



**COMBAT MEDIC/
CORPSMAN**



TACTICAL COMBAT CASUALTY CARE COURSE

MODULE 19: FRACTURES



**Committee on
Tactical Combat
Casualty Care
(CoTCCC)**

TCCC TIER 1
All Service Members

TCCC TIER 2
Combat Lifesaver

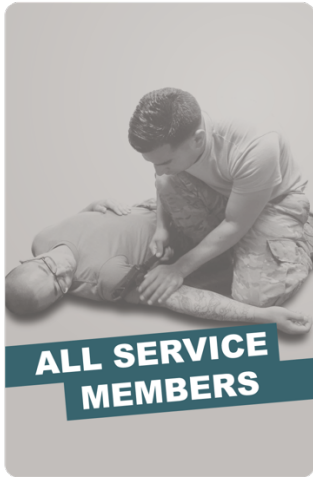
TCCC TIER 3
Combat Medic/Corpsman

TCCC TIER 4
Combat Paramedic/Provider

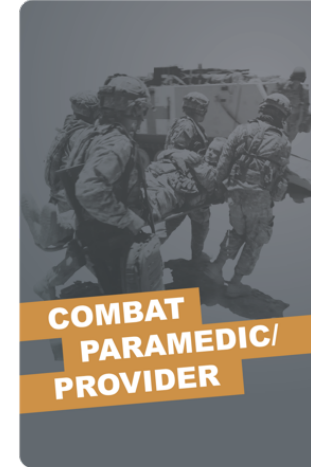
TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

ROLE 1 CARE

**NONMEDICAL
PERSONNEL**



**MEDICAL
PERSONNEL**



◀ **YOU ARE HERE**

STANDARDIZED JOINT CURRICULUM

1 x **TERMINAL LEARNING OBJECTIVES**

22 Given a combat or noncombat scenario, perform assessment and initial treatment of fractures during Tactical Field Care in accordance with CoTCCC Guidelines.

- **22.1** Identify signs of a suspected fracture.
- ⊗ **22.2** Demonstrate the basic care of fractures in accordance with CoTCCC Guidelines.
- ⊗ **22.3** Demonstrate proper splint application using a malleable, rigid or improvised splint to a suspected fracture in Tactical Field Care.

03 x **ENABLING LEARNING OBJECTIVES**

MARCH PAWS

LIFE-THREATENING

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

AFTER LIFE-THREATENING

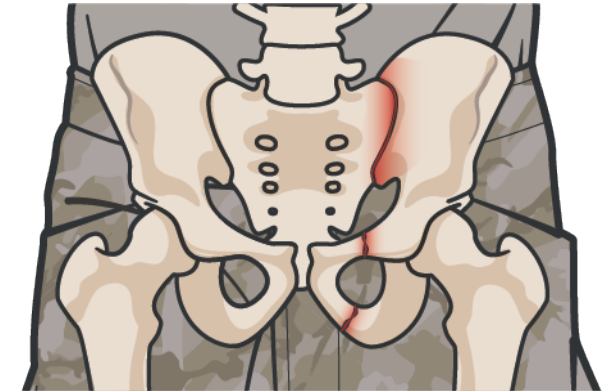
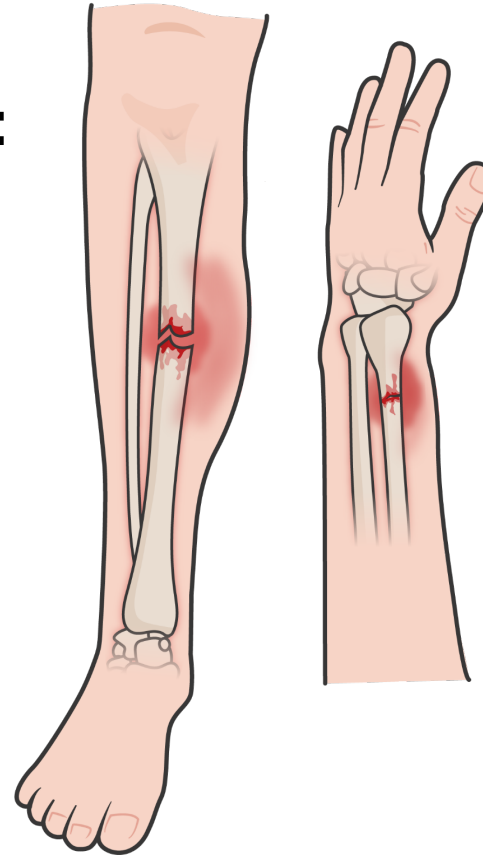
- P** PAIN
- A** ANTIBIOTICS
- W** WOUNDS
- S** SPLINTING



SIGNS OF A SUSPECTED CLOSED FRACTURE

WARNING SIGNS OF A CLOSED FRACTURE:

- Significant tenderness, pain, and/or marked swelling
- Deformity or instability of the bone
- An audible or perceived “snap”
- Hematoma/bruising
- Crepitus (crackling/popping under the skin)
- Different length or shape of limb
- Loss of pulse or sensation distally in the injured arm or leg



A pelvic compression device is indicated in any casualty who suffers severe blunt force or blast injury with symptoms of a pelvic fracture



Splints are not applied to spinal fractures, although the casualty may be immobilized, depending on the tactical situation

P A W S

FRACTURES



CLOSED FRACTURE

- No open wound (break in skin)
- Risk for tissue damage still significant



Treat all fractures with nearby skin wounds as open fractures (*even without bony protrusion or a laceration that doesn't align*)

Significant blood loss is possible when dealing with Femur Fractures:

Approximate Internal Blood Loss Associated with Fractures	
Bone fractured	Internal blood loss *milliliters [ml] per fracture
Rib	125
Radius or ulna	250-500
Humerus	500-700
Tibia or fibula	500-1,000
Femur	1,000-2,000
Pelvis	1,000-massive

*(Average total blood volume in an adult = 5,000 to 6,000 ml)

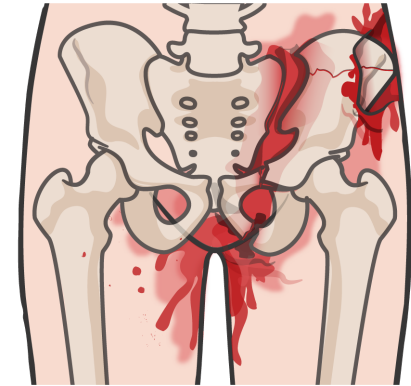
SIGNS OF AN OPEN FRACTURE

WARNING SIGNS OF A OPEN FRACTURE:

- Significant tenderness, pain, and/or marked swelling
- Bone protruding from the wound
- Open wound near the site
- Bleeding
- Crepitus
- Different length or shape of limb
- Loss of pulse or sensation distally in the injured arm or leg



Open fracture to the pelvis may lacerate the rectum, perineum, or vagina, and an obvious source of external blood loss may not be readily apparent.



Every effort should be made to control bleeding coming from the site, before any splinting is attempted

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OPEN FRACTURES (Cont')

- Open wound – associated with an overlying skin wound, significant risk of infection (osteomyelitis)
- Open fractures may not always be easy to identify in a trauma patient.
- Wound(s) near a possible fracture is considered an open fracture and treated as such
- Protruding bone or bone end should **not** be replaced
- Bones occasionally return to a near-normal position when realigned



Ensure that any open injuries are bandaged, and bleeding has been controlled!

**BASIC MANAGEMENT
OF FRACTURES**

**PRIMARY OBJECTIVES
OF FRACTURE
TREATMENT:**

- Prevent further injury
- Protect nerves and vessels
- Make the casualty more comfortable

Identify the location of the fracture and place the extremity in a **NEUTRAL POSITION** or **POSITION OF FUNCTION**.

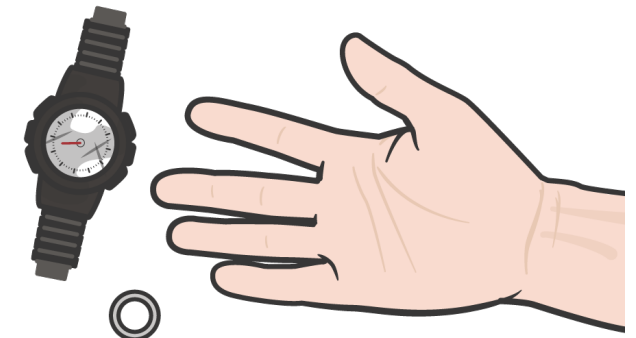


REASSESS BLEEDING control prior to further management of the fracture



CHECK PULSES, skin color, and sensorimotor function distal to the site of the fracture before and after splinting

REMOVE jewelry, watch, clothing, and/or boots as the situation dictates



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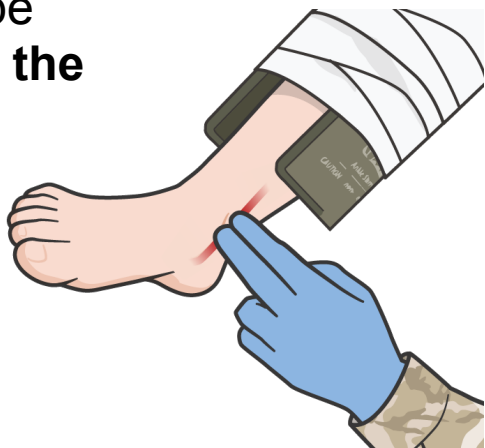
Module 19: Fractures

PRINCIPLES OF FRACTURE MANAGEMENT

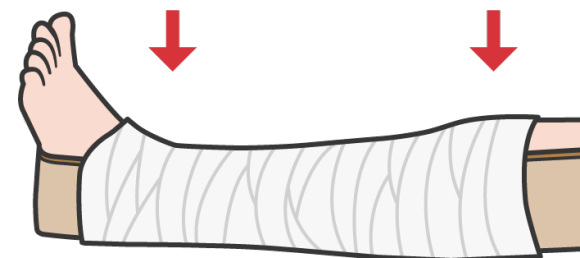
DRESS ALL WOUNDS prior to splint application



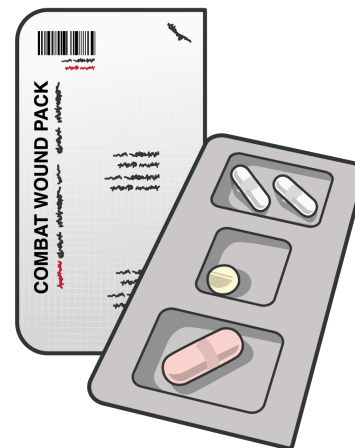
Once you have applied a splint, be sure to **reassess the pulses**, motor and sensory (PMS) function



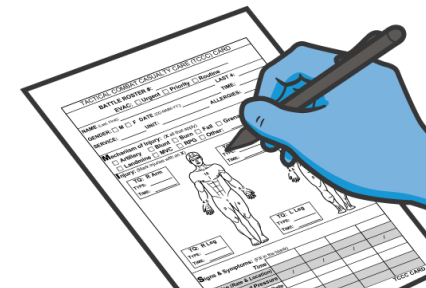
Always immobilize the joint proximal and the joint distal to the site of the fracture in your splint



ADMINISTER pain medications as needed and antibiotics for any open fracture(s)



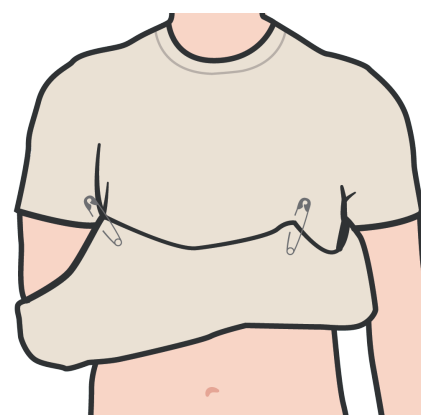
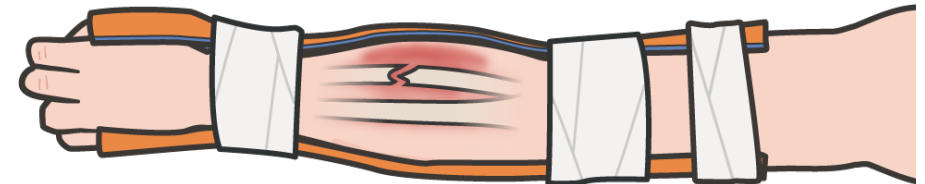
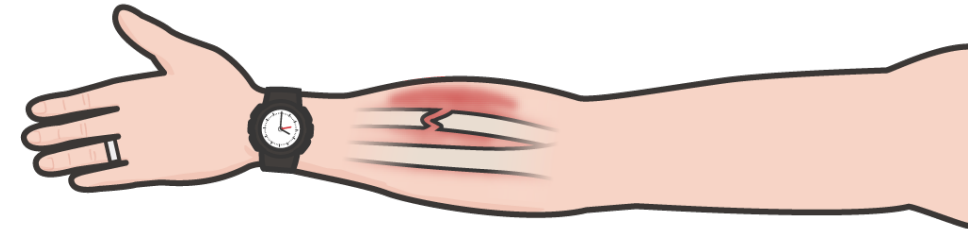
DOCUMENT all findings and treatments on a DD Form 1380 TCCC Casualty Card and attach it to the casualty



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BASIC SPLINTING PRINCIPLES

- Collect materials for splints, padding and securing the splint prior to getting started
- Have a Combat Lifesaver assist you, when possible
- Use the unaffected extremity to mold or design your splint
- Pad all voids to prevent the splint from applying direct pressure to the injured site
- Incorporate one joint above and one below the fracture
- Secure splint with elastic bandage, cravats, tape, etc.
- Consider slings and/or swathes, including using the casualty's shirt or sleeve, if appropriate

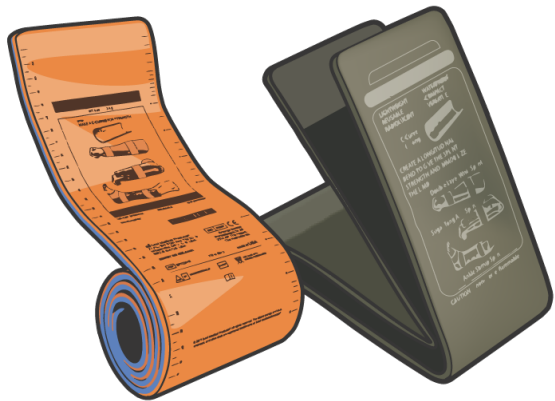


Check skin color and PMS before and after splinting

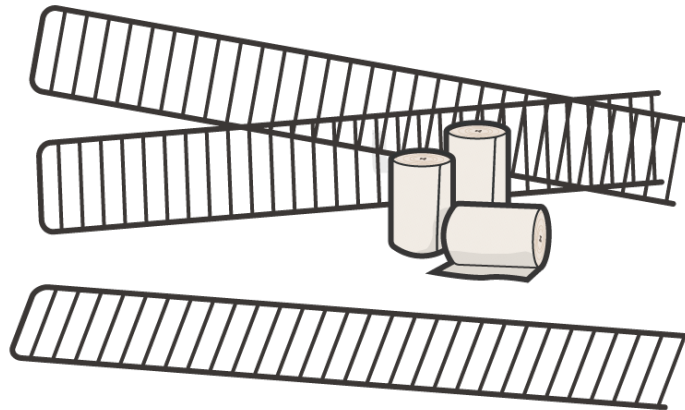
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MALLEABLE SPLINTS

Malleable splints gain rigidity by folding or creasing the metal framework

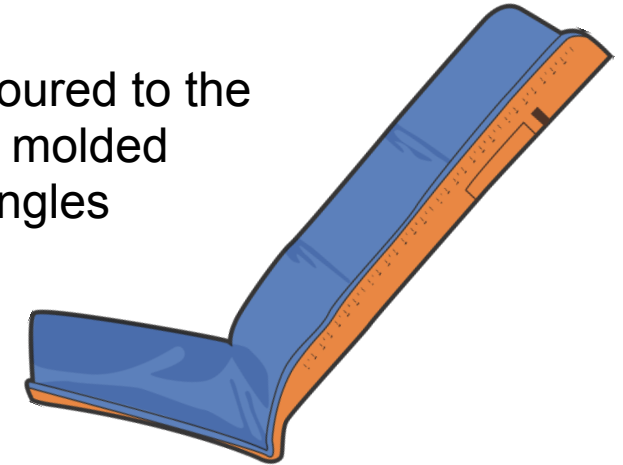


Aluminum foam splint

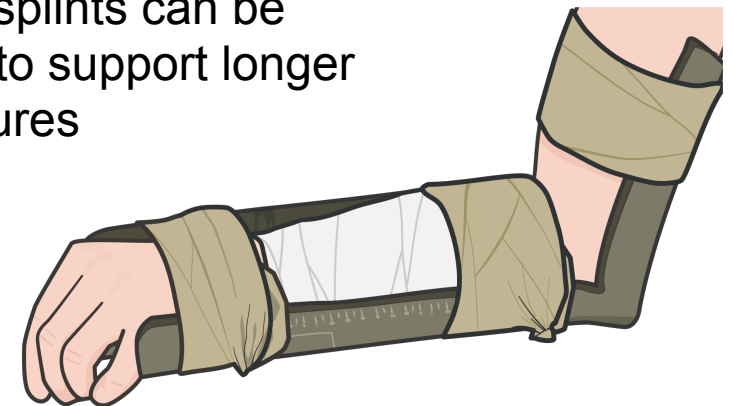


Wire splint

They can be contoured to the area of injury and molded around joints at angles using casualty's unaffected limb

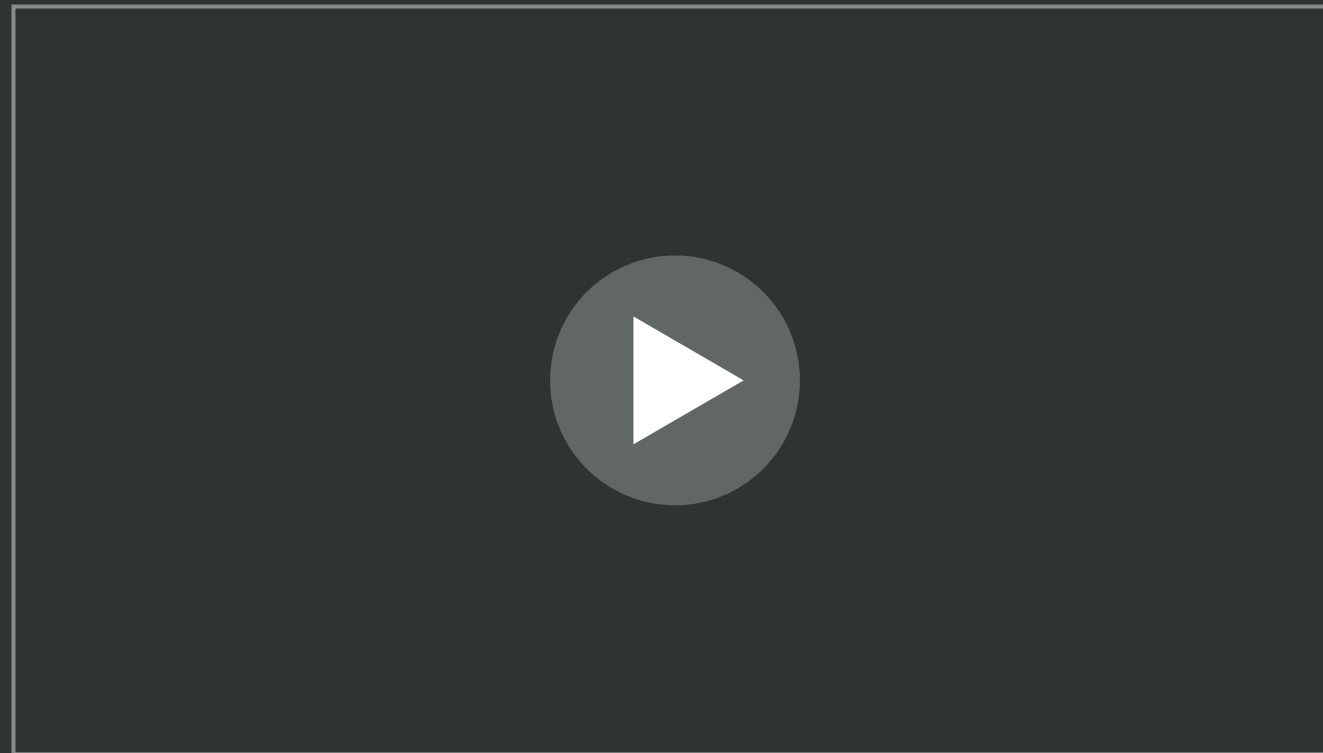


Good for shorter bones and angled splint positions; multiple malleable splints can be combined to support longer bone fractures



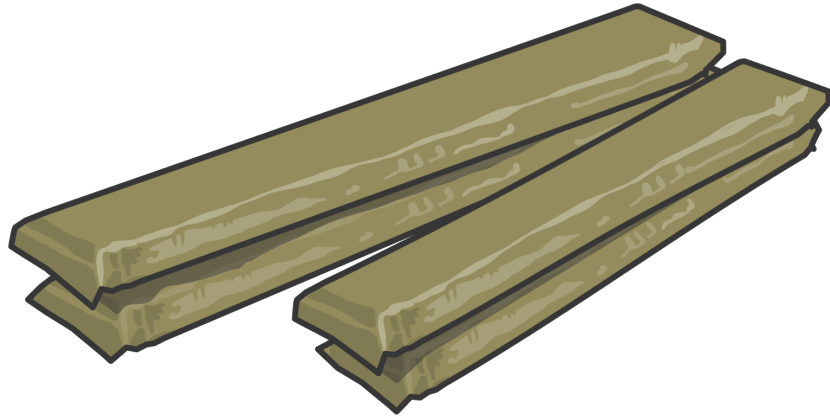
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MALLEABLE SPLINTING

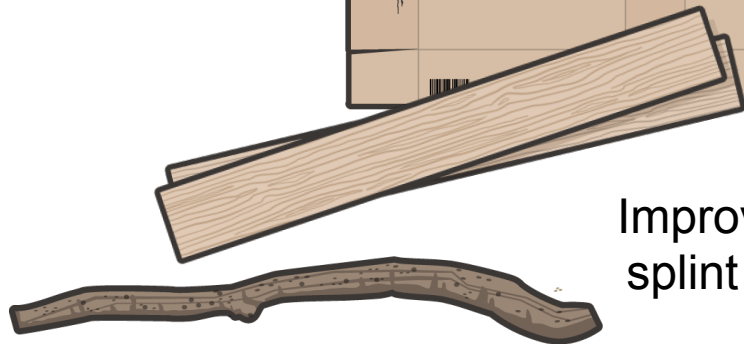
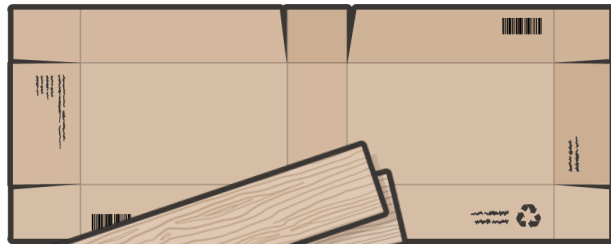


Video can be found on deployedmedicine.com

RIGID SPLINTS

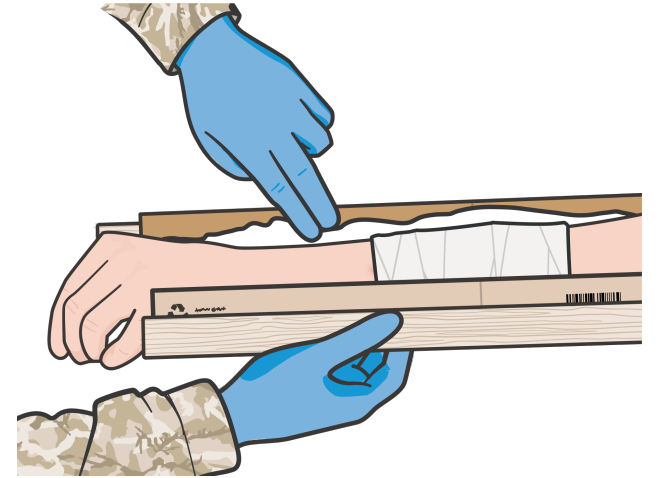


Padded board splints



Improved rigid splint materials

The lack of anatomic contours will usually require more padding

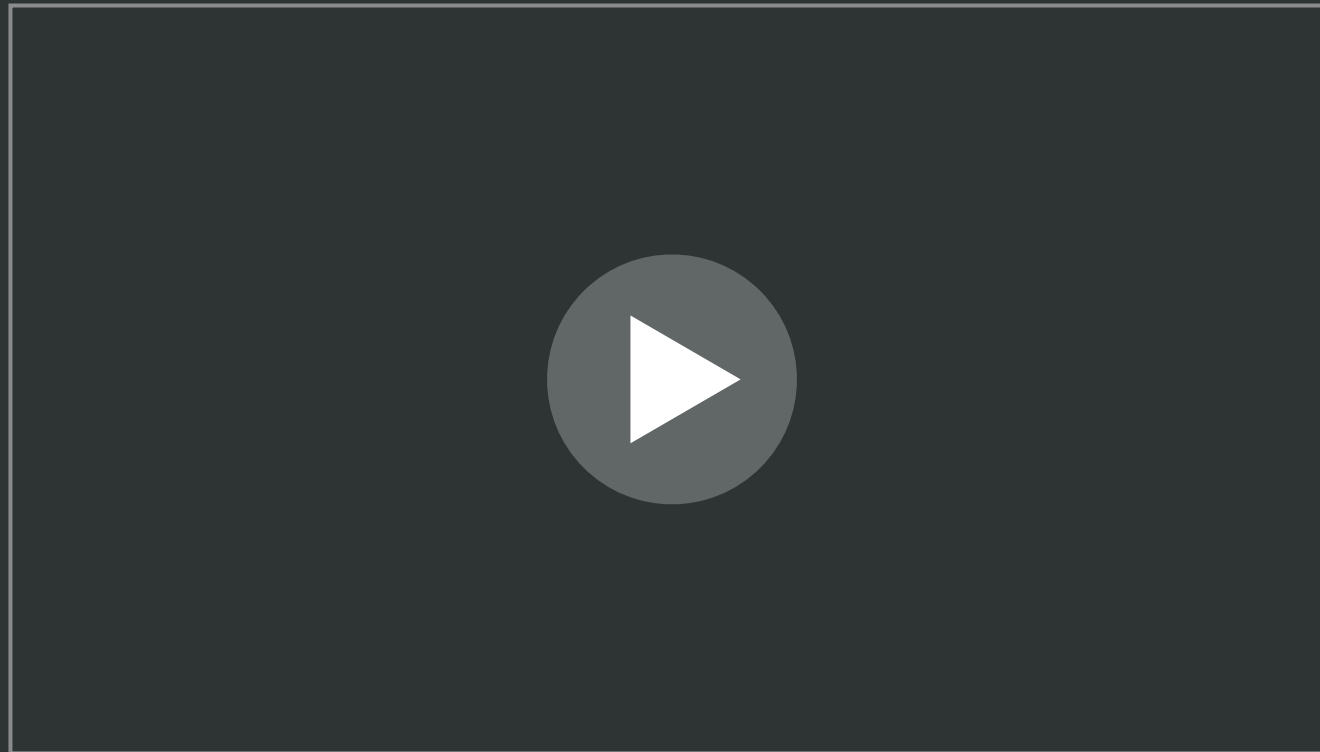


Often the ends of the splints stick out, creating a hazard during casualty transport



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RIGID SPLINTING



Video can be found on deployedmedicine.com

THINGS TO AVOID WHEN SPLINTING

- ✘ **Manipulating the fracture site too much**; resulting in pain, additional damage to tissues, blood vessels and nerves
- ✘ **Splinting near or over a wound** that has not be properly treated
- ✘ **Failing to immobilize joint** above and below fracture when possible
- ✘ **Securing too tightly**, cutting off blood flow
- ✘ **Making casualty uncomfortable** during transport/evacuation

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SKILL STATION

Splinting



Splint application using malleable and rigid

SUMMARY

- Identifying the signs and symptoms of fractures
- Distinguishing open from closed fractures
- The basic management of fractures
- Splint application using both malleable, rigid, and improvised splints



The most important aspects of splinting are to prevent further injury, splint in a way that does not harm the nerves or blood vessels in the splinted extremity, and minimize the casualty's pain

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CHECK ON LEARNING



What are the three objectives of fracture management and splinting?



True or False: When applying a splint, ensure the joints above and below the fracture are immobilized in the splint whenever possible.

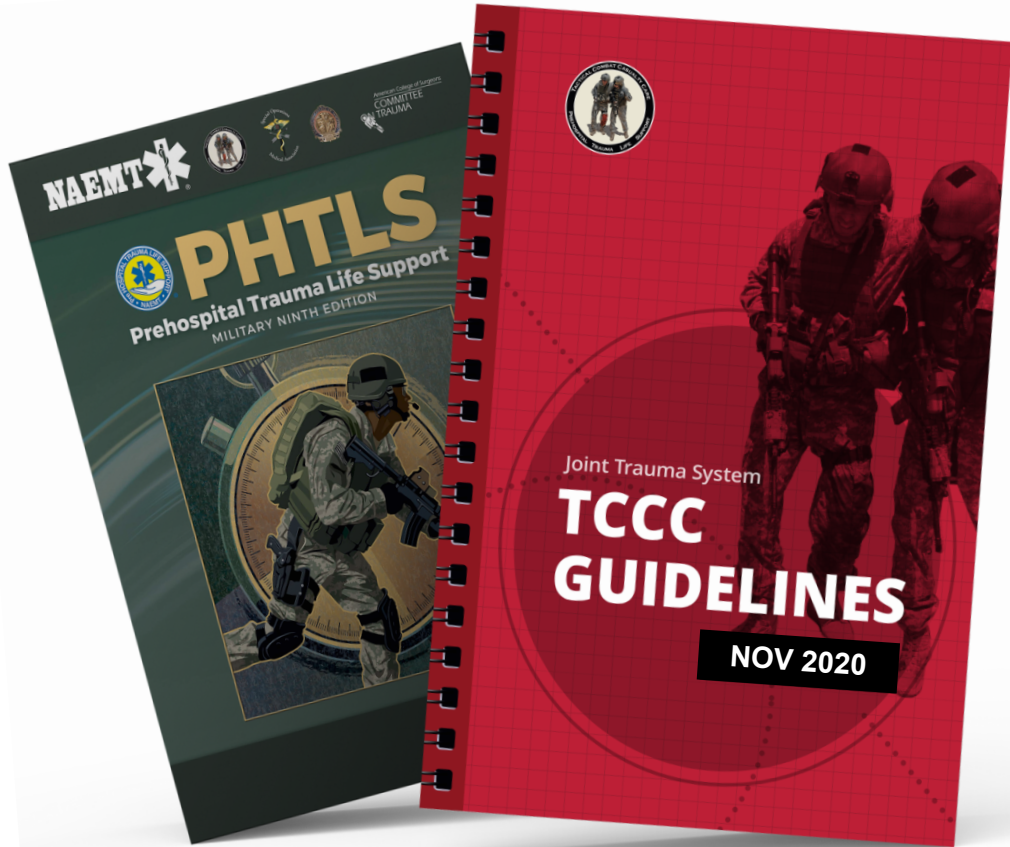


What should you assess before and after splinting?



ANY QUESTIONS?

REFERENCES



TCCC: Guidelines

by JTS/CoTCCC

Updated regularly – latest edition dated
5 November 2020

These guidelines are the result of decisions made by the Committee on Tactical Combat Casualty Care as they explore evidence-based research regarding best practices

PHTLS: Military Edition, Chapter 25

by NAEMT

**Prehospital Trauma Life Support,
Military Ninth Edition**