenser has sufficient quantity of surgical detergent.
 - b. Ensure that there are sufficient brushes and nail cleaners.
 - c. Ensure that the water supply is adequate.
 - d. Ensure that the water control valves are operable.
 - e. Open the scrub brush and nail cleaner packages and place them to the side in an accessible location.
2. Prepare for the surgical scrub.
 - a. Remove any rings, bracelets, or other jewelry from your hands and arms and secure the items.
 - b. Trim fingernails as necessary.

NOTE: The nails should not be visible when looking at the palm side of the hand.

- c. Remove nail polish as applicable.

NOTE: Nail polish can have minor cracks that could harbor microorganisms.

- d. Roll the sleeves of the scrub shirt to approximately 4 inches above the elbow.
- e. Position the soap dispenser foot control on the floor near the sink where it is easily accessible.

3. Turn on the water.
 - a. Adjust the temperature to a comfortable degree of warmth.
 - b. Adjust the water flow so that it is fast enough to allow expeditious rinsing but not so fast as to splash clothing.

NOTE: If the scrub suit becomes damp, it will dampen and contaminate the sterile gown.

4. Wash your hands and arms.
 - a. Bend your body slightly at the waist.
 - b. Do not allow any part of your body to touch the sink.
 - c. Keep your hands above elbow level.

NOTE: Do not allow your hands, arms, and elbows to touch other part of your body.

- d. Wet your hands and arms by making a smooth, gliding motion through the water flow.
 - (1) Wet one arm at a time.
 - (2) Begin at the fingertips and continue to approximately 2 inches above the elbow.

NOTE: Perform all washing, scrubbing, rinsing, and drying actions beginning at the fingertips and ending above the elbows.

- e. Dispense a few drops of the antimicrobial soap into the palms of your hands.
- f. Make a lather by adding a small amount of water.
- g. Wash your hands and arms to 2 inches above the elbows using the palms.
- h. Clean your fingernails.
 - (1) Remove the fingernail cleaner from the opened package.
 - (2) Clean your fingernails by scraping under each one while holding the hands under the running water.
 - (3) Drop the fingernail cleaner in the bottom of the sink or trash can.
- i. Rinse your hands and arms, one at a time.
 - (1) Hold your hands higher than your elbows.

Performance Steps

- (2) Pass each hand and arm through the water, starting at the fingertips and rinsing to 2 inches above the elbow.

NOTE: The first hand and arm is completely rinsed before proceeding to the other hand and arm.

- (3) Repeat step 4i if additional rinsing is required to remove all the soap.

5. Scrub your hands and arms.

- a. Pass the scrub brush under the running water.
 - (1) If using a disposable brush, squeeze it until the lather forms.
 - (2) If using a nondisposable brush, apply antimicrobial soap to the bristles.

NOTE: Each finger, thumb, hand, and arm is considered a four sided object. Each side must be scrubbed. The disposable brush is turned from the bristle side to the sponge side to apply the lather and back to the bristle side to scrub. This rotation is repeated for each of the four sides. Additional soap will probably need to be added during the scrub to maintain sufficient lather.

- b. Scrub your fingertips.
 - (1) If using a disposable brush, apply the soap using the sponge portion of the brush.
 - (2) If using a nondisposable brush, apply the soap using the bristle side of the brush.
 - (3) Scrub your fingernails vigorously for 30 strokes using the bristle side of the brush.
- c. Scrub your fingers, thumbs, and web spaces.
 - (1) Apply soap to each anatomical section to be scrubbed. (See steps 5b(1) and 5b(2).)
 - (2) Scrub each anatomical section using 30 strokes on each section.
- d. Scrub the palm, backside, and heel of your hand.
 - (1) Apply soap to each anatomical section to be scrubbed.
 - (2) Scrub each anatomical section using 20 strokes on each section.
- e. Scrub the first arm.
 - (1) Scrub 3-inch areas with the brush.
 - (2) Use a small circular motion.
 - (3) Make 20 strokes per 3-inch area.
 - (4) Systematically scrub from the wrist to 2 inches above the elbow.
 - (5) Scrub all four sides of your arm as you progressively move up the arm.
 - (6) Keep the hand and arm above the level of the elbow at all times.

NOTE: This will allow the water to flow away from the scrubbed area.

- f. Repeat steps 5e(1) through 5e(6) to scrub the other arm.
- g. Repeat steps 4i(1) through 4i(3) to rinse both hands and arms.

6. Discard the scrub brush.

- a. Leave nondisposable brushes in the designated area IAW local SOP for later collection.
- b. Discard disposable brushes in the trash receptacle.

7. Turn off the water IAW sink design and local SOP.

CAUTION: Avoid touching unsterile items during the scrub. If the scrubbed area is touched by an unsterile object, the entire scrub must be repeated.

8. Enter the sterile area (O.R.).

- a. Keep your hands and arms above elbow level.
- b. Position your hands and arms in front of your body.

NOTE: Maintain your hands and arms in this position to prevent touching contaminated objects and to allow water to drip from the elbows rather than run down the forearms towards the hands.

9. Dry your hands and arms.

- a. Lift a sterile hand towel from the top of the gown pack straight up without touching the sterile gown under the towel or any unsterile item.

NOTE: Take care to avoid dripping water onto the sterile field. If the sterile field is contaminated, a new gown pack must be obtained.

- b. Step back from the sterile field and bend forward slightly at the waist.
- c. Turn the hand to be dried palm up.
- d. Place the end of the towel on the palm surface of the hand to be dried.

Performance Steps

e. Use a rotating and blotting motion to dry the hand and arm starting at the fingertips.

NOTE: Do not retrace over areas that have been dried.

f. Grasp the dry end of the towel with the hand that has been dried and repeat steps 9c through 9e to dry the other hand and arm.

NOTE: Do not allow the towel to contact your scrub suit.

10. Discard the towel by either placing it in the laundry hamper or allowing the circulator to take it.

NOTE: Do not allow the circulator to touch you.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Checked for adequate supplies and equipment.	_____	_____
2. Prepared for the surgical scrub.	_____	_____
3. Turned on the water.	_____	_____
4. Washed your hands and arms.	_____	_____
5. Scrubbed your hands and arms.	_____	_____
6. Discarded the scrub brush.	_____	_____
7. Turned off the water.	_____	_____
8. Entered the OR.	_____	_____
9. Dried hands and arms.	_____	_____
10. Disposed of the towel.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Put On Sterile Gown and Gloves

081-837-0002

Conditions: This task is performed in the operating room by the scrub with the assistance of the circulator, prior to setting up the sterile field in preparation for a surgical procedure. The scrub has already completed the surgical hand and arm scrub and dried his or her hands with a sterile towel. The sterile supplies are already opened and in place.

Standards: Do all the steps required to put on a sterile gown and gloves. Perform all steps in order without contamination.

Performance Steps

1. Prepare the gown.
 - a. Lift the gown directly upward by grasping it so that all layers are held in one hand.
 - (1) Touch only the gown and not the wrapper.
 - (2) Touch only the inside of the gown.
 - b. Step back from the sterile field while keeping your hands above waist level in front of and away from your body.
 - c. Open the gown halfway by holding it at arms length, at eye level, and allowing it to gently unfold.

NOTE: Disposable gowns are folded and packaged differently. Follow the manufacturer's instructions for opening them.

- d. Turn the gown so that the inside is toward you.

2. Put on the gown.
 - a. Slide your hands and arms into the arm openings.
 - (1) Move your hands to the sleeve openings.
 - (2) Slip both hands into the armholes simultaneously while keeping your hands at eye level and your elbows slightly flexed.
 - b. Grasp the inside seam of each sleeve between the gown sleeve and the cuff with your thumb and index finger to prevent your hands from being exposed.

NOTE: This prevents the circulator from pulling the gown sleeves too far.

- c. Bend at your waist until the circulator brings both waist ties to the back of the gown in preparation for tying.

3. Step up to and face the sterile field.

4. Position the glove package without allowing your bare fingers to protrude from the gown cuff.
 - a. Turn the package so that the gloves are right side up and the arrow on the paper package is pointing toward you.
 - b. Ensure that the gloves are the correct size by checking the wrapper.

NOTE: If the gloves are not the correct size, ask the circulator to obtain the right size.

5. Put on the first glove.
 - a. Remove the first glove.
 - (1) Lift the glove compartment flap with one hand.
 - (2) With the other hand pick up the folded cuff edge of the glove and remove it from the wrappers.

NOTE: Do not allow your hands to come out of the sleeve.

- b. Place the glove on the palm side of the opposite hand, palm of the glove down, with the fingers of the glove pointing towards your elbow.
- c. Grasp the rolled edge of the glove cuff with your thumb and fingers that are in the sleeve cuff and stretch the glove up and over the gown cuff while working your fingers out of the cuff of the gown into the glove.

6. Put on the second glove.

Performance Steps

- a. Remove the second glove from the other side of the wrapper with your gloved hand.
- b. Place it on the sleeve of the gown with the fingers pointing towards your elbow.
- c. Grasp the rolled edge of the glove cuff with your thumb and fingers that are in the sleeve cuff without allowing your hand to come out of the sleeve.
- d. Stretch the glove up and over the gown cuff while working your fingers out of the cuff of the gown into the glove.

7. Adjust the gloves so that the fingers fit snugly.

8. Stand erect to allow the circulator to make the final adjustments on the neck, waist closures, and the hem of the gown.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Prepared the gown.	_____	_____
2. Put on the gown.	_____	_____
3. Stepped up to the sterile field.	_____	_____
4. Positioned the glove package.	_____	_____
5. Put on the first glove.	_____	_____
6. Put on the second glove.	_____	_____
7. Adjusted the gloves.	_____	_____
8. Allowed the circulator to adjust the gown.	_____	_____
9. Do all steps in order.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Subject Area 27: NBC

Triage Casualties on an Integrated Battlefield
081-833-0082

Conditions: You are in a chemical environment and have casualties with conventional injuries and/or signs and symptoms of chemical agent poisoning. Both you and the casualties are in MOPP level 4. Necessary materials and equipment: aid bag.

Standards: Complete all the steps necessary to correctly establish priorities for the treatment and evacuation of casualties on an integrated battlefield.

Performance Steps

1. Survey the situation.
 - a. Number and location of the injured.
 - b. Severity of the injuries.
 - c. Assistance available (self-aid or buddy-aid).
 - d. Evacuation support capabilities.
 - e. Type of chemical agents used, if known.
2. Survey the individual casualties.
 - a. Survey for conventional injuries.
 - b. Survey for signs and symptoms of chemical agent poisoning.
 - (1) Determine if the casualty responds to commands.
 - (a) Check the casualty's response to simple directions, such as "Hold up your right arm."
 - (b) Ask the casualty to describe any symptoms.
 - (2) Check for symptoms of chemical agent poisoning.
3. Establish priorities for treatment.
 - a. Immediate.
 - (1) No signs and symptoms of chemical agent poisoning.
 - (2) Presence of life-threatening conventional injuries.
 - b. Chemical immediate.
 - (1) Presence of signs and symptoms of severe chemical agent poisoning.
 - (2) No conventional injuries.
 - c. Delayed.
 - (1) Presence of mild signs and symptoms of chemical agent poisoning.
 - (2) Presence of conventional injuries that are not life-threatening.
 - d. Minimal.
 - (1) No signs and symptoms of chemical agent poisoning.
 - (2) Presence of minor conventional injuries.
 - e. Expectant.
 - (1) Presence of severe signs and symptoms of both chemical agent poisoning and life-threatening conventional injuries.
 - (2) No conventional injuries and not breathing due to chemical agent poisoning.

NOTE: Expectant casualties are so critically injured that only prolonged and complicated treatment may offer increased life expectancy.

4. Initiate treatment in the following order.
 - a. Chemical agent poisoning.
 - b. Conventional injuries.

NOTES: 1. Employ casualties who have only minor injuries or minimal chemical agent exposure to provide buddy-aid for those with more severe injuries. 2. Sorting and treatment should be done almost simultaneously.

Performance Steps

5. Move the casualties to the collection point.
6. Record all observations and treatment on the appropriate form.
7. Establish evacuation priorities (task 081-833-0080, Triage Casualties on a Conventional Battlefield).

Evaluation Preparation: Setup: You will need several soldiers in MOPP4 gear to act as the casualties. Use a moulage kit or similar materials to simulate conventional wounds. Coach the soldiers on signs and symptoms of nerve agent poisoning to exhibit.

Brief soldier: Tell the soldier to triage casualties on an integrated battlefield.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Surveyed the situation.	_____	_____
2. Surveyed the individual casualties.	_____	_____
3. Established priorities for treatment.	_____	_____
4. Initiated treatment.	_____	_____
5. Moved the casualties to the collection point.	_____	_____
6. Recorded all observations and treatment on the appropriate form.	_____	_____
7. Established evacuation priorities.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Treat a Nerve Agent Casualty in the Field

081-833-0083

Conditions: You are in a chemical environment and have a casualty who is lying on the ground wearing protective outer garments, overboots, and mask carrier. You are wearing MOPP4 gear. Given an aid bag, impermeable litter cover, litter, and blanket.

Standards: Treat a nerve-agent casualty in the field without causing further injury to the casualty. The soldier does not kneel when providing treatment.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as the casualty. Nerve-agent antidote autoinjector training aids must be used to train and evaluate this task. Actual autoinjectors will not be used. The casualty will be lying on the ground wearing a mask carrier containing the training autoinjectors. You may decide whether the casualty is already masked or not.

Brief Soldier: Tell the soldier to state the symptoms of nerve agent poisoning, and then treat the casualty.

Performance Measures

GO **NO GO**

1. Assessed the casualty for the signs and symptoms of nerve-agent poisoning.
NOTE: If the casualty has been exposed to vapor or aerosol, the pupils will become pinpointed immediately. However, if the nerve agent is absorbed through the skin only or by ingesting contaminated food or water, the pinpointing of the pupils will be delayed or absent.

- a. Mild--the casualty is able to use self-aid.
 - (1) Unexplained runny nose.
 - (2) Unexplained sudden headache.
 - (3) Difficulty seeing.
 - (4) Sudden excessive salivation and drooling.
 - (5) Tightness in the chest and breathing difficulty.
 - (6) Stomach cramps.
 - (7) Nausea.
 - (8) Localized sweating and muscular twitching in the area of contaminated skin.
- b. Severe--the casualty is unable to use self-aid.
 - (1) All or most of the mild symptoms.
 - (2) Strange or confused behavior.
 - (3) Severe difficulty seeing and/or pinpointing pupils.
 - (4) Red, watery eyes.
 - (5) Respiratory failure.
 - (6) Vomiting.
 - (7) Involuntary urination and defecation.
 - (8) Severe muscular twitching and general weakness.
 - (9) Convulsions.
 - (10) Unconsciousness.
 - (11) Decrease in heart rate.
 - (12) Early elevation and later fall in the blood pressure.
 - (13) Paralysis.

2. Masked the casualty.

- a. Instructed the casualty to mask himself if able.
- b. Positioned the casualty face up and masked the casualty. Did not fasten the hood at this time.

3. Checked the casualty's pocket flaps and the area around the casualty for expended autoinjectors.

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Administered the antidote.	_____	_____
a. Mild symptoms. Instructed the casualty to administer one Mark I nerve-agent antidote kit (Soldiers Training Publication [STP] 21-1-SMCT, task 081-831-1030, Administer Nerve Agent Antidote to Self [Self-Aid]).		
b. Severe symptoms. Administer three Mark I nerve agent antidote kits to the casualty (STP 21-1-SMCT, task 081-831-1031, Administer First Aid to a Nerve Agent Casualty [Buddy-Aid]).		
NOTE: Decontamination in the field will not be done by the medic. It should be performed by the casualty.		
5. Checked the casualty for signs of effectiveness of treatment (atropinization).	_____	_____
a. Carotid pulse above 90 beats per minute.		
b. Dry mouth.		
c. Dry skin.		
d. Pupils dilated to greater than 6 mm.		
6. Administered positive pressure ventilation, if available.	_____	_____
7. Recorded the number of injections given and all other treatment given on the field medical card.	_____	_____
8. Evacuated the casualty.	_____	_____
9. Do not kneel while treating the casualty.	_____	_____
CAUTION The transport crew, other personnel, and the casualty should wear protective mask and overgarments. The medic should be careful not to contaminate self during treatment.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
STP 21-1-SMCT

Treat a Blood Agent (Cyanide) Casualty in the Field
081-833-0084

Conditions: You are in a chemical environment and have a casualty who is lying on the ground wearing protective overgarments, overboots, and mask carrier. You are wearing MOPP4 gear.

Standards: Treat a blood-agent casualty in the field without causing further injury to the casualty.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as the casualty and exhibit symptoms such as hyperventilation. Tell the soldier that the casualty is exhibiting symptoms such as slow pulse rate. You may decide whether the casualty is already masked or not.

Brief Soldier: Tell the soldier to state the signs and symptoms of blood-agent poisoning and then treat the casualty.

Performance Measures	<u>GO</u>	<u>NO GO</u>
CAUTION Blood agents (cyanide) causes symptoms ranging from convulsions to coma. After inhaling a high concentration of blood agents, a person may become unconscious and die within minutes. Blood agents in high concentration act quickly, and death may result in 15 seconds. These agents release an odor of bitter almonds or peach kernels. Anyone smelling the odors should mask immediately.		
1. Checked for the signs and symptoms of blood-agent poisoning. a. Dizziness. b. Nausea and vomiting. c. Headache. d. Increased respirations. e. Reddening of the lips, skin, and fingernail beds. f. Convulsions. g. Coma. h. Respiratory arrest. i. Cardiac arrest.	_____	_____
2. Masked the casualty immediately.	_____	_____
3. Administered positive pressure ventilation, if available. CAUTION No device currently exists that can provide medical assistance in a contaminated environment.	_____	_____
4. Recorded the treatment given on the field medical card.	_____	_____
5. Evacuated the casualty.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Treat a Choking Agent Casualty in the Field**081-833-0085**

Conditions: You are in a chemical environment and have a casualty who is lying on the ground wearing protective overgarments, overboots, and mask carrier. You are wearing MOPP4 gear.

Standards: Treat a choking-agent casualty in the field without causing further injury.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as the casualty and exhibit signs such as a choking cough (coach the casualty on how to answer the soldier's questions on symptoms such as headache). Tell the medic the casualty is exhibiting symptoms such as cyanosis. You may decide whether the casualty is already masked or not.

Brief Soldier: Tell the soldier to state the signs and symptoms of a choking-agent casualty and then treat the casualty.

Performance Measures**GO NO GO**

NOTE: The treatment available for the choking-agent casualty in the field is limited. It is essential that the casualty be masked and evacuated to increase the possibility of survival.

1. Checked for the signs and symptoms of choking-agent poisoning. _____

a. Immediate signs and symptoms. _____

NOTE: Although heavy concentrations of poison bring on these symptoms very quickly, small doses may take up to 2 to 6 hours before there is any sign of poisoning.

(1) Watery eyes.

(2) Dry throat.

(3) Choking cough.

(4) Tightness in the chest

(5) Nausea.

(6) Vomiting.

(7) Headache.

b. Delayed signs and symptoms.

(1) Wheezing.

(2) Cyanosis.

(3) Anxiety.

(4) Severe coughing, producing white or yellow (sometimes bloody) frothy fluid.

(5) Weak and rapid pulse.

(6) Chest wall retractions.

(7) Pulmonary edema.

c. Asymptomatic. The casualty has been exposed, but shows no signs or symptoms.

2. Positioned the casualty. _____

a. Sitting position if conscious.

b. On back (face up) if unable to sit.

3. Masked the casualty but did not fasten the hood. _____

4. Treated the casualty. _____

a. Asymptomatic.

(1) Restricted the casualty's activities to light duties to avoid stress to the respiratory system.

(2) Monitored the casualty for the onset of symptoms.

b. Symptomatic.

Performance Measures**GO** **NO GO**

- (1) Had the casualty rest in a sitting position.
- (2) Kept the casualty warm.

5. Recorded the treatment given on the field medical card.

6. Evacuated the casualty.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Treat a Blister Agent Casualty (Mustard, Lewisite, Phosgene Oxime) in the Field
081-833-0086

Conditions: You are in a chemical environment and are treating a casualty who is lying on the ground wearing MOPP4 gear. You are wearing MOPP4 gear. Given the casualty's canteen and a personal decontamination kit.

Standards: Treat a blister-agent casualty in the field without causing further injury to the casualty. The soldier does not kneel when providing treatment.

Evaluation Preparation: Setup: For training and evaluation, have another soldier act as the casualty and exhibit signs such as coughing. Coach the casualty on how to answer the soldier's questions on symptoms such as headache. Tell the soldier that the casualty is exhibiting signs such as blisters. Training decontamination kits must be used.

Brief Soldier: Tell the soldier to state the signs and symptoms of blister-agent poisoning and then treat the casualty. For Performance Measure 4, have the soldier tell you what should be done.

Performance Measures

GO **NO GO**

1. Checked for the signs and symptoms of blister-agent poisoning. NOTE: Moist areas of the body are highly susceptible to blister agents. Therefore, during hot weather, blister agents can cause a greater number of casualties. a. Skin. (1) Itching. (2) Redness. (3) Blisters. (4) Pain. (a) Intense and immediate if contaminated by Lewisite (L) (arsenical) or phosgene oxime. (b) Delayed from 30 minutes to 6 hours if contaminated by mustard (HD). b. Eyes (L--immediate, HD--1 hour). (1) Extremely sensitive to light. (2) Gritty feeling. (3) Painful. (4) Watery. (5) Involuntary spasms of the eyelids. c. Respiratory tract (L--immediate, HD--4 to 6 hours). (1) Coughing (2) Sore throat. (3) Frothy sputum. (4) Phlegm. d. Systemic disorders. (1) Malaise. (2) Headache. (3) Nausea and vomiting. (4) Severe skin burns. (5) Drop in white blood cells (fever, infection). (6) Liver necrosis (L).	_____ _____

CAUTION Seek overhead protection, if available.

2. Told the casualty to take a deep breath, hold it, and close the eyes. CAUTION While the eyes are being irrigated, the breath should be held and the mouth kept closed to prevent contamination and absorption through mucous membranes.	_____ _____

3. Removed the casualty's mask.	_____ _____

Performance Measures**GO** **NO GO**

4. Irrigated the casualty's eyes.

a. Used water from the casualty's canteen.

NOTE: If the casualty's water has been contaminated, use sterile water or sterile normal saline from the aid bag.

b. Tilted the casualty's head to one side.

c. Told the casualty to open the eyes as much as possible.

d. Poured water slowly into one eye.

e. Avoided spreading contamination by letting the water run off the side of the face.

f. Repeated steps 2 and 4a through 4e for the other eye.

NOTE: It may be necessary for the casualty to remask and take additional breaths if unable to hold the breath until both eyes are irrigated.

5. Used the casualty's personal decontamination kit on the face and the portion of the mask in contact with the face.

6. Replaced the casualty's mask.

7. Told the casualty to clear and check the mask.

8. Told the casualty to breathe normally.

NOTE: Further decontamination procedures will be performed by the casualty (self-aid) or buddy.

9. Recorded the treatment given on the field medical card.

10. Evacuated the casualty, if necessary.

11. Did not kneel at any time.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Set Up a Casualty Decontamination Station

081-833-0093

Conditions: You are assigned to a division level medical facility (battle aid station [BAS] or division clearing station [DCS]). Chemical agents are being used against the units supported by your medical treatment facility. The commander has ordered that a decontamination station and protective shelter, be established. Your current location is in a noncontaminated area, upwind from the chemical hazard. Necessary materials and equipment: medical equipment sets (MESS) for patient decontamination and patient treatment, protective shelter, tentage, plastic sheeting, supertropical bleach (STB), shovels, chemical agent alarms, chemical agent monitors, engineer tape or wire, field radio or telephone, windsock, camouflage netting, water source, plastic bags, litters, litter stands, and contaminated disposal containers.

Standards: Set up a fully operational decontamination station in a noncontaminated area upwind from the chemical hazard. Establish the decontamination area on the downwind side of the protective shelter or other clean treatment area and clearly mark a hot line. Construct a shuffle pit as the only point of access to the clean areas. Install chemical agent alarms.

Performance Steps

1. Select sites for the location of the operation.

- a. Primary and alternate sites must be selected in advance of operations.

NOTE: Alternate sites must be selected in conjunction with selection of the primary site. If the prevailing winds change direction, use of the primary site may no longer be possible.

- b. Site selection factors.

- (1) The direction of the prevailing winds.
 - (2) The downwind chemical hazard.
 - (3) The availability of protective shelters or buildings to house clean treatment facilities.
 - (4) The terrain.
 - (5) Availability of cover and concealment.

NOTE: The protective shelter may possess visual, audible, and infrared signatures. Therefore, concealment may be compromised.

- (6) The general tactical situation.
 - (7) The availability of evacuation routes (contaminated and clean).
 - (8) The location of the supported unit's vehicle decontamination point, personnel decontamination point, and MOPP exchange point.

NOTE: It is sometimes best to collocate with these unit decontamination sites. The arrangement of the operational areas must be kept flexible and adaptable to both the medical and tactical situations.

2. Set up the decontamination area.

- a. Triage area.
 - b. Emergency treatment area.

NOTE: Sometimes, triage and emergency treatment are conducted in the same area.

- c. Clothing removal area.
 - d. Skin decontamination area.
 - e. Overhead cover.

- (1) Erect an overhead cover, at least 20 x 50 feet, to cover the decontamination area and the clean waiting and treatment area. If the protective shelter is used, the overhead cover should overlap the air lock entrance.
 - (2) If plastic sheeting is not available, alternate materials such as trailer covers, ponchos, or tarpaulins may be used.

3. Set up the clean side of the decontamination station on the upwind side of the contaminated areas.

NOTE: Erect a windsock for easy determination of wind direction.

- a. Clean waiting area.
 - b. Clean treatment area.

Performance Steps

4. Set up the shuffle pit as the only point of access between the decontamination area and the clean waiting and treatment area.
 - a. Turn over the soil in an area that is 1 to 2 inches deep, and of sufficient length and width to accommodate a litter stand.
- NOTE: The shuffle pit should be wide enough that the litter bearers are not able to straddle the pit.
- b. Mix STB with the soil in a ratio of two parts STB to three parts soil.
5. Set up the protective shelter on the upwind side of the clean waiting and treatment area.
 - a. Set up the protective shelter with the air lock adjoining the clean side of the decontamination station.
 - b. When a protective shelter is not available for use, set up a protected medical treatment facility 30 to 50 meters upwind from the shuffle pit.
 6. Set up the evacuation holding area.
 - a. Set up an overhead cover of plastic sheeting at least 20 x 25 feet.
 - b. Make sure the cover overlaps part of the clean treatment area and part of the protective shelter.
 - c. When the protective shelter is used, set up the cover on the side opposite the generator.
 7. Mark the hot line.
 - a. Use wire, engineer's tape, or other similar material to mark the entire perimeter of the hot line.
 - b. Ensure that the hot line is clearly marked.
 8. Establish ambulance points on both the "clean" and "dirty" evacuation routes.
 - a. Establish a "dirty" ambulance point downwind from the triage area in the decontamination station.
 - b. Establish a "clean" ambulance point upwind from the evacuation holding area on the clean side of the decontamination station.
 9. Set up a contaminated (dirty) dump.
 - a. Establish the contaminated dump 75 to 100 meters downwind from the decontamination station.
 - b. Clearly mark the dump with NATO chemical warning markers.
 10. Emplace chemical agent alarms.
 11. Camouflage areas IAW tactical directives.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Selected primary and alternate sites.	—	—
2. Set up the decontamination area.	—	—
3. Set up the clean treatment/waiting area.	—	—
4. Set up the shuffle pit.	—	—
5. Set up the protective shelter.	—	—
6. Set up the evacuation holding area.	—	—
7. Marked the hot line.	—	—
8. Established ambulance points.	—	—
9. Set up a contaminated (dirty) dump.	—	—
10. Emplaced chemical agent alarms.	—	—

Performance Measures

GO

NO GO

11. Camouflaged areas.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Decontaminate a Casualty

081-833-0095

Conditions: You are supervising the contaminated side of an established chemical decontamination station. Medical personnel and nonmedical augmentees are in MOPP4. Chemically contaminated casualties have been triaged by the senior medic and have been routed to your area for decontamination. Given an M258A1 or M291 decontamination kit, 5 percent calcium hypochlorite solution, 0.5 percent calcium hypochlorite solution, butyl rubber aprons, butyl rubber gloves, stainless steel buckets, cellulose sponges, water source, plastic bags, litters, litter stands, bandage scissors, M8 chemical detection paper, chemical-agent monitor (CAM), contaminated disposal containers, bandages, gauze, and tourniquets.

Standards: Remove the casualty's clothing without further contaminating the casualty or contaminating decontamination team personnel. Remove dressings, replace tourniquets, and decontaminate splints. Effectively decontaminate the casualty and transfer across the shuffle pit without contaminating the clean side of the hot line.

Performance Steps

NOTE: It is the responsibility of medical personnel to supervise casualty decontamination at medical treatment facilities. To assist in medical decontamination of casualties at Echelon I, the battalion aid station, or Echelon II, the division clearing station, establish a casualty decontamination station. Nonmedical personnel are required to augment the decontamination station as the decontamination team and are provided by the supported unit. (A minimum of ten augmentees should be provided.) Although casualty decontamination is routinely performed by these nonmedical personnel, the supervision of, and final determination as to the completeness of, the decontamination rests with medical personnel. NOTE: Steps 1 through 16 will be performed by personnel in the clothing removal area. At the clothing removal area, two to four persons will be working together as a team, one or two on either side of the casualty.

1. Decontaminate the casualty's hood.
 - a. Cover the mask air inlets with clean gauze or sponges. Instruct the casualty to do this if he is able.
 - b. Wipe off the front, sides, and top of the hood with a cellulose sponge soaked with 5 percent calcium hypochlorite solution, or use the M258A1 or M291 skin decontaminating kit.

NOTE: The medical equipment set (MES) for chemical-agent patient decontamination contains powdered calcium hypochlorite (High Test Hypochlorite or HTH). It is mixed with water to make the decontaminating solutions. Liquid chlorine bleach (household bleach), or a 5 percent solution of sodium hypochlorite may also be used.

- c. Uncover the mask air inlets.

2. Cut off the casualty's hood.
 - a. Dip scissors in 5 percent calcium hypochlorite solution.

CAUTION Dip and scrub the scissors in calcium hypochlorite solution every two or three cuts, and rinse your gloves in the same solution to reduce the spread of contamination.

- b. Cut the neck cord.
 - c. Cut off the zipper cord.
 - d. Release or cut the hood straps.
 - e. Cut away the drawstring below the voicemitter.
 - f. Unzip the hood zipper.
 - g. Begin cutting at the zipper below the voicemitter (Figure 1).
 - h. Proceed cutting upward close to the filter inlet covers and eye lens outserts.
 - i. Cut upward to the top of the eye lens outserts.
 - j. Cut across the forehead to the outer edge of the next eye outsert.
 - k. Cut downward toward the patient's shoulder, staying close to the eye lens outserts and filter inlet covers.
 - l. Cut across the lower part of the voicemitter to the zipper.
 - m. Cut from the center of the forehead, over the top of the head.

Performance Steps

- n. Fold the left and right sides of the hood to the sides of the casualty's head, laying the sides of the hood on the litter.



Figure 1. Location of Cut

3. Decontaminate the casualty's mask and exposed skin.

- a. Use the M258A1 or M291 skin decontamination kit or calcium hypochlorite (5 percent calcium hypochlorite for the mask and 0.5 percent calcium hypochlorite for the skin).

CAUTION Use only the 0.5 percent calcium hypochlorite solution to decontaminate the skin and the parts of the mask that touch the face. The 5 percent solution is corrosive and will burn the skin.

- b. Decontaminate the exterior of the mask as in steps 1a and 1b.
 - c. Wipe down all the exposed skin areas, to include the neck and behind the ears.
4. Maintain the casualty's field medical card.

- a. Cut the field medical card tie-wire, allowing the field medical card to fall into a plastic bag.
- b. Seal the plastic bag and rinse the plastic bag with the 0.5 percent decontamination solution.
- c. Place the plastic bag under the protective mask head straps (Figure 2).

Performance Steps

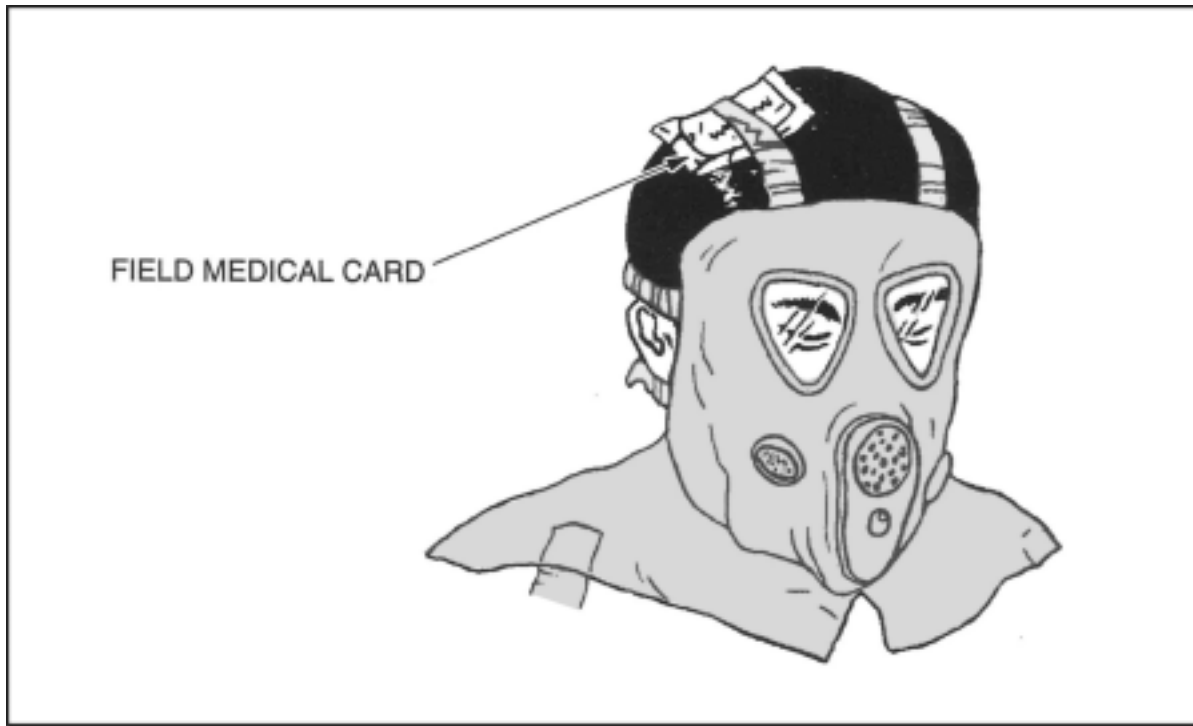


Figure 2. Location of Field Medical Card

5. Remove and secure personal effects from the overgarment pockets.
 - a. Remove the casualty's personal articles from pockets.
 - b. Place the articles in plastic bags.
 - c. Label the bags with the casualty's name and SSN. (Print the information on a piece of paper and place the paper into the plastic bag.)
 - d. Seal the plastic bags.
 - e. If the contents are uncontaminated, place the bags in the clean holding area for return to the casualty.
 - f. If the contents are contaminated, place the bags in the contaminated holding area until they can be decontaminated.

6. Remove the casualty's protective overgarment jacket (Figure 3).
 - a. Cut the sleeves from the cuff up to the shoulder of the jacket, and then through the collar. Keep the cuts close to the inside of the arms so that most of the sleeve material can be folded outward.

CAUTION Dip and scrub the scissors in 5 percent calcium hypochlorite before doing each cut to avoid contaminating the inner garment or the casualty's skin.

- b. Unzip the jacket (or cut alongside the jacket's zipper).
 - c. Roll the chest sections to the respective sides, with the inner black liner outward. Carefully tuck the cut jacket between the arm and the chest.
 - d. Roll the cut sleeves away from the arms, exposing the black liner.

Performance Steps



Figure 3. Overgarment Jacket

CAUTION Medical items are not removed at the clothing removal area. Cut around medical items such as dressings, splints, and tourniquets.

7. Remove the casualty's protective overgarment trousers (Figure 4).
 - a. Cut the trouser legs from the ankle to the waist along the inseam to the crotch.
 - (1) Cut up the right leg and across the crotch of the trousers.
 - (2) Cut up the left leg, cross over the crotch cut, and continue to cut up through the waistband.

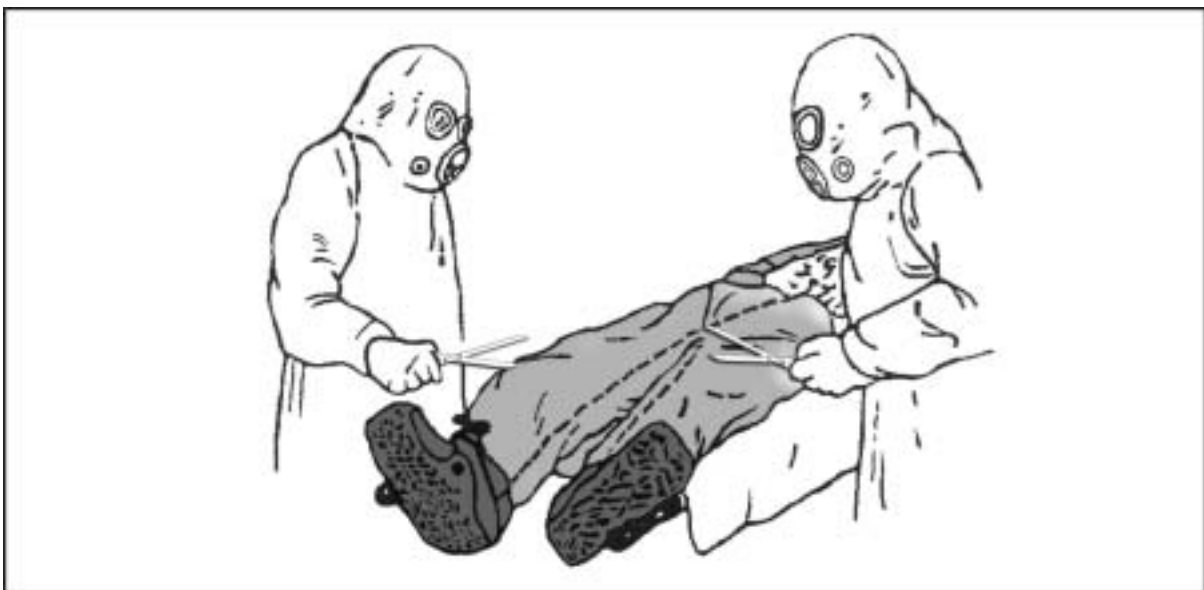


Figure 4. Overgarment Trousers

NOTE: Avoid cutting through the pockets.

CAUTION Dip and scrub the scissors in 5 percent calcium hypochlorite before doing each cut to avoid contaminating the inner garment or the casualty's skin.

Performance Steps

- b. Fold the cut trouser halves onto the litter with the contaminated sides away from the casualty. Make sure the outer side of the protective overgarment does not touch the skin or undergarments of the casualty.
- c. Roll the inner leg portion under and between the legs.

8. Remove the casualty's butyl rubber gloves.

- a. Decontaminate your butyl rubber gloves in 5 percent calcium hypochlorite.
- b. Lift the casualty's arm up and out of the cutaway sleeve unless contraindicated by the casualty's condition.
- c. Pull the butyl rubber gloves off by rolling the cuff over the fingers, turning the glove inside out. Do not remove the white glove liners at this time.
- d. Lower the casualty's arms and fold them across the chest.

CAUTION Do not allow the arms to come into contact with the exterior of the protective overgarments.

- e. Place the gloves in a contaminated disposal container.
- f. Decontaminate your butyl rubber gloves in 5 percent calcium hypochlorite.

9. Remove the casualty's protective overboots.

- a. Stand at the foot of the litter facing the casualty.
- b. Cut the protective overboot laces.
- c. Grasp the heel of the protective overboot with one hand and the toe of the protective overboot with the other hand.
- d. Pull the heel downward and then toward you until the overboot is removed.

NOTE: While still holding the casualty's raised foot, have an assistant wipe down the end of the litter with the 5 percent solution.

- e. Place the overboots in a contaminated disposal container.

10. Remove the inner boots following the same procedures as for removing the protective overboots.

NOTE: Remove the boots without touching the patient's inner clothing or exposed skin.

11. Cut off the casualty's BDU.

NOTE: Repeat step 5 to remove the casualty's personal effects from the BDU pockets before cutting off the BDU. CAUTION Decontaminate your butyl rubber gloves in 5 percent calcium hypochlorite before you touch the casualty's garments or exposed skin.

- a. Cut off the BDU shirt.
 - (1) Uncross the patient's arms.
 - (2) Cut the BDU shirt using the same procedure as for the protective overgarment jacket.
 - (3) Recross the casualty's arms over the chest.
- b. Unbuckle or cut the belt material.
- c. Cut off the BDU trousers following the same procedure as for the protective overgarment trousers.

CAUTION Dip and scrub the scissors in 5 percent calcium hypochlorite before doing each cut to avoid contaminating the inner garment or the casualty's skin.

12. Cut off the casualty's undergarments.

CAUTION Decontaminate your butyl rubber gloves in 5 percent calcium hypochlorite before you touch the casualty's garments or exposed skin.

- a. Cut off the underpants following the same procedure as for the overgarment trousers.
- b. Cut off the T-shirt following the same procedure as for the overgarment jacket.
- c. Cut off the brassiere, if necessary.
 - (1) Lift the casualty's arm off the chest.
 - (2) Cut between the cups.
 - (3) Cut both shoulder straps where they attach to the cup.
 - (4) Lay the cups away from the casualty onto the litter.
 - (5) Lay shoulder straps up and over the shoulders onto the litter.

NOTE: At this point, the white glove inner liners of a female may be removed while the casualty's arms are lifted off her chest.

Performance Steps

13. Remove the casualty's glove inner liners.
 - a. Remove the glove liners using the same procedure as for removing butyl rubber gloves.
 - b. Cross the casualty's arms over the chest.
14. Remove the casualty's socks.
 - a. Decontaminate your butyl rubber gloves in 5 percent calcium hypochlorite.
 - b. Position yourself at the foot of the litter.
 - c. Remove the sock by rolling it down over the foot, turning it inside out or by cutting the sock off.
 - d. Place the socks into a contaminated disposal container.

15. Remove the casualty's ID tags if contaminated.

NOTE: The ID tags will not have to be removed during the clothing removal process unless one of the following conditions exists: the protective hood has been breached, the overgarment jacket (chest or neck areas) has been breached, or the tags become contaminated through the clothing removal process.

- a. Cut the ID tag chain, allowing the chain to fall to the litter.
- b. Slip the ID tags from the chain and rinse them in 5 percent calcium hypochlorite solution.
- c. Place the ID tags in a clean plastic bag and seal the bag.
- d. Place the plastic bag on the casualty's chest.
- e. Place the chain in a contaminated disposal container.

16. Move the casualty to the skin decontamination litter.

CAUTION Observe proper body mechanics to avoid injury to your back. Use your legs instead of your back to lift the casualty.

- a. Decontaminate your butyl rubber aprons and gloves in 5 percent calcium hypochlorite solution.
- b. Lift the casualty out of the cutaway garments, using a three-person arms carry.
 - (1) Lifter #1 slides his arms (palms up) under the casualty's head/neck and shoulders.
 - (2) Lifter #2 slides his arms (palms up) under the casualty's back and buttocks.
 - (3) Lifter #3 slides his arms (palms up) under the casualty's thighs and calves.
 - (4) On the command of Lifter #1, lift the casualty. (PREPARE TO LIFT: LIFT.)
- c. Once the casualty has been lifted off the litter, all three lifters stand upright and turn the casualty in against their chests.

NOTE: At this point, the casualty has nothing on his body except the protective mask (minus the hood) and medical items (dressings, splints, tourniquets).

- d. While the casualty is being held, another team member quickly removes the contaminated litter and replaces it with a clean litter. A decontaminatable mesh litter should be positioned, if available.
- e. Lower the casualty onto the clean litter, in a supine position, on the command of Lifter #1.
- f. Carry the litter to the next station, skin decontamination, and then return to the clothing removal area.
- g. Dispose of all contaminated material at the clothing removal area.
 - (1) The casualty's contaminated clothing is placed in a bag and put in a contaminated disposal container.
 - (2) The dirty litter is rinsed with the 5 percent decontamination solution and placed in a dirty litter storage area.

CAUTION Before obtaining another casualty, the clothing removal team should rinse their gloves and aprons in the 5 percent calcium hypochlorite decontaminating solution and drink sufficient water to compensate for the heat and workload. NOTE: Steps 17 through 22 are performed by personnel in the skin decontamination area. At the skin decontamination area, two to four persons will be working together as a team, one or two on either side of the casualty.

17. Check for and perform skin decontamination.

Performance Steps

- a. Check the casualty for chemical contamination. Place M8 chemical-agent detection paper on the casualty in suspected contaminated areas or use the CAM (Figure 5).
- b. Spot decontaminate detected chemical contamination with the M258A1 or M291 skin decontaminating kit or 0.5 percent calcium hypochlorite, paying particular attention to the neck, wrists, hair, lower part of the face, and the areas around wounds.
- c. During mass casualty situations, a total body wash down of the casualty with 0.5 percent calcium hypochlorite may be required instead of spot decontamination. This will speed processing and reduce the chance of casualty recontamination. Provisions should be made to handle excess water run-off.

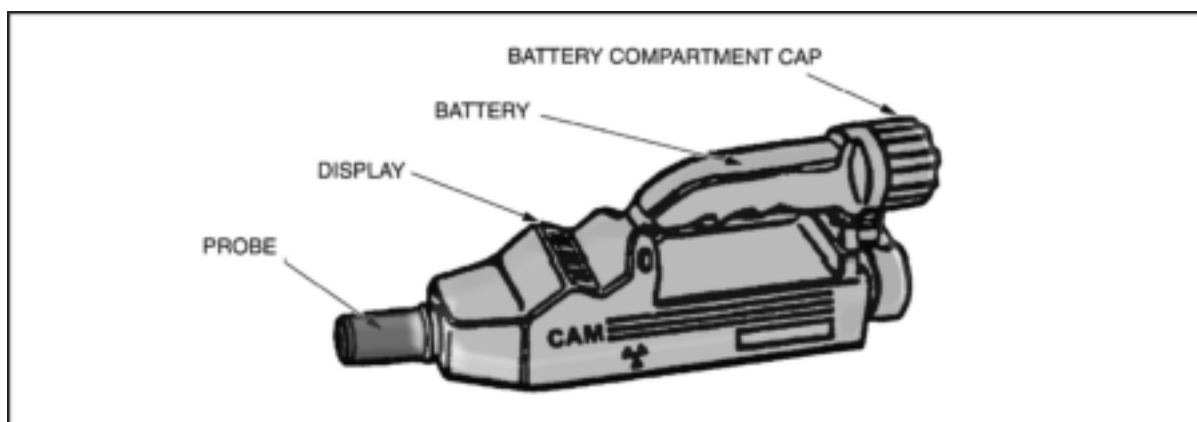


Figure 5. CAM

NOTE: It takes approximately 12 minutes to fully scan a casualty for areas of contamination using the CAM. For this reason, it is not practical for use during a mass casualty situation. Additionally, the contaminated clothing in the decontamination area may interfere with the function of the CAM.

18. Remove field dressings and bandages.

NOTE: This step must be performed by medical personnel.

- a. Carefully cut off dressings and bandages.
- b. Cut off any remaining clothing that was covered by the dressings and bandages.
- c. Decontaminate the exposed areas of skin with the 0.5 percent calcium hypochlorite solution.
- d. Irrigate the wound with water, saline, or 0.5 percent calcium hypochlorite solution if the wound is suspected to be contaminated.
- e. If necessary, perform a quick wound debridement by removing pieces of contaminated clothing and debris that may be lodged in the wound.

NOTE: Do not replace bandages unless there is a critical medical need (for example, to control bleeding). Replace the bandages when the casualty is in the clean (uncontaminated) treatment area.

- f. Place removed dressings and clothing in a contaminated disposal container.

19. Replace any tourniquets.

NOTE: This step must be performed by medical personnel.

- a. Decontaminate a large area above the existing tourniquet.
- b. Place a new tourniquet 1/2 to 1 inch above the old tourniquet.
- c. Remove the old tourniquet.
- d. Remove any remaining clothing or dressings covered by the old tourniquet.
- e. Decontaminate and irrigate the newly exposed areas as in steps 18c through 18e.
- f. Place the removed tourniquet, dressings, and clothing in a contaminated disposal container.

20. Decontaminate any splints.

NOTE: Do not remove splints until the casualty has reached the medical treatment facility (normally a corps-level hospital) at which he will receive definitive treatment.

- a. Stabilize the splinted extremity.

Performance Steps

- b. Cut away or remove any excess bulky material.
- c. Decontaminate the splint and the extremity by flushing with 0.5 percent calcium hypochlorite solution.

CAUTION Do not remove any part of a traction splint from a femoral fracture.

- d. Check the splint and surrounding area with M8 paper or the CAM.
- e. Repeat the decontamination process if any contamination is evident.

CAUTION Under no circumstances should a casualty who has not been entirely decontaminated be moved across the hot line. If a wound or splinted area cannot be entirely decontaminated, inform the senior medic. **DO NOT** move the casualty across the hot line. He must be treated on the contaminated side of the casualty decontamination station.

- 21. Recheck the casualty for contamination.
 - a. Use M8 chemical-agent detector paper or the CAM.
 - b. Decontaminate any areas of detected contamination, as necessary.
- 22. Transfer the casualty to the shuffle pit.
 - a. Personnel decontaminate themselves by rinsing their butyl rubber gloves and apron with a 5 percent calcium hypochlorite solution.
 - b. Lift the casualty from the decontamination litter and transfer him or her to the clean litter using the same technique described in step 16.
 - c. Carry the litter to the shuffle pit, place it on the litter stand, and quickly move away from the shuffle pit.

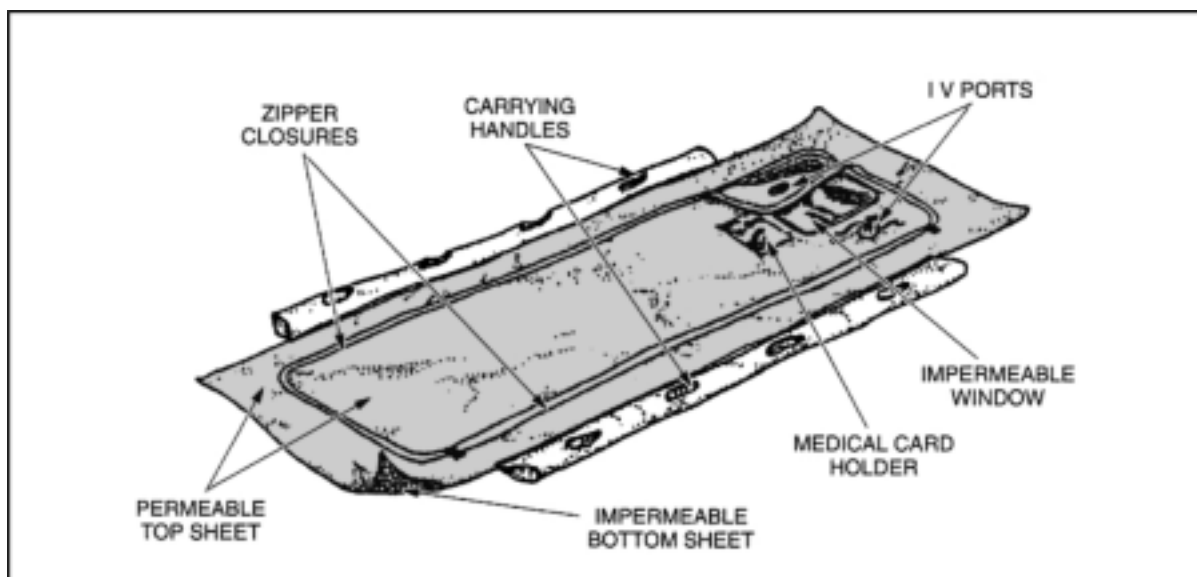


Figure 6. PPW

NOTE: Do not step across the hot line. Personnel from the clean side of the hot line will take the casualty to the clean waiting area for triage by the senior medic on the clean side of the hot line. **CAUTION** If the clean treatment facility is not collocated with the decontamination station, it may be necessary to place the casualty in a patient protective wrap (PPW) (Figure 6) at the shuffle pit. This will provide protection against chemical agents while the casualty is being transported to the treatment facility.

Performance Measures

- 1. Decontaminated the casualty's hood.
- 2. Cut off the casualty's hood.
- 3. Decontaminated the casualty's mask and exposed skin.

GO **NO GO**

_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Maintained the casualty's field medical card.	—	—
5. Removed and secured the casualty's personal effects.	—	—
6. Removed the casualty's protective overgarment jacket.	—	—
7. Removed the casualty's protective overgarment trousers.	—	—
8. Removed the casualty's butyl rubber gloves.	—	—
9. Removed the casualty's protective overboots.	—	—
10. Removed the casualty's combat boots.	—	—
11. Removed the casualty's BDU.	—	—
12. Removed the casualty's undergarments.	—	—
13. Removed the casualty's glove liners.	—	—
14. Removed the casualty's socks.	—	—
15. Removed the casualty's ID tags, if necessary.	—	—
16. Moved the casualty to the skin decontamination area.	—	—
17. Checked for and performed skin decontamination.	—	—
18. Removed field dressings and bandages.	—	—
19. Replaced any tourniquets.	—	—
20. Decontaminated any splints.	—	—
21. Rechecked the casualty for contamination.	—	—
22. Transferred the casualty to the shuffle pit.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Manage Chemical Casualties

081-833-4553

Conditions: Given patient's medical record, atropine, two pralidoxime (PAM) chloride, diazepam, oxygen, bag-valve-mask (BVM), oxygen delivery equipment, topical corticosteroid ointment, sterile petroleum jelly, 10 percent mafenide acetate or silver sulfadiazine burn cream, sterile dressings, narcotic analgesics, dexamethasone-sodium phosphate inhalers, prednisolone intravenous (IV), sodium nitrite, and sodium thiosulfate.

Standards: Manage a chemical casualty so the life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the physiological actions of the various chemical agents.
 - a. Nerve agents (anticholinesterase) such as tabun (GA), sarin (GB), soman (GD), GF, and VX inhibit the cholinesterase enzymes. The cholinesterase enzymes are responsible for the hydrolysis of acetylcholine, a chemical neurotransmitter. This inhibition creates an accumulation of acetylcholine at a cholinergic synapse that disrupts the normal transmission of nerve impulses. Cholinergic synapses are located at the following:
 - (1) In the central nervous system (CNS).
 - (2) In the neuromuscular endplates of the peripheral voluntary nervous system.
 - (3) At the parasympathetic endings and sympathetic presynaptic ganglia of the autonomic nervous system (ANS).
 - b. Blister agents (vesicants) include sulfur mustard (H/HD), nitrogen mustard (HN), and arsenicals such as lewisite (L) and phosgene oxime (CX). Blister agents produce pain and injury to the eyes, reddening and blistering of the skin, and when inhaled, damage to the mucous membranes and respiratory tract. Mustard may produce major destruction of the epidermal layer of the skin.
 - c. Lung-damaging agents (choking agents) include phosgene (CG), diphosgene (DP), and chlorine and chloropicrin (PS). These agents produce injury to the lungs and irritate the eyes and respiratory tract. They may also cause intractable pulmonary edema and predispose the patient to secondary pneumonia.
 - d. Blood agents (cyanogens) include hydrogen cyanide (AC) and cyanogen chloride (CK). These agents are transported by the blood to all body tissues where the agent blocks the oxidative process, preventing tissue cells from using oxygen. The CNS is especially affected, which leads to cessation of respiration followed by cardiovascular collapse.
2. Manage nerve agent casualties.
 - a. First, perform all measures in task 081-833-0083, Treat a Nerve Agent Casualty in the Field.
 - b. Achieve atropinization if it has not already been achieved by giving 2 milligrams (mg) atropine every 15 minutes (q15min) until signs of atropinization (dry mouth and skin, with cleared pulmonary secretions) are achieved. Maintain atropinization on the basis of the patient's symptoms (usually 2 mg every 10 to 30 minutes [q10/30min]) until muscarinic signs disappear.

NOTE: Generally, no increased oxime benefit is obtained after 3 doses of 600 mg intramuscular (IM) injections of 2 PAM chloride. The patient may receive an additional 600 mg IM every hour (qh) if respirations have not improved. This may reduce the duration of required assisted ventilations.

- c. Manage convulsions with additional diazepam (convulsant antidote for nerve agents [CANA]). Anticipate seizures in all moderate to severe cases, and treat them with diazepam (usually 10 mg IM every 5 to 10 minutes [q5/10min]) up to a maximum dose of 30 mg).
- d. Place the patient in the left lateral, recumbent position, and elevate the head of the bed to minimize the chance of aspiration of excessive salivary secretions.
- e. Perform suctioning of the oropharynx q10/15min to help control secretions.
- f. Provide assisted ventilations.
- g. Administer oxygen (O₂) by mask or endotracheal (ET) tube, if available.
- h. Intubate unconscious casualties to protect the airway.

Performance Steps

- i. Treat ocular symptoms by administering atropine sulphate ophthalmic ointment 1percent. This may be repeated in several hours over a period of days.

NOTE: If local ocular effects of a nerve agent are present, the size of the pupils cannot be used as an indicator of the systemic effect of the nerve agent or the atropine.

- j. Perform gastric lavage if water or food contaminated with nerve agent has been ingested.

3. Manage blister agent casualties.

- a. First, perform all measures in task 081-833-0086, Treat a Blister Agent Casualty in the Field.
- b. Treat mustard conjunctivitis.

NOTE: Mild lesions require little treatment, although the lesions may become infected.

- (1) Apply a steroid antibiotic eye ointment, such as dexamethasone sodium phosphate-neomycin ophthalmic ointment.
- (2) Apply sterile petroleum jelly between the eyelids to provide additional lubrication and prevent sealing of the eyelids.

NOTE: More severe injuries will cause enough edema of the lids, photophobia, and blepharospasm to obstruct vision.

- (3) To allay patient fears of blindness, gently force open the patient's eyelids.
- (4) Control pain with systemic narcotic analgesics.
- (5) For patients with severe photophobia and blepharospasm, instill 1drop of atropine sulfate 1 percent into the affected eye three times a day (t.i.d.).

NOTE: The eye must not be bandaged or the lids allowed to stick together.

- (6) Keep patients in a darkened room, and give them dark sunglasses.

- c. Treat mustard erythema.

NOTE: In mild cases, mustard erythemarequires no treatment.

- (1) If an annoying itch is present, apply topical steroid creams or sprays to obtain considerable relief.
- (2) Severe erythema around the genitalia may become quite painful, with associated weeping and maceration. Steroid treatment with exposure of the area will relieve some of the symptoms. Care must be taken so that secondary infection of the tissue does not occur.

- d. Treat mustard blisters.

- (1) Protect blisters with loose dressings.
- (2) Once blisters have broken, it is best to remove its ragged roof to decrease the possibility of secondary infection.
- (3) Clean the area with saline, and then apply sterile petrolatum gauze if the areas are small. Dressings should be changed and the wound inspected every 3 to 4 days.
- (4) Small blisters on the face are best left uncovered.
- (5) Large blisters are best treated as open wounds (burns).
- (6) Apply a 1/8-inch thick layer of 10 percent mafenide acetate or silver sulfadiazine burn cream to the blisters as a topical antibiotic agent.

NOTE: For further information, see task 081-833-4023, Manage a Burn Casualty.

- e. Treat respiratory tract injury caused by mustard.

NOTE: Mild respiratory tract injury, with hoarseness and sore throat only, usually requires no treatment.

- (1) Relieve cough with cough syrup containing codeine.
- (2) Treat laryngitis and tracheitis symptomatically with steam or sterile, cool mist inhalations.
- (3) If bacterial pneumonia occurs, isolate the specific organisms with their antibiotic sensitivities. Then antibiotic therapy can be limited to the specific agent.

4. Manage lung-damaging agent (choking agent) casualties.

- a. First, perform all measures in task 081-833-0085, Treat a Choking Agent Casualty in the Field.
- b. Keep the casualty warm and at rest in the semisitting position if dyspnea and orthopnea make the supine position uncomfortable.
- c. Give 30 to 60 mg of codeine to suppress cough. Other sedatives should be used sparingly, if at all, until adequate oxygenation is ensured.

Performance Steps

NOTE: Early administration of intermittent, positive pressure breathing or positive end expiratory pressure, with or without intubation, may minimize pulmonary edema and reduce the degree of hypoxemia.

d. Administer inhaled and systemic corticosteroids.

(1) Using dexamethasone-sodium phosphate, the procedure is as follows:

NOTE: Treatment should start at the earliest possible moment with the inhalation of steroid from an inhaler.

- (a) Four puffs should be inhaled at once.
 - (b) This should be followed by 1 puff every three minutes until any sense of irritation is overcome.
 - (c) After this, 5 puffs should be inhaled every 15 minutes until a total of 150 puffs have been inhaled. (The contents of one standard inhaler equals 150 puffs.)
 - (d) When this stage has been reached, 1 puff should be inhaled hourly during the day.
 - (e) As a preparation for sleep, 5 puffs should be inhaled every 15 minutes until a total of 30 puffs have been reached.
 - (f) This regimen should be repeated each day for 5 days, or longer, if there are any abnormalities.
- (2) Definitive treatment for exposures that definitely endanger life should include the above regimen supplemented by systemic steroids as follows:
- (a) Day 1: 1,000 mg prednisolone IV.
 - (b) Days 2 and 3: 800 mg prednisolone IV.
 - (c) Days 4 and 5: 700 mg prednisolone IV.
 - (d) Beginning with day 6, the dose of systemic steroids should be reduced as soon as possible.
- (3) Using beclomethasone dipropionate or betamethasone dipropionate, the procedure is as follows:
- (a) Treatment should begin as soon as possible with the inhalation of 10 puffs of the steroid from an inhaler.
 - (b) Five puffs should be given each hour for the next 10 hours.
 - (c) Then 1 puff should be given hourly for the next 24 hours for at least 5 days.
- (4) Systemic therapy is needed even for precautionary treatment during the first 24 hours and should commence as soon as possible with the IV injection of 20 mg betamethasone or the equivalent.
- (a) This dose should be repeated IV or IM every 6 hours for at least the first 24 hours.
 - (b) During the next 5 days, systemic therapy may be reduced based on the clinical response.
- e. When the acute symptoms disappear, treat patients as follows:
- (1) Get them out of bed.
 - (2) Keep them hospitalized as short a time as possible.
 - (3) Encourage and train patients to resume physical exertion to minimize neurasthenic symptoms, which may be a major disabling feature.
5. Manage blood agent casualties.
- a. First, perform all measures in task 081-833-0084, Treat a Blood Agent Casualty in the Field.
 - b. Secure the airway.
 - c. Administer assisted ventilations with high-flow O₂.
 - d. Administer sodium nitrite at 10 milliliters (ml) of a 3 percent solution (300 mg) IV over a period of 3 minutes. This produces methemoglobin, thus sequestering the cyanide on the methemoglobin.
 - e. Administer sodium thiosulfite 50 ml of a 25 percent solution (12.5 grams [g]) IV over a period of 10 minutes. This combines with the sequestered cyanide to form thiocyanate, which is excreted from the body.

Performance Steps

NOTE:

- 1. The decrease in blood pressure following sodium nitrite injections is negligible unless the patient is allowed to get into an upright position.
- 2. The development of a slight degree of cyanosis is evidence of a desirable degree of methemoglobin formation. It is not anticipated that at the above dosages an extreme or injurious degree of methemoglobinemia will develop.
- 6. Record all treatment in the patient's medical record.
- 7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage chemical casualties.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the physiological actions of the various chemical agents.	—	—
2. Managed nerve agent casualties.	—	—
3. Managed blister agent casualties.	—	—
4. Managed casualties of lung-damaging agent (choking agent).	—	—
5. Managed blood agent casualties.	—	—
6. Recorded all treatment in the patient's medical record.	—	—
7. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 8-285

Manage a Biological Casualty
081-833-4557

Conditions: Given patient's medical record and a selection of antimicrobial agents.

Standards: Isolate the biological casualty, and manage the specific biological agent so that the life of the patient is preserved without causing further harm to the patient or causing other casualties.

Performance Steps

NOTE: Many bacteria, fungi, viruses, rickettsial agents, and toxins have been mentioned in various literature sources as possible biological warfare agents. Those mentioned most often include *Bacillus anthracis* (anthrax), botulinum toxin, *Yersinia pestis* (*Y. pestis*) (plague), ricin, Staphylococcal enterotoxin B (SEB), and Venezuelan equine encephalitis (VEE) virus. Despite the very different characteristics of these organisms, viruses, and toxins, biological agents used as weapons share some common characteristics.

1. Understand the common characteristics of biological weapons.
 - a. They can be dispersed in aerosols of particle size 1 to 5 micrometers (microns), which may remain suspended (in certain weather conditions) for hours and if inhaled, will penetrate into distal bronchioles and terminal alveoli of victims.
 - b. Particles larger than 5 microns would tend to be filtered out in the upper airway.
 - c. The aerosols may be delivered by simple technology, including industrial sprayers with nozzles modified to generate the smaller particle size.
 - d. The weather in the target area is very important in the employment of biological agents as aerosols. Higher wind speeds tend to break up the aerosol cloud, and stable wind direction is obviously important. Inversion conditions and lower wind speeds, 5 to 10 miles per hour, occur more often during nighttime and early morning hours. These conditions would be ideal for dispensing aerosols.
 - e. Other possible routes of exposure for biological agents include oral, by intentional contamination of food and water, and percutaneous. In general, these other routes of exposure are considered less important than the respiratory route.
 - f. Diseases produced by the offensive use of biological agents against United States forces could be lethal and/or disabling.
 - (1) Examples of lethal agents include *Bacillus anthracis*, botulinum toxin, and *Francisella tularensis*.
 - (2) Incapacitating agents include SEB and *Coxiella burnetii* (*C. burnetii*).
 - g. Some agents, such as *Y. pestis* and *C. burnetii*, would produce pulmonary syndromes characteristic of the endemic disease they produce in nature. Others, such as botulinum toxin, although delivered by a different route of exposure (respiratory) than usual with endemic disease, would produce a similar clinical picture to that commonly seen with oral exposure.
 - h. Person-to-person spread could be important for some agents, such as smallpox and pneumonic plague, and local disease cycles might occur if a competent vector for a bacterium or virus is present in the environment (for example, fleas for *Y. pestis* and certain mosquitoes for VEE).
 - i. The medical response to the threat or use of biological weapons may be different depending on whether medical measures are employed before exposure or whether exposure has already occurred and/or symptoms are present.
 - j. If provided before exposure, active immunization or prophylaxis with antibiotics may prevent illness in those exposed.
 - (1) Active immunization may be effective against several potential biological warfare agents.
 - (2) After exposure, active or passive immunization and pretreatment with therapeutic antibiotics or antiviral drugs may ameliorate disease symptoms.
 - (3) After onset of illness, only diagnosis of the disease and general or specific treatment are left to medical care providers.

Performance Steps

- k. The currently fielded chemical protective equipment, which includes the protective mask, battle dress overgarment (BDO), protective gloves, and overboots will provide protection against a biological agent attack.
- l. Adequate and accurate intelligence is required to develop an effective defense against biological warfare. Once an agent has been dispersed, detection of the biological aerosol before its arrival over the target is the best way to minimize or prevent casualties as it gives soldiers time to don protective equipment. However, interim systems of detecting biological agents are just now being fielded in limited numbers. Until enough reliable detectors are available, the first indication of a biological attack in unprotected soldiers usually will be the ill soldier.

2. Manage a biological casualty exposed to anthrax. See task 081-833-4269, Manage Anthrax.

3. Manage a biological casualty exposed to brucellosis.

a. Signs and symptoms:

NOTE: Fatalities are uncommon.

- (1) Incubation period from 5 to 60 days. Average period is 1 to 2 months; however, it can be highly variable.
- (2) Acute and subacute brucellosis are nonspecific.
- (3) Irregular fever, headache, profound weakness and fatigue, chills, sweating, arthralgias, and myalgias.
- (4) Depression and mental status changes.
- (5) Osteoarticular findings (that is, sacroiliitis or vertebral osteomyelitis).
- b. Isolation and decontamination:
 - (1) Healthcare workers should take standard precautions.
 - (2) Person-to-person transmission via tissue transplantation and sexual contact have been reported but are insignificant.
 - (3) Environmental decontamination can be done with a 0.5 percent hypochlorite solution.
- c. Diagnosis:
 - (1) Blood cultures require a prolonged period of incubation in the acute phase.
 - (2) Bone marrow cultures produce a higher yield.
 - (3) Confirmation requires phage-typing, oxidative metabolism, or genotyping procedures. Perform enzyme-linked immunosorbent (ELISA) test followed by Western blotting.
- d. Treatment:
 - (1) Doxycycline and rifampin for a minimum of 6 weeks.
 - (2) Ofloxacin with rifampin is also effective.
 - (3) Therapy with rifampin, a tetracycline, and an aminoglycoside is indicated for infections with complications such as endocarditis or meningoenzephalitis.

4. Manage a biological casualty exposed to glanders.

a. Signs and symptoms:

- (1) Incubation period ranges from 10 to 14 days after inhalation.
- (2) Inhalational exposure produces fever, rigors, sweats, myalgia, headache, pleuritic chest pain, cervical adenopathy, splenomegaly, and generalized papular/pustular eruptions.

NOTE: Exposure to glanders is almost always fatal without treatment.

b. Diagnosis:

- (1) Methylene blue stain of exudates may reveal scant, small bacilli.
- (2) Chest X ray (CXR) may show miliary lesions, small multiple lung abscesses, or bronchopneumonia.
- (3) *Pseudomonas mallei* (*P. mallei*) can be cultured from infected secretions by using meat nutrients.

c. Isolation and decontamination:

- (1) Healthcare workers should take standard precautions. Person-to-person, airborne transmission is unlikely, although secondary cases may occur through improper handling of infected secretions.
- (2) Environmental decontamination with a 0.5 percent hypochlorite solution is effective.

Performance Steps

d. Treatment:

- (1) Few antibiotics have been evaluated in vivo. Sulfadiazine may be effective in some cases.
- (2) Ciprofloxacin, doxycycline, and rifampin have in vitro efficacy.
- (3) Extrapolating from melioidosis guidelines, a combination of trimethoprim-sulfamethoxazole (TMP-SMX) + ceftazidime ± gentamicin might be considered.

e. Prophylaxis: No human or veterinary vaccine. Postexposure prophylaxis may be tried with TMP-SMX.

5. Manage a biological casualty exposed to plague (task 081-833-4262, Manage Plague).

NOTE: The current military vaccine is not effective against pneumonic plague. (This is the most likely militarized type, which would be delivered by aerosol means.)

6. Manage a biological casualty exposed to tularemia.

a. Signs and symptoms:

- (1) Ulceroglandular tularemia presents with a local ulcer and regional lymphadenopathy, fever, chills, headache and malaise.
- (2) Typhoidal tularemia presents with fever, headache, malaise, substernal discomfort, prostration, weight loss, and a nonproductive cough.

b. Diagnosis:

- (1) Clinical diagnosis can be made.
- (2) Physical findings are usually nonspecific.
- (3) CXR may reveal a pneumonic process, mediastinal lymphadenopathy, or pleural effusion.
- (4) Routine culture is possible but difficult. The diagnosis can be established retrospectively by serology.

c. Isolation and decontamination:

- (1) Healthcare workers should take standard precautions.
- (2) Organisms are relatively easy to render harmless by mild heat (55 degrees Celsius for 10 minutes) and standard disinfectants.

d. Treatment: Administration of antibiotics (streptomycin or gentamicin) with early treatment is very effective.

e. Prophylaxis: A live, attenuated vaccine is available as an investigational new drug. It is administered once by scarification. A 2-week course of tetracycline is effective as prophylaxis when given after exposure.

7. Manage a biological casualty exposed to smallpox.

a. Signs and symptoms:

- (1) Clinical manifestations begin acutely with malaise, fever, rigors, vomiting, headache, and backache.
- (2) Lesions appear 2 to 3 days later and quickly progress from macules to papules and eventually form pustular vesicles. They are more abundant on the extremities and face and develop synchronously.

b. Diagnosis:

- (1) Electron and light microscopy are not capable of discriminating variola from vaccinia, monkeypox, or cowpox.
- (2) The new polymerase chain reaction (PCR) diagnostic techniques may be more accurate in discriminating between variola and other orthopoxviruses.

c. Isolation and decontamination:

- (1) Take droplet and airborne precautions for a minimum of 16 to 17 days following exposure for all contacts.
- (2) Patients should be considered infectious until all scabs separate.

d. Treatment: At present there is no effective chemotherapy, and treatment of a clinical case remains supportive

e. Prophylaxis: Immediate vaccination or revaccination should be undertaken for all personnel exposed. Vaccinia immune globulin (VIG) is of value in postexposure prophylaxis of smallpox when given within the first week following exposure.

Performance Steps

8. Manage a biological casualty exposed to VEE.
 - a. Signs and symptoms: Sudden onset of illness with generalized malaise, spiking fevers, rigors, severe headache, photophobia, and myalgias. Nausea, vomiting, cough, sore throat, and diarrhea may follow. Full recovery takes 1 to 2 weeks.
 - b. Diagnosis:
 - (1) Clinical diagnosis can be made.
 - (2) Physical findings are usually nonspecific.
 - (3) White blood cell count often shows a striking leukopenia and lymphopenia.
 - (4) Virus isolation may be made from serum and, in some cases, throat swab specimens. Neutralizing or immunoglobulin gamma G (IgG) antibody in paired sera or a VEE-specific immunoglobulin M (IgM) present in a single serum sample indicate recent infection.
 - c. Isolation and decontamination:
 - (1) Healthcare workers should take standard precautions.
 - (2) Human cases are infectious for mosquitoes for at least 72 hours.
 - (3) The virus can be destroyed by heat (80 degrees Centigrade for 30 minutes) and standard disinfectants.
 - d. Treatment: Supportive only.
 - e. Prophylaxis: A live, attenuated vaccine is available as an investigational new drug. A second, formalin-inactivated, killed vaccine is available for boosting antibody titers in those initially receiving the live vaccine.
9. Manage a biological casualty exposed to botulinum toxin.
 - a. Signs and symptoms:
 - (1) Ptosis, generalized weakness, dizziness, dry mouth and throat, blurred vision and diplopia, dysarthria, dysphonia, and dysphagia followed by symmetrical descending flaccid paralysis and development of respiratory failure.
 - (2) Symptoms begin as early as 24 to 36 hours but may begin several days after inhalation of toxin.
 - b. Diagnosis:
 - (1) Clinical diagnosis can be made.
 - (2) No routine laboratory findings. Biowarfare attack should be suspected if multiple casualties present at the same time with progressive descending bulbar, muscular, and respiratory weakness.
 - c. Isolation and decontamination: Standard Precautions for healthcare workers.
 - (1) Healthcare workers should take standard precautions. Toxin is not dermally active, and secondary aerosols are not a hazard from patients.
 - (2) Decontamination by hypochlorite (0.5 percent for 10 to 15 minutes) and/or soap and water.
 - d. Treatment:
 - (1) Intubation and ventilatory assistance for respiratory failure. Tracheostomy may be required.
 - (2) Administration of heptavalent botulinum antitoxin may prevent or decrease progression to respiratory failure and hasten recovery.
 - e. Prophylaxis: Pentavalent toxoid vaccine (types A, B, C, D, and E) is available as a product for those at high risk of exposure.
10. Manage a biological casualty exposed to SEB.
 - a. Signs and symptoms:
 - (1) From 3 to 12 hours after aerosol exposure, sudden onset of fever, chills, headache, myalgia, and nonproductive cough.
 - (2) Some patients may develop shortness of breath and retrosternal chest pain.
 - (3) Fever may last 2 to 5 days, and cough may persist for up to 4 weeks.
 - (4) Patients may also present with nausea, vomiting, and diarrhea if they swallow toxin.
 - (5) Presumably, higher exposure can lead to septic shock and death.

Performance Steps

- b. Diagnosis: Diagnosis is clinical. Patients present with a febrile respiratory syndrome without CXR abnormalities. Large numbers of soldiers presenting with typical symptoms and signs of SEB pulmonary exposure would suggest an intentional attack with this toxin.
 - c. Isolation and decontamination:
 - (1) Healthcare workers should take standard precautions.
 - (2) Decontamination by hypochlorite (0.5 percent for 10 to 15 minutes) and/or soap and water.
 - (3) Destroy any food that may have been contaminated.
 - d. Treatment: Treatment is limited to supportive care. Artificial ventilation might be needed for very severe cases, and attention to fluid management is important.
 - e. Prophylaxis: Use of protective mask. There is currently no human vaccine available to prevent SEB intoxication.
11. Manage a biological casualty exposed to ricin.
- a. Signs and symptoms: Weakness, fever, cough, and pulmonary edema occur 18 to 24 hours after inhalation exposure, followed by severe respiratory distress and death from hypoxemia in 36 to 72 hours.
 - b. Diagnosis: Signs and symptoms noted in 11a numbers of geographically clustered patients could suggest an exposure to aerosolized ricin. The rapid time course to severe symptoms and death would be unusual for infectious agents. Laboratory findings are nonspecific but similar to other pulmonary irritants that cause pulmonary edema. Specific serum ELISA is available. Acute and convalescent sera should be collected.
 - c. Isolation and decontamination:
 - (1) Healthcare workers should take standard precautions.
 - (2) Secondary aerosols should generally not be a danger to health care providers.
 - (3) Weak hypochlorite solutions (0.1 percent sodium hypochlorite) and/or soap and water can decontaminate skin surfaces.
 - d. Treatment: Management is supportive and should include treatment for pulmonary edema. Gastric decontamination measures should be used if ricin is ingested.
 - e. Prophylaxis: There is currently no vaccine or prophylactic antitoxin available for human use, although immunization appears promising in animal models. Use of the protective mask is currently the best protection against inhalation.
12. Record all treatment in the patient's medical record.
13. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage a biological casualty.

Performance Measures

1. Understood the common characteristics of biological weapons.
2. Managed a biological casualty exposed to anthrax.
3. Managed a biological casualty exposed to brucellosis.
4. Managed a biological casualty exposed to glanders.
5. Managed a biological casualty exposed to plague.
6. Managed a biological casualty exposed to tularemia.
7. Managed a biological casualty exposed to smallpox.
8. Managed a biological casualty exposed to VEE.
9. Managed a biological casualty exposed to botulinum toxin.

GO **NO GO**

_____	_____
_____	_____
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Performance Measures	<u>GO</u>	<u>NO GO</u>
10. Managed a biological casualty exposed to SEB.	_____	_____
11. Managed a biological casualty exposed to ricin.	_____	_____
12. Recorded all treatment in the patient's medical record.	_____	_____
13. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 4-02.7
	FM 8-285
	FM 8-9

Manage Radiation Casualties

081-833-4559

Conditions: You are in a field environment. A casualty arrives at the unconventional warfare aid station, and you determine the casualty has been exposed to ionizing radiation. Given a Special Forces (SF) tactical medical equipment set and a decontamination site.

Standards: Effectively manage a casualty exposed to ionizing radiation.

Performance Steps

1. Wash the casualty thoroughly to remove contamination from the skin. (See task 081-833-0095, Decontaminate a Casualty).
2. Perform a survey of the casualty to identify any nonradiation injuries. (See task 081-833-4149, Perform Initial Assessment and Management of Trauma Patient).
3. Understand that the syndromes have common characteristics.
 - a. Patients within a few hours of a prompt exposure, regardless of which syndrome later develops, pass through a nonspecific, transient period of malaise, weakness, anorexia, vomiting, and diarrhea. This period is known as the initial response.
 - b. Patients will proceed through a latent phase (shortest for the central nervous system [CNS] syndrome) lasting a few hours. Gastrointestinal syndrome has an intermediate latent period of a few days. Hematopoietic syndrome has the longest latent period of 2 to 6 weeks.
 - c. Patients will enter the clinical phase.
 - (1) Patients with CNS syndrome (receiving 3,000 radiation absorbed dose [rad] or more) is one of progressive depression leading to coma and death.
 - (2) Patients with gastrointestinal syndrome (receiving 1,000 rad or higher) within 4 to 5 days will develop severe and bloody diarrhea. Massive amounts of fluid care must be immediate, and these patients will tax the medical facility. Patients with such care may survive up to a few weeks.
 - (3) The survival of patients with hematopoietic syndrome (receiving less than 1,000 rad) with supportive fluid care is directly related to the probability of recovery of the bone marrow.
4. Determine the irradiation of the body by the associated syndrome.
 - a. CNS syndrome, caused by very high doses and uniformly fatal within 2 to 4 days.
 - b. Gastrointestinal syndrome, caused by somewhat lower doses but also uniformly fatal.
 - c. Hematopoietic syndrome, caused by lower doses and associated with the possibility of recovery and survival.
5. Maintain the casualty supportively.

NOTE: The amount of supplies required by radiation casualties can exceed the capabilities of small clinics. Consider the chance of survival of the patient and the amount of supplies on hand when providing supportive care for the casualties.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage casualties exposed to ionizing radiation.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Washed the casualty thoroughly.	—	—
2. Performed a survey of the casualty to identify any nonradiation injuries.	—	—
3. Identified the phase the patient was in.	—	—
4. Determined the chance of survival by the associated syndrome.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
5. Provided supportive care for the casualty, depending on the situation.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 4-02.7 MERCK MANUAL 17TH ED

Manage an Incapacitating Agent Casualty

081-833-4564

Conditions: You are in a field environment where an incapacitating agent may be used. You are wearing a protective mask. Given a protective mask, soap, water, and M258A1 skin decontamination kit.

Standards: Effectively manage a patient with symptoms of incapacitating agent exposure.

Performance Steps

1. Mask the casualty.
2. Perform a survey of the casualty.
3. Assess the incapacitating agent.
 - a. Restlessness, dizziness, or giddiness.
 - (1) Indoles such as lysergic acid diethylamide (LSD).
 - (2) Cannabinols.
 - (3) Anxiety reaction.
 - b. Distractability, inappropriate smiling or laughter, or irrational fear.
 - (1) Intoxication.
 - (2) Lead.
 - (3) Bromides.
 - c. Euphoric, relaxed, unconcerned attitude.
 - (1) Cannabinols.
 - (2) Alcohol.
 - d. Tremors, clinging or pleading, or crying.
 - (1) Anxiety reaction.
 - (2) Alcohol.

4. Protect the casualty.

NOTE: Agents will be dispersed by smoke-producing munitions or aerosols, which makes the use of a protective mask essential.

5. Decontaminate the casualty.
 - a. Clean the skin with soap and water as soon as possible.
 - b. Use the M258A1 skin decontamination kit, if washing is impossible.
6. Give first aid to the patient.
 - a. Maintain an unobstructed airway for patients that are stuporous or comatose.
 - b. Immediately and vigorously cool patients that present with an elevated body temperature of 102 degrees Fahrenheit and mucous membranes that are dry.
 - c. Present a firm attitude to reassure a patient who can comprehend.
7. Monitor the patient, and maintain supportive care.
8. Evacuate the casualty for further treatment, if required.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage a patient with symptoms of incapacitating agent exposure.

Performance Measures

1. Masked the casualty.
2. Performed a survey of the casualty.
3. Assessed the incapacitating agent.

GO NO GO

_____	_____
_____	_____
_____	_____

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Protected the casualty.	_____	_____
5. Decontaminated the casualty.	_____	_____
6. Gave first aid to the patient.	_____	_____
7. Monitored the patient and maintained supportive care.	_____	_____
8. Evacuated the casualty for further treatment, if required.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	FM 8-285

Subject Area 28: Environmental Conditions

Manage Allergic Reactions

081-833-4003

Conditions: Given a patient demonstrating signs and symptoms of an allergic reaction, epinephrine, diphenhydramine, alcohol swabs, hypodermic needles, and syringes.

Standards: Recognize the cause and manifestation of allergic reactions, and manage allergic reactions so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Recognize the causes of allergic reactions.
 - a. Drugs.
 - b. Insect bites.
 - c. Pollen.
 - d. Food.
 2. Recognize the early manifestations of allergic reactions.
 - a. Apprehension.
 - b. Urticaria (hives).
 - c. Dyspnea (wheezing), which is a key concern.
 - d. Swelling of mouth, tongue, airway (angioedema).
 3. Manage allergic reactions.
 - a. Remove irritant and/or stop administration of medications.
 - b. Epinephrine 0.3 to 0.5 1:1,000 subcutaneously (SQ) can be used without Benadryl or in addition to Benadryl, if needed.
 - c. Diphenhydramine 25 to 50 milligrams (mg) by mouth (PO) or intramuscularly (IM).
 - d. Observe patient closely.
- CAUTION:** If the patient's symptoms worsen, refer to task 081-833-4006, Manage Anaphylaxis.
4. Manage specific types of allergic reactions.
 - a. Drug allergies.
 - (1) Avoid administration of the drug if at all possible.
 - (2) In a hospital setting if a particular drug is required to save life or limb, a program of desensitizing the patient to the drug may be undertaken. Always be prepared to treat anaphylactic shock when trying to desensitize a patient.
 - b. Insect allergies. Patients with a known allergy to insects should be provided with an anaphylaxis kit (ANAKIT), or "bee sting kit," and instructed in its use.
 - c. Pollen allergies.
 - (1) Recognize the signs and symptoms of allergic rhinitis.
 - (a) Swelling and itching of the nose, roof of the mouth, pharynx, and eyes.
 - (b) Sneezing and clear, watery nasal discharge.
 - (c) Frontal headache, irritability, anorexia, and insomnia may occur.
 - (d) Coughing and wheezing may develop.
 - (e) Many eosinophils are present in the nasal mucosa.
 - (2) Manage allergic rhinitis.
 - (a) Encourage avoidance of the allergen if possible.
 - (b) Give oral antihistamines.
 - (c) Sympathomimetics such as phenylpropanolamine or pseudoephedrine may be of limited benefit. If they are given, they should not be used for more than 5 consecutive days.
 - (d) Cromolyn sodium may be given as a nasal spray equivalent to 5.2 mg three times a day (t.i.d.). This is a mast cell stabilizer that prevents the release of histamine.

Performance Steps

- (e) Intranasal glucocorticoid sprays are available in a variety of types and may prove useful in the management of seasonal allergies.
- NOTE: In patients where drug therapy is poorly tolerated, the patient may be referred to an allergy specialist for desensitization therapy. The patient is desensitized by injecting an extract of the allergen SQ in gradually increasing doses.
- (3) For management of allergic conjunctivitis, refer to task 081-833-4213, Manage Conjunctivitis.
- d. Recognize the signs and symptoms of food allergies.
 - (1) Eczema or atopic dermatitis--especially in infants.
 - (2) Gastrointestinal symptoms such as colic and diarrhea.
 - (3) Allergic respiratory symptoms--especially in children over 1 year old.
 - (4) Urticaria, angioedema, and anaphylaxis are possible--especially with ingested proteins such as nuts, seeds, legumes, dairy products, and shellfish.
- NOTE: A number of food additives also cause allergic reactions. Although not foods themselves, their role should not be overlooked in the management of food allergies.
- e. Manage food allergies.
 - (1) Encourage avoidance of known food allergens. (If a patient is seriously allergic to a specific food, it will be painfully obvious.) If the allergic response is milder, the patient may try to eliminate food from his diet to determine the offending agent. If this is ineffective, it may require referral to an allergist for skin testing to determine the exact cause.
 - (2) Except for avoidance of the food, there is no specific treatment for food allergies.
- 5. Record all treatment in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage allergic reactions.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Recognized the causes of allergic reactions.	—	—
2. Recognized the early manifestations of allergic reactions.	—	—
3. Managed allergic reactions.	—	—
4. Managed specific types of allergic reactions.	—	—
5. Recorded all treatment in the patient's medical record.	—	—
6. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
MERCK MANUAL 17TH ED

Manage Nutritional Deficiencies

081-833-4117

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, patient's medical record, and The Merck Manual.

Standards: Solicit a patient history, perform a physical examination, perform and/or request laboratory studies, determine the cause of the disease, and administer supportive care and pharmacological therapy in accordance with The Merck Manual.

Performance Steps

1. Summarize causes of vitamin D deficiency (rickets), its environmental cause, and its pathophysiology.
 - a. Primary causes:
 - (1) Inadequate exposure to sunlight.
 - (2) Poor dietary intake.
 - b. Distribution is worldwide.
 2. Recognize the signs and symptoms of vitamin D deficiency.
 - a. Neonatal period: Metaphyseal lesions and tetany accompany maternal osteomalacia.
 - b. Young infants: Restless, sleep poorly, and have reduced mineralization of the skull away from the sutures.
 - c. Older infants: Sitting and crawling are delayed and there is bossing of the skull, costochondral beading, and delayed fontanelle closure.
 - d. Ages 1 to 4: There is enlargement of epiphyseal cartilages at the lower ends of the radius, ulna, tibia, and fibula; kypho-scoliosis; bowlegs; and delay in walking
 - e. Older children and adolescents: There is pain on walking and the development of such deformities as bowlegs and knock-knees in extreme cases.
 - f. Adults: Demineralization occurs, particularly in the spine, pelvis, and lower extremities. The bones soften. Weight may cause bowing of the long bones, vertical shortening of the vertebrae, and flattening of the pelvic bones, which contracts the pelvic outlet.
 3. Manage vitamin D deficiency.
 - a. With adequate calcium and phosphate intake, adult osteomalacia and uncomplicated rickets can be cured by intake of vitamin D 1,600 international units (IUs) per day.
 - b. After about 1 month of therapy, the dose can be reduced gradually to normal levels.
 - c. If tetany is present, treatment should be supplemented during the first week with intravenous (IV) calcium salts.
 - d. Rickets and osteomalacia that result from defective production of vitamin D metabolites do not respond to the doses that would be effective in nutritional rickets. Some respond to massive doses, but toxicity may result.
 4. Take steps to prevent vitamin D deficiency in at-risk populations.
 - a. Provide health education, including dietary advice, to susceptible communities.
 - b. Administer 3,000 IU weekly, which gives complete protection.
- NOTE: Fortified milk and unleavened flour has proven to be effective among Asian immigrants.
- c. In adolescents, administer a single intramuscular (IM) dose of ergocalciferol at 100,000 IU in the fall. This dosage produces a substantial rise in plasma levels until spring.
- NOTE: Steps 5 through 7 relate to the management of vitamin B1 deficiency (beriberi).
5. Summarize causes of vitamin B1 deficiency (beriberi) its environmental cause, and its pathophysiology.
 - a. Primary thiamine deficiency arises from inadequate intake, particularly in people subsisting on highly polished rice. Milling removes the husk, which contains most of the thiamine, but boiling before husking disperses the vitamin throughout the grain, thus preventing its loss.
 - b. Secondary deficiency arises from the following:

Performance Steps

- (1) Increased requirement, as in hyperthyroidism, pregnancy, lactation, and fever.
- (2) Impaired absorption, as in long continued diarrheas.
- (3) Impaired use, as in severe liver disease.
- (4) A combination of decreased intake, impaired absorption and use, increased requirements, and possibly an apoenzyme defect occur in alcoholism.

6. Recognize the signs and symptoms of vitamin B1 deficiency.

- a. Fatigue.
- b. Irritation.
- c. Poor memory.
- d. Sleep disturbances.
- e. Precordial pain.
- f. Anorexia.
- g. Abdominal discomfort.
- h. Constipation.
- i. Peripheral neurologic changes (dry beriberi)
 - (1) Paresthesias of the toes.
 - (2) Burning of the feet.
 - (3) Calf muscle cramps and pains in the legs.
- j. Cerebral beriberi (Wernicke-Korsakoff syndrome).
 - (1) Mental confusion.
 - (2) Aphonia.
 - (3) Confabulation.
 - (4) Reduced cerebral blood flow.
 - (5) Nystagmus.
 - (6) Total ephthalmoplegia.
 - (7) Coma.
 - (8) Death.
- k. Cardiovascular beriberi (wet beriberi or Shoshin disease).
 - (1) Tachycardia.
 - (2) Wide pulse pressure.
 - (3) Sweating.
 - (4) Warm skin.
 - (5) Pulmonary or peripheral edema.
 - (6) Cold, cyanotic extremities.
 - (7) Heart failure.

7. Manage vitamin B1 deficiency.

- a. In mild polyneuropathies, administer 10 to 20 milligrams of vitamin B1 per day (mg/day).
- b. In moderate or advanced neuropathy, administer 20 to 30 mg/day of vitamin B1.
- c. In cardiovascular beriberi and in Wernicke-Korsakoff syndrome, administer 50 to 100 mg IM or IV twice daily (b.i.d.) of vitamin B1 until a therapeutic response is obtained.
- d. Symptomatic management includes the following:
 - (1) Bedrest.
 - (2) Nutritional intake of dried yeast, whole grains, meat (especially pork and liver), enriched cereal products, nuts, legumes, and potatoes. All of these foods are good sources of vitamin B1.

NOTE: Steps 8 through 10 relate to the management of niacin deficiency (pellagra).

8. Understand niacin deficiency (pellagra), its environmental cause, and its pathophysiology.

- a. Primary deficiency is a main cause of pellagra. It usually occurs in areas where maize (Indian corn) forms a major part of the diet. Bound niacin, found in maize, is not assimilated in the intestinal tract unless it has been previously alkali-treated (as in the preparation of tortillas). Corn protein is also deficient in tryptophan, a precursor from which the body can synthesize niacin.

Performance Steps

- b. Amino acid imbalance also may play a part, as pellagra is common in India among those who eat millet with a high leucine content.
- c. Secondary deficiencies are seen in diarrheal disease, cirrhosis of the liver, and alcoholism and following extensive postoperative use of nutrient infusions lacking vitamins.
- d. Pellagra may also complicate prolonged isoniazid (INH) therapy (the drug replaces niacinamide in nicotinamide adenine dinucleotide [NAD]), malignant carcinoid tumor, and Hartnup disease.

9. Recognize the signs and symptoms of niacin deficiency.

- a. Memory impairment.
- b. Disorientation.
- c. Confabulation.
- d. Organic psychosis.
- e. Burning of the mouth, pharynx, and esophagus.
- f. Abdominal discomfort.
- g. Scarlet stomatitis and glossitis.
- h. Cutaneous lesions.
- i. Vomiting.
- j. Diarrhea, which is often bloody.
- k. Uncontrollable sucking and grasping reflexes.
- l. Butterfly-shaped lesions on the face.

10. Manage niacin deficiency.

- a. Niacinamide is generally used in deficiency states, since niacin can cause flushing, itching, burning, or tingling sensations and niacinamide does not.
- b. Supplemental niacinamide 300 to 1,000 mg/day given orally in equally divided doses.
- c. If oral therapy is precluded, 100 to 250 mg subcutaneously (SQ) b.i.d. to three times a day (t.i.d.).
- d. In encephalopathic states, 1,000 mg orally plus 100 to 250 mg parenterally is recommended.

NOTE: Steps 11 through 13 relate to the management of vitamin C deficiency.

11. Understand vitamin C deficiency (scurvy), its environmental cause, and its pathophysiology.

- a. Food idiosyncrasies related to culture of nonavailability of certain foods that lead to a diet low in vitamin C.
- b. Increased requirements caused by pregnancy, lactation, and thyrotoxicosis.
- c. Diarrhea.
- d. Acute and chronic inflammatory diseases.
- e. Surgical burns and cold or heat stress increase urinary excretion of vitamin C.

12. Recognize the signs and symptoms of vitamin C deficiency.

- a. Lassitude.
- b. Weakness.
- c. Irritability.
- d. Weight loss.
- e. Vague myalgias.
- f. Arthralgias.
- g. Multiple splinter hemorrhages may form near the distal ends of the nail.
- h. Gums become swollen, purple, spongy, and friable and bleed readily in extreme deficiency.
- i. Secondary infection, gangrene, and loosening of teeth.
- j. New wounds fail to heal.
- k. Spontaneous hemorrhages may occur in any part of the body.
- l. Oliguria.
- m. Edema of the lower extremities.
- n. Arthritis resembling rheumatoid arthritis.

13. Manage vitamin C deficiency.

Performance Steps

- a. For treatment of adult scurvy, vitamin C 250 mg by mouth (PO) b.i.d. is recommended until signs have disappeared. When parenteral therapy is required, sodium ascorbate can be given at the same dosage.
- b. Ascorbic acid 300 to 500 mg/day orally in divided doses should be given for several months in chronic scurvy with gingivitis, repeated hemorrhagic manifestations, or joint symptoms.
- c. Prophylaxis: 100 mg/day orally
- d. Nutritional sources include citrus fruits, tomatoes, potatoes, cabbage, and green peppers.

NOTE: Steps 14 through 16 relate to the management of protein-calorie malnutrition (PCM).

14. Summarize the causes of PCM.

- a. Inadequate consumption of protein and energy from food.
- b. Inadequate distribution of food to all age groups of the population.

15. Identify the signs of PCM.

- a. Kwashiorkor: presence of edema and bloated abdomen.
- b. Marasmus: loss of fat and muscle, skeletal appearance, and wasting around extremities.
- c. Marasmus-Kwashiorkor: combination of a and b above.
- d. Usually combined with anemia and other B-complex vitamin deficiencies.
- e. In children, failure to grow; in adults and children, weight loss.
- f. Often seen in combination with severe dehydration and malabsorption.

16. Manage PCM.

- a. Obtain rations that provide adequate calories and protein.
- b. Provide basic health care.
- c. Provide foods with appropriate calories and protein that are blended for children.
- d. Plan for therapeutic feeding program assistance.

17. Summarize the risk factors of vitamin A deficiency.

- a. Refugee population is in an area of high risk; for example, no measles immunizations have been administered.
- b. Evidence of severe Vitamin A deficiency in the population.
- c. General ration provides inadequate quantities of vitamin A (2,000 to 2,500 IU per person per day).

18. Identify the disease and condition that occur as a result of vitamin A deficiency.

- a. Xerophthalmia and night blindness. Look for Bitot's spots (dryness around the cornea).
- b. Measles (rash, fever, and respiratory problems).

19. Manage vitamin A deficiency.

- a. Vitamin A capsules or syrups.
- b. Foods and cereals fortified with vitamin A.
- c. Preventative treatment is 200,000 IU every 4 to 6 months and through diet.
- d. Curative treatment is 200,000 IU on days 1, 2, and 7.
- e. For children 6 months to 1 year old or who weigh less than 8 kilograms: 100,000 IU only.

NOTE: Steps 20 through 22 relate to management of iron deficiency.

20. Summarize the causes of iron deficiency.

- a. Rations contain few animal products.
- b. Risk categories include women who are pregnant or lactating and children 9 to 36 months.
- c. Blood loss caused by parasitic infections.

21. Identify the symptoms or signs of iron deficiency.

- a. Tiredness.
- b. Anemia.
- c. Pica.
- d. Concave or spoon-shaped nails.
- e. Easily pluckable hair.

Performance Steps

- f. Pale conjunctiva.
- g. Impaired wound healing.

22. Manage iron deficiency.
 - a. Animal products and dried fruits consumed with vitamin C to increase absorption
 - b. Iron or folate supplements or fortified cereal blends.
 - c. Complementary vegetable foods that contain adequate iron.
23. Record all treatment in the patient's medical record.
24. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage nutritional deficiencies.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood vitamin D deficiency (rickets), its environmental cause, and its pathophysiology.	—	—
2. Recognized the signs and symptoms of vitamin D deficiency.	—	—
3. Managed vitamin D deficiency.	—	—
4. Took steps to prevent vitamin D deficiency in at-risk populations.	—	—
5. Understood vitamin B1 deficiency (beriberi), its environmental cause, and its pathophysiology.	—	—
6. Recognized the signs and symptoms of vitamin B1 deficiency.	—	—
7. Managed vitamin B1 deficiency.	—	—
8. Understood niacin deficiency (pellagra), its environmental cause, and its pathophysiology.	—	—
9. Recognized the signs and symptoms of niacin deficiency.	—	—
10. Managed niacin deficiency.	—	—
11. Understood vitamin C deficiency (scurvy), its environmental cause, and its pathophysiology.	—	—
12. Recognized the signs and symptoms of vitamin C deficiency.	—	—
13. Managed vitamin C deficiency.	—	—
14. Recorded all treatment in the patient's medical record.	—	—
15. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
 MERCK MANUAL 17TH ED

Manage a Heat Casualty**081-833-4160**

Conditions: A casualty is suffering from a heat injury. No other more serious injuries or conditions are present. Given water, salt, a thermometer, a stethoscope, and a sphygmomanometer.

Standards: Provide the correct treatment on the basis of the signs and symptoms of the injury.

Performance Steps

1. Understand the definitions, etiology, and pathophysiology associated with conditions causing heat casualties.
 - a. Heat cramps are caused by excessive loss of sodium, and occasionally potassium and magnesium, during strenuous activity at high atmospheric temperature. However, they can happen in any environment, depending on the mode of dress of the casualty.
 - b. Heat exhaustion is caused by excessive fluid loss. Heat exhaustion usually provides warning signs to the casualty of increasing fatigue. However, the warning signs are often overlooked.
 - c. Heat stroke is caused by failure of the heat loss mechanism and dangerous hyperpyrexia. The condition may be brought on by prolonged exposure to heat with excessive sweating and subsequent dehydration similar to heat exhaustion. However, the similarity of the conditions ends there.
2. Identify the type of heat injury on the basis of the following characteristic signs and symptoms:
 - a. Heat cramps. Muscle cramps of the arms, legs, and/or abdomen.
 - b. Heat exhaustion.
 - (1) Often, signs and symptoms are the following:
 - (a) Profuse sweating and pale (or gray), moist, and cool skin.
 - (b) Headache.
 - (c) Weakness or faintness.
 - (d) Dizziness.
 - (e) Loss of appetite or nausea.
 - (2) Sometimes, signs and symptoms include the following:
 - (a) Heat cramps.
 - (b) Nausea (with or without vomiting).
 - (c) Urge to defecate.
 - (d) Chills.
 - (e) Rapid breathing.
 - (f) Tingling sensation of the hands and feet.
 - (g) Confusion.
 - c. Heat stroke.
 - (1) Rapid onset with the core body temperature rising to above 106 degrees Fahrenheit within 10 to 15 minutes.
 - (2) Hot, dry skin.
 - (3) Headache.
 - (4) Dizziness.
 - (5) Nausea (stomach pains).
 - (6) Confusion.
 - (7) Weakness.
 - (8) Loss of consciousness.
 - (9) Possible seizures.
 - (10) Pulse and respirations are weak and rapid.
3. Provide the proper first aid for the heat injury.
 - a. Heat cramps.
 - (1) Move the casualty to a cool shaded area, if possible.
 - (2) Loosen the casualty's clothing unless he or she is in a chemical environment.

Performance Steps

- (3) Give the casualty at least one canteen of salt solution. Oral rehydration salts (ORS) are preferable. If ORS is not available, dissolve 1/4 teaspoon (one meal, ready to eat [MRE] packet) of salt in one canteen of water. If salt is unavailable, give plain water.
- b. Heat exhaustion.
 - (1) Conscious casualty.
 - (a) Move the casualty to a shaded area, if possible.
 - (b) Loosen and/or remove the casualty's clothing and boots unless he or she is in a chemical environment.
 - (c) Pour water on the casualty, and fan him or her, if possible.
 - (d) Slowly give the casualty one canteen of salt solution. (See step 2a(3).) If the casualty is nauseated, do not give initial fluids by mouth (PO), give 0.9 percent normal saline (NS) IV. If IV solutions are plentiful, consider giving 1 to 2 liters (L) of NS via IV concomitantly with oral rehydration.
 - (e) Elevate the casualty's legs.
 - (2) An unconscious casualty or one who is nauseated, unable to retain fluids, or whose symptoms have not improved after 20 minutes should be considered for evacuation from the battle area, if feasible.
- c. Heat stroke.

CAUTION: Heat stroke is a medical emergency. If the casualty is not cooled rapidly, the body cells--especially the brain cells--are literally cooked. As a result, irreversible damage is done to the central nervous system. The casualty must be evacuated to the nearest medical treatment facility immediately.

- (1) Conscious casualty.
 - (a) Remove the casualty's outer garments and/or protective clothing, if possible.
 - (b) Keep the casualty out of the direct sun, if possible.
 - (c) Immerse the casualty in cold water, if available, or cool the body core with ice, and massage him or her.

CAUTION: The thermoregulatory system in a heat stroke casualty is nonfunctional. Vigorous efforts to cool the casualty may result in hypothermia. Wide swings of body temperature may exacerbate the casualty's condition. Rectal temperature should be monitored every 10 minutes to avoid cooling the casualty below 101degrees Fahrenheit.

- (d) Lay the casualty down, and elevate his or her legs.
- (e) Initiate an IV infusion of Ringer's lactate or sodium chloride to maintain a systolic blood pressure of at least 90 millimeters (mm) mercury (Hg).
- (f) Diazepam or other anticonvulsants may be required too if convulsions are not otherwise controllable.
- (g) Ideally, electrolyte determinations should guide IV therapy.

NOTE: Heat stroke casualties may require intensive thermoregulatory support for an extended period to prevent brain damage or other problems. This is not a condition that can be definitively managed in a field environment.

4. Record the treatment given.
5. Evacuate the casualty as soon as possible for higher echelon care.

Evaluation Preparation: This task is best evaluated by performance of the steps on a simulated patient. Give the soldier a scenario in which he must manage a heat casualty.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Understood the definitions, etiology, and pathophysiology associated with conditions causing heat casualties.	—	—
2. Identified the type of heat injury on the basis of the characteristic signs and symptoms.	—	—
3. Provided the proper first aid for the heat injury.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
4. Recorded the treatment given.	_____	_____
5. Evacuated the casualty as soon as possible for higher echelon care.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK MANUAL 17TH ED

Manage Cold Injuries

081-833-4162

Conditions: No other more serious injuries or conditions are present. Given patient's medical record, dry clothing or similar material, sterile dressings, and a thermometer.

Standards: Correct treatment is provided on the basis of the signs and symptoms of the injury.

Performance Steps

1. Recognize the signs and symptoms of cold injuries.
 - a. Chilblain is caused by repeated, prolonged exposure of bare skin to low temperatures from 60 degrees Fahrenheit down to 32 degrees Fahrenheit.
 - (1) Acutely red, swollen, hot, tender, and/or itching skin.
 - (2) Surface lesions with shedding of dead tissue or bleeding lesions.
 - b. Frostbite is caused by exposure of the skin to cold temperatures that are usually below 32 degrees Fahrenheit, depending on the windchill factor, length of exposure, and adequacy of protection.

NOTE: The onset is signaled by a sudden blanching of the skin of the nose, ears, cheeks, fingers, or toes followed by a momentary tingling sensation. Frostbite is indicated when the face, hands, or feet stop hurting.

- (1) Superficial (first and second degree).
 - (a) Redness of the skin in light-skinned individuals and grayish coloring of the skin in dark-skinned individuals that is followed by a flaky sloughing of the skin.
 - (b) Blister formation 24 to 36 hours after exposure followed by sheet-like sloughing of the superficial skin (second degree).
- (2) Deep.
 - (a) Loss of feeling.
 - (b) Pale, yellow, waxy look if the affected area is unthawed.
 - (c) Solid feel of the frozen tissue.
 - (d) Blister formation 12 to 36 hours after exposure unless rewarming is rapid.
 - (e) Appearance of red-violet discoloration 1 to 5 days after the injury.

NOTE: Gangrene and residual nerve damage will result without proper treatment.

- c. Generalized hypothermia is caused by prolonged exposure to low temperatures--especially with wind and wet conditions--and it may be caused by immersion in cold water.

CAUTION: With generalized hypothermia, the entire body has cooled with the core temperature below 95 degrees Fahrenheit. This is a medical emergency.

- (1) Moderate hypothermia.

NOTE: This condition should be suspected in any chronically ill person who is found in an environment of less than 50 degrees F.

- (a) Conscious, but usually apathetic or lethargic.
 - (b) Shivering, with pale, cold skin.
 - (c) May have acetone scent to breath.
- (2) Severe hypothermia.
 - (a) Unconscious or stuporous.
 - (b) Ice-cold skin.
 - (c) Inaudible heart beat.
 - (d) Unobtainable blood pressure.
 - (e) Unreactive pupils.
 - (f) Very slow respirations.
- d. Immersion syndrome (immersion foot and trench foot and hand) is caused by fairly long (hours to days) exposure of the feet or hands to wet conditions at temperatures from about 50 degrees Fahrenheit down to 32 degrees Fahrenheit.
 - (1) First phase (anesthetic).
 - (a) There is no pain sensation, but the affected area feels cold.

Performance Steps

- (b) The pulse is weak at the affected area.
- (2) Second phase (reactive hyperemic) occurs when limbs feel hot and/or burning and have shooting pains.
- (3) Third phase (vasospastic).
 - (a) Affected area is pale.
 - (b) Cyanosis.
 - (c) Pulse strength decreases.
 - (d) Possible presence of blisters, swelling, redness, heat, hemorrhage, or gangrene.

2. Treat the cold injury.

a. Chilblain.

- (1) Apply local rewarming within minutes.
- (2) Protect lesions (if present) with dry, sterile dressings.

CAUTION: Do not treat with ointments.

b. Frostbite.

- (1) Apply local rewarming by using body heat.

CAUTION: Avoid thawing the affected area if it is possible that the injury may refreeze before patient reaches the treatment center.

- (2) Loosen or remove constricting clothing, and remove jewelry.
- (3) Increase insulation, and exercise the entire body, including the affected body part(s).

CAUTION: Do not massage the skin or rub anything on the frozen parts.

- (4) Move the casualty to a sheltered area, if possible.
- (5) Protect the affected area from further cold or trauma.
- (6) Clinical management of frostbite consists of the following:
 - (a) Initiate treatment with a broad-spectrum intravenous (IV) antibiotic such as Rocephin.
 - (b) Warm the extremities in large containers of water kept at 38 to 43 degrees Celsius (100 to 110 degrees Fahrenheit).
 - (c) Ensure the patient's tetanus vaccination is up to date.
 - (d) Give ibuprophen 800 milligrams (mg) three times a day (t.i.d.) to prevent platelet clumping in the damaged extremities and to provide some analgesia.
 - (e) Give whirlpool baths followed by gentle drying and rest. Allow enough time for tissue sloughing as the black carapace of devitalized tissue will often be shed to reveal vital tissue below. Remember the adage "Freeze in January, operate in July."
 - (f) Hyperbaric oxygenation is still a controversial treatment for frostbite.
- (7) Evacuate the casualty to a higher echelon of care, if possible.

NOTE: For frostbite of a lower extremity, evacuate the casualty by litter, if possible.

CAUTION: Do not allow the casualty to use tobacco or alcohol.

c. Generalized hypothermia.

- (1) Moderate.
 - (a) Remove the casualty from the cold environment.
 - (b) Replace wet clothing with dry clothing.
 - (c) Cover the casualty with insulating material or blankets.
 - (d) If available, apply heating pads to the casualty's armpits, groin, and abdomen.

NOTE: If far from a medical treatment facility and the situation and facilities permit, immerse the casualty in a tub of 105 degree Fahrenheit water.

- (e) If available, give sugar and sweet, warm fluids.

CAUTION: Do not give the casualty alcohol.

- (f) Wrap the casualty from head to toe.
- (g) Evacuate the casualty lying down.

- (2) Severe. Core temperature below 30 degrees Celsius (86 degrees Fahrenheit).

CAUTION: Handle the casualty very gently. Rough handling may cause or exacerbate cardiac dysrhythmias.

- (a) Cut away wet clothing, and replace it with dry clothing.
- (b) Maintain the airway, and administer oxygen, if available. Assist with ventilation if the casualty's respiration rate is less than 5 breaths per minute.

Performance Steps

CAUTION: If the patient is breathing on his own, do not use artificial airways. They have been shown to precipitate ventricular fibrillation in hypothermic patients. Do not hyperventilate the casualty. Keep the rate of artificial ventilation at about 8 to 10 per minute.

- (c) Take all available active rewarming measures. Things to consider are: warm IV fluids (43 degrees Celsius); warm, humid oxygen (O₂) (42 to 46 degrees Celsius); warm peritoneal lavage with potassium chloride-free fluids; and esophageal rewarming tubes.
- (d) Continue internal rewarming measures until the core temperature reaches more than 35 degrees Celsius.
- (3) Manage a hypothermic patient in cardiac arrest by doing the following:
 - (a) Beginning cardiopulmonary resuscitation (CPR).
 - (b) Defibrillate ventricular fibrillation (VF) and ventricular tachycardia (VT) at 200 joules (J), 300 J, 360 J, and up to a total of three shocks.
 - (c) Intubate the patient, and ventilate with warm, humid O₂.
 - (d) Establish an IV, and infuse warm NS at 43 degrees Celsius.
 - (e) If the core temperature is less than 30 degrees Celsius, continue CPR, withhold IV medications, limit shocks to three, and continue with aggressive rewarming measures as per above. Remember, the patient is not dead until he is warm and dead.
 - (f) If the core temperature is less than 30 degrees Celsius, continue CPR, give IV medications as indicated by the cardiac rhythm, but at longer than normal dosing intervals, and repeat defibrillation for VF and VT as core temperature rises.

d. Immersion syndrome.

- (1) Dry the affected part immediately, and gradually rewarm it in warm air.

CAUTION: Never massage the skin. After rewarming the affected part, it may become swollen, red, and hot. Blisters usually form when circulation returns.

- (2) Protect the affected part from trauma and secondary infection.
- (3) Elevate the affected part.
- (4) If signs of infection are present, administer a broad spectrum antibiotic and perform thorough wound cleaning.
- (5) Allow the affected area time to heal. There is no treatment for the prolonged symptoms of paresthesias and shooting pains that follow immersion syndrome or frostbite.

NOTE: There is some evidence that suggests that once a patient has suffered frostbite or immersion syndrome, he has increased susceptibility to recurring injury.

- 3. Record all treatment in the patient's medical record.
- 4. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps on a simulated casualty. Give the soldier a scenario in which he must manage cold injuries.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Recognized the signs and symptoms of cold injuries.	—	—
2. Treated the cold injury.	—	—
3. Recorded all treatment in the patient's medical record.	—	—
4. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
MERCK MANUAL 17TH ED

Manage Near Drowning

081-833-4205

Conditions: Given M-5 medical kit, oxygen, and oxygen administration equipment.

Standards: Solicit a patient history, perform a physical examination, and administer supportive care and pharmacological therapy in accordance with The Merck Manual without causing further harm.

Performance Steps

1. Understand the pathophysiology of near drowning.
 - a. Most drownings have a pattern. Cold water can stimulate involuntary gasping soon after it contacts the face, which can distract from or hinder the victim's attempt to resurface. After a period of breath holding, a reflex swallowing mechanism forces the intake of water. Laryngospasm usually minimizes aspiration of water during the early stages of consciousness and struggling, so the lungs remain relatively dry. However, swallowing frequently takes place making aspiration of vomitus a risk. After the victim lapses into unconsciousness, the trachea opens, allowing water to flow.
 - b. Two types of drowning.
 - (1) Wet drowning: Fluid is inhaled or aspirated into lungs. This usually occurs after vocal cords relax and lungs become partially flooded with water. Typically, 85 percent of all drownings are wet drownings. Wet drowning victims usually die because of pulmonary edema hours or days later and are referred to as secondary drownings.
 - (2) Dry drowning: Occurs when no fluid is aspirated or inhaled into lungs. Estimated 15 percent of victims drown without aspiration as a result of prolonged laryngospasm. Because no water enters lungs, dry drownings respond readily to artificial respirations.
 - c. Breath holding and unconsciousness (shallow water blackout).
 - (1) Most people can hold their breath between 1 and 2 minutes.
 - (2) At some point during the breath-holding attempt, the desire to breath becomes so intense that it can no longer be forestalled.
 - (3) Demand signaled by the respiratory center is caused by the respiratory center responding to the increasing levels of carbon dioxide and acids in the arterial blood and the chemoreceptors responding to the corresponding fall in the level of oxygen and rise in arterial carbon dioxide.
 - (4) If no air intake is achieved, unconsciousness will follow.
 - (5) Repeated practice of breath holding to achieve an increase in time has a positive effect on the will power to resist the demand to breathe, as does actual improvement of physical capacities.
 - d. Saltwater versus freshwater drowning.
 - (1) Saltwater.
 - (a) Hypertonic (higher osmotic pressure than body fluids)--saltwater is three to four times more concentrated than plasma.
 - (b) Fills the alveoli and pulls protein-rich fluid from the capillaries into the alveoli and interstitial space leading to pulmonary edema and decrease blood volume.
 - (c) Can cause some degree of hypernatremia (increase in sodium).
 - (d) The high concentration of salt contained in the water that has collected in the lungs draws fluid from the bloodstream into the lungs to equalize the concentration of salt. Saltwater aspiration has been shown to be twice as lethal as fresh water aspiration.
 - (e) Victims drown in their own fluids as much as in the saltwater itself.
 - (f) Hemoconcentration occurs from the resultant loss of plasma into the alveoli.
 - (g) Serum electrolyte concentration increases.
 - (h) Loss of surfactant is not a significant problem.

NOTE: Surfactant is a chemical in the alveoli of the lungs that is responsible for the stability of the alveoli. It reduces surface tension. In contrast to water, surfactants are attracted to the surface. They displace water molecules there and allow the surface to expand.

Performance Steps

- (2) Freshwater.
 - (a) Freshwater in the lungs can chemically alter the alveolar-capillary interface and alter the normal pulmonary surfactant.
 - (b) Loss of surfactant results in an increase in surface tension properties increase followed by damage of the pulmonary capillary membrane. The result is leading to respiratory distress syndrome.
 - (c) Freshwater passes through the lungs rapidly into the bloodstream expanding the blood volume and thus being hypotonic to plasma.
 - (d) Hemodilution occurs. With the increase in volume, electrolytes, except potassium, are deleted.
 - (e) Hemolysis occurs when red blood cells rupture from the water that is diffusing into the cells. Potassium is released from the lysis of the cells and is therefore at a higher extracellular level than normal.
- e. Other considerations.
 - (1) Electrolyte changes are not generally a severe problem, unless more than 22 milliliters per kilogram (ml/kg) of water is aspirated. (Autopsy studies show that only about 15 percent of those who die in water aspirate more than this quantity.)
 - (2) Electrolyte changes usually occur within 3 minutes, reversible within 1 hour in survivors.
 - (3) Severe delayed pulmonary edema is more likely in freshwater drowning (loss of surfactant).
 - (4) Ventricular fibrillation may be more likely with freshwater aspiration.
 - (5) Water components other than salt complicate patient survival. Silt, organic matter, pollutants, and pool chlorine all promote either physical obstruction of alveoli, body chemistry alterations, or later pulmonary infection.
 - (6) The important event in both types of drowning is hypoxemia, which results from perfusion of poorly ventilated alveoli.
 - (7) The immediate requirement for rescue in both types of drowning is adequate cardiopulmonary resuscitation with 100 percent oxygen.

NOTE: For cold water drowning, refer to task 081-833-4162, Manage Cold Injuries.

2. Recognize the signs and symptoms of near drowning.

- a. Change in level of consciousness.
- b. Restlessness.
- c. Chest pain.
- d. Rales, rhonchi, or wheezing.
- e. Vomiting.
- f. Cyanosis.
- g. Signs of shock (common in near-drowning). When shock is present, try to determine if shock is hypovolemic, hypoxic, or neurogenic (spinal injury).
- h. Pink froth from nose and mouth.

3. Perform prehospital management for near-drowning and aspiration.

- a. The patient should be raised to the surface and removed from the water as soon as possible.

NOTE: Cervical or spinal injuries is always a primary concern, as is that rescuers do not become hypothermic or drowning patients themselves.

- b. Immediate rescue breathing (in the water, if possible), then cardiopulmonary resuscitation (CPR).
- c. Maneuvers to drain water from lungs are controversial. Evidence indicates at this time that time is better spent in oxygenating the victim. However, two conditions exist where draining water from the lungs may be of some benefit:
 - (1) In seawater aspirations.
 - (2) Without compromising adequate ventilation.
- d. Basic life support must be continued until patient arrives at hospital, despite presence of poor prognostic indicators. Administer oxygen by mask, control cervical spine, and correct hypovolemia, if present.

Performance Steps

- e. Cervical spine injury must be considered in all near-drowning victims. Consider cervical spinal injury in cases where patient was diving, shows signs of trauma, or is unconscious. Immobilize patient with a rigid collar, head chocks, and long spine board. (See task 081-833-0092, Transport a Casualty With a Suspected Spinal Injury, in STP 31-18-SM-TG, Special Forces Basic Tasks.)
- f. Proper placement of the patient in the lateral recumbent position or in the prone position should patient vomit or vomiting seems imminent.
- g. All victims should be hospitalized for at least 24 hours for observation. Most common complications of near-drowning are respiratory failure and circulatory collapse.

4. Perform hospital management for near-drowning or aspiration.

- a. Ventilation or oxygenation.
 - (1) Monitor serial arterial blood gases (ABGs) on all patients.
 - (2) Watch for pulmonary edema.
 - (3) Use endotracheal tube, if necessary.
 - (4) Administer oxygen with volume-cycled respirator.
 - (5) Use positive end-expiratory pressure (PEEP) if unable to achieve greater than 55 millimeters (mm) mercury (Hg) partial pressure of oxygen (PO₂) on less than 50 percent of oxygen.
 - (6) Use bronchodilator, if bronchospasm is present.
 - (7) Use antibiotics if pneumonitis is present.
 - (8) Use nasogastric (NG) tube to prevent aspiration of stomach contents.
- b. Cardiovascular.
 - (1) Monitor for arrhythmias.
 - (2) Monitor central venous pressure (CVP) to guide fluid replacement.
 - (3) Be prepared to defibrillate.
- c. Electrolyte and potential of hydrogen (pH).
 - (1) Electrolyte disturbances rarely require specific management by the time the patient arrives at the hospital.
 - (2) Most patients submerged long enough to stop breathing have become acidotic and may develop ventricular ectopy as well as hypoxemia as a result.
 - (3) Metabolic acidosis.
 - (a) Hyperventilation is the first-line method for treating acidosis.
 - (b) Administration of 1(milliequivalent per kilogram (mEq/kg) IV sodium bicarbonate may be authorized along with hyperventilation. The IV may be difficult to start in a cold patient.
- d. Neurologic.
 - (1) Cerebral hypoxia causes the neurologic damage. In the presence of hypoxia, brain tissues become acidotic and cerebral edema may develop after circulation is restored.
 - (2) No general agreement exists on preventing central nervous system (CNS) sequelae.
 - (3) Measures in use include the following:
 - (a) Controlled hypothermia (84.2 to 86 degrees Fahrenheit) (29 to 30 degrees Celsius). High fever may damage already injured brain cells.
 - (b) Barbiturates. Use to control straining, grunting, abnormal movements, and seizures. Also protective against cerebral anoxia.
 - (c) Corticosteroid 5 milligrams per kilogram per day (mg/kg/day) IV in 6 divided doses for cerebral inflammation. These may also benefit the pulmonary condition--especially if bronchospasm is present.
 - (d) Mannitol 100 grams (g) in 500 milliliters (ml) dextrose 5 percent in water (D5W) over 15 to 30 minutes for overhydration of the brain.
 - (e) Bedrest.
- e. General supportive measures.
 - (1) Close observation.
 - (2) Maintain urine output.

Performance Steps

- (3) Placement in intensive care unit (ICU), if indicated. Most common complications are respiratory failure and circulatory collapse.
- (4) Do not neglect to search for associated injuries.
- 5. Record all treatment in the patient's medical record.
- 6. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage near-drowning.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the pathophysiology of near-drowning.	_____	_____
2. Recognized the signs and symptoms of near-drowning.	_____	_____
3. Performed prehospital management for near-drowning or aspiration.	_____	_____
4. Performed hospital management for near-drowning or aspiration.	_____	_____
5. Recorded all treatment in the patient's medical record.	_____	_____
6. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
ACLS 1997-1999
EMT-P, BRADY 3RD ED. 1997
MERCK MANUAL 17TH ED

Manage Suspected Barotrauma

081-833-4233

Conditions: Given stethoscope, sphygmomanometer, otoscope-ophthalmoscope set, The Merck Manual, a hyperbaric oxygen chamber, oxygen, and oxygen administration equipment.

Standards: Manage suspected barotrauma so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Obtain a rapid history of injury.
 - a. Ear "squeeze" and sinus squeeze usually occur in patients who have a history of sinus or nasal congestion before a dive.
 - b. Gas embolism usually occurs in patients who hold their breaths or have airway obstruction during ascent, even from a few feet of depth, or experience decompression from increased pressure.
 - c. Decompression sickness usually occurs in patients who have a history of diving beyond no-stop limits and not making appropriate decompression stops.

2. Determine sinus squeeze caused by pressure increases.

NOTE: Blocked sinistal ostia (openings) prevent equalizing of air into or out of the sinus cavity.

- a. Walls of the sinus are rigid.
- b. Fluids from the mucosal lining are drawn inward and fill sinus cavity.
- c. Areas of severe pain will occur in the sinus.
- d. There is bleeding from the nose in severe cases; blood is in nasal discharge in all cases.

3. Determine ear squeeze caused by pressure increases.

NOTE: Blocked eustachian tube or external ear canal prevents the entrance or exit of equalizing air.

- a. Walls of the middle ear are inflexible.
- b. There is bleeding as capillaries rupture.
- c. Eardrum is distended inward.

NOTE: If pressure differential increases, the eardrum will rupture inward.

- d. Patients have severe pain, tinnitus, and a temporary, minor hearing loss.
- e. Signs include bleeding from the external ear if the eardrum ruptures and bleeding from the eustachian tube into the throat and nose.

WARNING: Do not dive with head colds, do not use nose sprays or drops, and do not use ear plugs or wear tight-fitting hoods during diving operations.

4. Determine gas embolism on the basis of the patient's signs and symptoms.

NOTE: Symptoms are caused by overinflation of the lungs, which leads to entry of free gas into the pulmonary vessels followed by embolization of cerebral vessels.

- a. Unconsciousness, often with convulsions.

NOTE: Any unconscious diver should be assumed to have gas embolism and should be recompressed promptly.

- b. Mediastinal or subcutaneous emphysema.
- c. Occasionally pneumothorax.
- d. Sudden onset during, or shortly after the causative event.

5. Determine decompression sickness on the basis of the patient's signs and symptoms.

NOTE: Symptoms are caused by formation of bubbles from excess dissolved gas in the blood or tissue when external pressure decreases.

- a. Symptoms are extremely variable and include itching, skin rash, and exceptional fatigue.

NOTE: Recompression is not usually performed for such symptoms, but since these symptoms are sometimes forerunners of more serious problems, divers complaining of them should be kept under observation.

- b. "The bends" (pain in or near a joint).

Performance Steps

- c. Neurologic manifestations of almost any degree or type.
- d. "Chokes" (respiratory distress followed by circulatory collapse).

CAUTION: Respiratory distress followed by circulatory collapse is an extreme emergency.

- e. Symptoms may have a gradual or sudden onset during decompression or up to 24 hours after a dive of over 30 feet.
- f. Symptoms may be brought on or exacerbated by air travel within 24 hours after a dive.

6. Treat sinus squeeze.

- a. Examine the nasal cavity with a nasal cannula.
- b. Apply cotton bandage into nostril to control severe bleeding.
- c. Conditions without severe bleeding will resolve themselves with time.

7. Treat ear squeeze.

- a. If there is bleeding from the ear canal, place a bandage over the affected ear.
- b. Patients who have severe pain or bleeding should be treated by an ears, nose, and throat (ENT) specialist.

8. Treat gas embolism and decompression sickness.

- a. Secure the airway.
- b. Place the patient in the horizontal position.
- c. Give 100 percent oxygen by close-fitting mask or endotracheal tube.
- d. Initiate an intravenous (IV).
- e. Transport the patient to the nearest recompression chamber.
- f. Know how to find nearest chamber either through service means or civilian sector.

NOTE: The definitive treatment for gas embolism and decompression sickness is recompression and slow decompression to allow the body to rid itself of the excess dissolved gas. If emergency therapeutic measures will delay arrival at the recompression unit, they should be postponed or performed in transit.

9. Record all treatment given.

10. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a simulated patient and a scenario in which he must manage suspected barotrauma.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Obtained a rapid history of injury.	—	—
2. Determined sinus squeeze caused by pressure increases.	—	—
3. Determined ear squeeze caused by pressure increases.	—	—
4. Determined gas embolism on the basis of the patient's signs and symptoms.	—	—
5. Determined decompression sickness on the basis of the patient's signs and symptoms.	—	—
6. Treated sinus squeeze.	—	—
7. Treated ear squeeze.	—	—
8. Treated gas embolism and decompression sickness.	—	—
9. Recorded all treatment given.	—	—
10. Sought the advice and assistance of a higher medical authority whenever possible.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

MERCK MANUAL 17TH ED

Manage High Altitude Illness

081-833-4683

Conditions: Given patient's medical record, aspirin, humidified oxygen (O₂) and O₂ delivery equipment, nifedipine, hyperbaric bag, and acetazolamide.

Standards: Manage high-altitude illness so that the life of the patient is preserved without causing further harm.

Performance Steps

1. Understand the physics involved with high-altitude illness.
 - a. Atmospheric pressure decreases as altitude increases.
 - b. The percentage of O₂ in the atmosphere remains constant.
 - c. The result of this is that the partial pressure of O₂ decreases with altitude.
 - d. At 18,000 feet, the partial pressure of O₂ is about half that at sea level.
2. Understand the pathology and pathophysiology of altitude sickness.
 - a. About 20 percent of persons ascending above 8,000 feet in less than 1 day develop some form of altitude sickness.
 - b. Most persons acclimatize to altitudes of up to 10,000 feet in a few days. The higher the altitude, the longer full acclimation takes.
 - c. The basic pathophysiology of altitude sickness is disturbance of water and electrolyte balance.
 - (1) Capillary permeability increases (probably because of vascular endothelial damage), allowing fluid to accumulate in various locations.
 - (2) Increased antidiuretic hormone secretion results in tissue fluid retention and plasma volume is decreased, simulating an increase in hematocrit (Hct).
 - (3) Hypoxia increases pulmonary vascular resistance and pulmonary artery pressure.
 - (4) Cerebral blood flow is decreased by hypocapnia and increased by hypoxia. Therefore, cerebral blood flow varies with the balance between arterial carbon dioxide (CO₂) and O₂.
3. Recognize the signs and symptoms of various types of high-altitude illness.
 - a. Acute mountain sickness (AMS).

NOTE: AMS is the most common form of altitude sickness and may develop at altitudes as low as 6,500 feet.

- (1) Headache.
- (2) Fatigue.
- (3) Nausea.
- (4) Dyspnea.
- (5) Sleep disturbances.
- (6) Symptoms are aggravated by exertion.

NOTE: AMS may evolve into high-altitude pulmonary edema, high-altitude cerebral edema, or both.

- b. High-altitude pulmonary edema (HAPE).

NOTE: HAPE usually develops 24 to 96 hours after rapid ascent above 8,000 feet.

- (1) HAPE is characterized by increasing dyspnea.
- (2) Irritative cough that produces frothy, often bloody sputum.
- (3) Weakness.
- (4) Cyanosis.
- (5) Low-grade fever.
- (6) Tachycardia.
- (7) Fine or coarse rales.
- (8) Ataxia.
- (9) Coma.

WARNING: HAPE may worsen rapidly. Coma and death may occur within hours.

- c. High-altitude cerebral edema (HACE):

NOTE: HACE is believed to be present to a mild degree in all forms of altitude sickness.

Performance Steps

- (1) Gait ataxia is a reliable early warning sign.
- (2) Headache.
- (3) Mental confusion.
- (4) Hallucinations.
- (5) Stiff neck does not occur.

WARNING: Coma and death may develop within a few hours of the first warning signs of HACE.

4. Initiate prophylactic measures to prevent high-altitude illnesses.

- a. Altitude sickness is best prevented by slow ascent.
 - (1) Most individuals can ascend to 5,000 feet in 1 day without symptoms.
 - (2) Above 5,000 feet, a rate of 1,500 feet per day is advisable.

NOTE: All rates are variable. A climber should learn how fast he can ascend without developing symptoms. A climbing party should be paced to its slowest member.

- b. Although physical fitness enables greater exertion with lower O₂ consumption, it does not protect against any form of altitude sickness.
- c. Increased hydration with moderate salt restriction may prevent or diminish symptoms of AMS.
- d. Eating frequent, small meals that are high in easily digestible carbohydrates improves altitude tolerance.
- e. Acetazolamide 125 milligrams (mg) at bedtime, or 125 mg every 8 hours (q8h) for susceptible persons is an effective prophylactic for AMS. It should be started on the first day patient is at high altitude.

5. Manage high-altitude illnesses.

- a. AMS.
 - (1) Increase fluid intake.
 - (2) Give aspirin or a nonsteroidal anti-inflammatory drug (NSAID) for altitude headache.
 - (3) Light diet.
 - (4) Activity restriction.
 - (5) Descent, if symptoms worsen or are intractable.
- b. HAPE.
 - (1) Bedrest and O₂ at high altitude may be tried with mild HAPE, depending on mission requirements.
 - (2) If the condition worsens, immediate descent is essential.

NOTE: On the basis of mission parameters, a portable hyperbaric bag may be transported and used as a temporary substitute for descent. However, this will only buy time for mission completion, and descent must be accomplished at the earliest opportunity.

- (3) Nifedipine 20 mg sublingually followed by a 30-mg, slow-released tablet will lower pulmonary artery hypertension and is beneficial.
- (4) Once descent is accomplished, the patient should be continued on oxygen and managed as with other forms of pulmonary edema. (See task 081-833-4190, Manage Pulmonary Edema.)
- (5) When promptly treated, patients usually recover from HAPE within 24 to 48 hours after descent.
- c. HACE.
 - (1) HACE requires immediate descent. As above, pressurization in a hyperbaric bag may buy time if descent is not possible.
 - (2) Dexamethasone 8 mg IV every 4 hours (q4h) may help, but not dramatically.

6. Record all episodes of altitude illness and treatment for it in the patient's medical record.

NOTE: All episodes of even mild AMS should be noted, as they may indicate an increased susceptibility to altitude illness that must be considered before future operations.

7. Seek the advice and assistance of a higher medical authority whenever possible.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must manage high-altitude illness.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Understood the physics involved with high-altitude illness.	_____	_____
2. Understood the pathology and pathophysiology of altitude sickness.	_____	_____
3. Recognized the signs and symptoms of various types of high-altitude illness.	_____	_____
4. Initiated prophylactic measures to prevent high-altitude illnesses.	_____	_____
5. Managed high-altitude illnesses.	_____	_____
6. Recorded all episodes of altitude illness and treatment in the patient's medical record.	_____	_____
7. Sought the advice and assistance of a higher medical authority whenever possible.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	MERCK MANUAL 17TH ED

Subject Area 29: Special Forces Medic Skills

Establish a Pharmacy**081-833-4000**

Conditions: As a Special Forces medical sergeant in a field environment and given a suitable shelter, a 30-day supply of medications, a securable cabinet or locker, pen, paper, and a means of resupply.

Standards: Establish the pharmacy in a manner that maximizes efficiency of drug access by authorized personnel, establishes security procedures, and minimizes waste.

Performance Steps

1. Request the drugs that will be needed on the basis of the following considerations:
 - a. The type of operation the pharmacy will be supporting. A pharmacy in support of a foreign internal defense mission will require different stocking than a pharmacy supporting a guerrilla warfare hospital.
 - b. The anticipated population of the area of operation.
 - c. The endemic diseases in the area of operation.
 - d. Do not order obsolete drugs or drugs that are less than optimal for treating conditions.
 - e. Do not order drugs that require blood level monitoring that cannot be performed.
2. Store drugs by dosage forms; that is, oral, topical, parenteral, vaginal, and rectal.
3. Identify drugs that are schedule II, III, IV, and V.
4. Provide for the security of scheduled drugs.
5. Establish procedures for daily inventory of controlled drugs and ensure that there is 100 percent accountability for drugs designated as controlled substances.
6. Establish procedures for monthly inspection and inventory of all drugs.
7. Arrange drugs so that those that expire first are used first.
8. Maintain a 30-day supply on hand and a 30-day resupply request.
9. Maintain a record of all incoming and outgoing drugs.

Evaluation Preparation: Give the soldier a scenario in which he is required to establish a pharmacy.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Considered the following factors before ordering medications: a. The type of operation the pharmacy will be supporting. b. The anticipated population of the area of operation. c. The endemic diseases in the area of operation d. Expired drugs or drugs less than optimal for treating conditions. e. Drugs that require blood level monitoring that cannot be performed.	_____	_____
2. Requested the drugs needed.	_____	_____
3. Stored drugs by dosage forms.	_____	_____
4. Identified schedule II, III, IV, and V drugs.	_____	_____
5. Secured scheduled drugs.	_____	_____
6. Established procedures for daily inventory of controlled substances.	_____	_____

Performance Measures**GO** **NO GO**

7. Ensured that there was 100 percent accountability for controlled substances.	_____	_____
8. Established procedures for monthly inspection and inventory of all drugs.	_____	_____
9. Arranged drugs so that those that expire first are used first.	_____	_____
10. Maintained a 30-day supply on hand and a 30-day resupply request.	_____	_____
11. Maintained a record of all incoming and outgoing drugs.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References**Required****Related**

AR 40-2
FM 8-260
SANFORD, 1999

Plan the Medical Aspect of Civic Action Programs

081-833-4652

Conditions: As a Special Forces (SF) medical sergeant in an SF operational area, and all requested equipment.

Standards: Perform all steps needed to organize a medical civic action project.

Performance Steps

1. Nominate a program for medical civic action.
 - a. Project nominations can originate from the following:
 - (1) U.S. military personnel.
 - (2) Host nation (HN) via country team.
 - b. Nominations are then reviewed by theater humanitarian and civic assistance (H/CA) representatives, HN, and United States Agency for International Development (USAID).
 - c. After review, nominations are forwarded to secretary of defense for approval.
 - d. Theater geographic combatant commander issues mission orders after receiving approval.
2. Establish goals for the civic action project. The overarching goals of civic action are as follows:
 - a. Mobilize individual communities to achieve better quality of life through self-help projects that enhance their health and social-economic well-being.
 - b. Improve relations.
 - c. Enhance status and cooperation between nations
 - d. Develop medical and engineering skills among host and U.S. military forces.
 - e. Develop community information bases to understand community's needs and to help the communities and military provide security.
 - f. Reduce risk of insurgency or effectiveness of insurgent groups.
 - g. Enhance the stability of developing nations, and promote the security interest of the United States.

NOTE: All medical civic action programs should support the goals of the theater geographic combatant commander and the goals of the overall civic action effort.

3. Organize the phases of a civic action project.
 - a. Preparatory phase:
 - (1) Site selection. Determined by HN or country team during nomination.
 - (2) Site visit. Avoid premature expectation and excessive demands.
 - (3) Site survey. Obtain as much data as possible without making promises. Gather the following data:
 - (a) Total number of locations expected to operate at the same time.
 - (b) Number of people expected to require treatment at each location.
 - (c) Level of basic medical knowledge of the local population.
 - (d) Level of medical knowledge and skill of the local medical community.
 - (e) Common and endemic diseases in the area.
 - (f) Availability of medical supplies within the HN.
 - (g) Possibility of conducting the project in conjunction with nongovernment organizations (NGOs) working in the area.
 - (h) Availability of transportation--military, rental cars, and so on.
 - (i) Availability of housing for the staff.
 - (j) Availability of electricity.
 - (k) Availability of refrigeration.
 - (l) Adequacy of lighting.
 - (4) Coordinate with local government for the following:
 - (a) Use of HN medical personnel.
 - (b) Cooperation of HN military.
 - (c) Locating and hiring interpreters.

Performance Steps

- (5) Evaluate all data. Look for special needs and possible complications.
 - (6) Conduct planning.
 - (a) Medical supplies. Be aware of regulations and restraints on purchasing and management of equipment and supplies. Consider the feasibility of bringing in medical equipment and supplies from outside the HN.
 - (b) Duties of participants. HN should be given every opportunity to nurture rapport between themselves and civilian populace.
 - (c) Support agencies. Contact organizations that can support the program (veterinarian, dentists and so on).
 - (d) Funding. Most medical civic action programs (MEDCAPs) are financed by Title 10, United States Code (USC). Title 10 funds may only be used to purchase items that will remain in the host country. Stevens Amendment authorizes use of operation and maintenance (O&M) fund only during exercises outside the continental United States (OCONUS) that are directed by the joint chiefs of staff (JCS) (for example, Fuerzas Unidas Panama 90). Title 10, USC and Stevens Amendment funds are the approved funds for the conduct of H/CA missions. DeMinimus funds permit the use of an unspecified amount of unit funds to be used in civic actions.
 - (7) Participant education (job hazards and so on).
 - (8) Organize medical teams. Allow a setup of stations that permits greater control. (Examples are physical examination teams, immunization teams, and public educator teams.)
 - b. Action phase.
 - (1) Participants perform assigned duties.
 - (2) Information, medical and nonmedical, should be continually collected, evaluated, and disseminated (information, not intelligence).
 - (3) Publicity is used to enhance HN's image. Use carefully. Consider the following:
 - (a) Psychological operations (PSYOP) support.
 - (b) Local broadcasts and newspapers.
 - (c) Loudspeaker operations (other than PSYOP).
 - (d) Signs or posters.
 - (e) Word of mouth. In many areas, this may be the most effective method.
 - c. Termination phase.
 - (1) Implement stated withdrawal. Allows locals to adjust to self-sufficiency.
 - (2) Ensure HN support continues after withdrawal.
 - (3) Plan return visits or future projects. Arranged through the same channels. Do not make promises.
- NOTE: Ensure that any treatment given during limited term MEDCAPs is either definitive or can be followed up.
- d. Evaluation phase.
 - (1) Write the after-action review (AAR).
 - (2) Ensure the AAR is properly disseminated.

Evaluation Preparation: Give the soldier a scenario in which he is required to organize medical civic action.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Nominated a program for medical civic action.	—	—
2. Established goals for the civic action project.	—	—
3. Organized the phases of a civic action project.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Organize a Hospital in a Special Operations Environment

081-833-4661

Conditions: As a Special Forces (SF) medical sergeant in a special operations environment and given SF tactical medical equipment set, medical equipment set medical laboratory, and medical blood set.

Standards: Organize the hospital so that patient care is rendered within the capabilities of the hospital staff, using the smallest amount of resources to achieve the greatest amount of care.

Performance Steps

1. Organize the command and control section to do the following:
 - a. Provide command over hospital personnel.
 - b. Supervise hospital functions.
 - c. Communicate with tactical commander exercising area control.
 - d. Provide security.
2. Organize the logistics section to provide logistics support to include the following:
 - a. Resupply.
 - b. Transportation.
 - c. Graves registration.
3. Organize the sorting section to establish one or more sites that serve as staging areas for limited medical care and movement of patients and supplies to the treatment section.

NOTE: For security reasons, in an unconventional warfare environment, ensure the staging areas are the only contact the guerrilla unit has with the guerrilla hospital.
4. Organize the treatment section to provide medical and surgical care and immediate postoperative care.
5. Organize the convalescent section to establish sites at which care is provided to patients no longer requiring the more intensive support of the treatment section.
6. Organize the out-staging section to establish sites to which patients may be transported once they have received maximum benefit from hospitalization.

NOTE: such sites are basically unmanned locations used as drop-off points from which patients may return to their units.
7. Organize hospital security to include the following:
 - a. Physical security of the various facilities.
 - b. Cover stories for facility personnel.
 - c. Early warning (provided by the auxiliary or hospital staff, depending on the environment).
 - d. Evacuation routes.
 - e. Isolation of sections.
 - f. Ensure only essential personnel know the location of the main treatment facility.
8. Establish a secure means of communication between the hospital sections, the SF commander in the area, and the area command (if applicable).
9. Establish a means of resupply.
10. Staff the hospital, considering the following:
 - a. Staff's medical complement will not consist solely of medical personnel. Nonmedical personnel will be used for security, communications, and logistics support.
 - b. Personnel requirements may be filled either by all indigenous assets or a combination of U.S. and indigenous assets with one exception--at least one SF medical sergeant must be included in the command section of each hospital.

Performance Steps

- c. Staff the facility to provide for 2 to 3 personnel for each bed in the facility. (For example, it takes 50 people to run a 20-bed facility).

Evaluation Preparation: Give the soldier a scenario in which he is required to organize a hospital.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Organized the command and control section.	_____	_____
2. Organized the logistics section.	_____	_____
3. Organized the sorting section.	_____	_____
4. Organized the treatment section.	_____	_____
5. Organized the convalescent section.	_____	_____
6. Organized the out-staging section.	_____	_____
7. Organized hospital security.	_____	_____
8. Established a secure means of communication between the hospital sections, the SF commander in the area, and the area command (if applicable).	_____	_____
9. Established a means of resupply.	_____	_____
10. Staffed the hospital.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References
Required**

Related
01-9143.50-3006
FM 3-05.201

Select Hospital Sites in an Operational Area

081-833-4665

Conditions: As a special operations medic in an operational area and given this task outline to use as a checklist.

Standards: Ensure that the existing hospital is clean, is staffed with well-trained personnel, and has properly functioning diagnostic equipment, or if no such hospital exists, the soldier must select an appropriate site at which to establish a hospital.

Performance Steps

1. Determine if an existing hospital can support planned operations.

NOTE: Much of this information may be available from the Armed Forces Medical Intelligence Center. However, a personal visit to a hospital will usually reveal discrepancies between their information and reality.

- a. Determine the level of sanitation. Answer the following questions:
 - (1) Is the hospital obviously dirty?
 - (2) Does the hospital have a janitorial staff?
 - (3) Does the hospital have an established standing operating procedure (SOP) for preventing nosocomial infections?
 - (4) Does the hospital keep records of known nosocomial agents and what they are?
 - (5) Is the hospital water supply safe? Test for chlorine residual, if possible.
- b. Determine the skill level of the hospital staff. Answer the following questions:
 - (1) Where was the hospital staff trained?
 - (2) Does the hospital staff appear competent? (Do they have difficulty recognizing common medical conditions or performing common medical tasks?)
 - (3) Does the hospital staff appear knowledgeable? (Do they know the answers to basic medical questions?)
- c. Determine the level of logistics support available to the hospital. Answer the following questions:
 - (1) Does the hospital keep common medications on hand?
 - (2) How many day's worth of supply does the hospital maintain relative to the available number of beds?
 - (3) From where does the hospital obtain its medical supplies?
 - (4) How long does it take from the medical supplies are ordered until the medical supplies are received at the hospital?
 - (5) Does the hospital have a continuous supply of electricity? Does the hospital have a backup generator?
 - (6) Does the hospital have a continuous supply of potable water?
- d. Determine if the hospital can fulfill mission requirements. Answer the following questions:
 - (1) Has or can the government reach an agreement with the hospital or host nation (HN) government that will ensure the required support will be provided? This will probably be handled through the country team.
 - (2) Does the hospital have enough space to handle contingent casualties? Consider the following:
 - (a) Type of mission.
 - (b) Total number of troops involved.
 - (c) Will the situation increase the civilian patient load on the hospital?
 - (3) Does the hospital have enough critical care staff?
 - (4) Does the hospital have enough logistics support?

NOTE: If any of the above areas are deficient, consider the possibility of augmenting the existing facility with outside personnel or logistics support. If that is not possible, proceed to step 2.

2. Select a site at which to establish a temporary (mission-oriented) hospital.

- a. Select a location. Answer the following questions:

Performance Steps

- (1) Is the location in a secure area, or is it in an area that can be secured?
- (2) Is the location serviced by all-weather roads?
- (3) Are there areas nearby where helicopters can land? If not, can such areas be created?
- (4) Is the location accessible to the mission? (Remember the "golden hour.")
- (5) Is the location within a reasonable distance of staff quarters, or can staff live on-site?
- (6) Is the location accessible to supply lines?
- (7) Is the location acceptable to the HN?

b. Examine an available building to determine its suitability. Answer the following questions:

NOTE: The soldier should request engineer support in answering the questions.

- (1) Is the building available at an acceptable price? (This will usually be coordinated through the HN and the country team.)
- (2) Is the building large enough?
- (3) Does the building have a continuous supply of electricity, or is the building wired in such a way that electricity could be supplied by generator?
- (4) Does the building have a continuous supply of potable water?
- (5) Is the building safe? Consider the following:
 - (a) Number of exits.
 - (b) Number of stories. (Avoid multistory buildings in the third world, if possible. The buildings may collapse because of poor construction techniques and the lack of building codes. It is unlikely that the local infrastructure could respond to a fire in a multistory building.)

NOTE: If no available buildings meet the above requirements, use a less desirable building or try to erect enough tents to house the hospital.

c. Determine the mission requirements.

- (1) Will the mission be long or short? It may not be worthwhile to expend resources on hospital locations for short missions.
- (2) How many troops will be involved in the mission? (Include United States, HN, and allied troops, if applicable.)
- (3) Will refugees be expected or treated at the facility?
- (4) Will HN civilians be treated at the facility?

3. Select a hospital site in an unconventional warfare environment.

- a. Determine the maximum feasible distance the hospital can be from the area of operations, taking into account the following considerations:
 - (1) Means of transporting casualties.
 - (2) Terrain restrictions.
 - (3) Freedom of movement.
 - (4) Support of the local populace.
 - (5) Enemy counter guerrilla activity.
- b. Choose a site in the most secure area that is still accessible enough to all sorting sections or aid stations that are serviced by the hospital.
- c. Choose a site that allows for early warning, by the auxiliary or other means, in the event evacuation becomes necessary.
- d. Choose a site that prevents ground and air observation or accidental detection or provides for the use of a cover story, depending on the situation.
- e. Choose a location that allows for secure delivery and evacuation routes from sorting stations to the hospital and from the hospital to convalescent sites.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must select a hospital site in an operational area.

Performance Measures

GO **NO GO**

1. Determined if an existing hospital could support planned operations.
 - a. Determined the level of sanitation.

— —

Performance Measures	<u>GO</u>	<u>NO GO</u>
b. Determined the skill level of the hospital staff.		
c. Determined the level of logistics support available to the hospital.		
d. Determined if the hospital could fulfill mission requirements.		
2. Selected a site at which to establish a temporary hospital.	_____	_____
a. Selected a location.		
b. Examined available buildings to determine its suitability.		
c. Determined the mission requirements.		
3. Selected a hospital site in an unconventional warfare environment. Considered the following:	_____	_____
a. Distance from the hospital to the area of operations.		
b. Most secure site in a secure area.		
c. A site that allows for early warning.		
d. Location allows for secure delivery and evacuation routes from sorting stations to the hospital and from the hospital to convalescent sites.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
FM 3-05.201
FM 90-8

Prepare a Multi-Echelon Casualty Evacuation Plan

331-201-4000

Conditions: As a special forces (SF) medical sergeant in a field environment and given Field Manual (FM) 8-10-6 Medical Evacuation in a Theater of Operations Tactics, Techniques, and Procedures, and a requirement to develop a multiechelon casualty evacuation plan.

Standards: Performs all steps needed to develop a functional multiechelon casualty evacuation plan.

Evaluation Preparation: Give the soldier a scenario in which he is required to prepare a multiechelon casualty evacuation plan.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Conduct generic premission coordination, to include the following:	—	—
a. What unit is assigned to support you?		
b. How will you contact them? (Need at a minimum the radio frequency and call sign.)		
c. Who will be your point of contact at the unit? (Preferably, have someone who works in air operations.)		
d. What is your priority in their overall operation?		
2. Use available combat service support (CSS) medical evacuation (MEDEVAC) assets for direct action (DA) and special reconnaissance (SR) missions in a developed theater of operations. The soldier makes maximum use of the available CSS MEDEVAC assets by doing the following:	—	—
a. Preplanning possible pickup zones (PZs) with the flight operations officer of the air ambulance medical company in support of his operational area.		
b. Ensuring that brevity codes for possible MEDEVAC PZs are passed to the communications officer of the air ambulance company and passed to the flight crews.		
c. Preplanning special extraction requirements with designated aircrews.		
3. Use opportune transportation assets for DA and SR missions in an undeveloped theater of operations. In this situation, the primary means of urgent evacuating case will be through coordination with the air operations officer for the special operations aviation assets assigned in support of the SF mission.	—	—
NOTE: In this case, it may be necessary to make coordination through the theater special operations command or highest command and control element deployed to the theater.		
4. Plan for evacuation contingencies for foreign internal defense, stability operations, and support operations. The soldier may be forced to plan for a number of evacuation contingencies, depending on the area of operations. For evacuations within the area of operations, civilian or military ground transportation will be the most feasible. For evacuations outside the area of operations, the soldier should consider the following options:	—	—
a. Purchase of a civilian airline ticket.		
b. Use of Embassy or consulate supply or channel flights.		
c. Request for diversion of military flight for special pickup. (This is best coordinated through the SF group S-3 air.)		
d. Request for MEDEVAC by a dedicated Air Force MEDEVAC aircraft. (Contact procedures should be established for the Air Force aircraft that service your area of operations before deployment.)		
e. Use of the SF group chartered air evacuation asset. (If applicable, this will probably be the first choice, depending on group SOP.)		

Performance Measures

GO **NO GO**

5. Plan for casualty evacuation during unconventional warfare (UW) missions. Evacuations within the joint special operations area will depend on the level of development and sophistication of the area command and the amount of control they have over the area. When dealing with evacuating cases in an UW environment, several things should be considered:
- a. Make every effort to evacuate wounded personnel as rapidly as possible, because they impose an immediate tactical limitation on the commander.
 - b. Do not admit a disabled patient to an escape-and-evasion net.
 - c. If possible, evacuate the dead, because their identification by the enemy could lead to retaliation against their family.
 - d. As the operational area comes under control of the area command, evacuate casualties to friendly countries to lighten the load on local medical facilities and provide optimum care for the injured.

Evaluation Guidance: This task should be evaluated by verbalization of the steps.

References

Required
FM 8-10-6

Related
AMCR55-141CH15
AR 40-538
JP 4-02.2
MCI11-205V15
MCI11-217V15
STANAG 2132 ED.2(2)
STANAG 3204 ED 5

Prepare the S-5 Portion of a Detachment Briefback
331-201-4001

Conditions: As a Special Forces (SF) medical sergeant in isolation and given a pencil and paper, prepare the S-5 portion of a detachment briefback.

Standards: The soldier annotates all relevant information in the prescribed format.

Performance Steps

- 1. Prepare Annex H (Civil Affairs) in the prescribed format.
 - a. Describe the status of the local government in the joint special operations area (JSOA).
 - b. Describe the status of the shadow or resistance government in the JSOA.
 - c. Describe requirements for interagency coordination in the JSOA.
 - d. Describe plans to minimize civilian interference with the JSOA.
 - e. Describe plans to protect cultural properties in the JSOA.
 - f. Describe plans to develop civil defense groups in the JSOA.
 - g. Describe humanitarian and civil assistance plans.
 - h. Describe military civic action plans.
 - i. Describe personnel control measures.
- 2. Prepare Annex D (PSYOP) in the prescribed format.
 - a. Describe the target audiences.
 - b. Describe the approved themes and messages for each target audience.
 - c. Describe the themes and messages to be avoided.
 - d. Describe the media production and dissemination means available in the JSOA.
 - e. Describe the PSYOP material to accompany the team.

Evaluation Preparation: This task is best evaluated by performance of the steps. Give the soldier a scenario in which he must prepare the S-5 portion of a detachment briefback.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepared Annex H (Civil Affairs) in the prescribed format.	_____	_____
2. Prepared Annex D (PSYOP) in the prescribed format.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
FM 3-05.20 (FM 31-20)

Prepare the Medical Portion of an Area Study

331-201-4003

Conditions: As a Special Forces medical sergeant and given an area study format, the Armed Forces Medical Intelligence Center report for your area, and any other relevant research sources.

Standards: Compile all information available on the designated area, and present the information in the prescribed area study format.

Evaluation Preparation: Give the soldier access to a personal computer or word processor and all required reference material.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Describe the civilian populace to include the following:	—	—
a. Population density.		
b. Basic racial stock and physical characteristics.		
c. Ethnic and religious groups.		
2. Describe the attitudes of the populace toward the following:	—	—
a. The existing regime or occupying power.		
b. The resistance movement (if any).		
c. The United States and its allies.		
3. Describe the divisions between urban, rural, or nomadic groups, focusing on the following:	—	—
a. Large cities and population centers.		
b. Rural settlement patterns.		
c. Areas and movement patterns of nomads and migrant workers.		
4. Describe the standard-of-living levels, focusing on the following:	—	—
a. Extremes away from average.		
b. Class structure and percentage of populace in each class.		
5. Describe the average educational levels, focusing on the following:	—	—
a. Urban versus rural.		
b. Variations among the classes.		
6. Describe the health and medical standards, to include the following:	—	—
a. General health and well-being.		
b. Common diseases.		
c. Standard of public health.		
d. Medical facilities available.		
e. Medical personnel and level of training.		
f. Potable water supply.		
g. Sufficiency and quality of medical supplies and equipment.		
7. Explain traditions and customs, focusing on the following:	—	—
a. Taboos.		
b. Influence of customs on building rapport.		
c. Customs that are strong enough to influence an individual's actions and attitudes in a wartime setting.		

Evaluation Guidance: Task should be evaluated by actual preparation of the Civilian Populace portion of an area study.

**References
Required**

Related
FM 3-05.20 (FM 31-20)

Subject Area 30: Senior Special Forces Medic Skills

Supervise the Ongoing Medical Portion of an Area Study

081-833-4624

Conditions: Your detachment has received a mission statement, and you will begin the area study update.

Standards: The area study will be specific to the country and operational area in which the senior medic will plan the medical support needed to accomplish the mission.

Performance Steps

1. Ensure all intelligence of the nation's health status is obtained, if possible.
2. Ensure all environmental health factors are documented.
 - a. Information on topography and climate.
 - (1) Effects on health.
 - (2) Emergency medical evacuation.
 - (3) Medical logistics support.
 - b. Social economic features.
 - (1) Demography.
 - (a) Population.
 - (b) Ethnic groups.
 - (c) Life expectancy.
 - (d) Infant mortality.
 - (2) Living conditions.
 - (3) Nutrition.
 - (a) Facilities for refrigeration.
 - (b) Food inspection programs.
 - (4) Customs and religion.
 - (5) Addictions.
 - c. Sanitation engineering.
 - (1) Water supply.
 - (a) Methods of supply.
 - (b) Locations.
 - (c) Treatments.
 - (d) Health hazards.
 - (2) Waste disposal.
 - (3) Pollution problems.
 - d. Fauna of medical importance.
 - (1) Disease vectors.
 - (2) Hosts.
 - (3) Reservoirs.
 - (4) Poisonous reptiles.
 - (5) Snakes and spiders.
 - e. Flora of medical importance.
 - (1) Poisonous plants.
 - (2) Plants having medicinal value.
 - (3) Edible plants.
3. Ensure the complete study of the epidemiology situation within the operational area.
 - a. Diseases of prevalence and their contributing factors.
 - b. Diseases of military importance.
 - (1) Communicable diseases.
 - (2) Cold injury.

Performance Steps

- (3) Heat injury.
- c. Diseases of animals.
 - (1) Diseases of prevalence.
 - (2) Diseases transmissible to man.
 - (3) Programs for preventive medicine.
- 4. Ensure the information of public health services is obtained.
 - a. Administration, organization, and public health laws.
 - b. Programs and social services.
 - c. Services for emergency medicine and civil defense.
 - d. Capabilities.
 - e. Personalities of medical importance.
- 5. Ensure the information of military medical service is obtained.
 - a. Administration and organization.
 - b. Policies and programs.
 - c. Standards of physical fitness.
 - d. Logistics.
 - e. Capabilities.
- 6. Ensure medical facilities are recorded.
 - a. Hospitals.
 - b. Emergency treatment facilities.
 - c. Laboratories.
- 7. Ensure the operational area medical personnel meet the appropriate training level.
- 8. Ensure the availability of medical supplies within the operational area.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give soldier a scenario in which he must describe the medical portion of an area study.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained all available intelligence of the nation's health status.	—	—
2. Documented all environmental health factors.	—	—
3. Recorded a complete study of the epidemiology situation within the operational area.	—	—
4. Obtained information of public health services.	—	—
5. Obtained information of military medical service.	—	—
6. Obtained information about medical facilities in the operational area.	—	—
7. Ensured the operational area medical personnel meet the appropriate training level.	—	—
8. Ensured the availability of medical supplies within the operational area.	—	—
9. Organized and recorded the information in the area study format.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Supervise a Substance Abuse Program

081-833-4632

Conditions: As a Special Forces (SF) medical sergeant in a garrison environment and given a requirement to supervise a substance abuse program.

Standards: Ensure the program is supported by the command and covers the areas of prevention, education, identification, and rehabilitation.

Performance Steps

1. Ensure the program focuses on substance abuse prevention by ensuring the following:
 - a. Prevention programs are aimed at individual target groups and are integrated with other mission-related efforts.
 - b. Prevention programs are coordinated with local civilian community efforts.
 - c. A high degree of involvement of military personnel in local community prevention efforts is encouraged.
 - d. Quality-of-life initiatives are coordinated with prevention activities by providing alternatives to substance abuses.
2. Ensure the program stresses substance abuse education by doing the following:
 - a. Provide information on substance abuse and the prevention aspect of the program to military personnel, civilian employees, and their families.
 - b. Ensure leaders at all levels are knowledgeable about the program policies, procedures, and prevention strategies.
3. Ensure that the program identifies substance abusers by one of the following methods:
 - a. Voluntary (self) identification.
 - b. Command identification.
 - c. Biochemical identification.
 - d. Medical identification.
 - e. Investigation and apprehension.
4. Ensure once substance abusers are identified, they are referred, screened, and evaluated for entry into the appropriate rehabilitation level within 4 days.
5. Ensure the program provides for rehabilitation of substance abusers by providing the following:
 - a. All available resources to aid the individual during rehabilitation.
 - b. Help to cope with the environment in which they are expected to function.
 - c. Positive and clearly visible supervisory support.
 - d. Entry into the appropriate rehabilitation level.
 - (1) Army Alcohol/Drug Awareness and Prevention Control (AADAPC): This level provides alcohol and other drug awareness education. It does not require medical evaluation. It is 8 hours long.
 - (2) Outpatient: This level provides individual, group, or family counseling on an outpatient basis for a minimum of 30 days and will not exceed 360 days. It does not require a medical evaluation; however, one may be done at any time.
 - (3) Inpatient: This level provides an intensive residential rehabilitation program of up to 8 weeks long with a mandatory outpatient follow-up period for a total treatment time of one year. A medical evaluation is required before placement in the inpatient program and again before release from the residential phase of the inpatient program.
6. Ensure the program provides for proper treatment of substance abusers by ensuring the following:
 - a. Residential treatment facilities do the following:
 - (1) Operate in a strictly military environment.
 - (2) Do not locate within a psychiatric facility.
 - (3) Are equipped to allow either female or male patients.

Performance Steps

- b. Treatment follows the multidisciplinary approach by using the following:
 - (1) Group therapy as the primary treatment modality.
 - (2) Pharmacotherapy.
 - (3) Alcoholics Anonymous.
 - (4) Alcoholics Anonymous (AL-ANON) family groups.
 - (5) Individual counseling.
 - (6) Education.
 - (7) Physical training.
 - (8) Recreational therapy.
- 7. Ensure evaluation of the program is objective rather than subjective.
 - a. Compare the relative effectiveness of the various approaches to prevention and rehabilitation.
 - b. Ascertain the relative effectiveness of various approaches with different target groups.
 - c. Stress the impact of the program on its recipients.

Evaluation Preparation: Give the soldier a scenario in which he is required to supervise a substance abuse program.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Ensured the program focused on substance abuse prevention.	—	—
2. Ensured the program stressed substance abuse education.	—	—
3. Ensured the program identified substance abusers.	—	—
4. Ensured once substance abusers were identified, they were referred, screened, and evaluated for entry into the appropriate rehabilitation level within 4 days.	—	—
5. Ensured the program provided for rehabilitation of substance abusers.	—	—
6. Ensured the program provided for proper treatment of substance abusers.	—	—
7. Ensured evaluation of the program was objective rather than subjective.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Supervise a Pediatric Health Care Program

081-833-4633

Conditions: As a Special Forces (SF) medical sergeant in a SF operational area and given an operational pediatric health care program.

Standards: Perform all steps needed to ensure the operation of the pediatric health care program.

Performance Steps

1. Ensure the scope of the pediatric health care program is within the capabilities of the element assigned to conduct the program.
2. Ensure the program has adequate support on the basis of the following:
 - a. The number of patients being seen.
 - b. The level of medical training of the local medical community.
 - c. The presence of outside medical experts.
 - d. The level of cooperation of nongovernmental organizations in the area.
 - e. The adequacy of interpreters.
3. Ensure the programs supply requirements are met on the basis of the following considerations:
 - a. The number of patients being seen.
 - b. The nutritional level of the patients. (Do they require additional food?)
 - c. Common/Endemic diseases in the area.
 - d. The presence of outside medical supply channels.
 - e. The procurement of supplies within the local area.
4. Ensure there is adequate transportation for staff and supplies.
5. Ensure there is adequate housing for outside staff.
6. Ensure clinic facilities afford adequate space, lighting, water, electricity, refrigeration, and security.
7. Ensure the program is well advertised and the true nature of the program is known.
8. Ensure any care given during short-term programs is definitive or can be followed up.
9. Ensure all treatment is documented.

Evaluation Preparation: This task should be evaluated through verbalization of the steps. Give the soldier a scenario in which he is required to supervise a program of prenatal care.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured the scope of the pediatric health care program was within the capabilities of the element assigned to conduct the program.	—	—
2. Ensured the program had adequate support.	—	—
3. Ensured the program supply requirements were met.	—	—
4. Ensured there was adequate transportation for staff and supplies.	—	—
5. Ensured there was adequate housing for outside staff.	—	—
6. Ensured clinic facilities afforded adequate space, lighting, water, electricity, refrigeration, and security.	—	—
7. Ensured that the program was well advertised and the true nature of the program was known.	—	—

Performance Measures**GO****NO GO**

8. Ensured any care given during short-term programs was definitive or could be followed up.

9. Ensured all treatment was documented.

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Supervise a Malaria Control Program

081-833-4635

Conditions: As a Special Forces (SF) medical sergeant in a predeployment environment and given a requirement to supervise a malaria prevention program.

Standards: Supervises the malaria prevention program so that all risk factors for contracting malaria are minimized.

Performance Steps

1. Ensure the most current information on the types of malaria in the area and their level of drug resistance is presented to the commander.
2. Ensure all deploying soldiers receive classes on the life cycle of the malaria parasite and its mosquito vector and how their preventive measures keep them from becoming a host. Include information on the biting behavior of known or suspected mosquito vectors in the area (for example, time of day mosquito is most active and whether it bites indoors and/or outdoors).
3. Ensure all deploying soldiers receive appropriate chemoprophylaxis on the basis of the most recent command surgeon's guidance.
4. Ensure preventive measures are begun on infiltration.
 - a. Use the Department of Defense (DOD) Arthropod Repellent System, requiring the concurrent use of repellents on skin (N, N diethyl-mtolumide [DEET]) and clothing (permethrin).
 - b. Wear clothing properly to minimize vector access to the skin.
 - c. Sleep under permethrin-treated bed nets.
 - d. On extended operations, identify mosquito vector breeding sites, modify or eliminate these, and use DOD-approved mosquito larvicides in standing water, if necessary.
5. Ensure infected soldiers are protected from biting mosquitoes to prevent passing the infection to other soldiers.
6. Ensure infected soldiers receive treatment or are evacuated as soon as possible.
7. Report the development of suspected drug-resistant strains of malaria to the Centers for Disease Control and the Armed Forces Military Intelligence Center.

Evaluation Preparation: This task should be evaluated during an actual deployment or through verbalization of the steps. Give the soldier a scenario in which he is required to supervise a malaria prevention program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Presented the most current information on the types of malaria in the area and their level of drug resistance to the commander.	—	—
2. Ensured all deploying soldiers receive classes on malaria. Include information on the following: a. Life cycle of the malaria parasite. b. Mosquito vector. c. Preventive measures. d. Biting behavior of known or suspected mosquito vectors in the area.	—	—
3. Ensured all deploying soldiers received appropriate chemoprophylaxis.	—	—
4. Ensured all deploying soldiers are taking the prescribed chemoprophylaxis.	—	—
5. Ensured preventive measures are begun on infiltration.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
6. Ensured infected soldiers do not pass on the infection.	_____	_____
7. Ensured infected soldiers received treatment or were evacuated as soon as possible.	_____	_____
8. Reported the development of suspected drug-resistant strains of malaria to the Centers for Disease Control and the Armed Forces Military Intelligence Center.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	VT 877

Supervise a Rabies Control Program

081-833-4636

Conditions: A rabies control program must be developed and established within the operational area and conducted by personnel under your supervision.

Standards: Conduct an area study, give classes to team members, perform vaccinations, and implement control measures in accordance with Field Manual (FM) 8-33, Control of Communicable Diseases Manual.

Performance Steps

1. Ensure an area study is conducted and the commander is briefed on the distribution of rabies in the operational area.
2. Ensure team members are educated on the virus.
 - a. Routes of infection.
 - (1) Bites from a rabid animal transfer the virus through its saliva.
 - (2) Viruses delivered through inhalation.
 - (a) Bats shed the virus through their saliva; it is held in the moist air of the cave.
 - (b) Rabies virus invades the nasal mucosal epithelium.
 - (3) Ingestion of the virus.
 - (a) Viruses have been demonstrated in the oral mucosa and taste bud cells.
 - (b) Tissues from an animal dying of rabies should not be eaten.

NOTE: Domestic livestock can be eaten within 6 days of a rabid animal attack. The bite wound area is trimmed and discarded.

- b. Periods for incubation.
 - (1) Human incubation period can vary from 9 days to 1 year.
 - (2) Periods of incubation vary with virus strain, dosage, site of inoculation, and host species.
 - c. Signs and symptoms between the third and fifth day will have either the dumb or furious form.
 - (1) Dumb form.
 - (a) Stupor.
 - (b) Staring expression.
 - (c) Paralysis of muscles of mastication.
 - (d) Tendency to hide.
 - (e) Seen more commonly in dogs.
 - (2) Furious form.
 - (a) Aggressive behavior.
 - (b) Bite at moving or inanimate objects.
 - (c) Hypersalivate and difficulty swallowing.
 - (d) Often seen in cats.

NOTE: With cats, any wound received may transmit the disease and even a claw scratch will cause infection. The hypersalivation caused by rabies combined with the cat's grooming habits will literally cover the cat in contaminated saliva.

- (e) Cattle tend to bellow constantly.
 - (f) Abdominal pain.

NOTE: Paralysis and convulsions can follow either form of the disease. Animals such as raccoons may actually recover from rabies and remain healthy carriers.

3. Ensure team members and in-country medical personnel appreciate the most important treatment is prompt, thorough wound therapy.
 - a. Washing with soap and water
 - b. Alcohol scrub.
 - c. Irrigation with large quantities of 20 percent aqueous soap solution.
 - d. Use quaternary ammonium compound (for example, benzalkonium chloride).

Performance Steps

- 4. Ensure team members receive pre-exposure prophylaxis with human diploid cell vaccine (HDCV) when the threat is high.
 - a. Give the vaccine as either three doses at 1.0 milliliters (ml) given intramuscularly (IM) or 0.1 ml intradermally (ID).
 - b. Single boosters should be given (1.0 ml IM or 0.1 ml ID) every 2 years.
- 5. Implement control measures IAW FM 8-33.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must supervise a rabies control program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Briefed the commander on the distribution of rabies in the operational area.	_____	_____
2. Educated team members about the virus. a. Routes of infection. b. Periods for incubation. c. Signs and symptoms of the dumb and furious form.	_____	_____
3. Ensured team members and in-country medical personnel know that the most important treatment is prompt, thorough wound therapy.	_____	_____
4. Administered prophylaxis with human diploid cell vaccine (HDCV) to team members.	_____	_____
5. Implemented control measures IAW FM 8-33.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References	Related
Required	AR 40-905

Supervise Immunization Programs

081-833-4637

Conditions: As a Special Forces (SF) medical sergeant in an SF operational area and given all requested equipment and a functioning immunization program.

Standards: Perform all steps needed to ensure all staffing, logistics, and information requirements are met so that the immunization program functions properly.

Performance Steps

1. Determine the desired scope of the immunization program on the basis of the following considerations:
 - a. Availability of resources.
 - b. Availability of trained personnel.
 - c. Current level of immunization.
 - d. Target population. (Is this a program for children or the entire population? Is it for a specific disease, or a total program?)
2. If enough trained personnel are not available, ensure additional personnel are trained in accordance with task 081-833-4013, Administer Medications. Ensure personnel are trained in basic life support procedures
3. Ensure enough support is available on the basis of the following considerations:
 - a. Total number of patients expected to participate in the program.
 - b. Scope of the program.
 - c. Feasibility of bringing in outside medical personnel.
 - d. Possibility of working with nongovernment organizations (NGOs) operating in the area.
 - e. Need for interpreters.
4. Ensure all supply or logistics requirements are met on the basis of the following considerations:
 - a. Total number of patients expected to participate in the program.
 - b. Type and number of diseases you will be immunizing against.
 - c. Feasibility of bringing in additional medical supplies from outside the area.
 - d. Availability of medical supplies within the host nation.
 - e. Transportation requirements for supplies and staff.
 - f. Storage requirements for supplies.
 - g. Housing requirements for staff.
 - h. Availability of emergency equipment or supplies such as epinephrine and an oral airway.
 - i. Availability of medical waste disposal equipment.
5. Ensure location requirements are met on the basis of the following considerations:
 - a. Relative benefits of a mobile versus a fixed facility.
 - b. Number of patients expected to be seen at each location.
 - c. Number of support personnel who will be working at each location.
 - d. Availability of electricity.
 - e. Availability of water.
 - f. Availability of refrigeration.
 - g. Adequacy of lighting.
 - h. Ease of crowd control or security.
6. Ensure notification or information dissemination requirements are met. Consider the use of the following:
 - a. Psychological operations (PSYOP) support.
 - b. Local broadcasts and newspapers.
 - c. Loudspeaker operations (other than PSYOP).
 - d. Signs and posters.

Performance Steps

- e. Word of mouth.
- 7. Ensure any vaccination series that is started can be completed.
- 8. Ensure all immunizations are documented.
- 9. Ensure adverse vaccine events are reported.

Evaluation Preparation: This task should be evaluated by verbalization of the steps. Give the soldier a scenario in which he is required to supervise an immunization program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined the desired scope of the immunization program.	_____	_____
2. When enough trained personnel were not available, ensured additional personnel were trained in accordance with task 081-833-4013, Administer Medications. Ensure personnel are trained in basic life support procedures.	_____	_____
3. Ensured enough support was available.	_____	_____
4. Ensured all supply or logistics requirements were met.	_____	_____
5. Ensured location requirements were met.	_____	_____
6. Ensured notification or information dissemination requirements were met.	_____	_____
7. Ensured any vaccination series that was started could be completed.	_____	_____
8. Ensured all immunizations were documented.	_____	_____
9. Ensured adverse vaccine events were reported.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required	Related
	AR 40-562
	TB MED 114

Supervise Field Sanitation Programs

081-833-4638

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given all requested equipment and FM 21-10-1, Field Hygiene and Sanitation.

Standards: The soldier must ensure each area of field sanitation is carried out in accordance with the guidelines in FM 21-10-1.

Performance Steps

1. Ensure a review of the area study before infiltration to determine specific sanitation needs in the operational area.
2. Ensure a water source is identified upon infiltration of the detachment. Consider the following sources:
 - a. Public water supply systems.
 - b. Surface water.
 - c. Melted ice and snow.
 - d. Distilled seawater.
3. Ensure a water treatment method is established on the basis of the quality of the water supply. Consider the following treatment types:
 - a. Chemical treatment (chlorine or iodine).
 - b. Filtration.
 - c. Boiling.
 - d. A combination of these methods.
4. Ensure a waste disposal program is established that provides for the disposal of feces, liquid waste, garbage, and rubbish by one of the following methods according to the conditions and the tactical situation.
 - a. Burial.
 - b. Burning.
 - c. Soakage (liquid waste only).
 - d. Latrines:
 - (1) Cat-hole.
 - (2) Deep-pit.
 - (3) Straddle trench.
 - (4) Burnout.
 - (5) Pail.
5. Ensure a field food sanitation program is begun. (See task 081-833-4639, Supervise Field Food Service Facility Inspection)
6. Ensure all personnel receive classes on the individual's responsibilities in maintaining a functioning field sanitation program and its importance in the prevention of disease.

Evaluation Preparation: This task should be evaluated through verbalization of the steps. Give the soldier a scenario in which he is required to supervise a field sanitation program.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Ensured a review of the area study before infiltration to determine specific sanitation needs in the operational area.	—	—
2. Ensured a water source was identified upon infiltration of the detachment.	—	—

Performance Measures	<u>GO</u>	<u>NO GO</u>
3. Ensured a water treatment method was established on the basis of the quality of the water supply.	—	—
4. Ensured a waste disposal program was established that provides for the disposal of feces, liquid waste, garbage, and rubbish.	—	—
5. Ensured a field food sanitation program was begun.	—	—
6. Ensured all personnel received classes on the individual's responsibilities in maintaining a functioning field sanitation program and its importance in the prevention of disease.	—	—

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References

Required

Related

FM 21-10-1

TF8-3596

Supervise Field Food Service Facility Inspection

081-833-4639

Conditions: As a Special Forces (SF) medical sergeant in a field environment and given all requested equipment and an operational field food service facility in need of inspection.

Standards: Provide supervision to ensure all foods are handled in a safe manner that minimizes the risk of contracting foodborne illnesses.

Performance Steps

1. Ensure the transportation of food is inspected, if applicable.
 - a. Vehicles used for transporting food are clean and completely enclosed. Vehicles used for transporting garbage, trash, petroleum products, or similar materials are not used for transporting food unless the vehicles have been properly cleaned and sanitized. Ensure food is placed on pallets at least 6 inches above the floor of the vehicle.
 - b. If bulk quantities of meat and dairy products are to be transported over a considerable distance, refrigerated containers are used. Every unit has clean tarpaulins, boxes, or bags to protect food from contamination.
2. Ensure food storage areas are inspected.
 - a. Food is inspected by unit food service personnel immediately upon receipt.
 - b. Food products requiring refrigeration are stored at a temperature of 40 degrees Fahrenheit (7 degrees Celsius) or below. When issued an ice chest, every effort is made to keep the temperature of the food stored in the ice chest below 50 degrees Fahrenheit (10 degrees Celsius).
 - c. When serving cold or hot meals in the field, potentially hazardous food are maintained at safe temperatures--40 degrees Fahrenheit or below and 140 degrees Fahrenheit or above. Any temperature between 41degrees Fahrenheit and 139 degrees Fahrenheit is in the danger zone.
 - d. The cumulative maximum time that potentially hazardous food can be in the danger zone is 4 hours. Each separate period of time that potentially hazardous food is in the danger zone adds to the 4-hour limit.
 - e. Insulated food containers are used when transporting potentially hazardous food from a base camp to troops at other locations.
3. Ensure that food service personnel are inspected for the following:
 - a. Personal hygiene.
 - b. Communicable diseases.
4. Ensure that the serving line and procedures are inspected.
5. Ensure that the dining area is inspected, if applicable.
6. Ensure the Inspection of the cleaning and sanitation of equipment and utensils.
 - a. Equipment and utensils are scraped free of food particles, washed in hot soapy water (120 degrees Fahrenheit to 150 Fahrenheit), rinsed in one container of boiling water, and sanitized in another container of boiling water.
 - b. The equipment and utensils are allowed to air-dry and then are stored in a clean, covered place to protect them from dust and vermin.
7. Ensure the inspection of waste disposal and hand-washing facilities.
8. Ensure the inspection of insect and rodent control. The physical facilities where food is stored, prepared, and served are free of rats, mice, flies, roaches, ants, and other vermin. Screening and rat-proofing methods are used to the greatest extent possible.
9. Prepare a report of findings with recommendations for corrective action.

Evaluation Preparation: Give the soldier a scenario in which he is required to supervise field food service facilities inspections.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured the transportation of food was inspected, if applicable.	_____	_____
2. Ensured food storage areas were inspected.	_____	_____
3. Ensured food service personnel were inspected.	_____	_____
4. Ensured the serving line and procedures were inspected.	_____	_____
5. Ensured that the dining area is inspected, if applicable.	_____	_____
6. Ensured the inspection of the cleaning and sanitation of equipment and utensils.	_____	_____
7. Ensured the inspection of waste disposal and hand-washing facilities.	_____	_____
8. Ensured the inspection of insect and rodent control.	_____	_____
9. Prepared a report of findings with recommendations for corrective action.	_____	_____

Evaluation Guidance: This task should be evaluated by verbalization of the steps.

Supervise Veterinary Immunization Programs

081-833-4640

Conditions: As a Special Forces (SF) medical sergeant in an SF operational area and given all requested equipment and a functional program of veterinary immunization.

Standards: Supervise the veterinary immunization program in such a way that the maximum benefit is received from the minimum amount of resources.

Performance Steps

1. Ensure the scope of the program is feasible taking, considering the following:
 - a. Availability of resources.
 - b. Availability of veterinary personnel.
 - c. Current standard of care.
 - d. Specific needs of the involved animals.
2. Ensure adequate support is available, considering the following:
 - a. Total number of animals expected to be treated.
 - b. Level of animal husbandry expertise of the local herders.
 - c. Feasibility of bringing in outside veterinary personnel.
 - d. Possibility of working with nongovernment organizations operating in the area.
 - e. Need for interpreters.
3. Ensure enough supplies are available, considering the following:
 - a. Total number of animals expected to be treated.
 - b. Endemic diseases in the area.
 - c. Feasibility of bringing in additional veterinary supplies from outside the area.
 - d. Availability of supplies within the host nation.
 - e. Transportation requirements for supplies and staff.
 - f. Storage requirements for supplies.
 - g. Housing requirements for staff.
4. Ensure there is enough refrigeration, coolers, and ice to accommodate storage of vaccines at night and transportation of them to the work sites during the day.
5. Ensure the program provides education to the herders regarding proper animal husbandry within the framework of existing traditions.
6. Ensure the program uses a system of semipermanent marking to identify animals that have been treated.
7. Ensure the target audience is notified of the true nature, purpose, and scope of the project. Consider the use of the following:
 - a. Psychological operations (PSYOP) support.
 - b. Local broadcasts and newspapers.
 - c. Loudspeaker operations (other than PSYOP).
 - d. Signs and posters.
 - e. Word of mouth.
8. Ensure any vaccinations requiring a series of shots can be followed up.
9. Ensure that all treatment is documented, at least by herd. Include the name of the herder and owner (if different), and the number of animals vaccinated for that individual.

Evaluation Preparation: Give the soldier a scenario in which he is required to supervise a veterinary immunization program.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured the scope of the program was feasible.	_____	_____
2. Ensured adequate support was available.	_____	_____
3. Ensured enough supplies were available.	_____	_____
4. Ensured enough refrigeration, coolers, and ice to accommodate storage of vaccines at night and transportation of them to the work sites during the day.	_____	_____
5. Ensured the program provided education to the herders regarding proper animal husbandry within the framework of existing traditions.	_____	_____
6. Ensured the program used a system of semipermanent marking to identify animals that have been treated.	_____	_____
7. Ensured the target audience was notified of the true nature, purpose, and scope of the project.	_____	_____
8. Ensured any vaccinations requiring a series of shots can be followed up.	_____	_____
9. Ensured all treatment was documented, at least by herd. Included the name of the herder and owner (if different) and the number of animals vaccinated for that individual.	_____	_____

Evaluation Guidance: This task should be evaluated through verbalization of the steps.

References
Required

Related
MERCK, VET 1998

Supervise Evacuation Routes Between Medical Facilities

081-833-4647

Conditions: An evacuation route must be determined for special, foreign internal defense (FID) and unconventional warfare (UW) operations.

Standards: Develop an evacuation route before and during the mission.

Performance Steps

1. Ensure a special operations evacuation is considered from the onset by using infiltration assets on hand.
2. Ensure the use of existing evacuation assets is planned in FID operations.
 - a. Use conventional assets of the country.
 - (1) Ambulances.
 - (2) Buses.
 - (3) Tracked ambulances.
 - (4) Helicopters.
 - (5) Fixed-wing aircraft.
 - b. Study the existing government evacuation and the military evacuation plans, and incorporate them into the mission.
3. Ensure an evacuation plan is developed within a UW environment.

NOTE: Evacuation within the UW operational area is very difficult. Reliance must be placed on the auxiliary and the underground.

- a. Self-aid for the individual guerrilla and maximum use of medical personnel will reduce evacuation requirements.
- b. Within the UW operational area, the use of load-bearing animals, water transport, and litter bearers will commonly be used for evacuation.
- c. Evacuation should take place as soon as possible. The wounded severely limit the mobility of guerrilla forces.
- d. The tactical situation and the patient's condition will dictate the evacuation process.

WARNING: A casualty should never be admitted to an escape and evasion net. A disabled individual may not be able to negotiate the net and would thus compromise it.

- e. Bodies of the dead are cached and recovered when the situation permits. They are disposed of by means consistent with local customs and religion.
- f. Priorities for the evacuation from the UW operation area will be determined by the controlling headquarters.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must supervise evacuation routes between medical facilities.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Considered evacuation using infiltration assets.	—	—
2. Planned for evacuation by considering existing evacuation assets in FID operations.	—	—
a. Planned for evacuation by using government and military evacuation plans.		
b. Planned for evacuation by using civilian assets of the country.		
3. Developed an evacuation plan within a UW environment on the basis of guidance from higher.	—	—
a. The plan must cover United States personnel and indigenous forces.		
b. The plan should use existing evacuation routes and facilities.		

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Supervise UW Aid Station Operations

081-833-4663

Conditions: An aid station has been established in the unconventional warfare (UW) operational area and is prepared to receive patients.

Standards: Perform inspections to ensure that each section is prepared with the proper materials to conduct patient care.

Performance Steps

NOTE: The organization and management of a UW aid station is extremely variable. This task reflects steps that should be covered if personnel and equipment are available. In a more developed UW environment, some of these elements would be moved to the guerrilla hospital.

1. Ensure the records section is prepared to receive patients.
 - a. Personnel medical records are kept on field files.
 - b. Maintain two field desks for sick slips, medical forms, medical logs, laboratory slips, and X ray slips.
2. Ensure the vital signs section is operational.
 - a. Forms are available to record certain information.
 - (1) Patient's age.
 - (2) Patient's chief complaint.
 - (3) Patient's medications and dosage.
 - (4) Duration of patient's complaint.
 - (5) Patient's allergies to drugs.
 - (6) Patient's duty position.
 - b. Patient's blood pressure, pulse, temperature, and respirations are taken and recorded.
 - c. Desks for supplies are in place.
3. Ensure the pharmacy station is supplied.
 - a. Medications are stored in a controlled and secure manner.
 - b. Desks are provided where prescriptions will be filled and logged.
 - c. Records are placed in a file box when completed.
4. Ensure the standard preparation of each surgical station.
 - a. A minimum of one light.
 - b. Two litters on stands.
 - c. Two Mayo stands.
 - d. One surgical chest with contents.
 - (1) Sutures.
 - (2) Needles.
 - (3) Intravenous (IV) medications and kits.
 - (4) Dressings for minor surgery sets.
 - (5) Gloves.
 - e. Masks and an oxygen canister.
 - f. Emergency medical packet with contents.
 - (1) Cardiac drugs.
 - (2) An Ambu bag.
 - (3) Endotracheal tubes.
 - (4) IV medications and kits.
 - (5) Tape.
 - g. Antishock garments.
5. Ensure each laboratory is prepared to perform at an emergency level.
 - a. One complete microscope set.
 - b. Areas for gram-staining.

Performance Steps

- c. One centrifuge.
 - d. One field desk with logbook and slips.
6. Ensure the holding ward is complete.
 - a. Enough cots or litters with IV poles for the expected patient load.
 - b. Chests with ward medications and supplies.
 - c. One field desk.
 7. Ensure the medical supply unit is prepared for operations.
 - a. Access roster and a diagram showing the location of certain needed items are posted.
 - b. A refrigerator is available for storing all immunizations and labile drugs.
 8. Train all personnel assigned to the aid station on basic first aid and life-saving techniques.
- NOTE:** Adjust the level of training to fit the tactical situation and the number of personnel available.
- a. Selected the best qualified medics for additional duties, such as supply specialist, records clerk, pharmacist, and surgical station chief.
 - b. Provide additional medical training to those most qualified.
9. Under optimum conditions, maintain the following staff:
 - a. One medical officer, if possible.
 - b. Six 18D-qualified medics, if possible.
 - c. One medical supply specialist.
 - d. One records clerk.
 - e. One individual for operational control.
 - f. One environmental health specialist.

Evaluation Preparation: This task is best evaluated by verbalization of the steps. Give the soldier a scenario in which he must supervise UW aid station operations.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Set up the records section.	_____	_____
2. Set up the vital signs section .	_____	_____
3. Set up the pharmacy station.	_____	_____
4. Prepared surgical stations.	_____	_____
5. Set up laboratory stations.	_____	_____
6. Organized the holding ward.	_____	_____
7. Ensured the medical supply section was prepared for operations.	_____	_____
8. Trained the medical personnel or staff.	_____	_____
9. Maintained enough personnel to staff the aid station.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Supervise Hospital Operations

081-833-4666

Conditions: As a Special Forces medical sergeant in an unconventional warfare (UW) environment and given a functioning hospital.

Standards: Supervise the hospital so that maximum use is made of minimal resources while providing the best possible treatment to the patients.

Performance Steps

1. Ensure patient administration systems are in place that provide for the following:
 - a. Control of the patient's personal belongings.
 - b. Integrated records keeping procedures that provide for inclusion of laboratory (lab) results, X rays, surgical procedures, other treatments given, and a description of the patients level of disability and his qualification to return to duty.
 - c. Ensure the patient's records follow him from the treatment facility to the convalescent facility and then are returned to the treatment facility for safekeeping. No record of hospital activities should leave the hospital complex for any reason because of the clandestine nature of the hospital.
2. Ensure a lab standing operating procedure (SOP) is in place that details proper methods for the following:
 - a. Performance of each procedure of which the lab is capable. (Consider the level of expertise of the lab technicians.)
 - b. Marking of each specimen so that they can be identified for each patient.
 - c. Documentation of the results of each test in a standardized way in the record of each patient.
 - d. Quality control of reagents and test equipment, to include cross-checking results with different technicians.
3. Ensure that an X ray SOP is in place that details proper methods for the following:
 - a. X ray machine calibration.
 - b. Machine setup for each type of X ray. This information should stay with the machine for which it was developed. This information will limit improper exposures and wasted film.
 - c. Safeguarding film and developing chemicals from exposure or contamination.
 - d. Marking X rays and documenting their findings in the record of the correct patient.
4. Ensure that a surgery or central materiel supply (CMS) SOP is in place that details proper methods for the following:
 - a. Patient preparation.
 - (1) Procedures for nothing by mouth.
 - (2) Labs ordered or completed.
 - (3) X rays ordered or completed.
 - (4) Pre-anesthesia medications given.
 - b. Surgical suite preparation.
 - (1) Sterilization procedures.
 - (2) Procedures to ensure that instrument packages meet the needs of the procedure being performed.
 - (3) Ensure scrub, mask, gown, and glove procedures are followed.
 - (4) Ensure crash carts and anesthesia drugs are restocked after each procedure.
5. Ensure a postoperative SOP is in place that details proper methods for the following:
 - a. Maintaining patient airway during end-stage anesthesia.
 - b. Providing postoperative pain relief and other medications.
 - c. Providing patient counseling on his role in his own recovery.

Performance Steps

- 6. Ensure a system is in place to evaluate patients for movement into the convalescent system at the earliest safe opportunity.

Evaluation Preparation: Give the soldier a scenario in which he is required to supervise the operation of a hospital in an UW environment.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Ensured patient administration systems were in place.	_____	_____
2. Ensured that a lab SOP was in place.	_____	_____
3. Ensured that an X ray SOP is in place.	_____	_____
4. Ensured that a surgery or CMS SOP is in place.	_____	_____
5. Ensured that a postoperative SOP was in place.	_____	_____
6. Ensured a system was in place to evaluate patients for movement into the convalescent system at the earliest safe opportunity.	_____	_____

Evaluation Guidance: Score the soldier go if all steps are passed. Score the soldier no-go if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

References
Required

Related
FM 3-05.201

GLOSSARY

#/HPF

number seen per high-power field

#/LPF

number of casts per low-power field

<

less than

A/T

Army

AABB

American Association of Blood Banks

AADAPC

Army Alcohol/Drug Awareness and Prevention Control

AAL

anterior axillary line

AAR

after-action review

Ab

antibody

ABC

atomic biological chemical; airway, breathing, and circulation; antigen-binding capacity

ABCS

alignment, bony changes, cartilage space assessment, soft tissue deformity

ABE

acute bacterial endocarditis

ABG

arterial blood gasses

ABO

blood typing system

Abr W

abraded wound

AC

Active component; assistant commandant; alternating current; hydrogen cyanide; active current; activated charcoal

Accreditation

The recognition afforded an educational institution when it has met accepted standards of quality applied by an accepted, professional accreditation agency.

ACE

American Council on Education; analysis and control element; angiotensin-converting enzyme

ACJ

acromioclavicular joint

ACLS

advanced cardiac life support

ACTH

adrenocorticotrophic hormone

ADAPCP

Army alcohol and drug abuse prevention and control program

ADCO

alcohol and drug control officer

additional skill identifier

Identification of specialized skills that are closely related to, and are in addition to, those required by MOS or areas of concentration (officers). Specialized skills identified by the additional skill identifier or officer skill include operation and maintenance of specific weapon systems and equipment, maintenance of specific weapons systems and equipment, administrative systems and subsystems, computer programming, procedures, installation management, analytic methods, animal handling techniques, and other required skills, that are too restricted in scope to comprise MOS.

ADH

antidiuretic hormone

admin

administrative

ADOC

alternate drug of choice

AER

Army Emergency Relief

AF

Air Force

AF/A

Air Force

AFB

acid-fast bacteria

AFMIC

Armed Forces Medical Intelligence Center

agent net

An organization for clandestine purposes which operates under the direction of a principal agent. (Joint Pub 1-02)

AGL

above ground level

AHA	American Heart Association
AHG	antihuman globulin
AI	air interdiction; area of interest
AIDS	acquired immunodeficiency syndrom
AL-ANON	Alcoholics Anonymous (family group)
ALL	acute lymphocytic leukemia
ALO	authorized level of organization; air liaison officer
ALT	alternate; alanine aminotransferase
AMDF	Army Master Data File
AMEDD	Army Medical Department
AMI	acute myocardial infarction
AML	acute myelocytic leukemia
AMPLE	allergies, medications, previous injury, last meal, and events preceding injury
AMS	acute mountain sickness
AMSIT	appearance, mood, sensorium, intellectual function, and thought (memory word)
AMTP	ARTEP Mission Training Plan
AN	annually; artery to nerve
ANAKIT	anaphylaxis kit
ANCOC	

Advanced Noncommissioned Officer Course

ANGU

acute necrotizing ulcerative gingivitis

ANS

autonomic nervous system

ANUG

acute necrotizing ulcerative gingivitis

AO

area of operation; agent orange

AOB

advanced operational base

AOR

area of responsibility

A-P

anterior-posterior

APAP

acetaminophine

APFT

Army physical fitness test

app

appendix

APT

alum precipitation toxoid

AR

Army regulation; Army reserve; assistant rifleman

ARA

American Rheumatism Association

ARBO

arthropod-borne

ARDS

adult respiratory distress syndrome

area assessment

(1) In unconventional warfare, the prescribed collection of specific information by the detachment that commences immediately after infiltration and is a continuous operation. It confirms, corrects, refutes, or adds to previous intelligence of the area from area studies and other sources prior to infiltration. (AR 310-25) (2) The commander's prescribed collection of specific information that commences upon employment and is a continuous operation. It confirms, corrects, refutes, or adds to previous intelligence acquired from area studies and other sources prior to employment. (JP 1-02)

area command

In unconventional warfare, the organizational structure established within an unconventional warfare operational area to command and control resistance forces, usually integrating the Special Forces operational detachment and the resistance forces. (AR 310-25)

area specialist team

An area specialist officer (ASO), an operations sergeant, and an intelligence analyst who assist in precommitment planning of detachments, coordination of detachment activities in the isolation area, and follow through on AV messages to and from committed detachments.

area study

In unconventional warfare, the prescribed collection of specific information pertaining to a given unconventional warfare area developed from sources available prior to infiltration. (AR 310-25)

Army Training Requirements and Resource System (ATRRS)

The Army training management system. It projects inputs, resource requirements, and student accountability and updates military personnel training records. It provides the data for Congressional Military Manpower Training Reports (MMTR), etc.

AROM

active range of motion

ARSOF

Army special operations forces

ARSOTF

Army special operations task force

ARTEP

Army Training and Evaluation Program

As

arsenic

ASA

American Standards Association; acetylsalicylic acid

ASAP

as soon as possible

ASI

Additional Skill Identifier

AST

area specialist team; aspartate aminotransferase

ATP

adenosine triphosphate

ATPase

adenosine triphosphatase

AUTO

automatic

auxiliary

In unconventional warfare, that element of the resistance force established to provide the organized civilian support of the resistance movement. (AR 310-25)

AV

Audiovisual; antivenom; atrioventricular

AVPU

alert and oriented, responds to vocal stimuli, responds to painful stimuli, and unresponsive to all stimuli

Awareness training

Training used to disseminate information that provides an individual with the basic knowledge/understanding of a policy, program, or system. The proponent school identifies the most efficient and economical media to disseminate the awareness training and disseminates as part of a TSP with supporting administrative information. The training may not be related to course-specific training objectives and takes place outside of scheduled POI time (although the training material may be passed out during POI time). It can be disseminated as handouts, supplemental reading, orientations, etc. It is not formally evaluated.

B. pertussis

Bordetella pertussis

B.E.

base excess

b.i.d.

twice daily

BAP

blood agar plate

BAS

battalion aid station

Baseline data

Valid and reliable information about the current level of performance of the student population. This data can be used to confirm the need to develop new instruction or to assess differences between student performance before (at baseline) and after instruction.

battlefield operating systems

(1) The major functions occurring on the battlefield and performed by the force to successfully execute operations. The seven systems are intelligence, maneuver, fire support, air defense, mobility and survivability, combat service support, and command and control. All BOS are not equal in all operations, nor do they apply for all tasks. The BOS must be synchronized to ensure total military power is coordinated and directed toward accomplishing the mission. (2) The major functions occurring on the battlefield. Each system is used by the total Army to successfully execute operations. Note: The blueprint is organized in three levels of war, each with its own operating systems and major functions. See TRADOC PAM 11-9, Blueprint of the Battlefield.

BDO

battle dress overgarment

BDU

battle dress uniform

BIO

Biological

blind drop

A technique wherein selected personnel, supplies, and/or equipment are airdropped on drop zones devoid of reception personnel.

Bn

Battalion

BP

blood pressure

BPM

beats per minute

briefback

A briefing given by the SFOD to the SFOB commander, his staff, and representatives of the SFOB, to include other interested agencies and services, to ensure that all aspects of the assigned mission are understood and that the detachment is ready for deployment.

BSA

brigade support area; body surface area

BT

basic tasks; borderline tuberculosis leprosy

BUN

blood urea nitrogen

BV

bag-valve

BVM

bag-valve-mask

C

centigrade; celsius

C. botulinum

Clostridium botulinum

C. burnetti

Coxiella burnetti

C. coli

Campylobacter coli

C. difficile

Clostridium difficile

C. fetus

Campylobacter fetus

C. jejuni

Campylobacter jejuni

C. perfringens

Clostridium perfringens

C. ramosum

Clostridium ramosum

C. tetani

Clostridium tetani

C. trachomatis

Chlamydial trachomatis

C1

first cervical vertebrae

C2

command and control; second cervical vertebrae

C4

fourth cervical vertebrae

C5

fifth cervical vertebrae

C6

sixth cervical vertebrae

C7

seventh cervical vertebrae

CA

civil affairs

CAD

civil affairs division; Course Administrative Data; coronary artery disease

CAM

chemical agent monitor

CANA

convulsant antidote for nerve agents

CBC

complete blood count

CBR

chemical, biological, and radiological

cc*

cubic centimeter

cc/hr

cubic centimeter per hour

cc/kg/hr

cubic centimeter per kilogram per hour

CDC

Centers for Disease Control

CD-ROM

compact disk-read-only memory

cell

Small group of individuals who work together for clandestine or subversive purposes. (Joint Pub 1-02 - AR 310-25) The basic unit of an underground organization consisting of a cell leader and cell members. The size and degree of compartmentalization depends on the assigned function of the cell. See also: net, chain, cell system.

CF

Correlation Factor; complement fixation

CG

Commanding General; phosgene

CGL

chronic granulocytic leukemia

cGy

Centigray

cGyph

Centigray per hour

CHF

congestive heart failure

CK

creatine kinase; cyanogen chloride

CLL

chronic lymphocytic leukemia

CM

civil-military; centimeters; control monitor

CMI

computer managed instruction; classified military information; cell-mediated immunity

CML

chronic myelocytic leukemia

CMO

civil-military operations

CMS

central materiel supply

CN

Chemical Corps; cranial nerve

CNS

central nervous system; cranial nerves

CO

company; Commissioned Officer; carbon monoxide; cardiac output

CO2

carbon dioxide

COCA

color, odor, clarity, and amount

COIN

counterinsurgency

Cont W

contused wound

COPD

chronic obstructive pulmonary disease

Co-Ral

coumaphos

counterguerilla warfare

Operations and activities conducted by armed forces, paramilitary forces, or nonmilitary agencies against guerillas. (Joint Pub 1-02)

counterinsurgency

(DOD) Those military, paramilitary, political, economic, psychological, and civic actions taken by a government to defeat insurgency. (JP 1-02)

covert operations

Operations which are so planned and executed as to conceal identity of or permit plausible denial by the sponsor. They differ from clandestine operations in that emphasis is placed on concealment of identity of sponsor rather than on concealment of the operation. (JP 1-02)

CPR

cardiopulmonary resuscitation

CRT

cathode ray tube

CS

combat support; chlorobenzalmalononitrile; compartment syndrome

CSF

cerebrospinal fluid

CSS

combat service support

CT

counterterrorism; computed tomography; ciphertext

cu mm

cubic millimeter

CV	cardiovascular
CVA	cerebrovascular accident
CVAT	costovertebral angle tenderness
CVP	central venous pressure
CX	phosgene oxime (blister agent)
CXR	chest X ray
D&C	dilation and curettage
D. latum	Diphyllobothrium latum
D2.5W	dextrose in 2.5 percent water
D5W	dextrose 5 percent in water
DA	Department of the Army; direct action
DA Form	Department of the Army Form
DC	dislocated civilian; Dental Corps; discharge; direct current
DCS	division clearing station; Defense Communications System
DEC	diethylcarbamazine
decon	decontamination
DEET	N, N diethyl-mtoluamide
DHE	dihydroergotamine
DHF	

dengue hemorrhagic fever

DIC

disseminated intravascular coagulation

DIP

distal interphalangeal joint

DIPJ

distal interphalangeal joint

DKA

diabetic ketoacidosis

DM

diabetes mellitus

DNA

deoxyribonucleic acid

DNBI

Diseases and Nonbattle Injuries

DOB

date of birth

DOC

Department of Commerce; drug of choice

DOD

Department of Defense

DofS

days of supply

DP

Dual Purpose; diphosgene

DS

direct support; double strength

DSCG

disodium cromoglycate

DTR

deep tendon reflex

E. coli

Escherichia coli

E. faecalis

Enterococcus faecalis

E. histolytica

Entamoeba histolytica

E. vermicularis

Enterobius vermicularis

e.g.

for example

EA

Each; electronic protection

EBV

Epstein-Barr Virus

ECG

electrocardiogram

ECM

electronic countermeasures; erythema chronicum migrans

EDC

estimated date of confinement

EDD

expected delivery date

EDTA

ethylenediaminetetraacetic acid

EEG

electroencephalogram

EENT

end-of-evening nautical twilight; eyes, ears, nose, and throat

EKG

electrocardiogram

ELISA

enzyme-linked immunosorbent assay

EMD

electromechanical disassociation

ENL

erythema nodosum leprosum

ENT

ear, nose, and throat

Environmental considerations.

The environment factors, concerns, and regulations that must be taken into account when conducting task analysis, designing training, and/or implementing training.

EOM

extra ocular movement; end of mission

ESR

erythrocyte sedimentation rate

ET

endotracheal

etc.

et cetera

ETOH

ethyl alcohol

evac

evacuation

F

Fahrenheit

F. hepatica

Fasciola hepatica

FAST

first access for shock and trauma

FC

field circular; fracture (compound) open

FCC

fracture (compound) open comminuted

FDA

Food and Drug Administration

FEV1

forced expiratory volume in 1 second

FFD

focal-film distance

FID

foreign internal defense

fig

figure

FITT

frequency, intensity, time, type

Flowchart

A graphic representation of the sequence of a specific activity, operation, or algorithm.

FM

field manual; frequency modulation

FMC

field medical card

FOB

forward operational base

foreign internal defense

Participation by civilian and military agencies of a government in any of the actions or programs taken by another government to free and protect its society from subversion, lawlessness, and insurgency. (JP 1-02)

FRC

functional residual capacity

freq

frequency

FS

fire support; fracture (simple) closed

FSH

follicle-stimulating hormone

FST

Field Sanitation Team

ft

feet; firing tables

FTA

fluorescent treponemal antibody

FTA-ABS

fluorescent treponemal antibody absorption

FVC

forced vital capacity

G

grenadier (M203); nerve agent

g*

gram

G. lamblia

Giardia lamblia

g/L

gram per liter

G6PD

glucose 6 dihydrogenase

GA

tabun

gal/head/day

gallon per head per day

GB

sarin; nerve agent

GC

gonococcal

GCS

ground control station; Glasgow Coma Scale

GD

ground distance; soman; guard receiver; grid declination

GE

gastroenteritis

GER

gastroesophageal reflux

GFR

glomerular filtration rate

GHIH

growth hormone inhibiting hormone

GI

government issue; gastrointestinal

gm

guided missile; gram

gm/day

gram per day

gm/dl

gram per deciliter

gm/kg/day

gram per kilogram per day

GNID

gram-negative intracellular diplococci

GPC

gram-positive cocci

Graphic Training Aid (GTA)

A Graphic Training Aid (GTA) provides a means for trainers to conduct and sustain task-based training in lieu of using extensive printed material or an expensive piece of equipment. The uses of GTAs range from quick reference memory aids to simulation games for a battalion.

GSW

gunshot wound

gtt

drops (lowercase)

GTT*

glucose tolerance test

GU

genitourinary

guerrilla base

A temporary site where installations, headquarters, and some guerrilla units are located. Installations such as command posts, training and bivouac areas, supply caches, communications, and medical facilities are found at these bases. A guerrilla base is considered to be transitory and must be capable of rapid displacement by personnel within the base.

guerrilla force

A group of irregular, predominantly indigenous personnel organized along military lines to conduct military and paramilitary operations in enemy-held or hostile territory. The overt element of the resistance movement. Often referred to as G-Force.

H

hour; blister agent mustard gas

H. heterophyes

Heterophyes heterophyes

H. influenzae

haemaphysalis influenzae

h.s.

at bedtime

H/CA

humanitarian and civic assistance

H/H

hematocrit and hemoglobin

H/HD

sulfur mustard

H₂

hydrogen

H₂O₂

hydrogen peroxide

HA

humanitarian assistance; headache

HACE

high-altitude cerebral edema

HAPE

high-altitude pulmonary edema

HAV

hepatitis A virus

Hb

hemoglobin

HBcAb

hepatitis B core antibody

HBeAb

hepatitis B e antibody

HBeAg

hepatitis B e antigen

HBIG

hepatitis B immune globulin

HBOC

Hb-based O₂ carrier

HBsAb

hepatitis B surface antibody

HBsAg

hepatitis B surface antigen

HBV

hepatitis B virus

HCG

human chorionic gonadotrophin

HCL

hydrochloride

HCO₃

bicarbonate ion

Hct

hematocrit

HCV

hepatitis C virus

HD

headquarters detachment; distilled mustard gas; half duplex

HDCV

human diploid cell vaccine

HDV

hepatitis D virus

HEENT

head, eyes, ears, nose, and throat

HEV

hepatitis E virus

Hg*	mercury
Hgb	hemoglobin
HI	hemagglutination inhibition
HIV	human immunodeficiency virus
HLZ	helicopter landing zone
HN	host nation; nitrogen mustard
HOB	head of bed; height-of-burst
HPI	history of present illness
HRIG	human rabies immune globulin
HRO	human relief organization
HSV	herpes simplex virus
HTN	hypertension
Hx	history
Hyper-tet	tetanus immune globulin (human)
HZV	herpes zoster virus
I	indeterminate
I&D	incision and drainage
I&O	intake and output; input and output
i.e.	

that is

IAPP

inspect, auscultate, palpate, and percuss

IAW

in accordance with

IBS

irritable bowel syndrome

ICP

intertheater COMSEC package; intracranial pressure; increased intracranial pressure

ICRC

International Committee of the Red Cross

ICS

intercostal space

ICU

intensive care unit

ID

identification; intradermal

IDDM

insulin-dependent diabetes mellitus

IG

inspector general; immunoglobulin

IgA

immunoglobulin A

IgG

immunoglobulin gamma G

IgM

immunoglobulin M

IGT

impaired glucose tolerance

IM

intramuscular

INH

isoniazid

Insect vectors

Insects that transmit diseases to man.

insurgency

(DOD, NATO) An organized movement aimed at the overthrow of a constituted government through use of subversion and armed conflict. (Joint Pub 1-02)

IP
intraperitoneal; internet protocol

IPJ
interphalangeal joint

IPPB
intermittent positive-pressure breathing

IRM
intermediate restorative material

ITEP
Individual Training Evaluation Program

IU
intrauterine; international units

IU/kg
international units per kilogram

IUD
Intrauterine device

IV
intelligence van; intravenous

J
journal; joules

JCS
Joint Chiefs of Staff

joint special operations area
A geographical area within enemy or enemy-held territory designated by the unified force commander for the conduct of special operations and related activities in support of theater objectives.

JOMAC
judgment, orientation, mentation, abstraction, calculation

JSOA
joint special operations area

JSOTF
joint special operations task force

JVD
jugular venous distension

kg*
kilogram

KIA
killed in action

km

kilometer

KOH

potassium hydroxide

kVp*

kilovoltage peak

L

left; liter; lewisite

L. MCL

left mid-clavicular line

L/M

liters per minute

L5

fifth lumbar vertebrae

lab

laboratory

lb

pound

LCL

lateral collateral ligament

LDH

lactic dehydrogenase

LDL

low-density lipoprotein

LGV

lymphogranuloma venereum

LH

luteinizing hormone

LL

lepomatous leprosy; live load

LLQ

left lower quadrant

LMP

last menstrual period

LOC

line of communications; location; level of consciousness

LOP

left occipitoposterior

LP

listening post; lumbar puncture

LR

lactated Ringer's

LSB

lower sideband; left sternal border

LSD

lysergic acid diethylamide

LUQ

left upper quadrant

LW

lacerated wound

M

meter

m Eq

milli equivalent

M. avium

Mycobacterium avium

M. bovis

Mycobacterium bovis

M. leprae

Mycobacterium leprae

M. tuberculosis

Mycobacterium tuberculosis

m. yokogawai

Metagonimus yokogawai

ma

milliampere

maint

maintenance

MAL

midaxillary line

mAs

milliamps

MAST

military antishock trousers

MC

Medical Corps

MC/M

Marine (DD Form 1380)

MCL

midclavicular line; medial collateral ligament

MCP

metacarpal phalangeal

MDAC

multiple-dose activated charcoal

MEA/DMSO

monoethylamine/dimethylsulfoxide

MEDCAP

medical civic action program

MEDEVAC

medical evacuation

Medical threat

The medical threat is heat, cold, arthropods and other animals, food borne and water borne diseases, the unfit soldier, noise, toxic chemical (non-NBC), and nonbattle injury.

mEq/kg*

milliequivalent per kilogram

MEQ/L

milliequivalent per liter

MES

medical equipment set

MET

meteorological

mg*

milligram

mg/day

milligram per day

mg/dl

milligram per deciliter

mg/h

milligram per hour

mg/kg

milligram per kilogram

mg/kg/24h

milligram per kilogram per 24 hours

mg/kg/day

milligram per kilogram per day

mg/kg/min

milligram per kilogram per minute

mg/lb

milligram per pound

mg/min

milligram per minute

mg/ml

milligram per milliliter

MGC

meningococcal

MHz

megahertz

MI

military intelligence; myocardial infarction

min

minute

misc

miscellaneous

MK1

MARK1

ml

milliliter

ml/day

milliliter per day

ml/hr

milliliter per hour

ml/kg

milliliter per kilogram

ml/kg/hr

milligram per kilogram per hour

ml/min

milliliter per minute

mm

millimeter

mm Hg

millimeters of mercury

mm/kg

millimeter per kilogram

mm/mv

millimeters per millivolt

mm/sec

millimeters per second

mmol*

millimoles

MMR

measles, mumps, rubella

MMSE

mini-mental state examination

Mnemonics

A technique such as a formula or rhyme used as a memory aid.

MOI

method of injury

mono

mononucleosis

MOOTW

military operations other than war

MOPP

mission-oriented protective posture

MOS

military occupational specialty

MPJ

middle phalangeal joint

MRE

meal, ready to eat

MRI

magnetic resonance imaging

MRSA

methicillin-resistant staphylococcus aureus

MTF

medical treatment facility

MTP*

metatarsophalangeal

mu	million units
mu/d	million units per day
MVA	motor vehicle accident
MW	multiple wounds
N&V	nausea and vomiting
N. gonorrhea	Neisseria gonorrhoeal
N/M	Navy (DD Form 1380)
N/N	normocytic/normochromic
N95	Rating for partial respirator for tuberculosis patients that indicates an N category at 95 percent efficiency.
NA	not applicable
Na*	sodium
NaCl	sodium chloride
NAD	nicotinamide adenine dinucleotide
NAIAD	nerve agent immobilized enzyme alarm and detector
NaOH	sodium hydroxide
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, and chemical
NCO	noncommissioned officer

NG

National Guard; nasogastric

NGO

nongovernmental organization

NGU

nongonococcal urethritis

NIDDM

noninsulin-dependent diabetes mellitus

NKHHHC

nonketotic hyperglycemic-hyperosmolar coma

NLT

no later than

No

number

NPO

nothing by mouth

NS

near-surface; normal saline

NSAID

nonsteroidal anti-inflammatory drug

NSN

national stock number; nonstandard number; nothing by mouth

NSU

nonspecific urethritis

NSV

nonspecific vaginitis

NUG

necrotizing ulcerative gingivitis

O&M

operation and maintenance

O&P

occiput posterior

O2

oxygen

OA

operational area; occiput anterior; osteoarthritis

OB-GYN

obstetrics and gynecology

OCOKA

Observation and fire, Concealment and cover, Obstacles, Key terrain, and Avenues of approach

OCONUS

outside continental U.S.

ODA

operational detachment - Alpha

OP

observation post; occiput posterior

OPQRST

onset, palliative provocative, quality, radiation region, severity, temporal relationship

OR

operational readiness; operating room

ORS

oral rehydration solution

P. aeruginosa

Pseudomonas aeruginosa

P. africanus

Paragonimus africanus

P. falciparum

Plasmodium falciparum

P. humanus capitis

Pediculus humanus capitis (head louse)

P. humanus corporis

Pediculus humanus corporis (body louse)

P. kellicotti

Paragonimus kellicotti

P. mallei

Pseudomonas mallei

P. miyazakii

Paragonimus miyazakii

P. ovale

Plasmodium ovale

P. peruviana

Paragonimus peruviana

P. vivax

Plasmodium vivax

P. westermani

Paragonimus westermani

PAC

Personnel and Administration Center; premature atrial contractions

PaCO₂*

partial pressure of carbon dioxide (in arterial blood)

Pam

pamphlet; pralidoxime

PAM Cl

pralidoxime chloride

PaO₂*

partial pressure of oxygen (in arterial blood)

pap

papanicolaou

PASG

pneumatic antishock garment

PAWP

pulmonary artery wedge pressure

PB

particle beam, property book; piggyback

Pb*

lead

PCB

printed circuit board; polychlorinated biphenyl

PCM

pulse code modulations; protein-calorie malnutrition

PCO₂

pressure of carbon dioxide

PCR

polymerase chain reaction

PE

Practical Exercise; physical examination

PEA

pulseless electrical activity

PEEP

positive end-expiratory pressure

PEG-ELS

polyethylene glycol electrolyte lavage solution

Pen W

penetrating wound

Perf W

perforating wound

PERRLA

pupils are equal, round, reactive to light and accommodation

pH

potential of hydrogen

PHF

properly handled food

PID

pelvic inflammatory disease

PIP

proximal interphalangeal

PIPJ

proximal interphalangeal joint

PJC

premature junctional contraction

PMH

past medical history

PMI

preliminary marksmanship instruction, preparatory marksmanship instruction; point of maximal impulse

PMN

polymorphonuclear

PMS

professor of military science; premenstrual syndrome

PND

paroxysmal nocturnal dyspnea

PO

by mouth

PO2

partial pressure of oxygen

PPD

plans and programs detachment (*Upon approval of this publication, this term and its definition will be included in FM 101-5-1.); purified protein derivative

PPM

parts per million

PPV

positive pressure ventilation

preop

preoperative

prep

preparation

prn

as needed

PROM

passive range of motion

PS

Personnel Strength; chlorine and chloropicrin

PSGN

poststreptococcal glomerulonephritis

psi

pounds per square inch

PSVT

paroxysmal supraventricular tachycardia

PSYOP

Psychological Operations

PTCA

percutaneous transluminal coronary angioplasty

PTH

parathyroid hormone

PUD

peptic ulcer disease

PVC

premature ventricular contraction

q

every

q/wk

every week

q1/4h

every 1 to 4 hours

q10/30min

every 10 to 30 minutes

q10yr

every 10 years

q12h	every 12 hours
q15min	every 15 minutes
q24h	every 24 hours
q2h	every 2 hours
q2wk	every 2 weeks
q3/5 min	every 3 to 5 minutes
q30 min	every 30 minutes
q3h	every 3 hours
q4/6h	every 4 to 6 hours
q4h	every 4 hours
q5min	every 5 minutes
q6h	every 6 hours
q8/12h	every 8 to 12 hours
q8h	every 8 hours
QC	quality control
qd	every day
qh	every hour
qid	four times a day
QMO	

every month

qod

every other day

QRS complex

The Q, R, S, and T waves of an electrocardiogram.

qty

quantity

R

rifleman; right; rimmed

RA

regular army; rheumatoid arthritis

rad

roentgens; radiation absorbed dose

RAM

random access memory; rapid alternating movements

RBC/hpf

red blood cell per high-power field

RC

Reserve Component

RCF

relative centrifugal force; range correction factor

REF

Reference

resp

respiration

RF

radio frequency; reserve forces; rheumatoid factor

Rh

rhesus factor

RICE

rest, ice, compression, and elevation

RL

Ringer's lactate

RLQ

right lower quadrant

RMSF

Rocky Mountain spotted fever

RNA	ribonucleic acid
ROM	range of motion
ROP	right occipitoposterior
ROS	review of systems; review of symptoms
rpm	revolutions per minute
RPR	rapid plasma reagin
RSB	right sternal border
RSV	respiratory syncytial virus
RUQ	right upper quadrant
RV	right ventricle
S. bovis	Streptococcal bovis
S. haematobium	Schistosoma haematobium
S. japonicum	Schistosoma japonicum
S. mansoni	Schistosoma mansoni
S. paratyphi	Salmonella paratyphi
S. progenies	Streptococcal progenies
S. sendai	Salmonella sendai
S. typhi	Salmonella typhi
S/S	signs and symptoms

S1*

first sacral vertebrae

SA

security assistance; semiannually; sinoatrial

SBE

subacute bacterial endocarditis

SCM

sternocleidomastoid

SEB

staphylococcal enterotoxin B

sec

second

SF

Special Forces; Standard Form

SFC

Sergeant First Class

SFG(A)

Special Forces group (airborne); Special Forces Group (Alpha)

SFOB

Special Forces operational base

SFODA

Special Forces operational detachment A

SI

Skill Identifier; syrup of ipecac

SIADH

syndrome of inappropriate antidiuretic hormone

sig*

mark

SKED

company trade name for litter

SL

skill level; slight

SLE

systemic lupus erythematosus

SLR

straight leg-raising

SM

soldier's manual

SMCT

Soldier's Manual of Common Tasks

SO

special operations

SOAP

subjective findings, objective findings, assessment, plan

SOB

short of breath

SOF

special operations forces

soln

solution

SOMED

special operations medical

SOP

standing operating procedure

sp. gr.

specific gravity

SPIES

special patrol infiltration and extraction system

SQ

subcutaneous; squelch; super quick

SR

supply route; special reconnaissance

SSA

supply support activity; single-source analysis; sulfosalicylic acid

SSG

staff sergeant; special study group

SSN

social security number

STABO

suspended tactical airborne body operations

staph

staphylococcus

STAR

Systems Threat Assessment Report; surface-to-air recovery

stat

immediately

STB

supertropical bleach

STD

sexually transmitted disease

STH

somatotropic hormone

STP

soldier training publication

strep

Streptococcus

STS

serologic tests for syphilis

SV

severe

T. brucei gambiense

Trypanosoma brucei gambiense

T. brucei rhodesiense

trypanosoma brucei rhodesiense

T. cruzi

Trypanosoma cruzi

T. pallida

Treponema pallida

T. saginata

Taenia saginata

T. solium

Taenia solium

t.i.d.

three times a day

T1

first thoracic vertebrae

T11

eleventh thoracic vertebrae

tab

table; tablet

TB

Technical Bulletin; tuberculosis

TBD	to be determined; to be developed
TC	technical coordinator; training circular
TCA	TRADOC Contracting Activity; tetracycline
TCP	Technical Cooperation Program; transcutaneous pacing
TF	Task Force; training film
TIA	Training Impact Analysis; transient ischemic attack
tid	three times a day
TIG	time in grade; tetanus immune globulin
TKO	to keep open
TI*	thallium
TM	technical manual; tympanic membrane
TMJ	temporomandibular joint
TMP-SMX	trimethoprim-sulfamethoxazole
TOE	table of organization and equipment
Trainer's Guide (TG). Trainer's guides can be a separate document	
TS	total solids
TSH	thyroid-stimulating hormone
tsp*	teaspoon
TT	

tuberculoid leprosy

tx

treatment; transmit

U

up; unit

U.S.

United States

u/kg

units per kilogram

u/kg/day

units per kilogram per day

UA

urinalysis

ug

microgram

ug/kg

micrograms per kilogram

ug/kg/day

microgram per kilogram per day

ug/kg/min

microgram per kilogram per minute

ug/min

microgram per minute

um

micrometers

unconventional warfare

(1) A broad spectrum of military and paramilitary operations, normally of long duration, predominantly conducted by indigenous or surrogate forces who are organized, trained, equipped, supported, and directed in varying degrees by an external source. It includes guerrilla warfare and other direct offensive, low-visibility, covert, or clandestine operations, as well as the indirect activities of subversion, sabotage, intelligence activities, and evasion and escape. (JP 1-02) (2) A broad spectrum of military and paramilitary operations conducted in enemy-held, enemy-controlled, or politically sensitive territory. Unconventional warfare includes, but is not limited to, the interrelated fields of guerrilla warfare, evasion and escape, subversion, sabotage, and other operations of a low-visibility, covert, or clandestine nature. These interrelated aspects of unconventional warfare may be prosecuted singly or collectively by predominantly indigenous personnel, usually supported and directed in varying degrees by (an) external source(s) during all conditions of war or peace. (JOPS - Annex C, App 5)

underground

(1) A covert unconventional warfare organization established to operate in areas denied to the guerrilla force or to conduct operations not suitable for guerrilla forces. (AR 310-25) (2) That element of the resistance force established to conduct operations in areas that normally are denied

to the guerrillas. (The majority of these activities take place in the urban areas of the UWOA. Members of the auxiliary outwardly follow their normal way of life, and their activities are conducted in a clandestine manner.)

UNHCR

United Nations High Commissioner for Refugees

UNICEF

United Nations International Childrens' Emergency Fund

URI

upper respiratory infection

US

United States

USA

United States Army

USAID

United States Agency for International Development

USAJFKSWCS

United States Army John F. Kennedy Special Warfare Center and School

USAMRIID

United States Army Medical Research Institute of Infectious Diseases

USASFC

United States Army Special Forces Command

USASOC

United States Army Special Operations Command

USC

United States Code

USSOCOM

United States Special Operations Command

UTI

urinary tract infection

UV

ultraviolet

UW

unconventional warfare

V

nerve agent; volts; voice; volume

V. alginolyticus

Vibrio alginolyticus

V. mimicus

Vibrio mimicus

V. parahemolyticus

Vibrio parahemolyticus

V. vulnificus

Vibrio vulnificus

VA

visual acuity

VC

Veterinary Corps; voice

VD

vertical distance; venereal disease

VDRL

Venereal Disease Research Laboratory

VEE

Venezuelan equine encephalitis

VF

ventricular fibrillation

VIG

vaccinia immune globulin

VMA

vanillylmandelic acid

VO2

maximal rate at which oxygen can be taken up and used during exercise

Vol

Volume

VPRC

volume packed red cells

VS

vital signs

VT

ventricular tachycardia; variable time

VX

nerve agent (persistent)

WBC

white blood cell

WBC/hpf

white blood cell per high-power field

WBCs/L

white blood cells per liter

WGBT

wet bulb globe temperature

WBI

whole bowel irrigation

WHO

World Health Organization

WIA

wounded in action

WNL

within normal limits

x

for

XM

crossmatch

Y. pestis

Yersinia pestis

yr

year

Z

zulu time (Greenwich Mean Time)

REFERENCES

Required Publications

Required publications are sources that users must read in order to understand or to comply with this publication.

Army Regulations

AR 40-61	Medical Logistics Policies and Procedures 25 January 1995
AR 40-66	Medical Record Administration and Health Care Documentation 3 May 1999

Department of Army Forms

DA FORM 2404	Equipment Inspection and Maintenance Worksheet 1 April 1979
DA FORM 2407	Maintenance Request 1 July 1994

Department of Army Pamphlets

DA PAM 710-2-1	Using Unit Supply System (Manual Procedures) 31 December 1997
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures 30 September 1998

Field Manuals

FM 8-10-6	Medical Evacuation in a Theater of Operations, Tactics, Techniques, and Procedures 14 April 2000
FM 8-73	Introduction to Operating Room Technique 1 March 1979

Other Product Types

ACLS 1997-1999	Advanced Cardiac Life Support (American Heart Association; Subcommittee on ACLS Staff) 1 January 1997
BATES PE, 5TH ED. 1991	A guide to Physical Examination, and History Taking Fifth Edition, Barbara Bates 1991 1 January 1991
BATES PE, 8TH ED. 2002	A Guide to Physical Examination and History Taking, Eighth Edition (by Barbara Bates) 15 August 2002
BONTRAGERS POCKET ATLAS	BONTRAGER'S POCKET ATLAS: Handbook of Radiographic Positioning and Techniques, 3rd Ed. (By Kenneth L. Bontrager; Bontrager Publishing) 1 January 1999
DD FORM 1380	Field Medical Card 1 December 1991
DD FORM 792	Twenty-Four Hour Patient Intake and Output Worksheet 1 January 1974
MERCK MANUAL 17TH ED	The Merck Manual 17th Edition, Merck & Co.1999 1 January 1999
SANFORD, 1999	The Sanford Guide to Antimicrobial Therapy, 1999
SF 511	Medical Record--Vital Signs Record 1 May 1989
SF 518	Medical Record--Blood or Blood Component Transfusion 1 September 1992

Soldier Training Publications

STP 31-18-SM-TG	Soldier's Manual, Skill Levels 3/4 and Trainer's Guide, CMF18, Special Forces Common Tasks 30 July 2003

Technical Manuals

TM 8-227-3	The Technical Manual of the American Association of Blood Banks 1 June 1999

TM 8-231 Orthopedic Specialist 3 November 1967

Training Circulars

TC 8-20-1 Dental Specialist 30 September 1993

Related Publications

Related publications are sources of additional information. They are not required in order to understand this publication.

Allied Tactical Publications

DA FORM 2062 Hand Receipt/Annex Number 1 January 1982

Army Regulations

AR 40-2 Army Medical Treatment Facilities: General Administration 3 March 1978
AR 40-538 Property Management During Patient Evacuation 1 June 1980
AR 40-562 Immunizations and Chemoprophylaxis 1 November 1995
AR 40-66 Medical Record Administration and Health Care Documentation 3 May 1999

AR 40-905 Veterinary Health Services 16 August 1994
AR 600-60 Physical Performance Evaluation System 25 June 2002
AR 710-2 Inventory Management Supply Policy Below the Wholesale Level 31 October 1997

AR 725-50 Requisition, Receipt, and Issue System 15 November 1995
AR 735-5 Policies and Procedures for Property Accountability 10 June 2002

Department of Army Forms

DA FORM 2765 Request for Issue and Turn-In 1 April 1976
DA FORM 3161 Request for Issue and Turn-In 1 December 2000
DA FORM 3862 Controlled Substances Stock Record 1 June 1972
DA FORM 3910 Death Tag 1 August 1972
DA FORM 3949 Controlled Substances Record 1 April 1973
DA FORM 705 Army Physical Fitness Test Scorecard 1 June 1999

Department of Army Pamphlets

DA PAM 710-2-2 Supply Support Activity Supply System: Manual Procedures 30 September 1998

Department of Army Visual Information Production and Distribution Program

TF 8-3693 EMERGENCY MEDICAL CARE-SHOCK
VT 1136 PROVIDE INITIAL TREATMENT FOR BURNS
VT 1405 FIRST STAGES OF WOUND HEALING
VT 587 CHEST TUBE THORASCOSTOMY
VT 877 MALARIA, CAUSES AND CONTROLS

Field Manuals

FM 21-10-1 Unit Field Sanitation Team 11 October 1989
FM 21-20 Physical Fitness Training 1 October 1998

FM 3-05.20 (FM 31-20)	Special Forces Operations
FM 3-05.201	Special Forces Unconventional Warfare Operations 30 April 2003
FM 4-02.7	Health Service Support in a Nuclear, Biological, and Chemical Environment 1 October 2002
FM 4-25.11	First Aid 23 December 2002
FM 8-260	Pharmacy Specialist 19 May 1986
FM 8-285	Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries 22 December 1995
FM 8-38	Centralized Materiel Service/Section 28 February 1979
FM 8-52	Clinical Textbook for Veterinary Technicians 8 May 1987
FM 8-73	Introduction to Operating Room Technique 1 March 1979
FM 8-74	Alexander's Care of the Patient in Surgery 1 August 1984
FM 8-9	NATO Handbook on the Medical Aspects of NBC Defensive Operations 1 February 1996
FM 90-8	Counter guerrilla Operations 29 August 1986

Joint Publications

JP 4-02.2	Joint Tactics, Techniques, and Procedures for Patient Movement in Joint Operations 30 December 1996

Other Product Types

01-9143.50-3006	Plan for an Unconventional Warfare Mission
ACLS 1997-1999	Advanced Cardiac Life Support (American Heart Association; Subcommittee on ACLS Staff) 1 January 1997
AMCR55-141CH15	C-141 Airlift Operations-Aeromedical Evacuation (1992/11/15)
ATLAS OF HUMAN PARASITOLOGY	Atlas of Human Parasitology (by Lawrence R. Ash and Thomas C. Orihel; 3d Edition; American Society for Clinical Pathology Press; October 1990.) 1 October 1990
ATLS 1997	Advanced Trauma Life Support for Doctors, American College of Surgeons Committee on Trauma 1 January 1997
BASIC ARRHYTHMIAS, 4TH ED	Basic Arrhythmias, Fourth edition, Brady 1995 1 January 1995
BATES PE, 5TH ED. 1991	A guide to Physical Examination, and History Taking Fifth Edition, Barbara Bates 1991 1 January 1991
BATES PE, 8TH ED. 2002	A Guide to Physical Examination and History Taking, Eighth Edition (by Barbara Bates) 15 August 2002
CDC	Centers for Disease Control and Prevention website on isolation precautions -- http://www.cdc.gov/ncidod/hip/isolat/isolat.htm
DA FORM 2000-3	Installation Inventory Count Card 1 October 1963
DD FORM 1150	Request for Issue or Turn-In
DD FORM 792	Twenty-Four Hour Patient Intake and Output Worksheet 1 January 1974
EMT-P, BRADY 3RD ED. 1997	Paramedic Emergency Care, third edition, Brady 1997 1 January 1997
ISBN 089189103X	Urinary Sediment: A Textbook Atlas (by Meryl H. Haber; American Society for Clinical Pathology Press; October 1981) 1 October 1981
MCI11-205V15	C-5 Operations - Aeromedical Evacuation (1996/02/15)
MCI11-217V15	C-17 Operations-Aeromedical Evacuation (1997/02/24)
MERCK MANUAL 17TH ED	The Merck Manual 17th Edition, Merck & Co.1999 1 January 1999
MERCK, VET 1998	The Veterinary Merck Manual 8th Edition, Merck & Co. 1998 1 January 1998
PEDS EMER, BRADY 2ND ED	Pediatric Emergencies, Second Edition, Brady 1997 1 January 1997
SANFORD, 1999	The Sanford Guide to Antimicrobial Therapy, 1999

SF 603	Health Record--Dental 1 October 1975
SF 603A	Health Record--Dental Continuation 1 October 1975
STANAG 2132 ED.2(2)	Documentation Relative to Medical Evacuation, Treatment, and Cause of Death of Patients 17 November 1978
STANAG 3204 ED 5	Aeromedical Evacuation 21 November 1997
WILDERNESS MED, 4TH ED.	Wilderness Medicine (Management of Wilderness and Environmental Emergencies), 4th Edition (By Paul S. Auerbach; Mosby Publishing) 15 February 2001

Soldier Training Publications

STP 21-1-SMCT	Soldier's Manual of Common Task Skill Level 1 1 October 1994
STP 8-91B15-SM-TG	Soldier's Manual and Trainer's Guide, MOS 91B, Medical Specialist, Skill Levels 1/2/3/4/5 (SUPERSEDED BY STP 8-91W15-SM-TG) 3 October 1995
STP 8-91C25-SM-TG	Soldier's Manual and Trainer's Guide, MOS 91C, Practical Nurse Skill Level 2/3/4/5 (SUPERSEDED BY STP 8-91W15-SM-TG) 17 July 1990
STP 8-91E15-SM-TG	Soldier's Manual and Training Guide, MOS 91E, Dental Specialist Skill Level 1/2/3/4/5 23 December 1993
STP 8-91K15-SM-TG	Soldier's Manual and Training Guide, MOS 91K Medical Laboratory Specialist, Skill Level 1/2/3/4/5 24 September 1996
STP 8-91V14-SM-TG	Soldier's Manual and Trainer's Guide, MOS 91V, Respiratory Specialist, Skill Level 1/2/3/4 3 October 1995
STP 8-91W15-SM-TG	Soldier's Manual and Trainer's Guide, MOS 91W, Health Care Specialist, Skill Levels 1/2/3/4/5 10 October 2001

Technical Bulletins

TB MED 114	IMMUNIZATION

Technical Manuals

TM 8-227-12	Armed Services Blood Program Joint Blood Program Handbook 21 January 1998
TM 8-227-3	The Technical Manual of the American Association of Blood Banks 1 June 1999

Training Aids

TF8-3596	FILM: "FIELD SANITATION"

Training Circulars

TC 31-24	Special Forces Air Operations 9 September 1988
TC 8-20-1	Dental Specialist 30 September 1993

Questionnaire

Type _____
 Unit _____
 Date _____
 MOS/Skill Level _____
 Current Duty Position _____
 Years in Service _____
 Years in Current Grade _____

Special Note to Commanders and Trainers: Results of hands-on evaluations are no longer reported for Enlisted Personnel Management System (EPMS) purposes. To improve its products, the USAJFKSWCS must obtain training diagnostic feedback from the field. Upon completion of your periodic hands-on evaluations, please provide the USAJFKSWCS with the consolidated results of your analysis. Strict unit anonymity will be maintained. We are only interested in obtaining sufficient data to identify tasks and performance measures that indicate a need for improvement in our training products.

Although data in any form will be accepted, the elements in the following example would be most meaningful to us:

Task Number	Number of Soldiers Evaluated	Total Number NO-GO	Steps Failed
061-294-1104	20	5	step 3 (2) step 5 (1) step 6 (2)

If you are aware of any external factors that affected the results of your evaluation, please identify them. Informal, handwritten feedback will be fine.

Again, responding to this request is entirely voluntary and unit anonymity will be maintained.

Thank you for your help.

Please complete the questionnaire below by indicating the number of the response that reflects your feeling about each statement. Please explain overall responses of Disagree or Strongly Disagree in the *Comments* section.

Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion/ Not Applicable
4	3	2	1	0
1. This manual is well-organized and easy to use. _____				
2. The tasks in this manual are assigned to the proper skill level. (Please identify tasks that you think should be assigned to a different skill level. Give your reasons in the <i>Comments</i> section.) _____				
3. The MTP is helpful in planning my training. _____				

4. The location of qualification training (resident or unit) in the MOS training plan is appropriate. (Please identify any disagreements by task and explain in the *Comments* section.)
5. The instructions given in the *Evaluation Preparation* section are clear and complete. (Please identify exceptions by task numbers in the *Comments* section.)
6. The conditions for all tasks are correct. (Please list exceptions in the *Comments* section.)
7. The standards for all tasks are correct and attainable. (Please list those that are not clear in the *Comments* section.)
8. The steps listed in the Evaluation Guide for all tasks are accurate.
9. The evaluation guidelines and hands-on evaluation (DA Form 5164-R) are clear and easy to use.
10. The study references for each task are complete and accurate. (Please list those that are not in the *Comments* section.)

If you need to comment on any item above or if you have any recommendations to improve this manual in any way, please write your thoughts in the *Comments* section.

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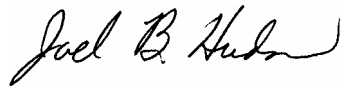
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Fort Bragg, NC 28310-5000

STP 31-18D34-SM-TG
1 OCTOBER 2003

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