CMC TCCC

COMBAT MEDIC/ CORPSMAN

DHA Defense Health Agency JOINT TRAUMA SYSTEM

TACTICAL COMBAT CASUALTY CARE COURSE

MODULE 08: RESPIRATION ASSESSMENT AND MANAGEMENT IN TFC

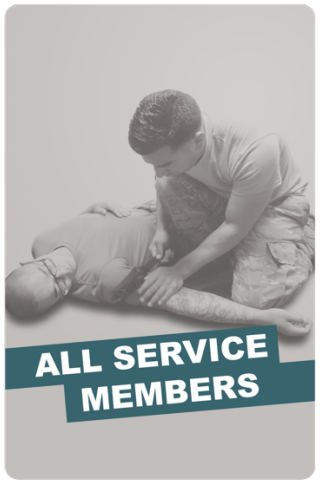
Committee on Tactical Combat Casualty Care (CoTCCC)

TCCC TIER 1	TCCC TIER 2	TCCC TIER 3	TCCC TIER 4
All Service Members	Combat Lifesaver	Combat Medic/Corpsman	Combat Paramedic/Provider

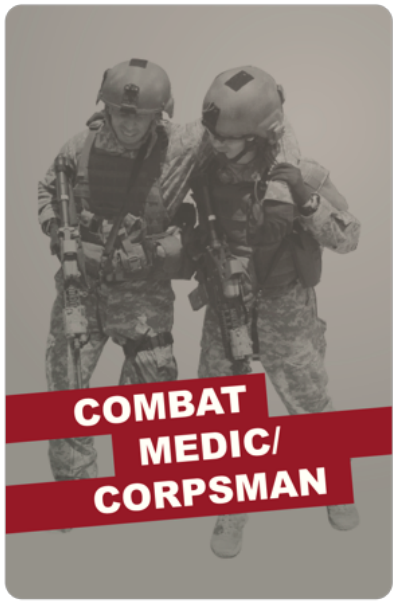
TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

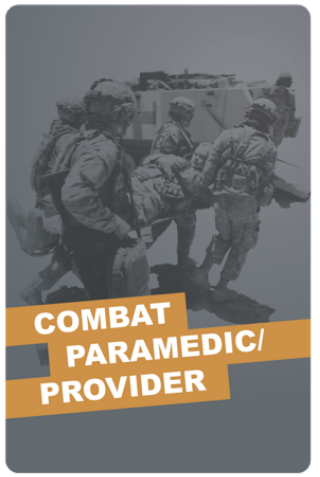
ROLE 1 CARE

NONMEDICAL PERSONNEL



MEDICAL PERSONNEL





◀ YOU ARE HERE

STANDARDIZED JOINT CURRICULUM

1 x TERMINAL LEARNING OBJECTIVES

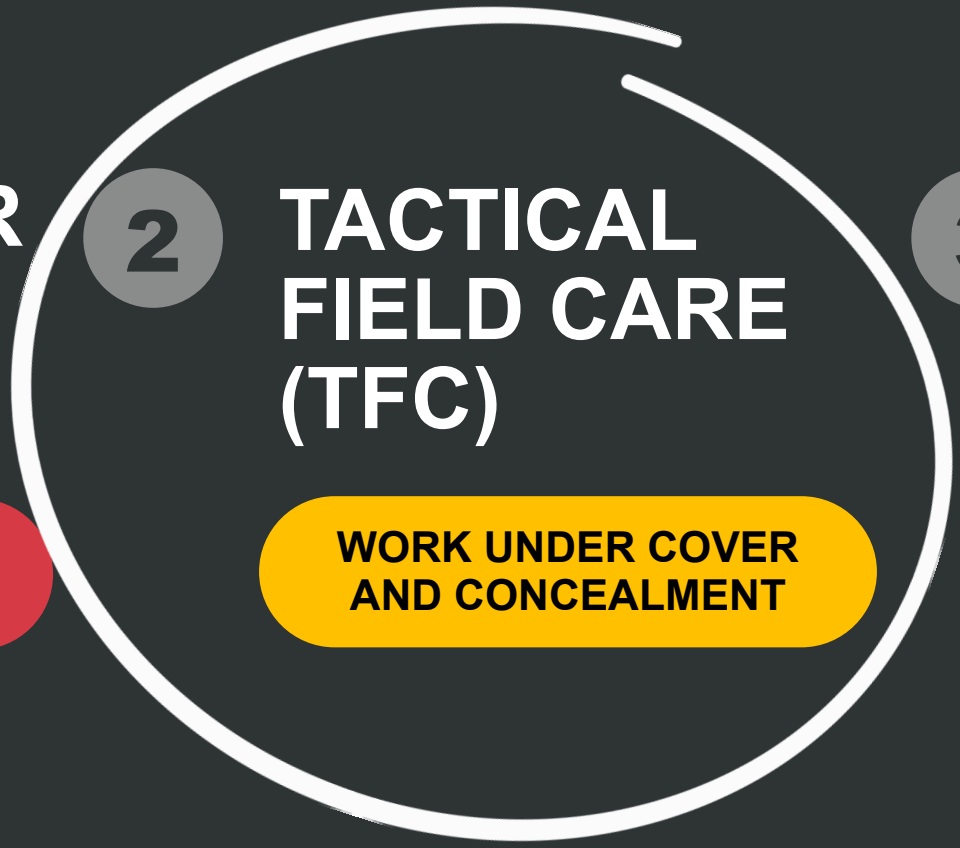
09 **Given a combat or noncombat scenario, perform assessment and management of respiration and chest trauma during Tactical Field Care in accordance with CoTCCC Guidelines.**

- **9.1** Identify the signs and symptoms of respiratory distress. (ASM T5:E23)
- **9.2** Identify the signs and symptoms of a life-threatening chest injury. (ASM T5:E24)
- **9.3** Identify the signs and symptoms of open pneumothorax (sucking chest wound) in Tactical Field Care. (CLS T9:E52)
- **9.4** Identify the importance and implications of vented and non-vented chest seals. (CLS T9:E53)
- **9.5** Demonstrate the application of a chest seal to an open chest wound. (CLS T9:E54)
- **9.6** Identify the signs, symptoms, and initial treatment of tension pneumothorax in Tactical Field Care. (CLS T9:E55)
- **9.7** Demonstrate a needle decompression of the chest at the second intercostal space in the midclavicular line. (CLS T9:E56)
- **9.8** Demonstrate a needle decompression of the chest at the fifth intercostal space in the anterior axillary line. (CLS T9:E57)
- **9.9** Identify the signs of recurring or unsuccessful treatment of tension pneumothorax. (CLS T9:E58)

09 x ENABLING LEARNING OBJECTIVES

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

Three PHASES of TCCC



1. **CARE UNDER FIRE (CUF) / THREAT**
   - RETURN FIRE AND TAKE COVER
2. **TACTICAL FIELD CARE (TFC)**
   - WORK UNDER COVER AND CONCEALMENT
3. **TACTICAL EVACUATION CARE (TACEVAC)**
   - MORE DELIBERATE ASSESSMENT AND PRE-EVACUATION PROCEDURES

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MARCH PAWS

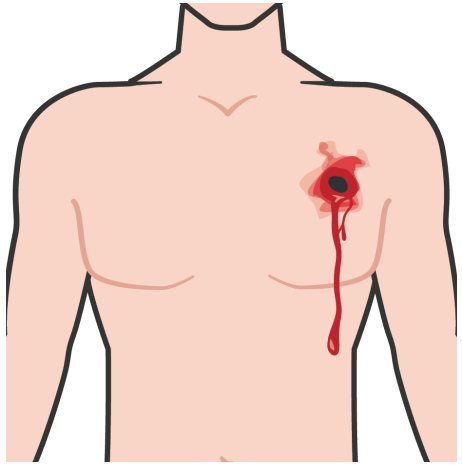
LIFE-THREATENING

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

AFTER LIFE-THREATENING

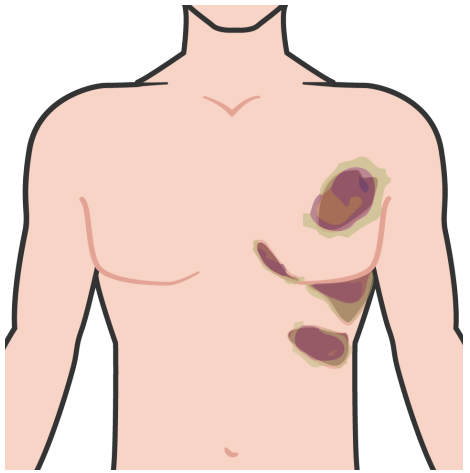
- **P** PAIN
- **A** ANTIBIOTICS
- **W** WOUNDS
- **S** SPLINTING

LIFE-THREATENING CHEST INJURY



PENETRATING TRAUMA

Gunshot or shrapnel wound to the chest



BLUNT FORCE TRAUMA

Force from an improvised explosive device explosion (IED), high-impact vehicle accident (chest hitting steering wheel), etc.

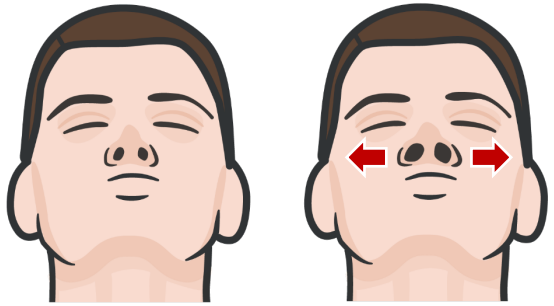
Deformities, Bruising, swelling, **contusions** (around the chest, back or rib cage), **crepitus** which is felt or heard (crackling, popping, grating)

ANY deformities of the chest

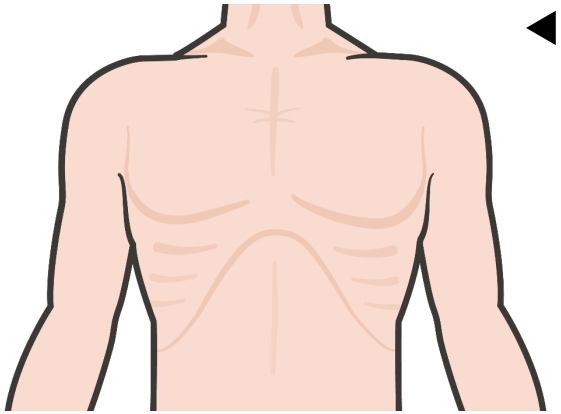
REMEMBER: These injuries can lead to a tension pneumo-thorax.
This is the **one of the most common causes** of preventable deaths on the battlefield

M A R C H

SIGNS OF RESPIRATORY DISTRESS



NASAL FLARING ▲
The nostrils widen when the patient breaths



◀ RETRACTIONS
Suprasternal notch or intercostal retractions, when the skin sinks into the chest wall when the patient inhales

◀ TRIPOD POSITIONING
The patient will sit or stand leaning forward while supporting the upper body with hands on the knees

CONFUSION/ LIGHTHEADED and/or **AGITATION** due to lack of oxygen

TACHYPNEA **DYSPNEA**

CYANOSIS
around mouth and lips

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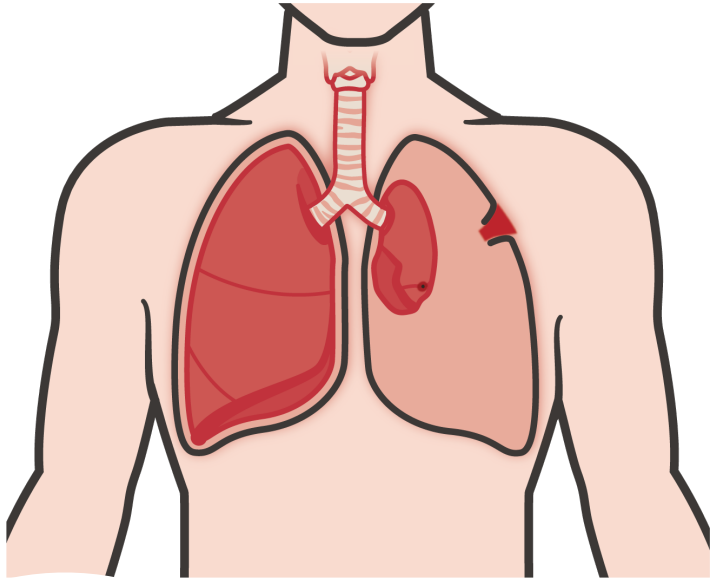
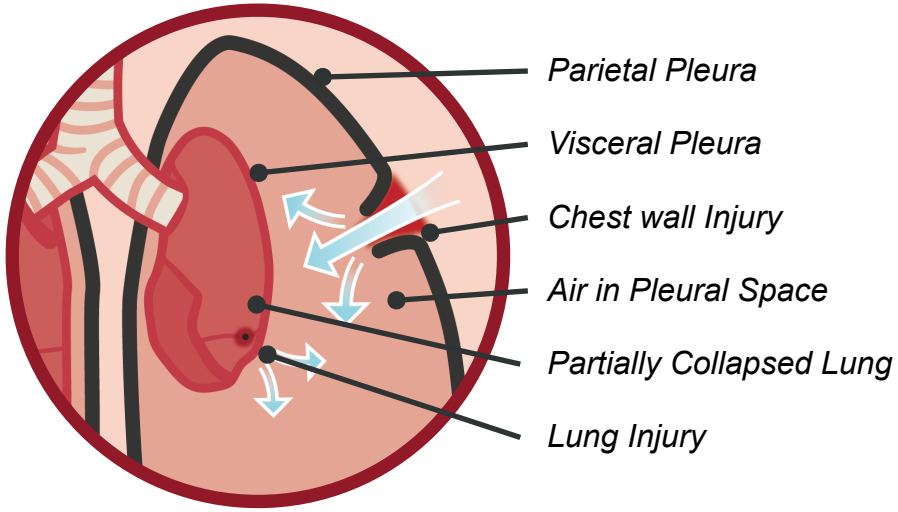
PULSE OXIMETRY

PULSE OXIMETRY is a tool that can help you determine if your patient is in respiratory distress.

A pulse ox level that is **less than 90%** can indicate a casualty is in respiratory distress.

OPEN PNEUMOTHORAX





The pleural space between lungs and chest wall naturally has negative pressure which helps the lungs stay expanded, and not collapse during exhalation

PENETRATING INJURIES TO THE CHEST WALL can be difficult to find through the casualty's clothes, protective gear and low-light situations

- On inspiration, air enters the chest through the wound and not the normal anatomy
- The affected lung cannot be fully re-inflated by inhalation
- The wound can be as small 2.0-2.5 cm in diameter and can cause an open pneumothorax

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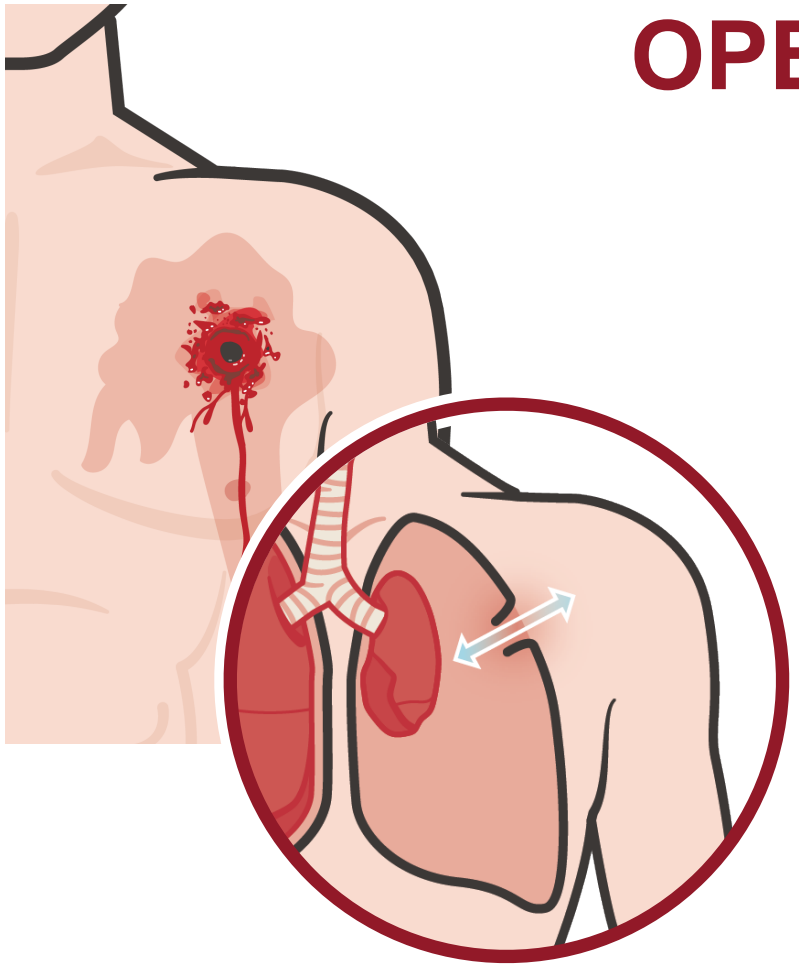
IDENTIFYING AN OPEN PNEUMOTHORAX



Open Pneumothorax

Signs and symptoms of a **sucking chest wound** in TFC

A casualty with an open chest wound will exhibit **ONE OR MORE** of the following signs and symptoms:

- Respiratory Distress
- A **puncture wound** of the chest
- **Froth** or **bubbles** around the injury
- A "**sucking**" or "**hissing**" sound when the casualty **inhales**
- Coughing up blood
- Blood-tinged sputum

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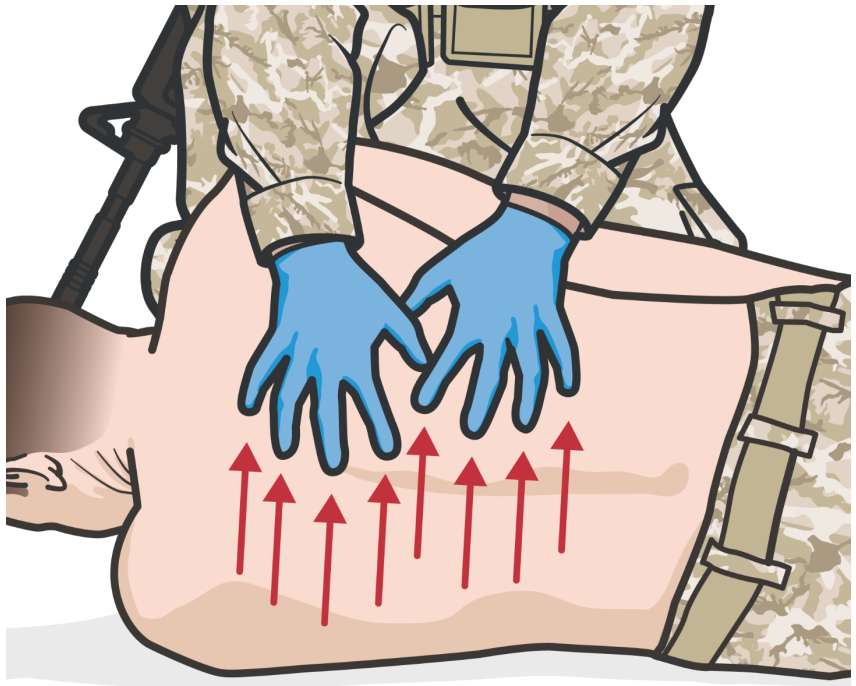
IDENTIFYING ADDITIONAL CHEST WOUNDS



Raking motion

EXPOSE, UNCOVER, and **CHECK/FEEL** for additional open chest wounds by using a *raking motion* (anterior, posterior, and axillary)

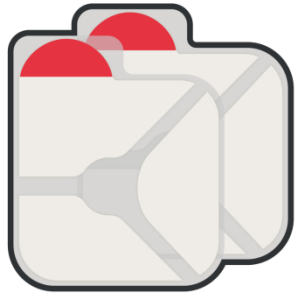
Treat them with additional vented chest seals

MARCH

VENTED AND NON-VENTED CHEST SEALS

For an **open** or **sucking chest wound,** **prompt application** of a vented chest seal is recommended

- When the casualty inhales, the plastic should be sucked against the wound, **preventing the entry of air**
- When the casualty exhales, trapped air should be able to escape from the wound and out the valve
- The injured lung will remain partially collapsed, **but the mechanics of respiration will be better**



⚠ If vented chest seal is **not** available, a non-vented chest seal should be used

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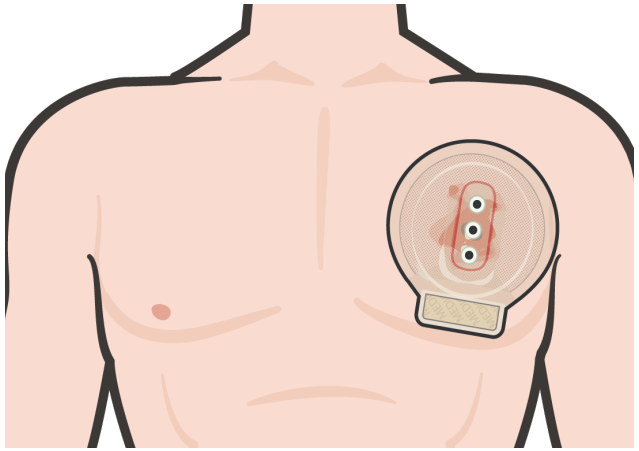
APPLYING & MANAGING CHEST SEALS

Chest seals are for **treating penetrating wounds** to the chest

- Place gloved hand or back of hand over the patients wound
- Use the casualty's chest seal from their JFAK
- Wipe excess blood, sweat or dirt away from wound
- When casualty exhales, place adhesive side directly over open/ sucking chest wound, pressing firmly to create a seal



⚠ **EDGES** of the chest seal must extend **2 INCHES BEYOND** the **edges** of the **wound**
MONITOR the casualty **closely** and if their condition **worsens**, you should **suspect a tension pneumothorax**. **Treat this by BURPING or temporarily removing the dressing for a few seconds**

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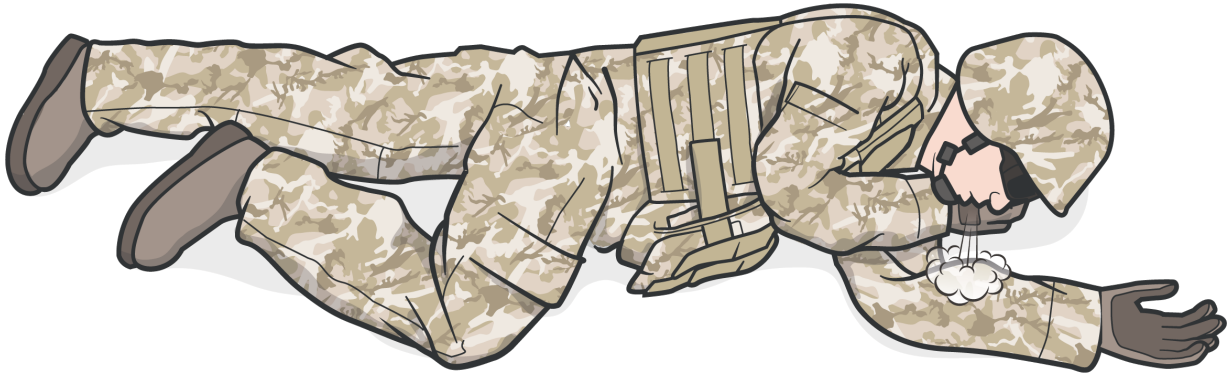
POSITION AFTER APPLYING VENTED CHEST SEAL



If the casualty is **UNCONSCIOUS**, place the casualty in the **RECOVERY POSITION** with the **injured side down**

If the casualty is **CONSCIOUS**, allow the casualty to adopt the **SITTING POSITION** or **POSITION** of **COMFORT** that helps the casualty to breath.

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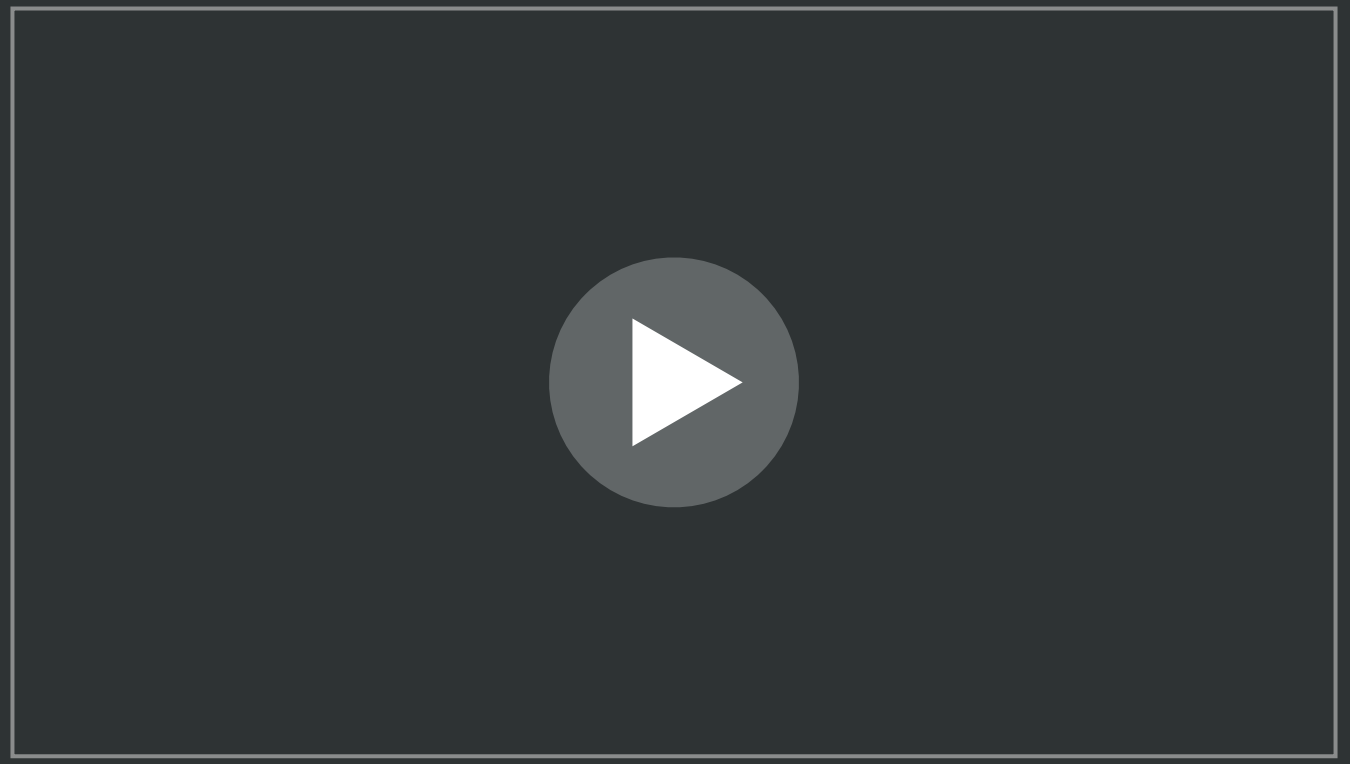
CHEST SEAL VIDEO



Video can be found on deployedmedicine.com

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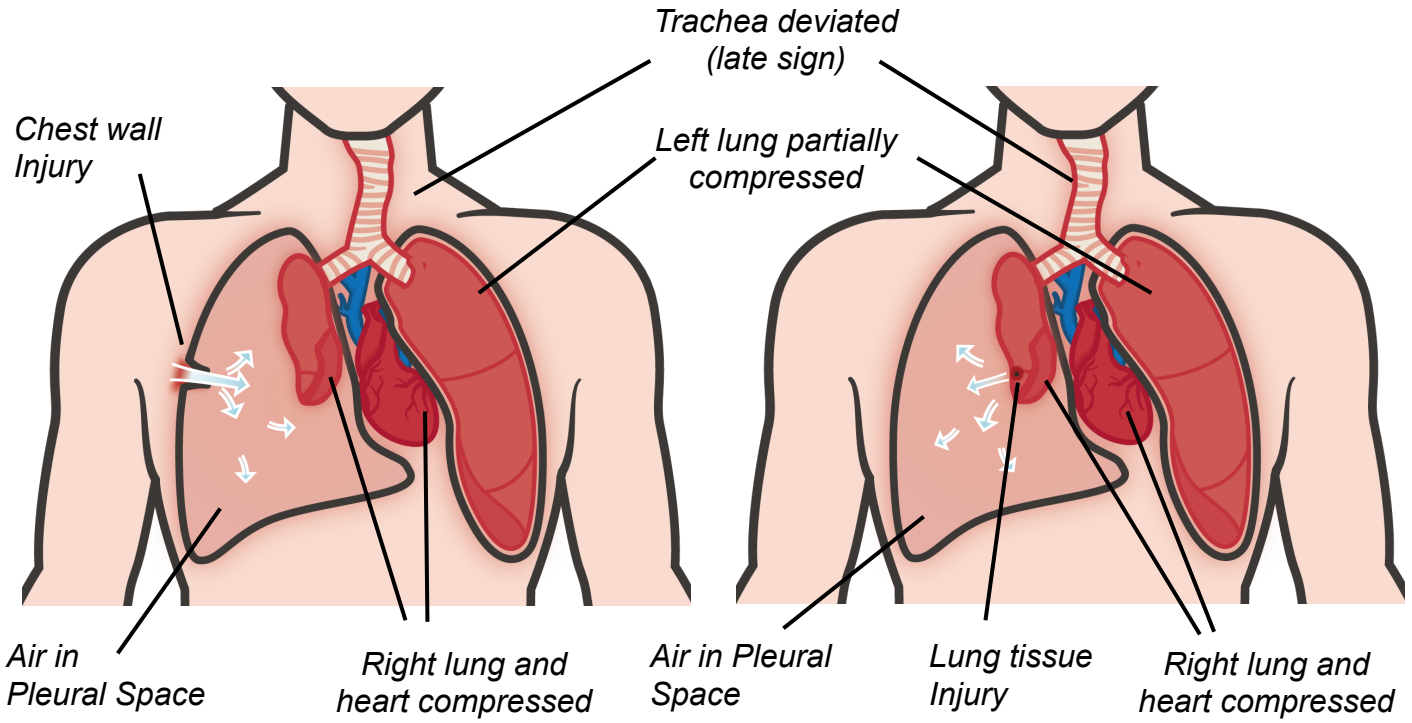
SKILL STATION

Respiration (skill)

Chest Seal Application

TENSION PNEUMOTHORAX

Consider the mechanism of injury such as significant torso trauma or primary blast injury that could cause a tension pneumothorax.



As a tension pneumothorax develops, **air enters** the chest cavity **through the wound WITH EVERY BREATH**

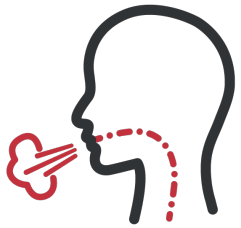
Injured lung tissue acts as a **one-way valve**, **TRAPPING more and more air between the lung and the chest wall**

PRESSURE BUILDS UP AND COMPRESSES BOTH LUNGS AND THE HEART

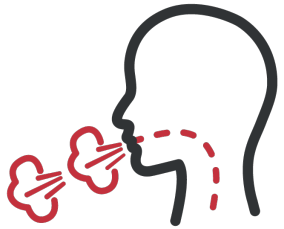
MARCH

IDENTIFYING TENSION PNEUMOTHORAX

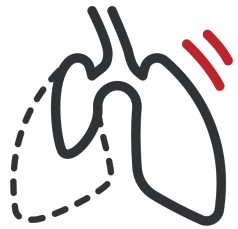
EARLY signs of a Tension Pneumothorax



Severe or progressive **RESPIRATORY DISTRESS**

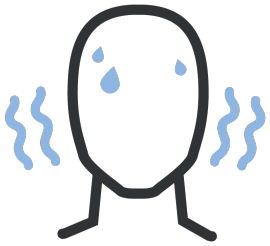


Severe or progressive **TACHYPNEA**

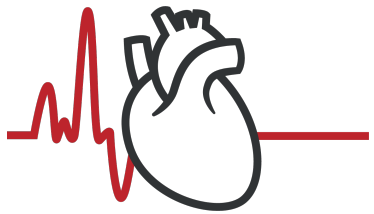


ABSENT or markedly **DECREASED** breath sounds one side of chest

Hemoglobin oxygen saturation **<90%** on **PULSE OX**



SHOCK



Traumatic **CARDIAC ARREST WITHOUT** obviously fatal wounds

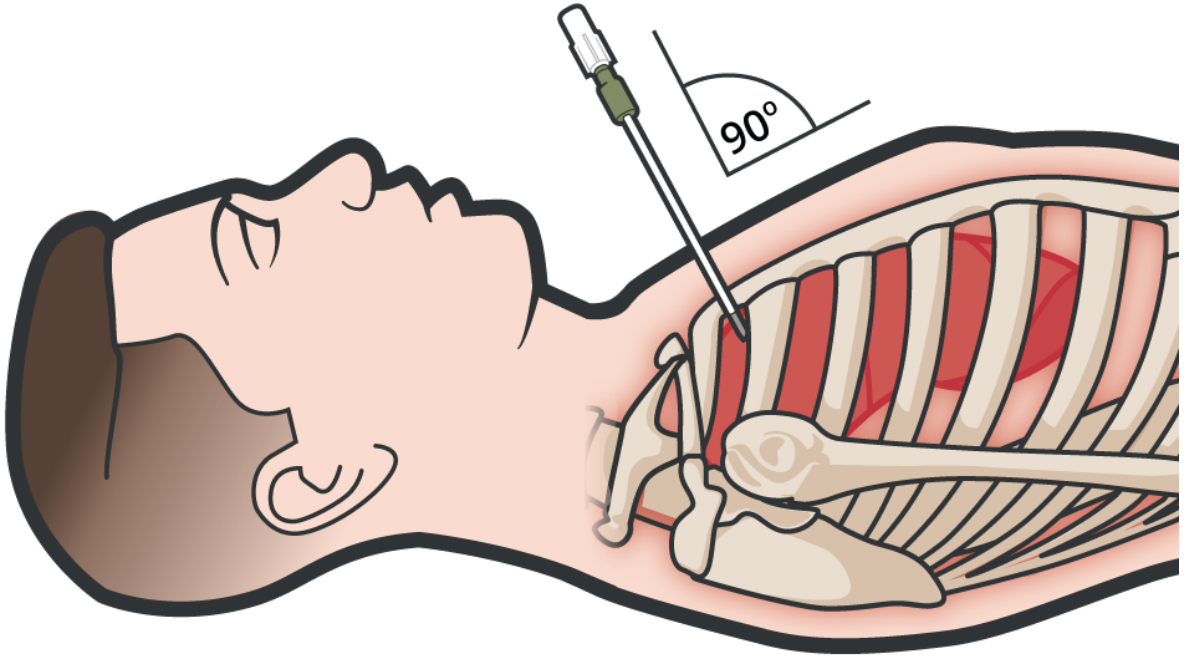
LATE signs of a Tension Pneumothorax

- **TRACHEAL DEVIATION**
- **SUBCUTANEOUS EMPHYSEMA**
- **JUGULAR VEIN DISTENTION**
- **MEDIASTINAL SHIFT**

CONSIDER TENSION PNEUMOTHORAX IN TACTICAL FIELD CARE

Despite modern body armor, tension pneumothorax remains **a leading cause of preventable death** on the battlefield

The recommended treatment of suspected tension pneumothorax is **Needle Decompression of the Chest (NDC)**



M A R C H

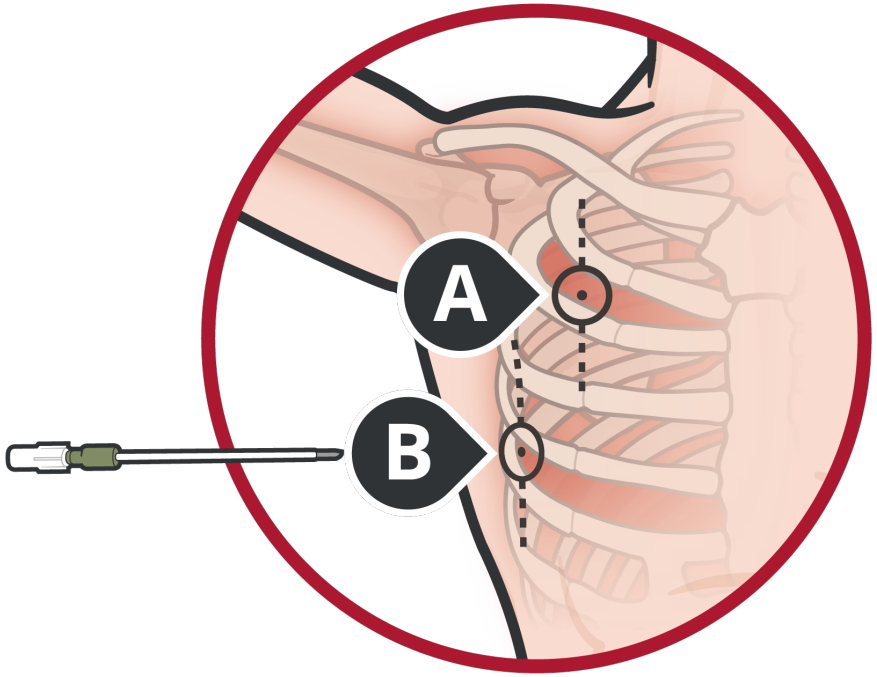
NDC SITE SELECTION

There are two sites to choose, neither is better than the other. Use either:

- **A** The **second** intercostal space, mid-clavicular line (MCL)

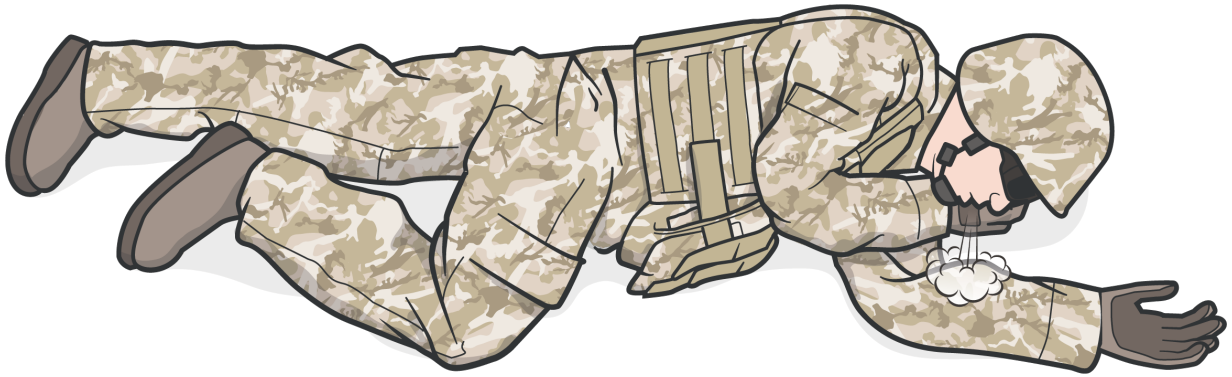
  or

- **B** The **fifth** intercostal space, anterior axillary line (AAL)



⚠ **NEVER** insert the needle medial to the nipple line for a MCL insertion.

POSITION AFTER NDC TREATMENT



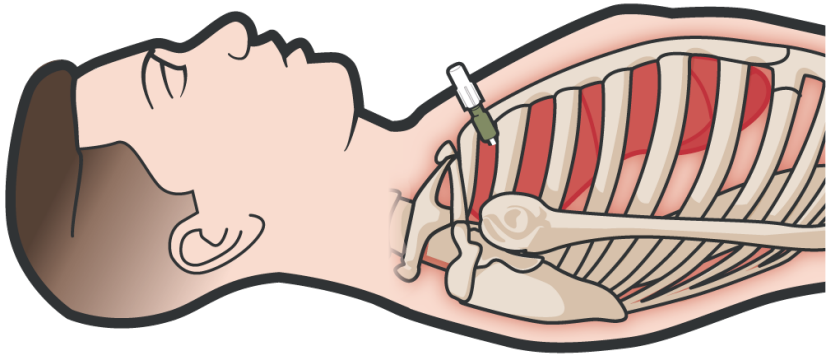
If the casualty is **UNCONSCIOUS**, place the casualty in the **SUPINE** or **RECOVERY POSITION** with the **injured side down**

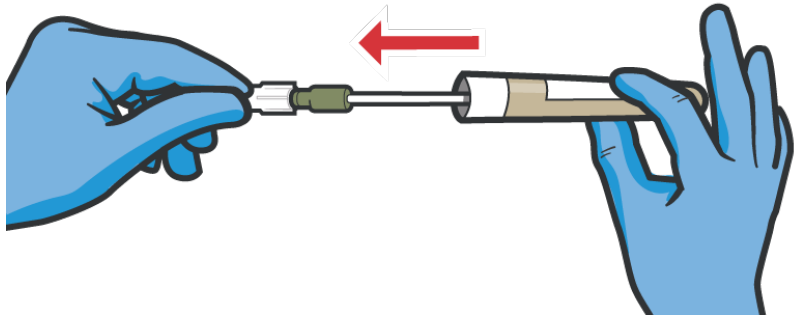
If the casualty is **CONSCIOUS**, allow the casualty to adopt the **SITTING POSITION** to help keep the airway clear as a result of maxillofacial trauma.

EXCESSIVE MOVEMENT may cause the NDC to become dislodged or obstructed,
EXERCISE CAUTION WHILE MOVING YOUR CASUALTY

UNSUCCESSFUL TREATMENT OR RECURRENCE OF TENSION PNEUMOTHORAX

- **BURP CHEST SEAL** if in place
- If tension pneumothorax initially responds to NDC, **but** symptoms later **recur**, then **perform second NDC at the same site lateral to the original NDC**
- If **initial** NDC **does not** result in improvement, **perform second NDC** at the alternate NDC site.
- If **no improvement** is noted with these measures, **proceed with circulation** assessment and treatment following the **MARCH protocol**





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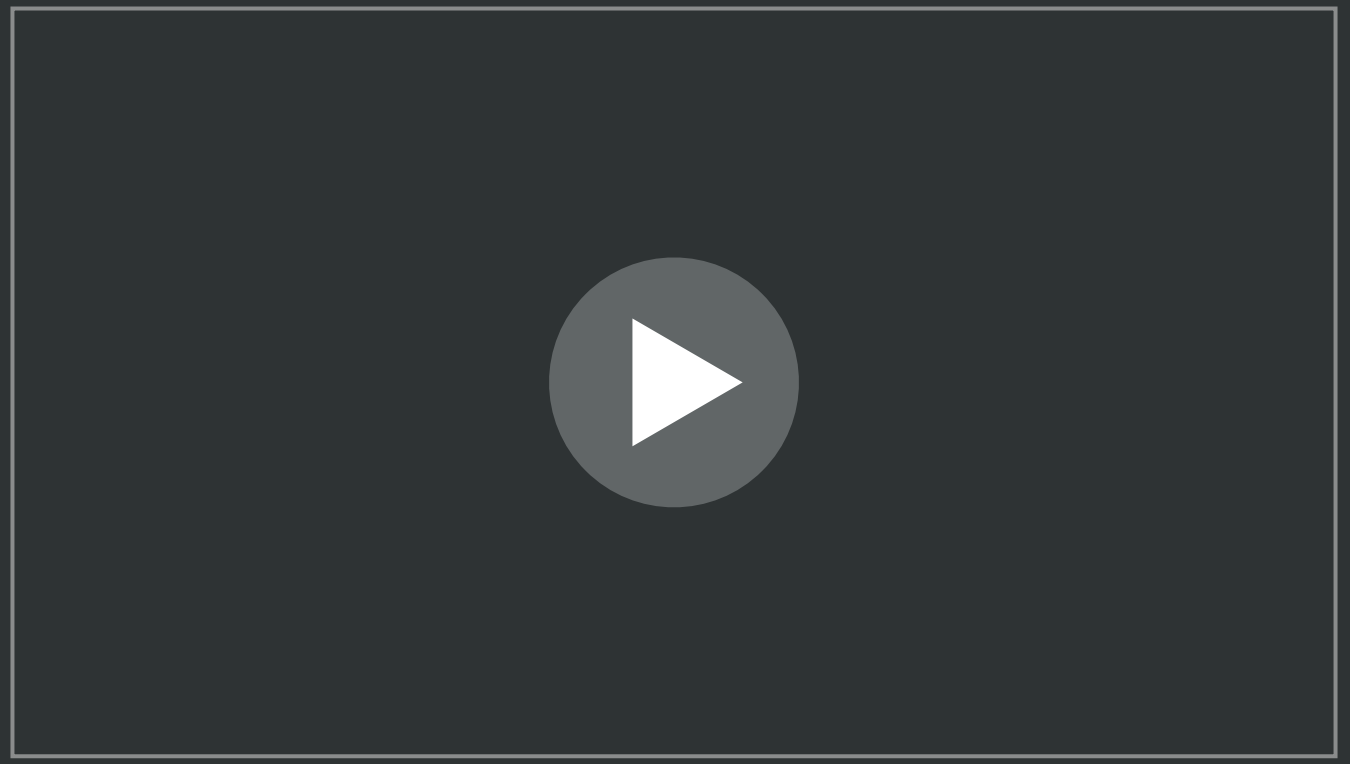
NEEDLE DECOMPRESSION OF THE CHEST



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SKILL STATION

Respiration (skill)

Needle Decompression of Chest (NDC)

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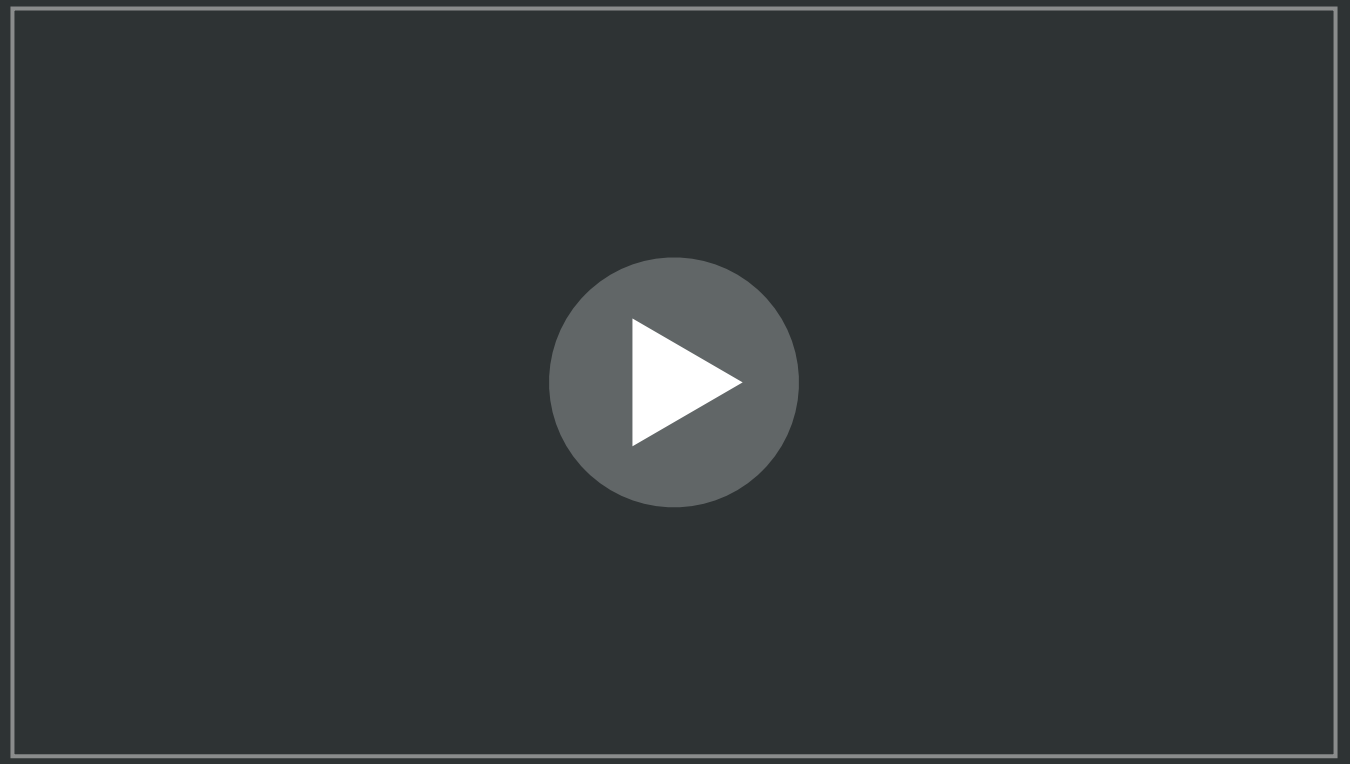
RESPIRATION MANAGEMENT HIGHLIGHTS



Video can be found on deployedmedicine.com

SUMMARY

- **RESPIRATIONS** (the **R** in MARCH) is assessed and managed in TFC
- Once you have identified a penetrating chest injury, place a gloved hand on the injury
- The application of a vented chest seal can “close” an open pneumothorax
- One of the most common causes of preventable death on the battlefield is tension pneumothorax, which is treatable
- Either location for the NDC is acceptable, either 5th ICS AAL or 2nd ICS MCL

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CHECK ON LEARNING

What is a tension pneumothorax?

How should you treat an open chest wound?

What should you do if you suspect a casualty has a tension pneumothorax?

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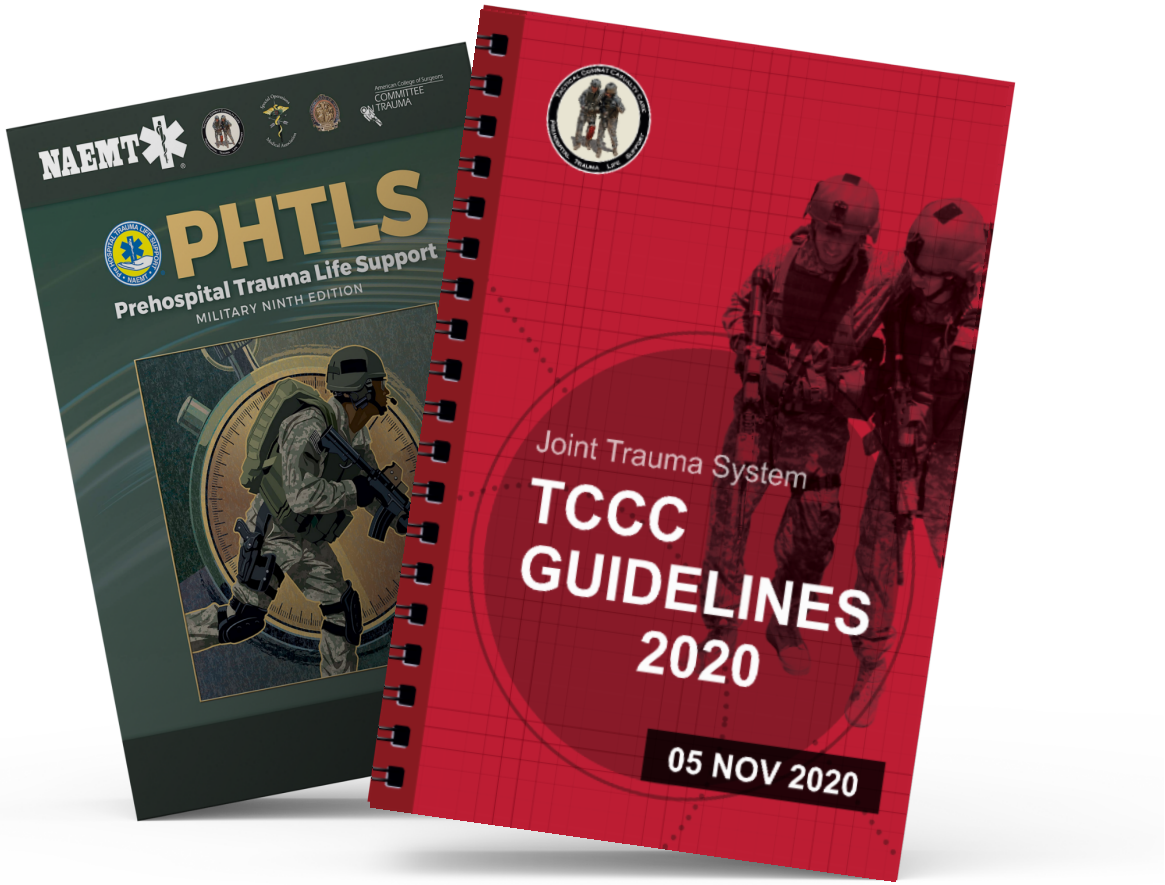
ANY QUESTIONS?

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

by NAEMT

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