CPP TCCC

COMBAT PARAMEDIC/ PROVIDER

TACTICAL COMBAT CASUALTY CARE COURSE

MODULE 16: ANTIBIOTIC ADMINISTRATION

Committee on Tactical Combat Casualty Care (CoTCCC)

TCCC TIER 1
All Service Members

TCCC TIER 2
Combat Lifesaver

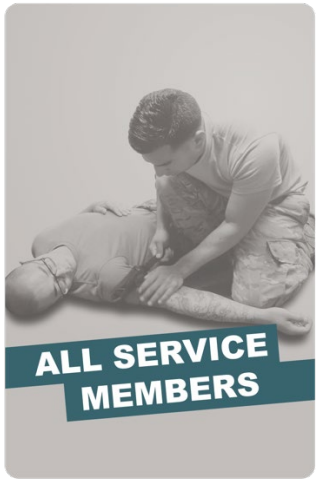
TCCC TIER 3
Combat Medic/Corpsman

TCCC TIER 4
Combat Paramedic/Provider

TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

ROLE 1 CARE

NONMEDICAL PERSONNEL



MEDICAL PERSONNEL

YOU ARE HERE

STANDARDIZED JOINT CURRICULUM

1 x TERMINAL LEARNING OBJECTIVES

18 Given a combat or noncombat scenario, perform antibiotic administration during Tactical Field Care in accordance with CoTCCC Guidelines.

- **18.1** Identify the evidence and considerations for early antibiotic administration in Tactical Field Care.
- **18.2** Identify the indications, contraindications, and administration methods of antibiotics in Tactical Field Care.
- **18.3** Describe the indications, contraindications, dosage, route, and administration methods of moxifloxacin in Tactical Field Care.
- **18.4** Describe the indications, contraindications, dosage, route, and administration methods of ertapenem in Tactical Field Care.
- **18.5** Demonstrate the preparation and administration of CoTCCC-recommended antibiotics in Tactical Field Care.
- **18.6** Identify any evidence-based medicine, best practices, casualty data, and Subject Matter Expert consensus on the indications, contraindications, and administration methods of antibiotics in Tactical Field Care.

06 x ENABLING LEARNING OBJECTIVES

= **Terminal Learning Objectives** ● = Cognitive ELOs ▨ = Performance ELOs

MARCH PAWS

LIFE-THREATENING

- **M** MASSIVE BLEEDING — #1 Priority
- **A** AIRWAY
- **R** RESPIRATION *(Breathing)*
- **C** CIRCULATION
- **H** HYPOTHERMIA / HEAD INJURIES

AFTER LIFE-THREATENING

- **P** PAIN
- **A** ANTIBIOTICS
- **W** WOUNDS
- **S** SPLINTING

THE IMPORTANCE OF EARLY ANTIBIOTIC ADMINISTRATION

1944	**WWII** Penicillin administered at front line surgical units saved lives
1950/ 60s	**Korea & Vietnam** Recommended battlefield antibiotics for any delays in evacuation to hospitals
1993	**Battle of Mogadishu (1993)** 16/58 casualties' wounds infected with 15-hour delay to treatment
1996	**Initial TCCC Guidelines** recommend battlefield antibiotics
2003	**Battle of Iraq – Road to Baghdad (2003)** 32 casualties treated in battlefield had negligible infections despite 11-hour evac delay
2007	**TCCC review** noted no reports of adverse effects from the use of battlefield antibiotics during GWOT operations

Antibiotics must be given as soon as possible after injury to maximize their ability to prevent wound infections

Level of Evidence: C-LD

PAWS

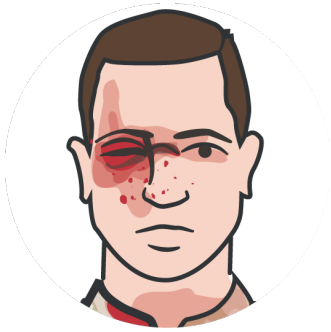
INDICATIONS AND CONTRAINDICATIONS TO ANTIBIOTICS IN TFC

Antibiotics are indicated in all open combat wounds, regardless of the mechanism of injury

Open Fractures

Burns

Amputations



Eye Injuries

Bleeding

- Very good safety profile of oral and parenteral antibiotics on the battlefield
- Only contraindication is a known drug allergy

> ⚠ Prehospital antibiotic therapy is **NOT** indicated solely for burns.

PAWS

Choosing the best antibiotics

- Effectiveness across a broad range of pathogens
- Minimal side effects
- Environmental stability
- Simple and infrequent dosage regimens
- Comparatively low cost

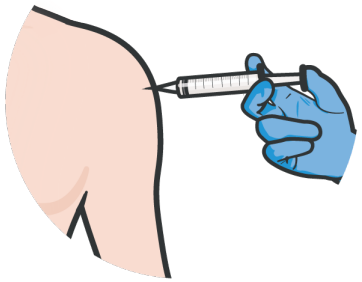
Oral - Moxifloxacin
Parenteral - Ertapenem

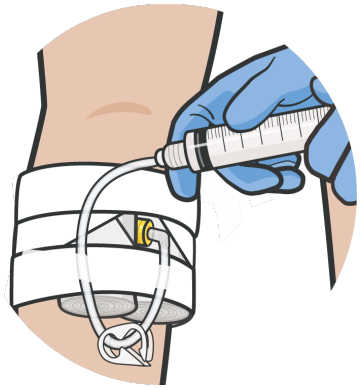
METHODS OF ADMINISTRATION OF ANTIBIOTICS IN TFC

The two methods of **administering antibiotics** in the tactical setting:

By mouth

By parenteral injection
(intramuscular, intravenous or intraosseous)





Antibiotic therapy should be accompanied by

- Wound irrigation
- Surgical debridement when situation permits
- Immunization for tetanus
- Appropriate post-surgical care

Oral route preferred because

- Fewer supplies to carry
- No reconstitution needed
- Saves resources and time spent injecting or infusing parenteral medications

Parenteral administration required if:

- Unconscious
- Cannot swallow
- In shock

Level of Evidence: C-EO

PAWS

INDICATIONS, DOSAGE, AND ADMINISTRATION OF MOXIFLACIN

Casualty with open combat wounds able to swallow:

MOXIFLACIN Dosing in TFC

- **400mg PO** once a day (from CWMP)

ONSET/PEAK/DURATION:

- 1 hr/2 hr/20-24 hr

CONTRAINDICATION:

- Fluoroquinolone allergy

ADVANTAGES:

- Excellent intraocular penetration when taken systemically
- Effective for most gram-positive and gram-negative bacteria; ideal for treatment of eye injuries
- Minimal to no mission impact

DRUG INTERACTIONS:

- Iron, zinc, antacids, aluminum, magnesium, calcium, and sucralfate decrease absorption, atenolol, cisapride, erythromycin, antipsychotics, TCAs, quinidine, procainamide, amiodarone, sotalol may prolong QTc interval, may cause false positive on opiate screening tests

Level of Evidence: C-LD

P A W S

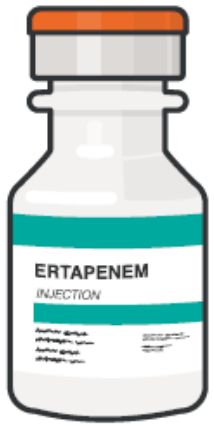
Document time of administration on casualty **DD Form 1380**

INDICATIONS, DOSAGE, AND ADMINISTRATION OF ERTAPENEM

Casualty with open combat wounds in shock, unconscious, and unable to swallow:

ERTAPENEM Dosing in TFC

- **1 gm** IV or IO reconstitute with 10ml saline or bacteriostatic water – don't mix with dextrose or infuse with other meds
- **1 gm** IM reconstitute with 3.2ml of 1% lidocaine (without epinephrine)



DRUG INTERACTIONS:

- Probenecid decreases renal excretion

CONTRAINDICATION:

- Beta-lactam allergy (penicillin, cephalosporins) or lidocaine (for IM injections)

ONSET/PEAK/DURATION:

- 30 sec-5 min/30 min-2 hr/24hr

Parenteral antibiotic of choice based on:

- Once-a-day dosing
- Excellent broad-spectrum coverage
- Good safety profile

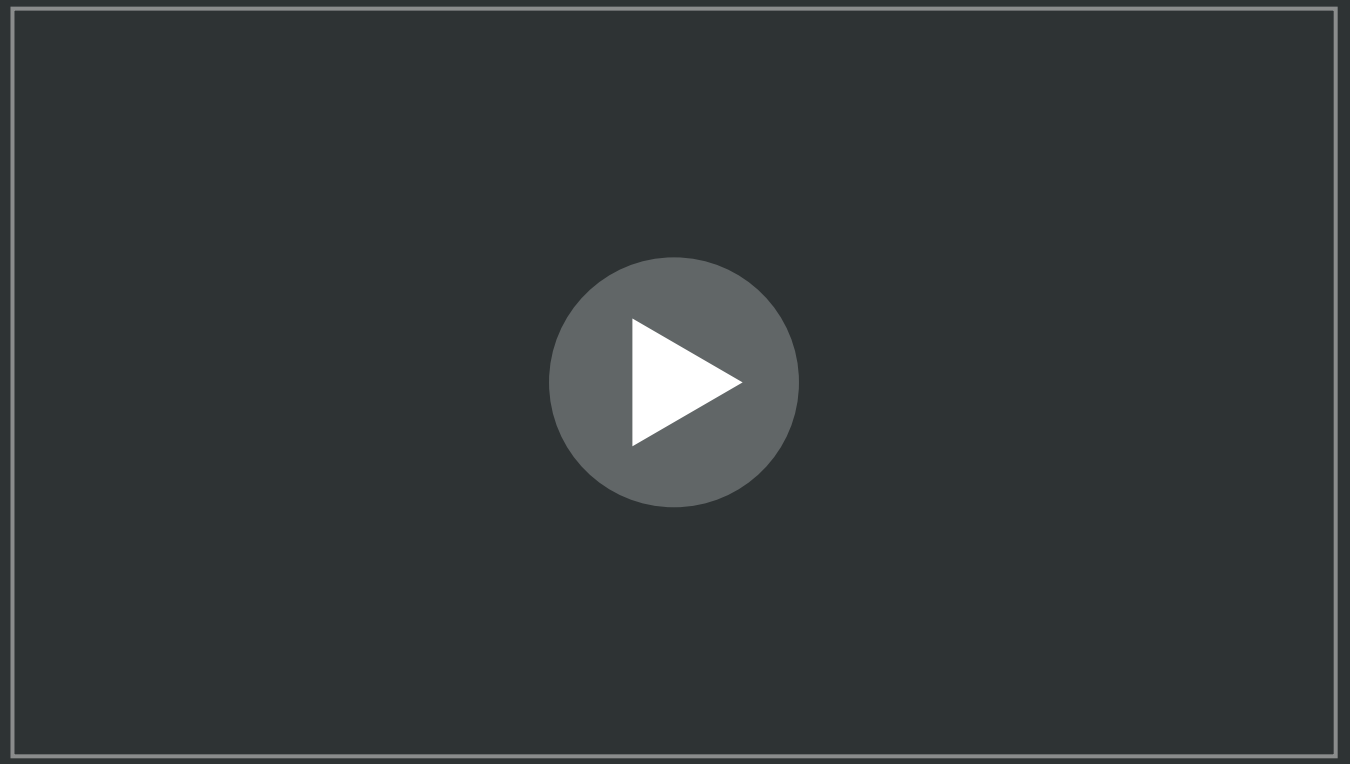
Know unit members' allergies prior to deployment

Document time of administration on casualty **DD Form 1380**

Level of Evidence: C-EO

PAWS

ANTIBIOTIC ADMINISTRATION OVERVIEW



Video can be found on deployedmedicine.com

ANTIBIOTIC ADMINISTRATION
Instructor-Led Demonstration

RECONSTITUTION OF POWDERED MEDICATION

(Trainer-led demonstration and/or student-led review of the reconstitution of IV parenteral antibiotic administration/key steps)

SKILL STATION

Antibiotic Administration

- Moxifloxacin (oral) antibiotic administration
- Ertapenem (parenteral) antibiotic administration

EVIDENCE SUPPORTING TCCC ANTIBIOTIC STRATEGIES

Subject Category	Study Types	Level of Evidence
Early Administration of Antibiotics	Retrospective registry review, Lab evaluation observational study with limitations	**C-LD**
Methods of Antibiotic Administration	Clinical Consensus, Expert Opinion & Discussion	**C-EO**
Oral Antibiotic (moxifloxacin) Selection	Retrospective registry review, Lab evaluation observational study with limitations	**C-LD**
Parenteral Antibiotic (ertapenem) Selection	Clinical Consensus, Expert Opinion & Discussion	**C-EO**

ASSESSING THE EVIDENCE FOR GUIDELINES

Level of Evidence	AHA Recommendation System Terminology Explanation	Why the AHA Classification System?
A	Evidence from multiple randomized clinical trials (RCT) with concordant results or from **HIGH-QUALITY** meta-analyses.	• The level of evidence recommendations allow readers to quickly glean information on the strength, certainty, and quality of evidence supporting each recommendation. • A recommendation with Level of Evidence (LOE) C does not imply that the recommendation is weak. • Although, RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.
B-R	Evidence from moderate-quality trials, or a meta-analysis of moderate quality (RCT) followed by an R to denote **RANDOMIZED** studies	
B-NR	Evidence from moderate-quality trials, or a meta-analysis of moderate quality followed by NR to denote **NON-RANDOMIZED** studies	
C-LD	There is no convincing evidence and is followed by LD to indicate **LIMITED DATA**	
C-EO	There is no convincing evidence and is followed by EO if the consensus is based on **EXPERT OPINION**, case studies or standards of care.	

SUMMARY

Knowledge Topics

- The importance of early antibiotic administration
- General indications and methods of antibiotic administration
- Indications and considerations for administering moxifloxacin
- Indications and considerations for administering ertapenem
- Evidence supporting the strategies for antibiotic administration methods in TFC

Skills and Abilities

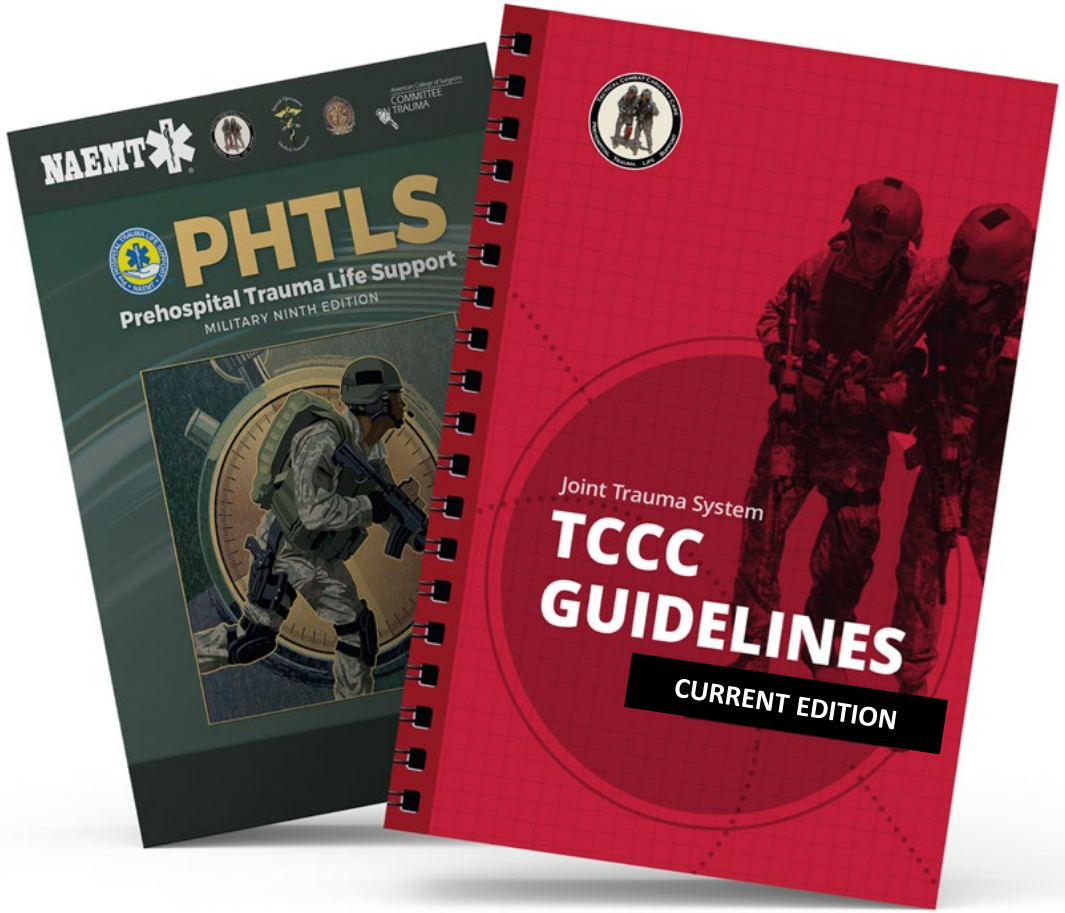
- Oral Antibiotic Administration
- Parental Antibiotic Administration

CHECK ON LEARNING

- What is the oral antibiotic of choice and its dose?
- When should you use ertapenem instead of moxifloxacin as an antibiotic therapy?
- What are the advantages of using an oral antibiotic over a parenteral antibiotic?
- When should you administer antibiotics in the Tactical Field Care phase?

ANY QUESTIONS?

REFERENCES



TCCC: Guidelines

by JTS/CoTCCC

These guidelines, updated regularly, are the result of decisions made by CoTCCC in exploring evidence-based research on best practices.

PHTLS: Military Edition, Chapter 25

by NAEMT

Prehospital Trauma Life Support (PHTLS), Military Edition, teaches and reinforces the principles of rapidly assessing a trauma patient using an orderly approach.