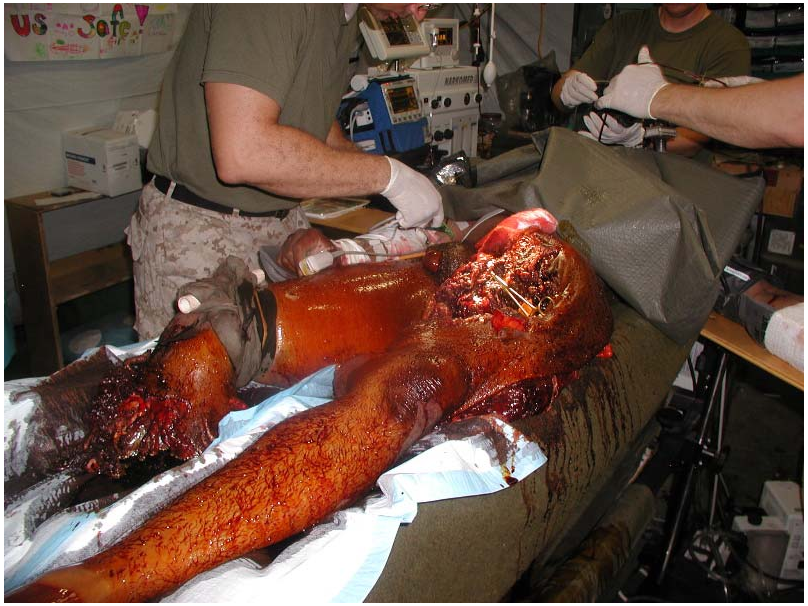
Tactical Combat Casualty Care

CAPT Peter Rhee, MC, USN
MD, MPH, DMCC, FACS, FCCM
Professor of Surgery /
Molecular Cellular Biology


Good medicine in bad places

Tactical Care



- 24 man team – raid
- Building in urban environment
- RPG
- Team Leader
  - massive trauma to leg
  - femoral arterial bleeding
- Two with minor fragmentation injuries

Civilian vs Military

- Patient number
- Location security
- Supplies and advice
- Environment
- Prehospital phase
- Clothing
- Communication
- Transport – time / capability

- Mass casualties -triage
- Tactical considerations
- Limited
- Heat/cold/rain/light
- Extended
- Gear
- Not always available
- Evacuation is delayed

Civilian Trauma

- Emergency Medical Technicians
- Basic Trauma Life Support (BTLS)
- Prehospital Trauma Life Support (PHTLS)
- Advanced Trauma Life Support (ATLS)

Casualty Care

- Mission has higher priority
- Often conflicts with standard of care

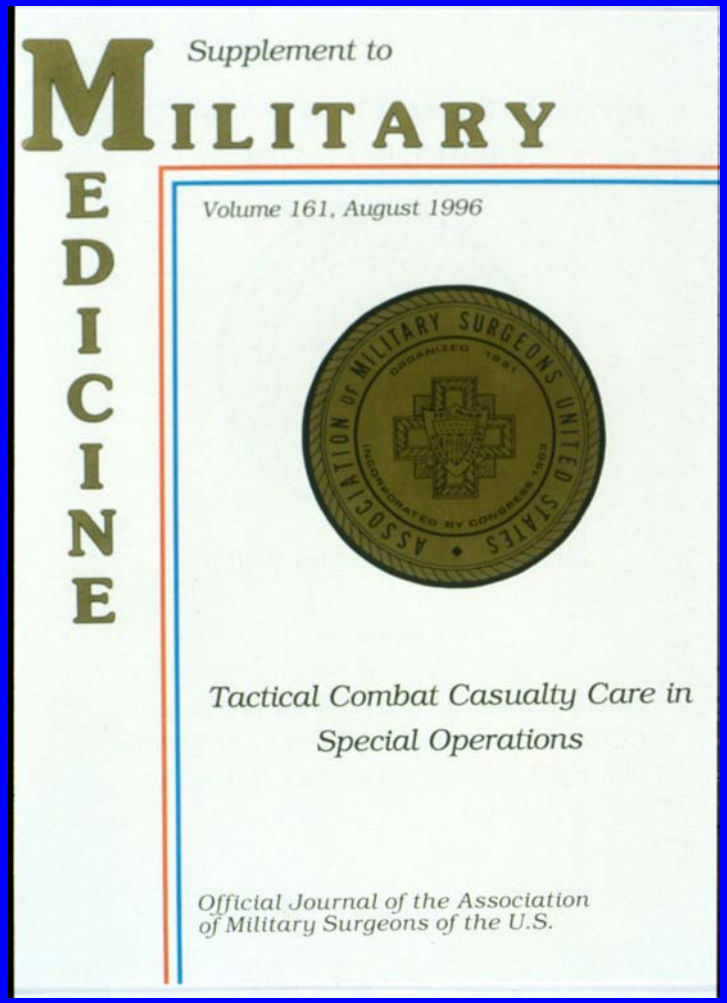
TCCC

- Tactical Combat Casualty Care
- Committee on TCCC – COTCCC
- Naval Special Warfare Command – 2002
- Approved by BUMED

Who / What is the TCCC?

- Standing Tactical Medicine Committee
- Tri-Service
- Sponsored by USSOCOM and BUMED
- Naval Operational Medicine Institute
- Military physicians of various specialties
- Civilian trauma surgeons
- Military medical enlisted

Tactical Combat Casualty Care in Special Operations

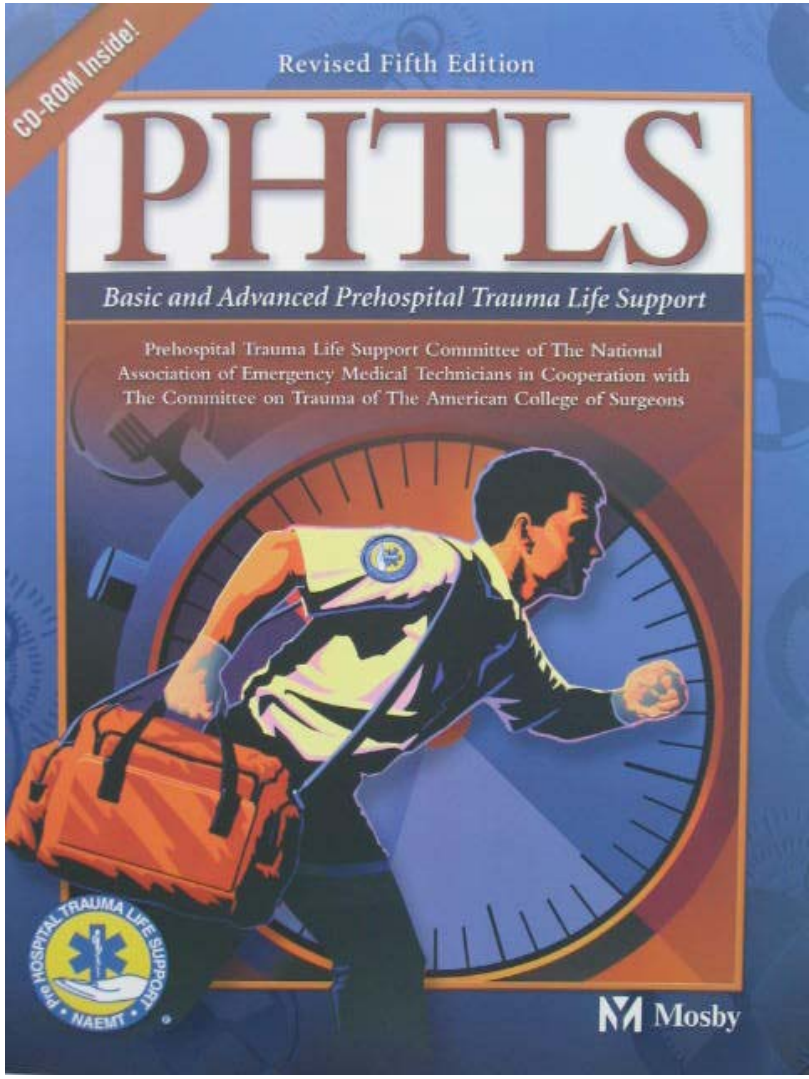


SEAL Biomedical R+D Task Statement 3-93

Military Medicine Supplement August 1996

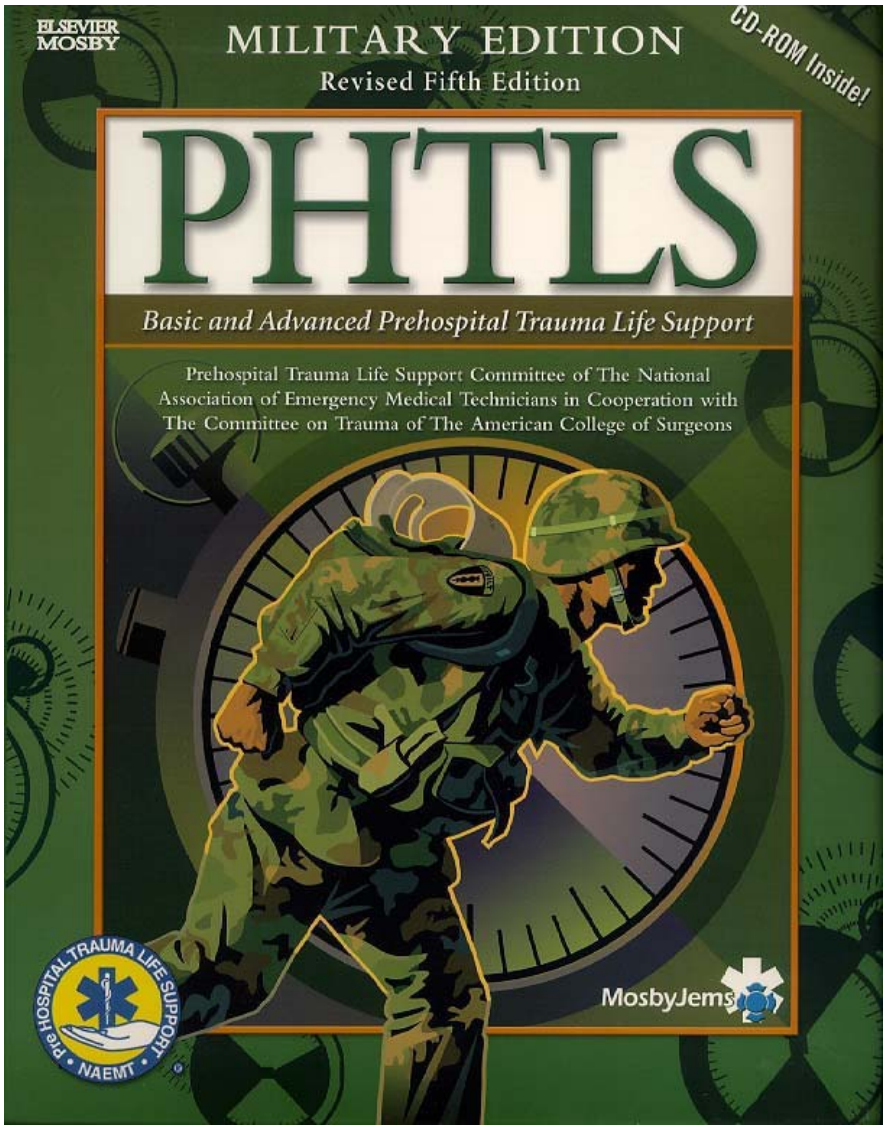
TCCC Revision 2003

- **Published in Revised 5th Edition**
- **American College of Surgeons**
- **National Association EMTs**



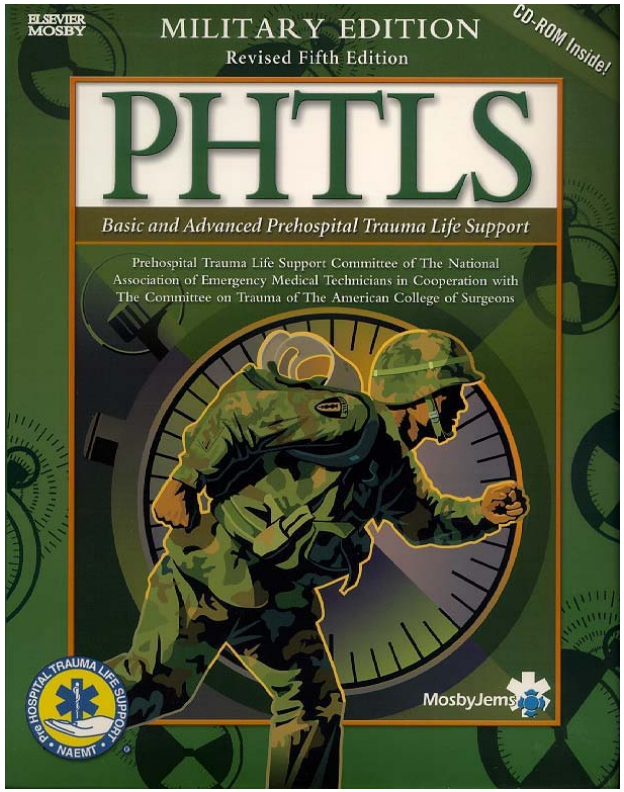
PHTLS Textbook

- Civilian educational care material
- Military chapter
  - Uniqueness of the combat environment
  - Special requirements for medical care in combat
  - Special treatment algorithms
    - Airway
    - Shock
    - Hemorrhage control



PHTLS & Military Relationship

- 3rd edition discussions re military education (VADM Michael Cowan)
- 4th edition
  - Military chapter written
- 5th edition
  - TCCC
- 5th edition military version
  - Release 1 September 2004
  - Minor changes
- 6th edition
  - Civilian version
    - 2 day education course
  - Military version
    - 2 sections = 2 jobs
    - 6 chapters
    - 1-2 day education course



Educational Program

Civilian

- 2 days
- Lecture
- Labs
- Skills
- Testing

Combat

- 1-2 days
- Lecture
- Labs
- Skills
- Testing

Total 3-4 days

PHTLS 6e
Military Chapters

- Unique needs of the Combat Medic
- Bomb/blast injury
- First responder burn care
- Urban warfare
- Stratevac/Medevac
- Ethics
- Battlefield triage

TCCC Transition

TCCC - Who's Using it Now?

TCCC Transition

- **Naval Special Warfare**
  - **BUMED UMO Course 1996**
  - **NSW Standard of Care 1997**
  - **Corpsman TCCC Course 1997**
  - **SEAL Junior Officer Course 1998**
  - **All BUD/S Graduates 2000**

TCCC Transition

- **U.S. Army (Rangers, SF, 91W)**
- **USAF - AFSOC PJ Manual**
- **C4 Course (DMRTI)**
- **Marine Divisions**
- **NTTC**

TCCC Transition

Allied Nations

- **Israeli Defense Force**
- **British SAS**
- **Canadian Counterterrorist Unit**
- **Belgium**
- **Sweden**

TCCC Transition

Allied Nations

- **Israeli Defense Force**
- **British SAS**
- **Canadian Counterterrorist Unit**
- **Belgium**
- **Sweden**

Goals of TCCC

1) Treat the casualty
2) Prevent additional casualties
3) Complete the mission

Important Differences

1. Tactical
2. Resources
3. Evacuation

Good medicine = Bad tactics

1. More wounded or killed
2. Mission failure

Stages of Care in TCCC

- Care Under Fire
- Tactical Field Care
- Combat Casualty Evacuation Care (CASEVAC)
  - MEDEVAC – non-combat medical transport

ATLS - Primary Survey

Trauma Center

- A - Airway with cervical spine protection
- B - Breathing
- C – Circulation
  - control external bleeding
- D – Disability
  - Neurologic status
- E - Exposure and Environment

Field

- A – get your ASS down
- B – get your BUTT out of the line of fire
- C – Circulation
  - control bleeding
- D – disability,
  - assess only
- E – expose what is necessary

Care Under Fire

1) Casualty to stay engaged as combatant if appropriate
2) Return fire as directed or required
3) Keep yourself from being shot
4) Try to keep the casualty from sustaining additional injuries
5) Airway management is best deferred until the Tactical Field Care Phase

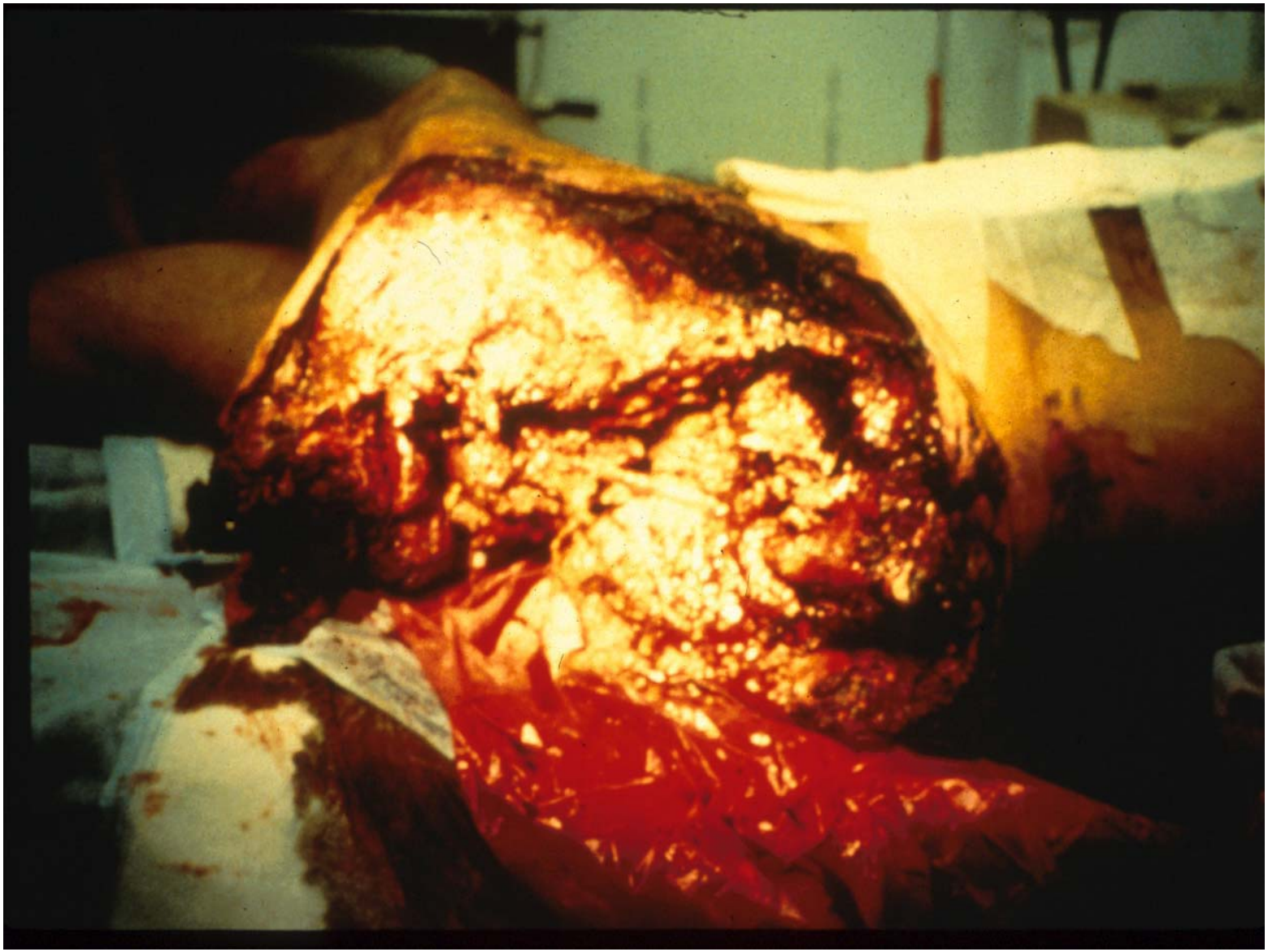
Care Under Fire

6) Stop life threatening external hemorrhage:
   - Use a tourniquet for extremity hemorrhage
   - For non extremity wounds, apply pressure and / or a Hem Con Dressing / or QuikClot

Example of a Wound That DOES NOT Need a Tourniquet

U.S. Army One-Handed Tourniquet

Ranger Ratchet Tourniquet



RPG wound of left hip

HemCon (chitosan) Dressing

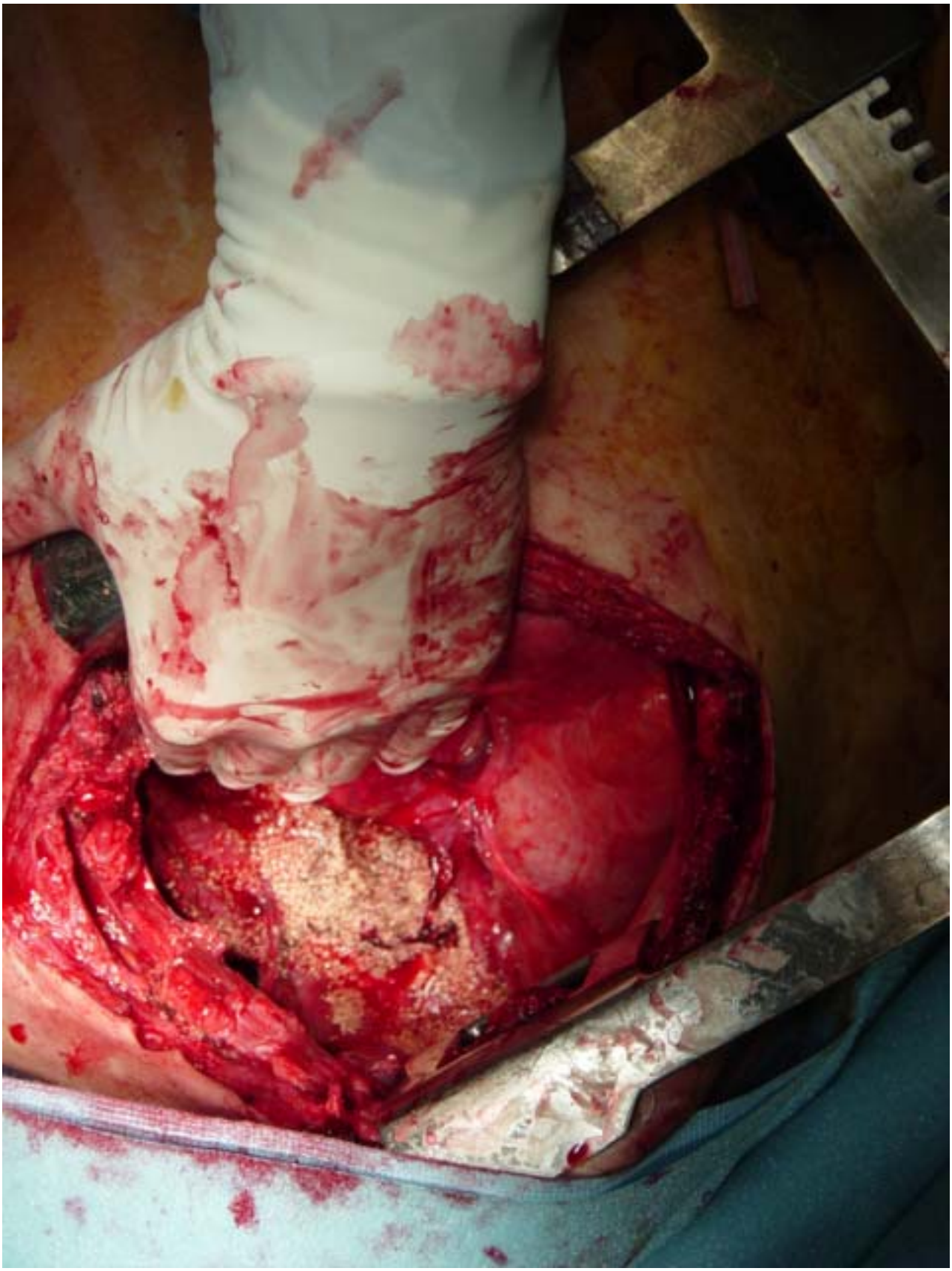
HEMCON
HEMORRHAGE CONTROL TECHNOLOGIES


MEDITRACE


Only
Rest


QuikClot
CINCH TIGHT


31 2:48 PM

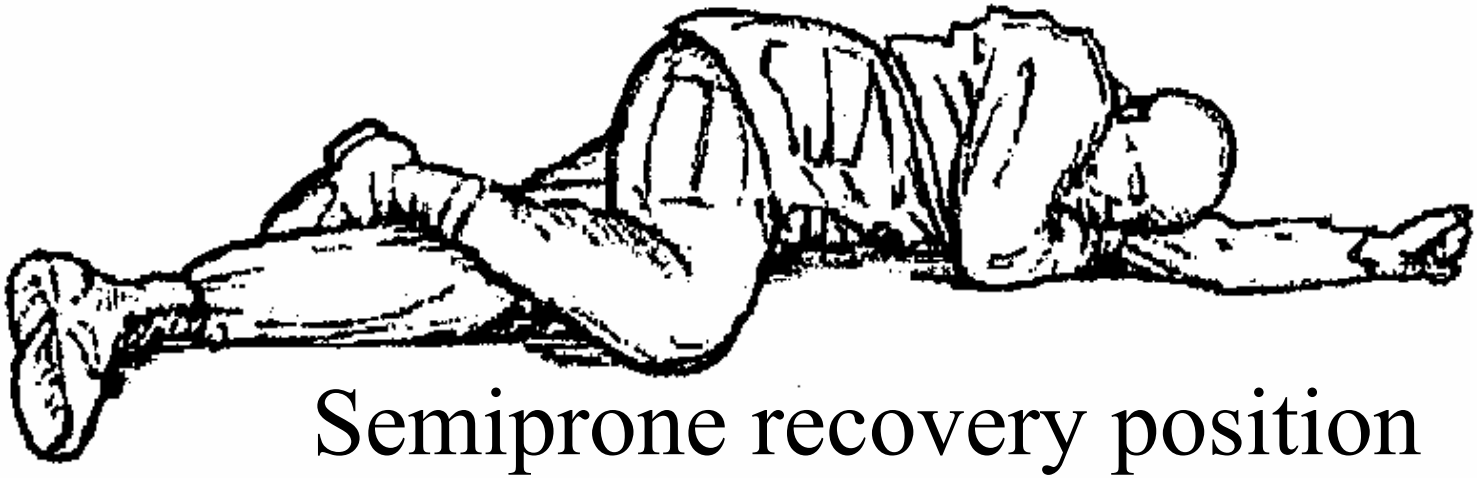


QuikClot
Moderate to Severe Blood Loss
Promoting Coagulation


uikot™

Care Under Fire

6) Stop life threatening external hemorrhage:
   - Use a tourniquet for extremity hemorrhage
   - For non extremity wounds, apply pressure and / or a Hem Con Dressing / or QuikClot
7) Communicate with the patient if possible
   - Offer reassurance and encouragement
   - Explain first aid actions

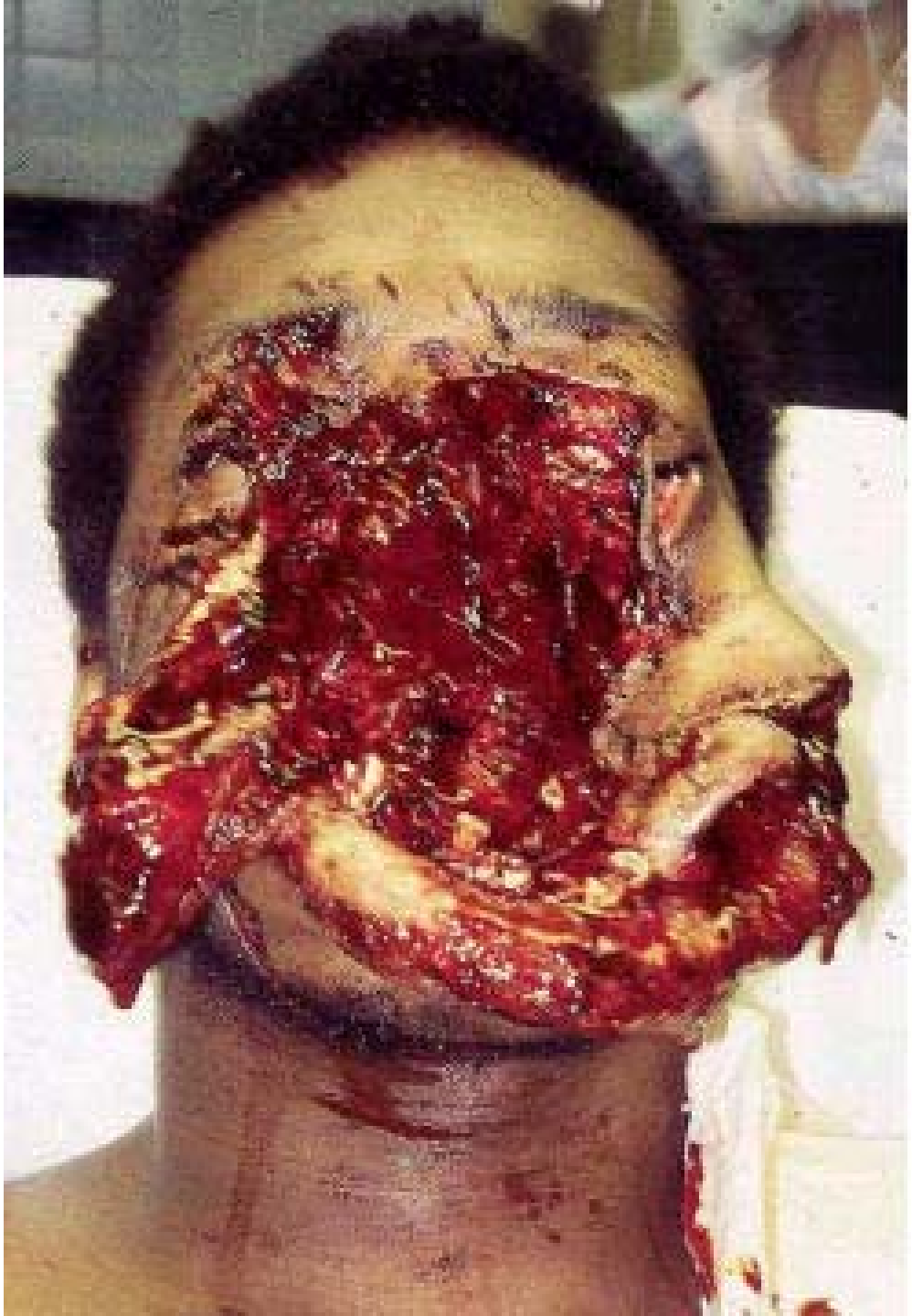


Semiprone recovery position

“This audience has gotten completely out of hand.”

Tactical Field Care

1) Casualties with an altered mental status should be disarmed immediately
2) Airway management
    a Unconscious casualty without airway obstruction
        - Chin lift or jaw-thrust maneuver
        - Nasopharyngeal airway
        - Place casualty in recovery position



Tactical Field Care

1) Casualties with an altered mental status should be disarmed immediately
2) Airway management
   a Unconscious casualty without airway obstruction
      - Chin lift or jaw-thrust maneuver
      - Nasopharyngeal airway
      - Place casualty in recovery position
   b Casualty with airway obstruction or impending airway loss
      - Chin lift or jaw-thrust maneuver
      - Nasopharyngeal airway
      - Place casualty in recovery position
      - Surgical cricothyroidotomy if above unsuccessful (lidocaine if conscious)

Tactical Field Care

3) Breathing
   - Consider tension pneumothorax
     - Needle thoracostomy
     - torso trauma / respiratory distress
   - Sucking chest wound
     - Vaseline gauze – expiration
     - Cover with field dressing
     - Sitting position
     - Monitor for tension pneumothorax

Tactical Field Care

4) Bleeding
   - Assess for unrecognized hemorrhage and control all sources of bleeding
   - Assess for discontinuation of tourniquets
   - Pressure dressing
   - Hemostatic dressing (Hem Con)
   - Hemostatic dressing (QuikClot)

Tactical Field Care

5) IV
   - Start an 18 gauge IV or saline lock, if indicated
   - If IV not obtainable – intra-osseous

Procedure

Step 1

Secure standard Saline Lock in place and completely cover with a tegaderm dressing.

Tactical Field Care

5) Intra-osseous

Tactical Field Care

6) Fluid resuscitation

- Assess for hemorrhagic shock – mental status or absent peripheral pulses are best field indicator of shock (if no head injury)

a. If not in shock:

- No IV fluids necessary
- PO fluids permissible if conscious

b. If in shock:

- Hextend 500 mL IV bolus
- Repeat once after 30 minutes if still in shock
- No more than 1L of Hextend

- Continued efforts – must be weighed against logistical and tactical considerations
  - Risk of incurring further casualties
- Unconscious casualty with TBI has no peripheral pulse, resuscitate to restore radial pulse

2000cc Blood Loss

3.0 Liters Blood Volume


SAFETY

Tactical Field Care

7) Inspect and dress known wounds
8) Check for additional wounds
9) Analgesia as necessary
    a. Able to fight:
        - Rofecoxib 50 mg PO qd
        - Acetaminophen 1000 mg PO q6h
    b. Unable to fight
        - Morphine 5 mg IV / IO
        - Reassess and repeat q 10 minutes
        - Monitor for respiratory depression
        - Promethazine 25 mg IV / IO / IM q4h

Tactical Field Care

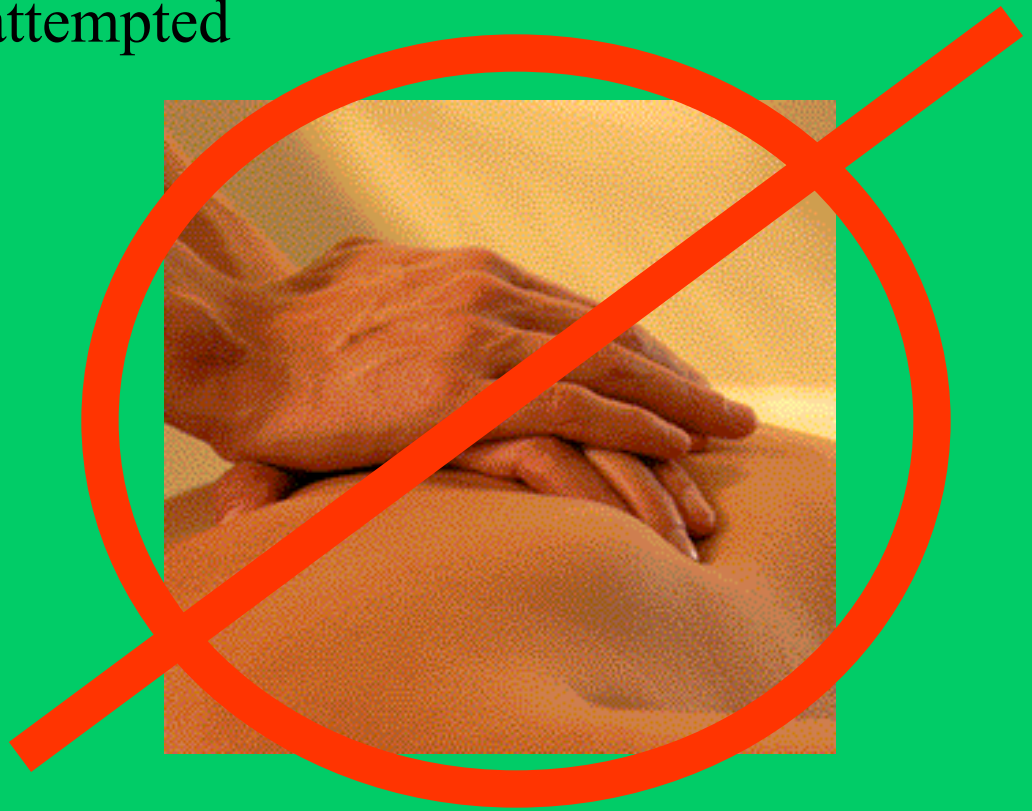
10) Splint fractures and recheck pulse
11) Antibiotics: for all combat wounds
    - Gatifloxacin 400 mg PO qd
    - Unable to take PO cefotetan 2 g IV / IM
        - Slow push 3-5 min q12h

12) Communicate with patient
    - Encourage, reassure
    - Explain care

Tactical Field Care

13) CPR for trauma

- Resuscitation on the battlefield:
  - Will not be successful
  - Should not be attempted



Casevac

CASEVAC care

1) Airway management
   a Unconscious casualty without airway obstruction
      - Chin lift or jaw-thrust maneuver
      - Nasopharyngeal airway
      - Place casualty in recovery position
   b Casualty with airway obstruction or impending airway loss
      - Chin lift or jaw-thrust maneuver
      - Nasopharyngeal airway
      - Place casualty in recovery position or LMA or Combitube or
      - Surgical cricothyroidotomy if above unsuccessful (lidocaine if conscious)
   c Spinal immobilization is not necessary for casualties with penetrating trauma

CASEVAC care

2) Breathing
   - Consider tension pneumothorax
     - Needle thoracostomy
     - torso trauma / respiratory distress
   - Consider chest tube if no improvement and/or long transport anticipated
   - Most combat casualties do **not** require oxygen except
     - Low pulse oximeter
     - Unconscious
     - TBI
   - Sucking chest wound
     - Vaseline gauze – expiration
     - Cover with field dressing
     - Sitting position
     - Monitor for tension pneumothorax

CASEVAC Care

3) Bleeding

-Assess for unrecognized hemorrhage and control all sources of bleeding

- Assess for discontinuation of tourniquets
- Pressure Dressing
- Hemostatic dressing (Hem Con)
- Hemostatic dressing (QuikClot)

CASEVAC Care

4) IV

- Reassess need for IV access
- In indicated – 18 gauge IV or saline lock
- If IV not obtainable – intra-osseous

CASEVAC Care

5) Fluid resuscitation

- Reassess for hemorrhagic shock – mental status or abnormal vital signs (if no head injury)

a. If not in shock:

- No IV fluids necessary
- PO fluids permissible if conscious

b. If in shock:

- Hextend 500 mL IV bolus
- Repeat once after 30 minutes if still in shock
- Continue with PRBC, Hextend or LR as indicated

- Unconscious casualty with TBI has no peripheral pulse, resuscitate to maintain SBP > 90 mmHg

CASEVAC Care

6) Monitoring
   - Institute ECG, Pulse ox and vital signs if indicated
7) Inspect and dress wound if not already done
8) Check for additional wound
9) Analgesia as necessary
   a. Able to fight:
      - Rofecoxib 50 mg PO qd
      - Acetaminophen 1000 mg PO q6h
   b. Unable to fight
      - Morphine 5 mg IV / IO
      - Reassess and repeat q 10 minutes
      - Monitor for respiratory depression
      - Promethazine 25 mg IV / IO / IM q4h

CASEVAC Care

10) Reassess fractures and recheck pulses

11) Antibiotics: for all combat wounds

- Gatifloxacin 400 mg PO qd
- Unable to take PO cefotetan 2 g IV / IM
  - Slow push 3-5 min q12h

12) PASG maybe useful for pelvic fractures and abdominal bleeding.

- Extended use must be carefully monitored
- Contraindicated for thoracic and brain injuries

ECCCT Course

(click to start)

The End

- Questions?