CPP TCCC

COMBAT PARAMEDIC/ PROVIDER

TACTICAL COMBAT CASUALTY CARE COURSE

MODULE 11: HEMORRHAGIC SHOCK FLUID RESUSCITATION IN TACTICAL FIELD CARE

Committee on Tactical Combat Casualty Care (CoTCCC)

TCCC TIER 1
All Service Members

TCCC TIER 2
Combat Lifesaver

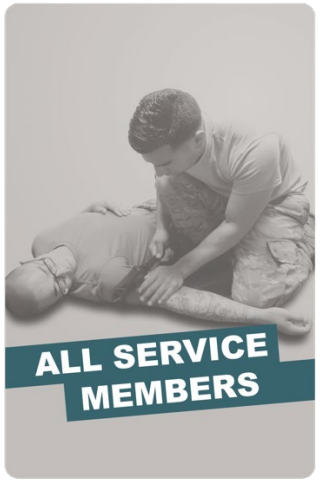
TCCC TIER 3
Combat Medic/Corpsman

TCCC TIER 4
Combat Paramedic/Provider

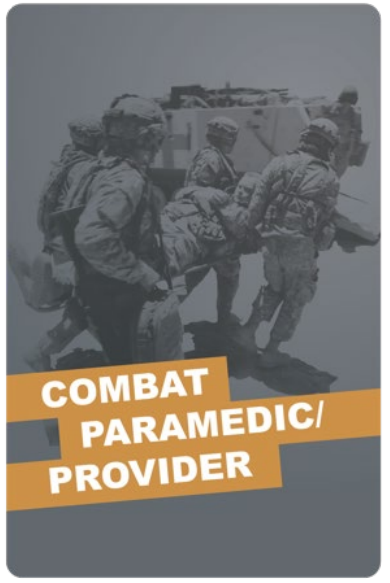
TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

ROLE 1 CARE

NONMEDICAL PERSONNEL



MEDICAL PERSONNEL



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STANDARDIZED JOINT CURRICULUM

1 x TERMINAL LEARNING OBJECTIVES

13 Given a combat or noncombat scenario, perform fluid resuscitation as part of the management of hemorrhagic shock on a trauma casualty during Tactical Field Care in accordance with CoTCCC Guidelines.

- **13.1** Identify progressive strategies, indications, and constraints of fluid resuscitation for hemorrhagic shock in Tactical Field Care.
- **13.2** Identify appropriate fluid resuscitation techniques to prevent or treat hemorrhagic shock in Tactical Field Care.
- **13.3** Identify the importance and advantages of early use of blood products in Tactical Field Care.
- **13.4** Identify the resuscitation fluids of choice from most to least preferred for casualties in hemorrhagic shock in Tactical Field Care.
- **13.5** Describe the advantages and disadvantages of cold stored low-titer O whole blood (LTOWB) in Tactical Field Care.
- **13.6** Describe the advantages and disadvantages of fresh low-titer O whole blood (LTOWB) in Tactical Field Care.
- **13.7** Identify the indications, contraindications, and administration methods of blood component products in Tactical Field Care.

11 x ENABLING LEARNING OBJECTIVES

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

1 x TERMINAL LEARNING OBJECTIVES

13 Given a combat or noncombat scenario, perform fluid resuscitation as part of the management of hemorrhagic shock on a trauma casualty during Tactical Field Care in accordance with CoTCCC Guidelines.

- **13.8** Demonstrate administration of blood products to a trauma casualty in Tactical Field Care.
  - a. Determine blood type with EldonCard®
  - b. Donor blood product collection
  - c. Administration of blood products
- **13.9** Identify the signs, symptoms, considerations, and treatment strategies of blood transfusion complications.
- **13.10** Describe the considerations and principles of field blood banking in Tactical Field Care.
- **13.11** Identify any evidence-based medicine, best practices, casualty data, and Subject Matter Expert consensus on the management of hemorrhagic shock fluid resuscitation in Tactical Field Care.

11 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

INTRO TO FLUID RESUSCITATION FOR SHOCK

1990s-2000s

Fluid resuscitation based on civilian guidelines
- Crystalloids
- Colloids

2003-2006

TCCC Guidelines include blood products for CASEVAC

2014

Crystalloids, Hextend® and **PLASMA-LYTE A** de-prioritized to be used only if blood products are not available

2018

FDA Emergency Use Authorization for freeze-dried plasma in shock

2021

Updated guidelines emphasize cold stored or fresh whole blood, other fluids not recommended for hemorrhagic shock

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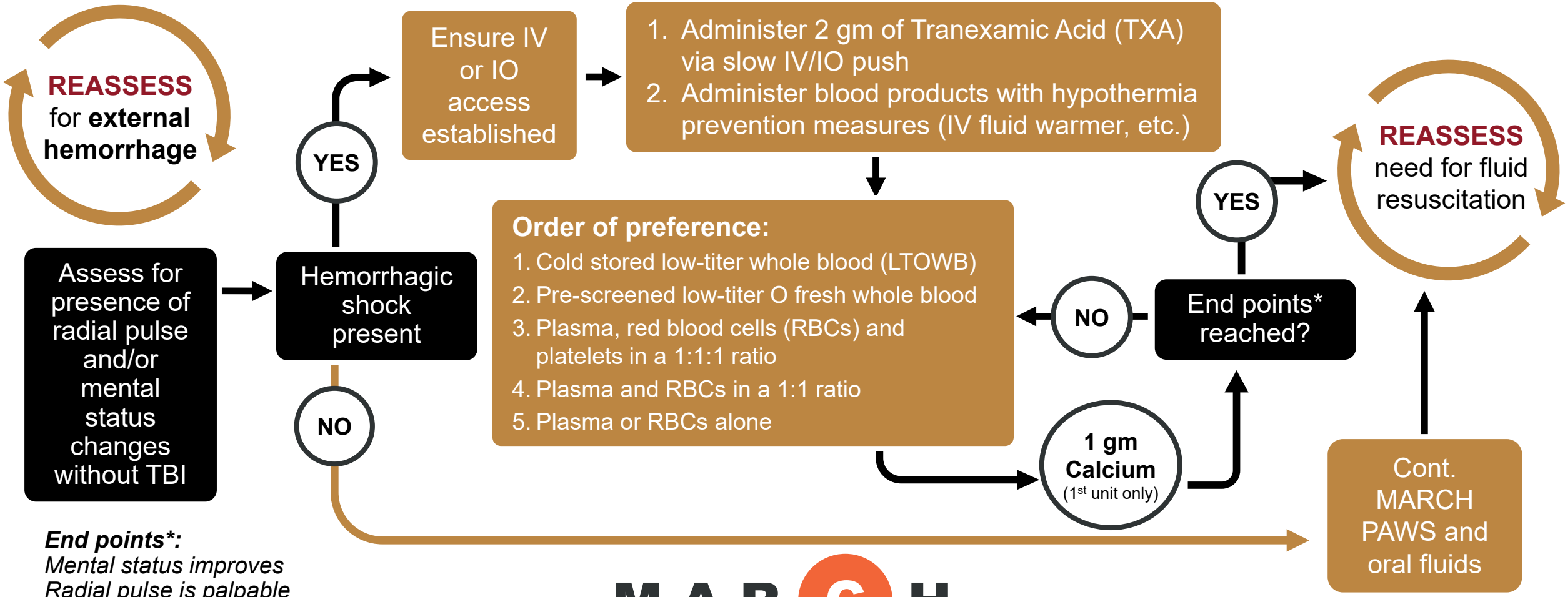
PROGRESSIVE STRATEGIES FOR FLUID RESUSCITATION IN HEMORRHAGIC SHOCK



End points*:
Mental status improves
Radial pulse is palpable
Systolic BP of 100 mm Hg

MARCH

TECHNIQUES FOR PREVENTION AND TREATMENT OF HEMORRHAGIC SHOCK

HEMORRHAGIC SHOCK PREVENTION AND TREATMENT	
Casualty not in shock (conscious and can swallow):	Casualty in shock (Altered Mental Status and/or weak or absent radial pulses)
• No IV fluids are immediately necessary	• Establish IV/IO access
• Oral rehydration is appropriate and recommended	• Administer resuscitation fluids
• Risk of emesis and aspiration is very low	• Hypothermia prevention measures
Reassess frequently for recurrence of shock	

Fluid Resuscitation selection priorities are:

1. Cold stored low-titer O whole blood
2. Pre-screened low-titer O fresh whole blood
3. Plasma, red blood cells (RBCs) and platelets in a **1:1:1 ratio**
4. Plasma and RBCs in a **1:1 ratio**
5. Plasma or RBCs alone

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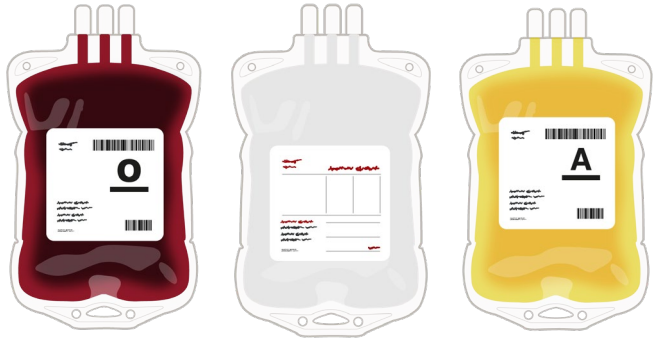
APPROPRIATE TECHNIQUES FOR TREATMENT OF HEMORRHAGIC SHOCK

Gather **blood products** for transfusion:



Cold stored whole blood

Fresh blood collected in the field

Plasma, RBCs, platelets

Hemorrhagic Shock Treatment Techniques

Establish IV or **IO** access

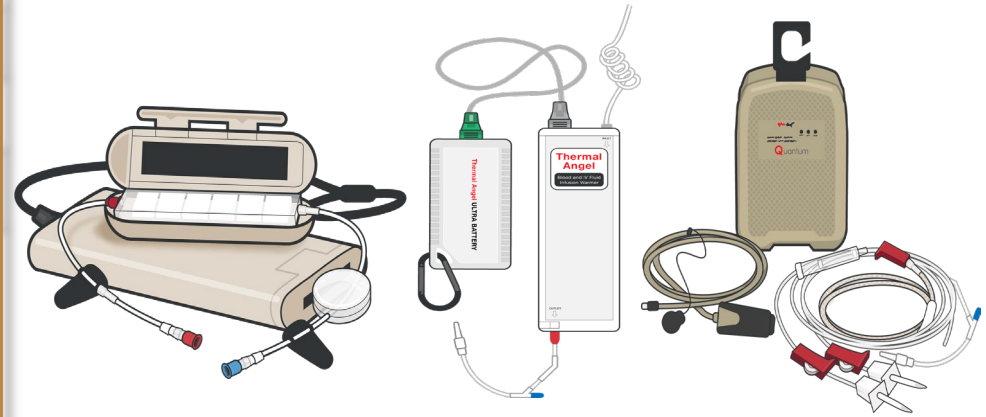
Administer TXA

Initiate Hypothermia Prevention measures

Administer Resuscitation Fluids
- Heat blood to **38°C/100.4°F** using warming device at a flow rate up to 150 ml/min

Monitor and **Reassess** for end points
- Palpable radial pulse
- Improved mental status
- SBP of 100mmHg

Select **Blood warming** device for transfusion:



Buddy Lite™

Thermal Angel®

Quantum™

CoTCCC does **NOT** recommend a specific blood warmer device

Level of Evidence: C-LD

MARCH

IMPORTANCE AND ADVANTAGES OF EARLY USE OF BLOOD PRODUCTS

502 U.S. military combat casualties in Afghanistan (2012-2015):
*Shorter time to initial blood product transfusion associated with **reduced** 24-hour and 30-day **mortality***

IMPORTANCE AND ADVANTAGES OF EARLY USE OF BLOOD PRODUCTS	
Restoration of Oxygenation and Tissue Perfusion	Early transfusion of blood products, particularly red blood cells (PRBCs), helps restore oxygen-carrying capacity and improves tissue perfusion.
Correction of Coagulopathy	Significant bleeding can disrupt the clotting cascade, resulting in coagulopathy. Early transfusion of blood products provides essential clotting factors and helps correct coagulopathy.
Hemodynamic Stability	The early administration of blood products helps replenish blood volume, improve circulatory function, and maintain hemodynamic stability.
Prevention of Organ Dysfunction	Early use of blood products restores perfusion and oxygenation to vital organs, reducing the risk of organ dysfunction, such as acute kidney injury, hepatic dysfunction, and cardiovascular compromise.
Facilitation of Surgical Interventions	In cases requiring urgent or emergent surgical procedures, early transfusion of blood products ensures optimal conditions for surgical interventions.

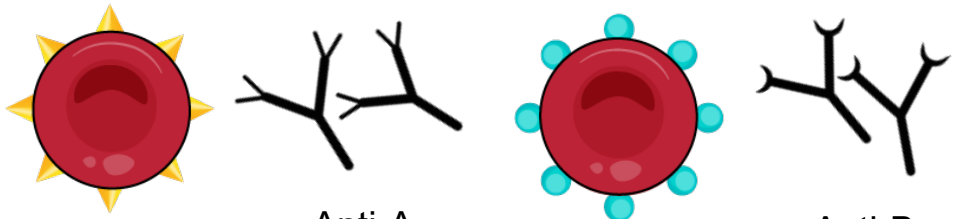
Level of Evidence: B-NR

MARCH

ADVANTAGES AND DISADVANTAGES OF LOW-TITER O WHOLE BLOOD

The **PREFERRED** fluid for hemorrhagic shock resuscitation is **cold stored low-titer O whole blood (LTOWB)**

- Titers refer to **anti-A/anti-B** in plasma
- WWII experience was mild reactions with titers **>512**
- Current threshold for low titer **<256**



POSSIBLE ADVANTAGES

- Tested for diseases (FDA requirement)
- Titers and leukocyte reduction
- Ready for immediate transfusion
- Whole blood better than three-component replacement in at least one study

POTENTIAL DISADVANTAGES

- Shelf life is less than packed RBCs and FFP
- Need to maintain cold chain to the point of transfusion (logistical burden)

MARCH

ADVANTAGES AND DISADVANTAGES OF FRESH WHOLE BLOOD

If cold stored **LTOWB** is not available, utilize **pre-screened low-titer O fresh whole blood**

Ideally, fresh whole blood donors are pre-screened for:

- Known low titers
- No transmissible diseases
- Could be group-specific (A-A, B-B), although up to 4% inaccuracy

POSSIBLE ADVANTAGES

- Availability even when cold chain is not in place (or cold stores exhausted)
- Degree of hypothermia during transfusion may be less than cold stored LTOWB
- Whole blood has balanced ratios of blood components because it's fresh

POTENTIAL DISADVANTAGES

- Time to collect blood may delay transfusion
- Pre-screened unit members unavailable to donate
- Limited availability of unit members with low-titer O
- Storage and refrigeration of collected blood

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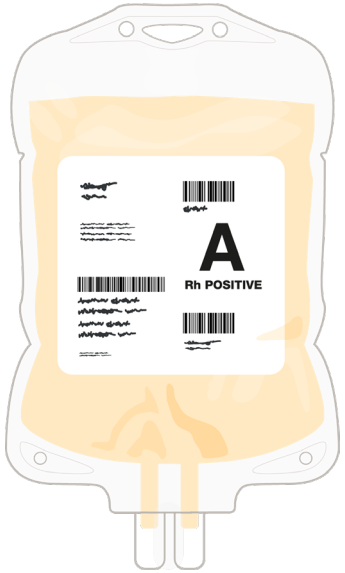
BLOOD COMPONENT PRODUCTS



Freeze-dried plasma (FDP)

- Developed in 1930s
- Used in WWII and Korea
- Stopped because of disease transmission
- Continued by other nations
- Rekindled interested by US military due to problems with access to whole blood at battlefront
- Approved for use in hemorrhagic shock in recent years

PLASMA

- Provides fibrinogen and hemostatic factors
- Although best with other blood products, can be used alone
- **FDP** stored without refrigeration and carried by Combat Medics/Corpsmen
- **FDP** reconstituted in vials must be administered through vented tubing, but with collapsible bags standard blood tubing can be used

Level of Evidence: B-NR

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BLOOD COMPONENT PRODUCTS

Blood Component Products Active Shelf-lives (*preservative dependent)
Platelets • 5 days room temp, 15 days refrigerated
Plasma • 1 year frozen, 5 days thawed
***RBCs** • 35-42 days refrigerated
***Fresh Low-Titer O Whole Blood** • Immediately, room temp max 24hrs, 21-35 days refrigerated
***Cold Stored Low-Titer O Whole Blood** • Immediately, room temp max 24hrs, 21-35 days refrigerated

In the absence of whole blood, either cold stored or fresh, packed **red blood cells (RBCs)**, **platelets** and **plasma** in a **1:1:1 ratio** should be used

1-part **RBCs** : 1-part **platelets** : 1-part **plasma**

If three component therapy isn't available, then:
Plasma and RBCs in a 1:1 ratio
if unavailable then:
Plasma or RBCs alone

MARCH

CALCIUM CHLORIDE vs CALCIUM GLUCONATE ADMINISTRATION

Calcium Chloride vs Calcium Gluconate

- Calcium chloride provides a higher concentration of elemental calcium per milliliter compared to calcium gluconate.
- Calcium chloride contains 27% elemental calcium compared with 9% in calcium gluconate.
- As such, it takes 3 times as much calcium gluconate to equal 1 dose of calcium chloride.
- The intent is to deliver approximately 250 mg of elemental calcium with the first unit of blood.

HYPOCALCEMIA refers to a condition characterized by lower-than-normal levels of calcium in the bloodstream.

	Calcium Salt	Elemental Calcium		
Calcium Chloride	1g	13.6 mEq	273 mg	6.80 mmol
Calcium Gluconate	1g	4.65 mEq	93 mg	2.32 mmol

Hypocalcemia from massive transfusion is common. The incidence of hypocalcemia in massive transfusion protocols has been reported to be 85-97% (Potestio, 2022).

Level of Evidence: B-NR

MARCH

CALCIUM ADMINISTRATION

DOSAGE(S):

- **1 gram Calcium** after the **first** unit of blood
  - 30 ml of 10% **calcium gluconate OR** 10 ml of 10% **calcium chloride**

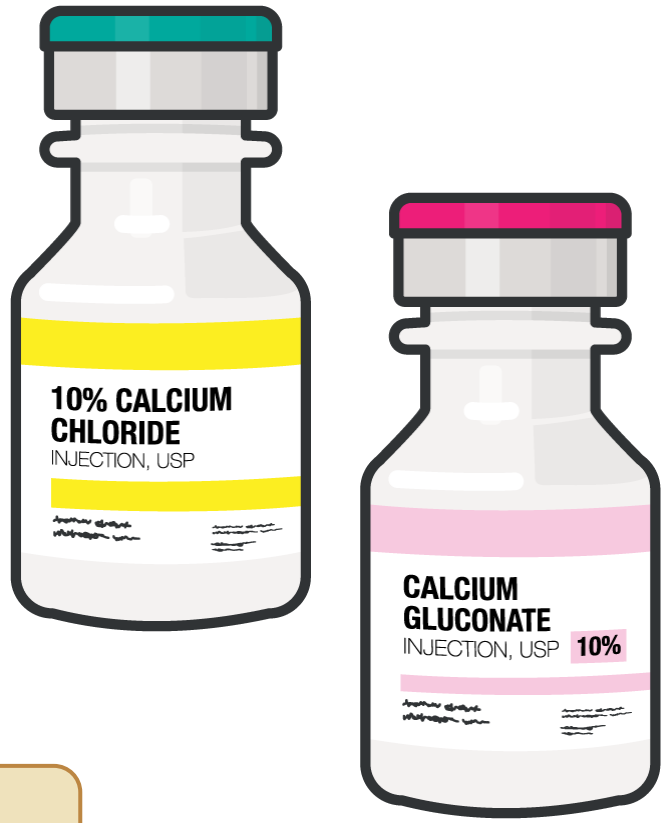
ROUTE(S):

- *Calcium is available in IV or IO form*

INDICATIONS:

- For use after blood product transfusions

⚠ **RISK OF HYPOCALCEMIA** from citrate binding to endogenous calcium



CONTRAINDICATIONS:

- Ventricular fibrillation
- Hypercalcemia
- Hypophosphatemia
- Renal calculi

Use cautiously in:

- Digitalized patients
- Patients with sarcoidosis
- Renal or cardiac disease
- Respiratory acidosis
- Respiratory failure potential

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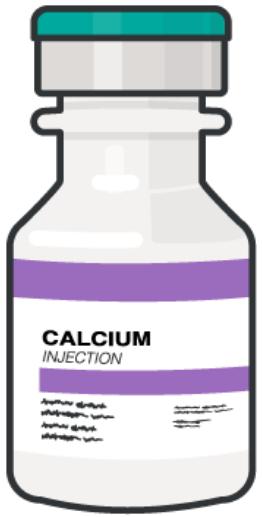
CALCIUM ADMINISTRATION cont.

POTENTIAL SIDE EFFECTS:

Tingling sensations, headache, irritability, weakness, syncope with rapid IV injection, mild decrease in blood pressure, vasodilation, bradycardia, arrhythmias, rebound hyperacidity, nausea, polyuria, renal calculi, hypercalcemia, and local reactions

DRUG INTERACTIONS:

Decreased bioavailability with atenolol, fluoroquinolones and tetracyclines, calcium channel blockers decrease calcium effectiveness, cardiac glycosides increase digitalis toxicity, thiazide diuretics cause a risk of hypercalcemia



ONSET/PEAK/DURATION:

Immediate/Immediate/1-2 hr

TACTICAL CONSIDERATIONS:

Administer one gram of calcium as either 30 ml of 10% calcium gluconate or 10 ml of 10% calcium chloride; immediately after the first transfused blood product. Monitor calcium chloride infusion closely as severe necrosis and skin sloughing can occur if peripheral IV extravasates.

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METHODS OF TRANSFUSING BLOOD COMPONENT PRODUCTS

PRIOR to fluid resuscitation ensure:

- **External Hemorrhage** is controlled
- **IV** or **IO** line with fluid is in place and functioning properly
- **TXA** administered

NOTE: The methods of transfusing blood products are essentially the same for whole blood, packed RBCs, thawed plasma, and platelets.

BEGIN transfusion within **5 min** of starting the process

- Administer **1 gm of calcium** after the first unit
- Monitor for and treat blood transfusion reactions:
  - **Anaphylactic reaction** *(hives, itching, stridor/shortness of breath, and/or hypotension)*
  - **Acute hemolytic reaction** *(arm pain, chest pain, back pain, nausea, disseminated intravascular coagulation, and/or fever)*
- Initiate Hypothermia prevention measures

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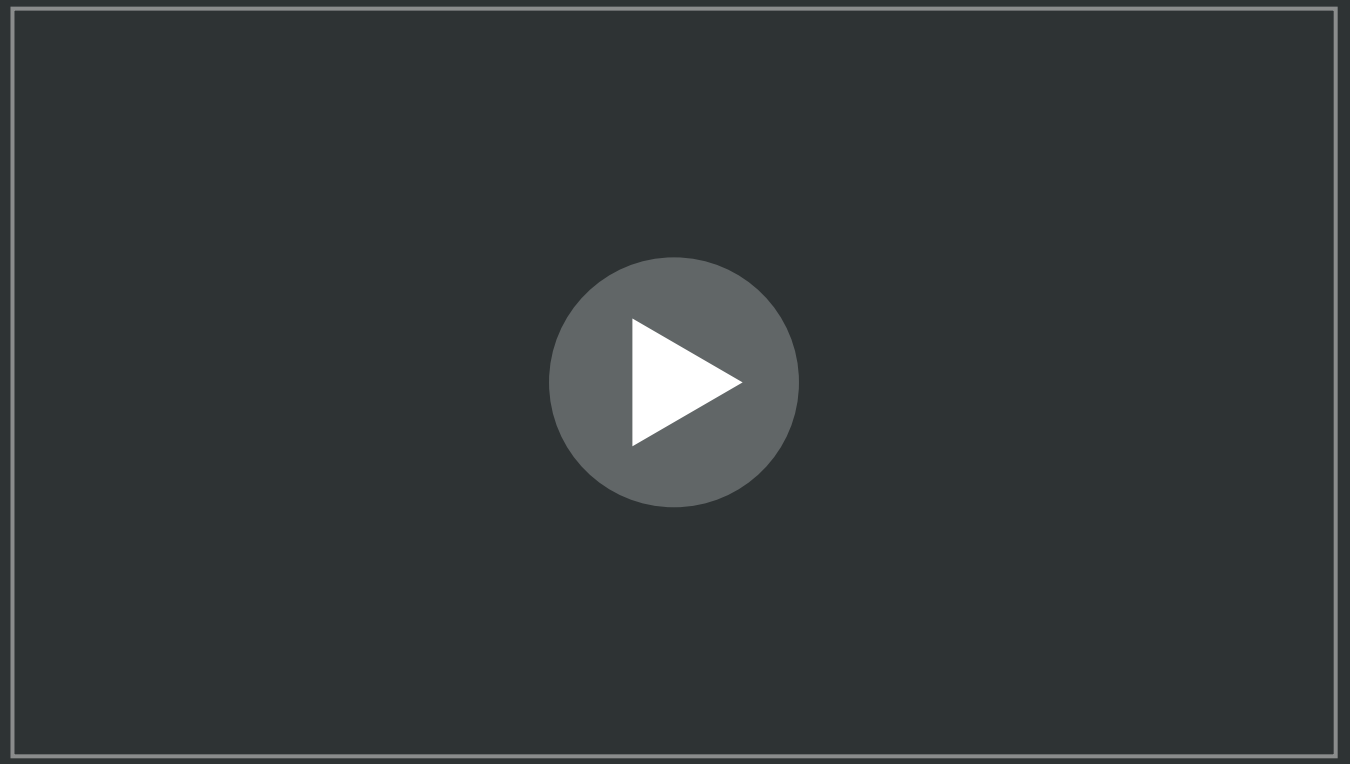
REASSESS after each unit for:

- Return of radial pulses
- SBP > 100
- Improved mental status

- **Discontinue** fluid administration when one or more are met

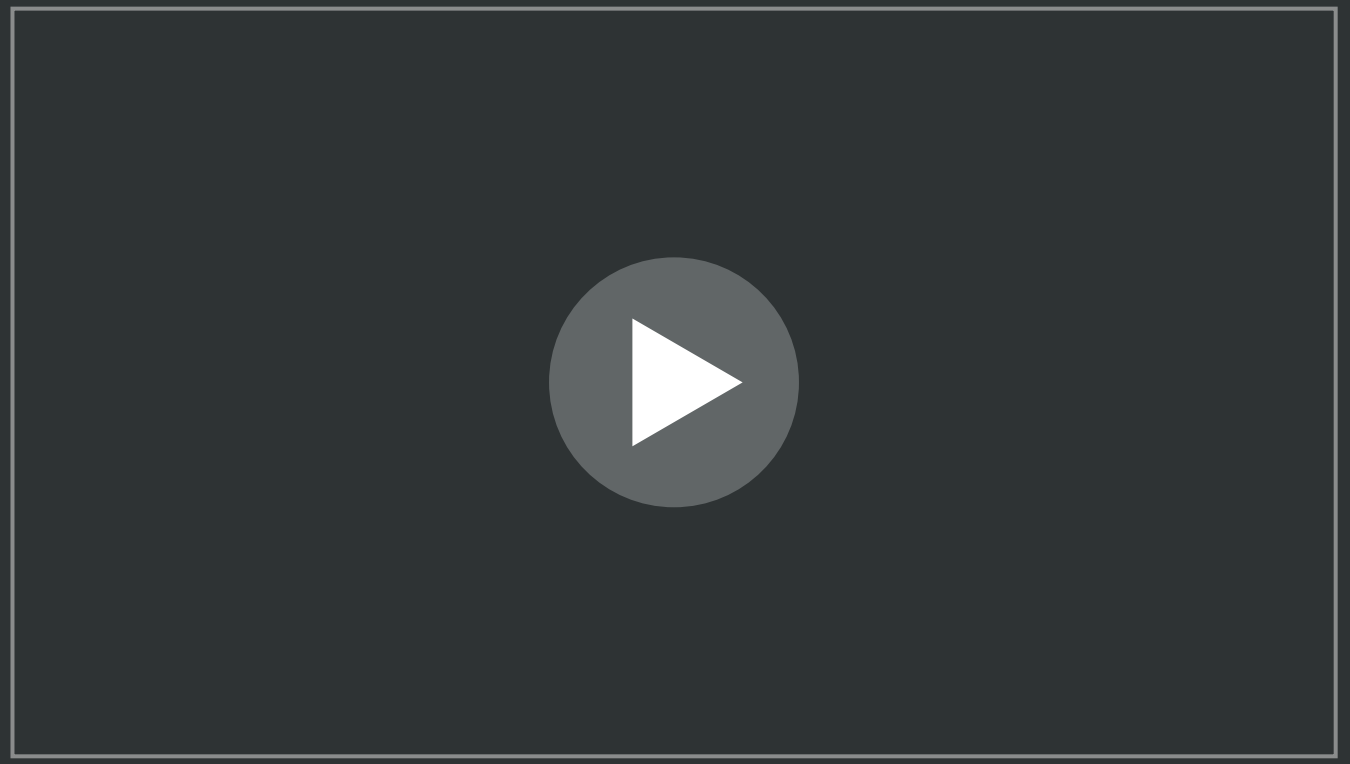
Blood filters remove small clots that develop during collection and storage

ADMINISTRATION OF COLD STORED BLOOD PRODUCTS IN TACTICAL FIELD CARE



Video can be found on deployedmedicine.com

ADMINISTRATION OF BLOOD PRODUCTS IN TACTICAL FIELD CARE



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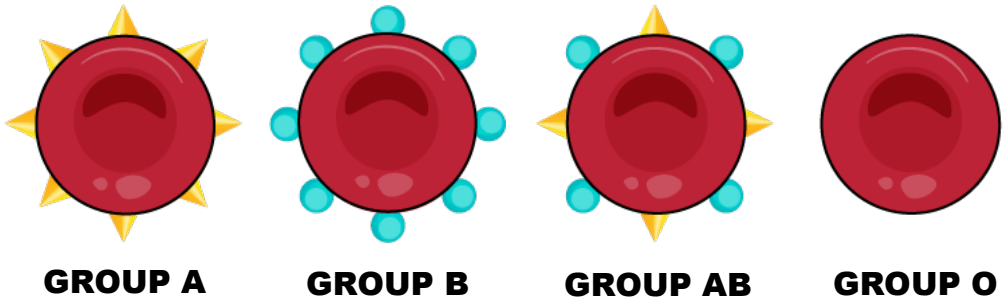
BLOOD TYPING

Surface markers (antigens) determine blood groups/types

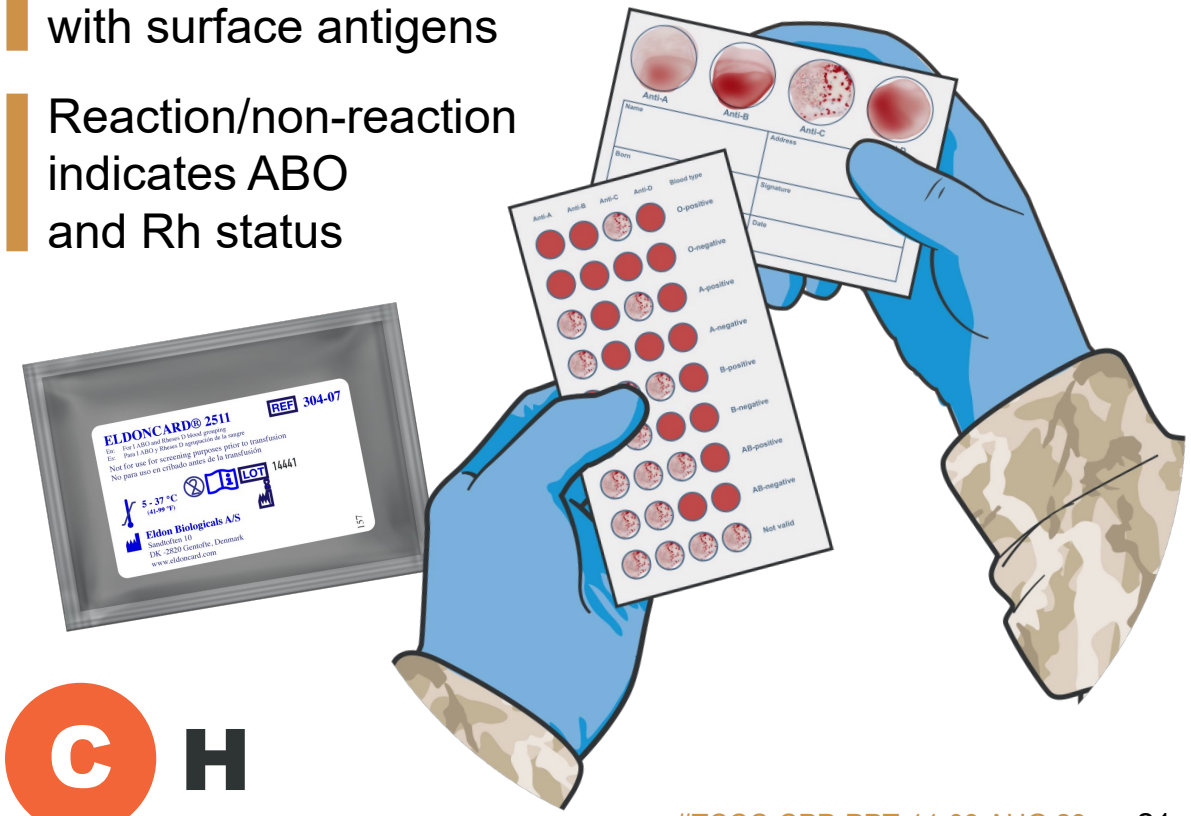
- A & B antigens determine ABO status
- Rh (Rhesus) antigen also a major marker
- Minor markers require more advanced lab resources, but not tactically important



Level of Evidence: C-LD

EldonCard®

- Antigen-impregnated surface
- Donor/casualty blood reacts with surface antigens
- Reaction/non-reaction indicates ABO and Rh status



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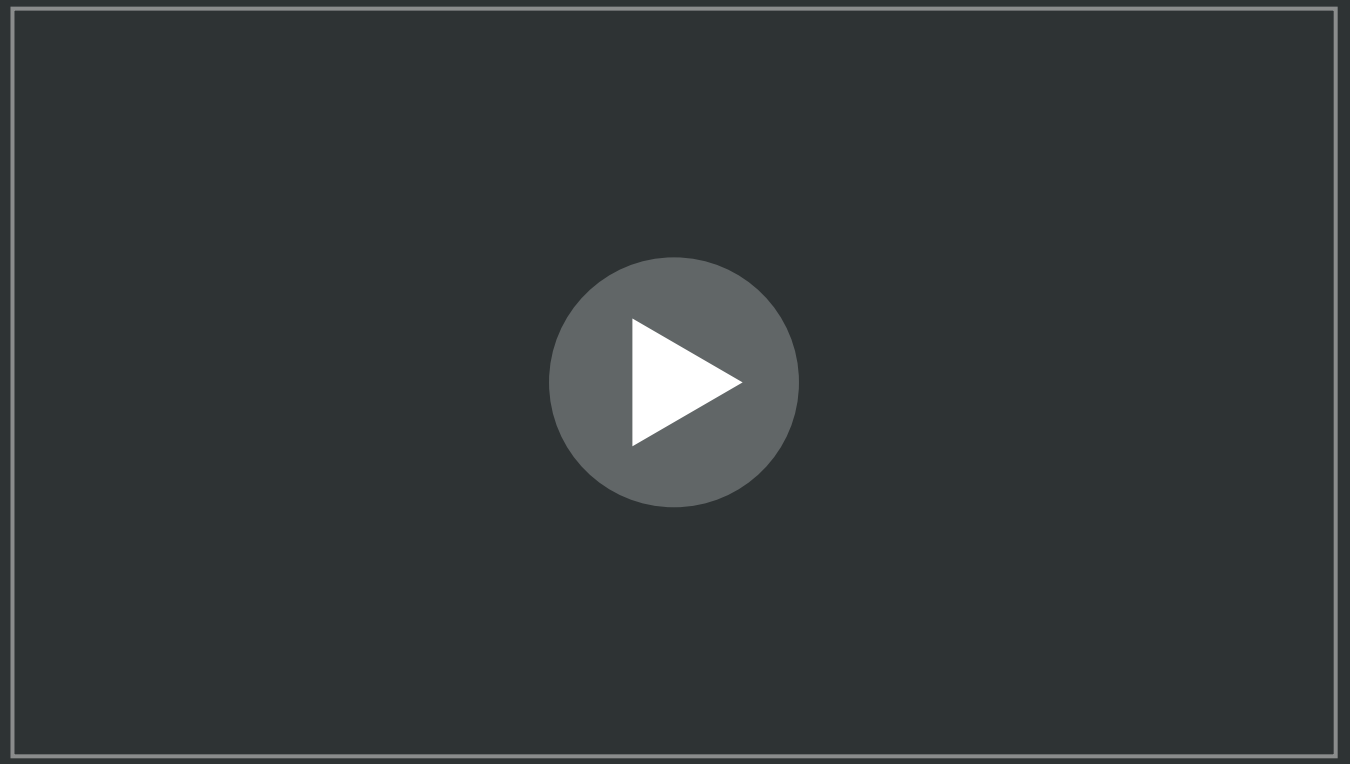
DETERMINING BLOOD TYPE (USING ELDONCARD®) IN TACTICAL FIELD CARE

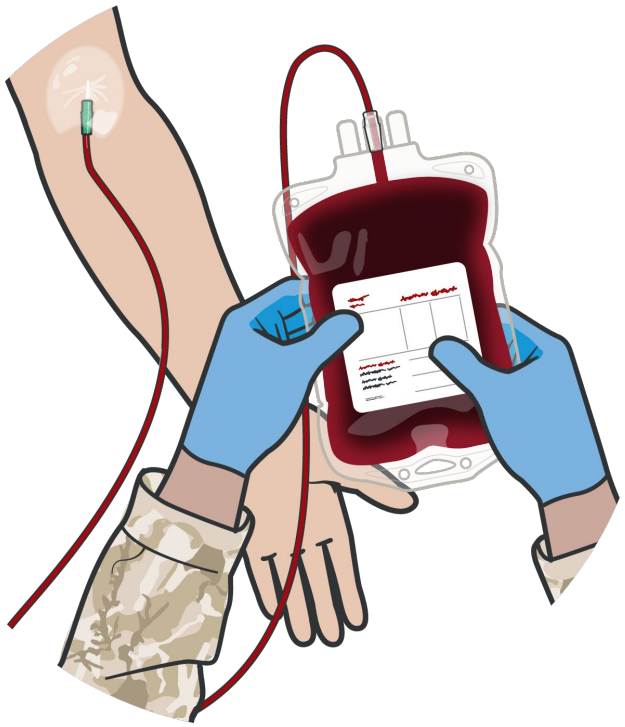


Video can be found on deployedmedicine.com

DONOR BLOOD PRODUCT COLLECTION

Main blood product considerations:

- Collection bags have needle attached (16-gauge)
- Lower collection bag below level of the heart
- Gently shake or agitate bag to mix citrate anticoagulants
- Do **NOT** overfill the bag
- Clamp and then tie off the collection tubing when bag is full



Field Expedient methods to determine bag is full:

- 6.5-inch beaded cable tie
- 6.5-inch zip tie
- Fold and clamp bottom 1-1½ inches of the bag
- Parachute 550 cord cut at 10 inches wrapped around center

⚠ Donors experience mild decline in oxygen-carrying capacity, but no decrease in performance or cognitive function

Level of Evidence: C-LD

MARCH

TRANSFUSION COMPLICATION IDENTIFICATION AND MANAGEMENT STRATEGIES

Monitor all transfusions for complication and adverse reactions:

Anaphylaxis – life-threatening allergic reaction
Stridor/SOB
Hypotension
Early signs – *hives, itching*

STOP TRANSFUSION

- Initiate NS or LR infusion
- 0.3 ml of 1:1000 epinephrine IM
- 25 mg of diphenhydramine IM, IO or slow IV push
- If available, consider 10-40 mg methylprednisolone slow IV push
- Immediately find another compatible blood product or donor

Acute hemolysis – rupture of RBCs
Flank, chest, arm or back pain
Fever
Disseminated intravascular coagulation
Early sign – nausea

STOP TRANSFUSION

- Initiate NS or LR infusion
- 25 mg of diphenhydramine IM or slow IV push
- Immediately find another compatible blood product or donor

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Level of Evidence: B-R

EPINEPHRINE ADMINISTRATION

DOSAGE(S):

- 0.3 mg (1:1000 solution), repeated every 5 to 10 minutes as necessary

ROUTE(S):

- IM

INDICATIONS:

- Emergency treatment of anaphylaxis or allergic reactions

CONTRAINDICATIONS:

- None

ONSET/PEAK/DURATION:

- 15-30 sec (IM)/20 sec to 4 min/5-10 min

POTENTIAL SIDE EFFECTS:

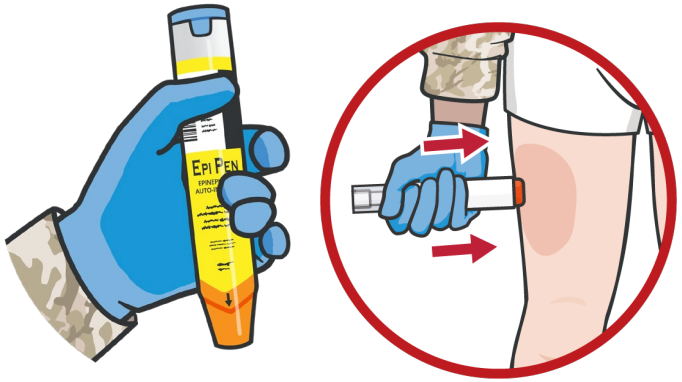
- Anxiety, restlessness, tremor, weakness, dizziness, sweating, palpitations, pallor, nausea and vomiting, headache, disorientation, and tachycardia

DRUG INTERACTIONS:

- Antihypertensives reduce the pressor effects of epinephrine, thyroid hormones, antihistamines and some anti-arrhythmic medications increase its arrhythmogenic effects

TACTICAL CONSIDERATIONS:

- Adult EpiPens® deliver the recommended 0.3 mg IM dose
- Casualties in hemorrhagic shock have poor tissue perfusion to their extremities reducing the delivery of epinephrine; use large muscle groups closest to the torso (in order of preference: thigh > deltoid > gluteal)



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DIPHENHYDRAMINE ADMINISTRATION

DOSAGE(S):

25 mg initial dose, may consider 50 mg based on clinical situation; repeat q 4-6 hr prn; max daily dose 300 mg

ROUTE(S):

IM or slow IV/IO push (over one minute)

INDICATIONS:

Emergency treatment of anaphylaxis
or allergic reactions

ONSET/PEAK/DURATION:

10 sec-20 min (IV<IO<IM)/
15 min-2 hr/2-6 hr

CONTRAINDICATIONS:

Documented hypersensitivity to diphenhydramine, breastfeeding mothers, use in pregnancy if clearly needed

POTENTIAL SIDE EFFECTS:

Sedation/somnolence/sleepiness, drowsiness, unsteadiness, dizziness, headache, rare extrapyramidal effects, tremor, or convulsions

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DRUG INTERACTIONS:

Accentuates effects of other medications that cause drowsiness or decreased level of consciousness (sedatives, hypnotics)

TACTICAL CONSIDERATIONS:

There is no evidence to support H1-antihistamines alone in emergency management of anaphylaxis – diphenhydramine should only be used as an adjunct to epinephrine during anaphylaxis management.

Casualty weapons, communications, and sensitive equipment should be secured.

METHYLPREDNISOLONE ADMINISTRATION

DOSAGE(S):

- 10-40 mg

ROUTE(S):

- *Slow IV or IO push (over one minute)*

INDICATIONS:

- Blood product transfusion anaphylactic reaction

ONSET / PEAK / DURATION:

- Immediate/1-2 min/1 hr

CONTRAINDICATIONS:

- Systemic fungal infections and known hypersensitivity (prior allergic reaction); potential benefits may warrant use in pregnant women despite potential risks if the alternative is worse

POTENTIAL SIDE EFFECTS:

- Sodium retention, fluid retention, potassium depletion, hyperglycemia, increased liver function tests, muscle weakness, impaired sweating, pancreatitis, esophagitis, urticaria or allergic reactions

DRUG INTERACTIONS:

- Accentuates effects of other medications that cause drowsiness or decreased level of consciousness (sedatives, hypnotics)

TACTICAL CONSIDERATIONS:

- Administer 10-40 mg IV or IO, after first administering epinephrine and diphenhydramine, when treating an anaphylactic reaction from a blood product transfusion.

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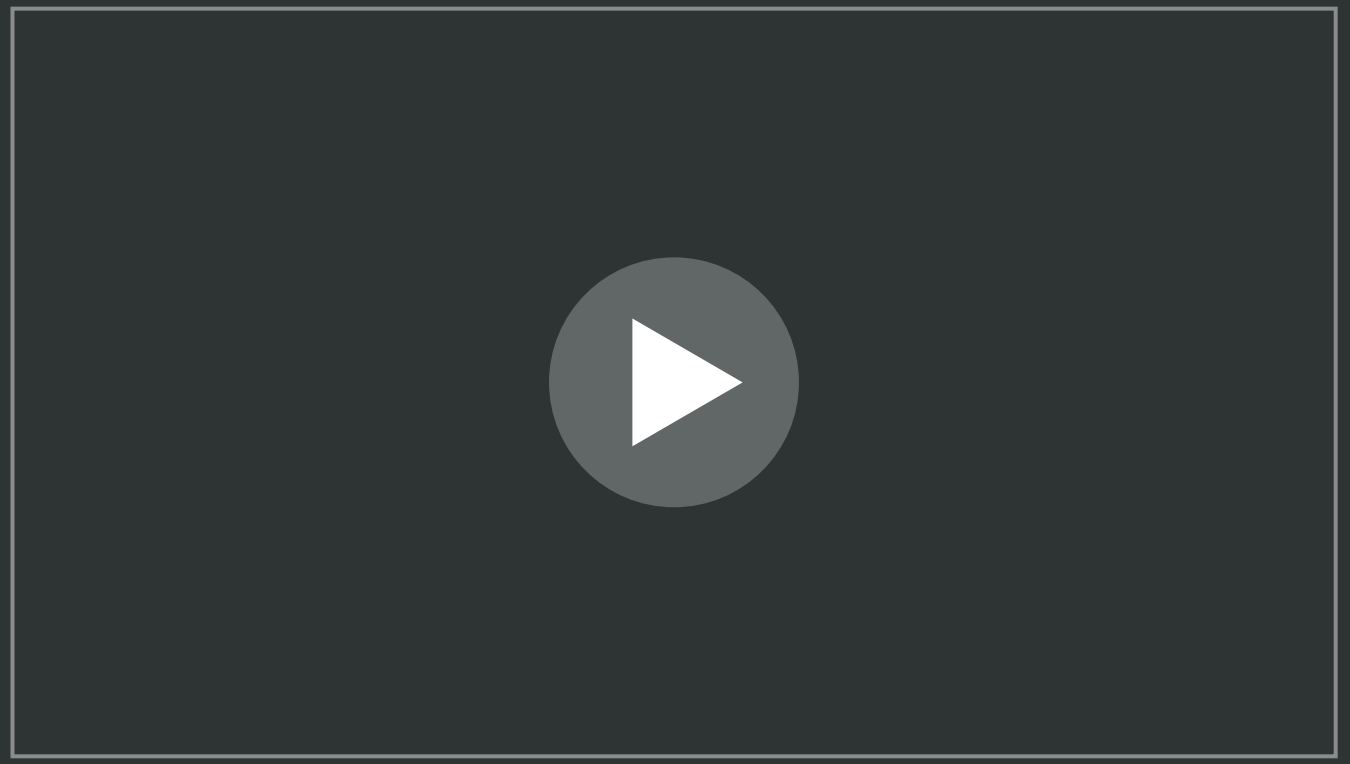
BLOOD DONOR COLLECTION IN TACTICAL FIELD CARE



Video can be found on deployedmedicine.com

SKILL STATION

Fluid Resuscitation in Hemorrhagic Shock

- Blood typing using an EldonCard®
- Donor blood product collection
- Casualty blood product administration

FIELD BLOOD BANKING IN TACTICAL FIELD CARE

Field Blood Banking indications: When a **theater blood supply system** is **unavailable**, **overwhelmed**, or **unable to move** blood products

Key Walking Blood Bank (WBB) Features:

- Unit standard operating procedures (following JTS guidelines)
- Unit training program
- Pre-screened donor pool
- Blood typing capabilities
- Blood donor collection capabilities
- Transfusion capabilities
- Blood storage capabilities, when appropriate
- Documentation process (using Theater Data Medical Stores)

Critical Considerations for the CPP and WBB Management:
Quick availability and accessibility
Storage requirements/constraints
Resource management of collection equipment
Proper handling and monitoring
Training and skill sustainment
Pre-screened donors

For a **Walking Blood Bank** to work, the unit must have a plan of action ready to activate and employ!

MARCH

CPP ROLES IN WALKING BLOOD BANKS

Determining when a field blood bank is indicated:

- Assessing potential for casualties
- Knowing whether theater blood system meets blood requirements

Activating the walking blood bank:

- Coordinating with Area Joint Blood Program Manager
- Initiating SOPs to begin unit activation

Level of Evidence: C-LD

Overseeing (and possibly performing) blood bank operations:

- Blood typing (confirming casualty and donor status)
- Blood collection, including test samples
- Blood transfusions

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Deactivating the field blood bank and follow-up:

- Determining situation is stable and blood bank is no longer needed
- Gathering and transmitting data for preventive medicine POCs
- Notifying donors and casualty of any lab findings

EVIDENCE SUPPORTING FLUID RESUSCITATION STRATEGIES

SUBJECT CATEGORY	STUDY TYPES	LEVEL OF EVIDENCE
Strategies & Techniques for Hemorrhagic Shock	Randomized Controlled Trials Animal Study, Lab evaluation observational study with limitations	**C-LD**
Early Administration of Blood Products	Meta-analysis of randomized controlled studies and retrospective observational	**B-NR**
Use of Whole Blood or Component Therapies	Meta-analysis of randomized controlled studies and retrospective observational	**B-NR**
Transfusion Reactions	Retrospective observational study	**B-R**
Blood Typing and Field Collection	Meta-analysis of observational studies, lab evaluations and case studies	**C-LD**
Hypocalcemia with Blood Transfusion	Retrospective observational study	**B-NR**
Field Blood Banking	Meta-analysis of observational studies, lab evaluations and case studies	**C-LD**

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

- Progressive strategies, indications, and limitations of fluid resuscitation for hemorrhagic shock
- Appropriate fluid resuscitation techniques to prevent or treat hemorrhagic shock
- Importance and advantages of early use of blood products
- Resuscitation fluid of choice from most to least preferred
- Advantages of cold stored low-titer O whole blood (LTOWB) and fresh low-titer O whole blood (LTOWB)
- Indications and administration methods of blood component products
- Considerations and principles of field blood banking
- Signs, symptoms, and treatment strategies of blood transfusion complications

Skills and Abilities

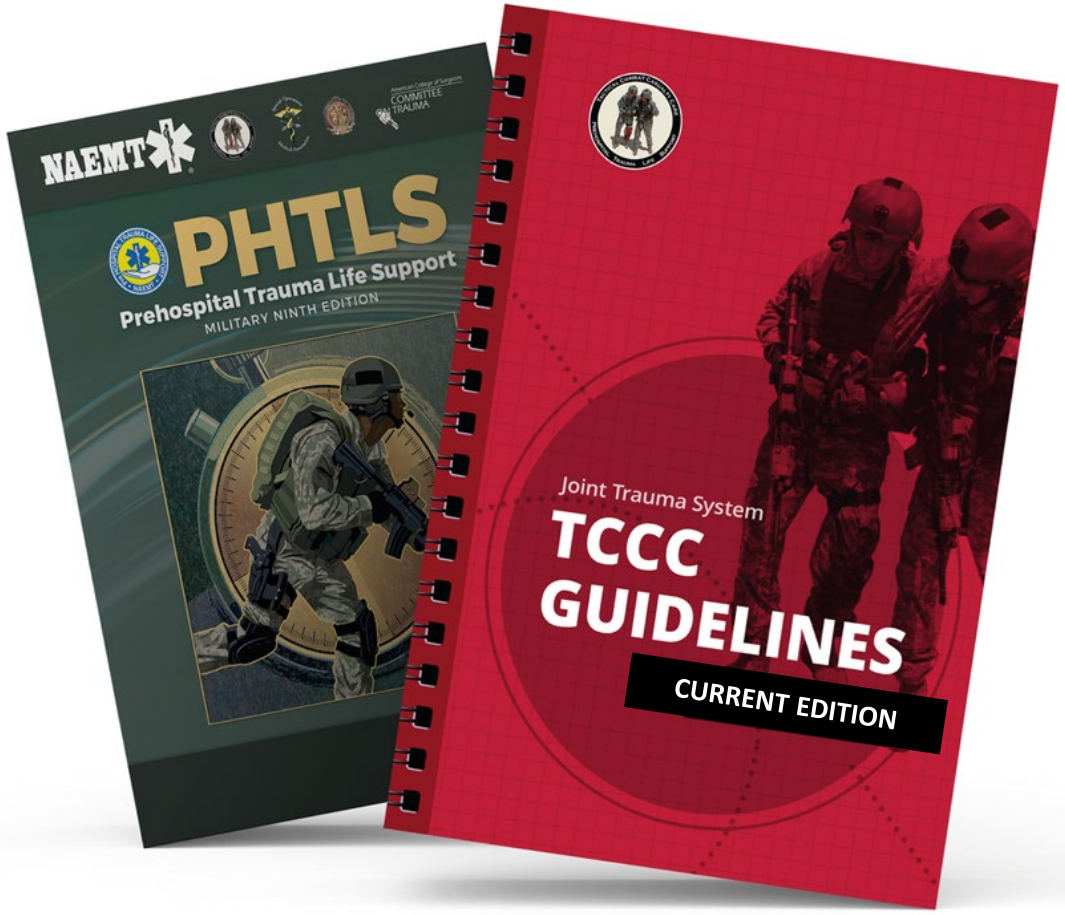
- Blood type determination with EldonCard®
- Blood Product donor collection
- Administration of blood component products

CHECK ON LEARNING

- What signs of hemorrhagic shock are indications that fluid resuscitation is needed?
- What is the preferred product for hemorrhagic fluid resuscitation?
- When should calcium be administered during fluid resuscitation?
- When should fluid resuscitation be discontinued?
- What is an advantage of freeze-dried plasma?

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.