CPP TCCC

COMBAT PARAMEDIC/PROVIDER

TACTICAL COMBAT CASUALTY CARE

MODULE 08

RESPIRATION ASSESSMENT AND MANAGEMENT IN TFC

Skill Instructions

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Committee on Tactical Combat Casualty Care (CoTCCC)

CHEST SEAL INSTRUCTION

TASK:	Apply an occlusive dressing/vented chest seal to an open/sucking chest wound
CONDITION:	Given a scenario where casualty and responder are in combat gear in the Tactical Field Care phases and the casualty has an open chest injury and you have a vented chest seal (preferred) or a non-vented chest seal to cover the defect, and the casualty's Joint First Aid Kit (JFAK)
STANDARD:	Demonstrate proper application of a vented chest seal following all steps and meeting performance measures without causing further injury to the casualty
EQUIPMENT:	Casualty's JFAK with a vented chest seal

PERFORMANCE MEASURES: step-by-step instructions

NOTE: Consider body substance isolation.
NOTE: If a Combat Lifesaver is available, direct them to assist.

1 Expose and uncover any anterior, posterior or axillary chest wounds.
NOTE: If multiple wounds are found, treat them in the order in which you found them.
1 Check for signs of an open and/or sucking chest wound.
NOTE: If you are not sure if the wound has penetrated the chest wall completely, treat the wound as though it were an open chest wound.
2 Place hand or back of hand over open chest wound to create a temporary seal.
3 Fully open the outer wrapper of the commercial vented chest seal or other airtight material from the casualty's JFAK.
NOTE: If a vented chest seal is not available, use a non-vented chest seal.
4 Remove and use the 4X4 gauze from the commercial vented chest seal package (or other gauze) to wipe away any dirt, blood, or other fluid.
5 Peel off the protective liner, exposing the adhesive portion of the vented chest seal.
6 As the casualty exhales, place the adhesive side directly over the open/sucking chest wound, while pressing firmly to create a seal.
NOTE: Ensure edges of the chest seal extend 2 inches beyond the edges of the wound.
7 Ensure that the adhesive surface of the chest seal is adhering to the skin.
NOTE: Tape may be used to secure the edges of the vented chest seal if needed.
8 Assess the effectiveness of the vented chest seal when the casualty breathes.
NOTE: When the casualty inhales, the plastic should be sucked against the wound, preventing air entry.
NOTE: When the casualty exhales, trapped air should be able to escape from the wound and out the commercial chest seal valve.
9 Check/feel for additional open/sucking chest wounds (anterior, axillary, and posterior) by using a raking motion and treat them the same way with additional vented chest seals (repeat steps 3–9), if needed.
10 Place a ***conscious*** casualty in a sitting position or a position of comfort that best allows the casualty to breathe; place an ***unconscious*** casualty with their injured side down in the recovery position.
11 Monitor for signs of a tension pneumothorax.
NOTE: Signs include significant torso trauma or primary blast injury followed by severe/progressive respiratory distress (a respiratory rate less than 8 or greater than 20 breaths per minute, or an oxygen saturation <90%).
12 If signs of a tension pneumothorax develop, lift one edge of the vented chest seal and allow the tension pneumothorax to decompress ("burping" the seal).
NOTE: Alternatively, remove the chest seal for a few seconds to decompress and then reapply or

replace it with a new commercial vented chest seal.

13 If the signs of a tension pneumothorax persist despite burping the vented chest seal, perform a Needle Decompression of the Chest (see Needle Decompression of the Chest Instruction).

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

NEEDLE DECOMPRESSION OF THE CHEST (NDC) INSTRUCTION

TASK:	Perform NDC
CONDITION:	Given a scenario where the casualty and responder are in combat gear in the Tactical Field Care phase and the casualty has significant torso trauma followed by severe/progressive respiratory distress, and you have NDC equipment in your Combat Lifesaver (CLS) or medic aid bag
STANDARD:	Perform NDC in 3 minutes or less
EQUIPMENT:	CLS/medic aid bag, exam gloves, 14- or 10-gauge, 3.25 in needle/catheter unit, and a sharps container

PERFORMANCE MEASURES: step-by-step instructions

NOTE: Consider body substance isolation.
NOTE: If a CLS is available, direct them to assist.

1 Assess the casualty for signs of suspected tension pneumothorax.
NOTE: Signs of a tension pneumothorax include significant torso trauma or primary blast injury followed by severe/progressive respiratory distress (respiratory rate of less than 8 or greater than 20 breaths per minute, or an oxygen saturation <90%).

15 If a vented chest seal has been previously applied, burp or remove the vented chest seal (if improperly applied, replace the vented chest seal) and reassess the casualty (see Chest Seal Instruction).

16 Identify site placement for needle insertion on the side of the injury.
NOTE: Either of two sites can be used (whichever one is more accessible):
(a) Fifth intercostal space (ICS) in the anterior axillary line on the side of the injury or decreased breath sounds.
(b) Second ICS at the midclavicular line on the side of the injury or decreased breath sounds.
NOTE: **Do not** insert the needle medial to the nipple line**.**

17 Secure a 14-gauge or a 10-gauge, 3.25 in needle/catheter unit.
NOTE: Remove the Luer lock cap from the needle catheter (if applicable).

18 If available, use an antiseptic solution or a pad to clean the site.

19 Insert the needle/catheter just over the top of the lower rib at the insertion site, at a 90-degree angle (perpendicular) to the chest wall, advancing it to the hub.

20 Leave the needle/catheter unit in place for 5–10 seconds to allow decompression to occur; then remove the needle, leaving the catheter in place.

21 Assess for successful needle decompression. Signs of success include:
(a) Respiratory distress improves.
(b) There is an obvious hissing sound as air escapes from the chest when NDC is performed.
NOTE: This may be difficult to appreciate in high-noise environments.
(c) Hemoglobin oxygen saturation increases to 90% or greater (respiratory distress should improve).
NOTE: This may take several minutes and may not happen at altitude.

22 If the first NDC fails to improve the casualty's signs/symptoms, then perform a second NDC on the same side of the chest at whichever of the two recommended sites was not previously used.
NOTE: Use a new needle/catheter unit for the second decompression attempt.

23 Place the casualty in a position of comfort or recovery position with the injured side down.

24 Continue reassessing the casualty for the reoccurrence of progressive respiratory distress.

25 If the initial NDC was successful, but symptoms later recur, then perform another NDC at the same site that was used previously. Use a new needle/catheter unit for the repeat NDC.

26 If the second NDC is also not successful, then continue onto the Circulation section of the Massive bleeding, Airway, Respiration, Circulation, Hypothermia/Head injury sequence.

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

FINGER THORACOSTOMY INSTRUCTION

TASK:	Thoracostomy (Finger)
CONDITION:	While in the Tactical Field Care (TFC) phase, you encounter a casualty with a suspected hemothorax or pneumothorax and will require a thoracostomy.
STANDARD:	Effectively perform a finger thoracostomy following all steps and measures correctly without causing further harm to the casualty.
EQUIPMENT:	Sterile gloves, stethoscope, sterile drape, scalpel (#10 or #15 blade), Kelly clamp, disinfectant solution (Betadine, Chlorhexidine, etc.), lidocaine 1% for injection, 18g needle, 23g needle, 10mL syringe, alcohol pads, 4x4's, tape and DD Form 1380 (TCCC card).

PERFORMANCE MEASURES: step-by-step instructions

NOTE: Consider body substance isolation.
NOTE: Direct Combat Lifesaver or Combat Medic/Corpsman to assist as needed.

1. Explain the procedure to casualty (if conscious).
2. Take and record baseline vital signs and respiratory assessment.
3. Prepare the casualty.
   (a) Position the casualty appropriately.
      (1) Raise the arm on the affected side above the casualty's head. If female, breast must be moved to identify the location and through procedure until complete.
   NOTE: If conscious, direct CLS or CMC to firmly hold the casualty's arm above their head.
   (c) Select the insertion site at the anterior axillary line over the 4th or 5th intercostal space.
4. Identify safe triangle and insertion site, 5th intercostal space in the midaxillary line.
   (a) The point of insertion in the chest most commonly occurs on the side (lateral thorax).
   A line drawn from the armpit (anterior axillary line) to the side (lateral) of the nipple in males, or to the side (about 2 to 5 cm) above the sternoxiphoid junction (lower junction of the sternum, or chest bone) in females.
5. Cleanse the site with an antiseptic solution.
6. Put on sterile gloves.
7. Drape the area.
8. Using aseptic technique, withdraw the desired amount of lidocaine using the 18g needle and liberally infiltrate the area with the 1% lidocaine solution using a 23g, 1.5-inch needle subcutaneously and in the underlying interspace.
   NOTE: Keep the total amount of Lidocaine used under 0.5 mL/kg of 1% lidocaine
   NOTE: If the casualty was given Ketamine for sedation or analgesia, lidocaine use may not be required.
9. Make an incision into the skin that is parallel to the rib.
   (a) Incision should be a 2 to 3 centimeters (cm) parallel to the rib over the selected site or directly over the rib (providing a backstop for the blade) and extend down to the intercostal

muscles.

CAUTION: Avoid puncturing the lung. Always use the superior margin of the rib to avoid the intercostal nerves and vessels.

(b) With Kelly clamp, perform a blunt dissect through the soft tissue passing over the superior aspect of the rib and into the chosen intercostal space and puncture the parietal pleura.

(c) Listen for and feel a "pop" as the points go into the cavity.

(d) Place the Kelly clamp, jaws closed on the rib and pointed toward the ICS above the rib.

(e) Spread the Kelly clamp, forcing the tissue apart.

(f) With the jaws of the clamp holding the hole open, carefully insert a gloved finger through the incision and into the pleural space to verify position.

(g) Once the finger is in place, remove the clamp.

(h) Widen the pleural opening and ensure there are no adhesions.

(i) Feel for lung tissue.

(j) Be sure there is air and the pink, spongy lung is immediately inside the chest. If not, you may be in the abdominal cavity.

(k) Allow 10-15 seconds to allow decompression of air in the chest cavity.

(l) Remove finger from chest

10 Apply 4x4's with tape as a protective dressing but with no occlusive properties.

11 Reassess the casualty.

(a) Check for bilateral breath sounds (or improvement on affected side)

(b) Clinical improvement e.g. respiratory distress improves and/or O2 SAT increases to 90% or greater.

(c) Monitor and record vital signs every 15 minutes.

(d) Administer analgesia for pain management (refer to Pain medication (Analgesia) skill instructions)

12 Document all findings and treatments on a DD Form 1380 TCCC Casualty Card and attach

to the casualty.

TUBE THORACOSTOMY INSTRUCTION

TASK:	Thoracostomy (Chest Tube)
CONDITION:	While in the Tactical Field Care (TFC) phase, you encounter a casualty suffering from a hemothorax or pneumothorax and requires a thoracostomy.
STANDARD:	Effectively insert a chest tube following all steps and measures correctly without causing further harm to the casualty.
EQUIPMENT:	Chest tube(16-36 French), gloves, stethoscope, sterile drape, one-way valve, scalpel (#10 or #15 blade), Kelly forceps x 2, disinfectant solution (Betadine, Chlorhexidine, etc.), needle driver, suture material (size 0 silk), lidocaine 1% for injection, petroleum

gauze, 18g needle, 23g needle, 10mL syringe, alcohol pads, 4x4's,and DD Form 1380 (TCCC card).

PERFORMANCE MEASURES: step-by-step instructions

NOTE: Consider body substance isolation.
NOTE: Direct Combat Lifesaver or Combat Medic/Corpsman to assist as needed.

1. Explain the procedure to casualty (if conscious).
2. Take and record baseline vital signs and respiratory assessment.
3. Prepare the casualty.
   (a) Position the casualty appropriately.
   (b) Raise the arm on the affected side above the casualty's head. If female, breast must be moved to identify the location and through procedure until complete.
   NOTE: If conscious, direct CLS or CMC to firmly hold the casualty's arm above their head.
   (c) Select the insertion site at the anterior axillary line over the 4th or 5th intercostal space.
4. Identify safe triangle and insertion site, 5th intercostal space in the midaxillary line.
   (a) The point of insertion in the chest most commonly occurs on the side (lateral thorax).
   A line drawn from the armpit (anterior axillary line) to the side (lateral) of the nipple in males, or to the side (about 2 to 5 cm) above the sternoxiphoid junction (lower junction of the sternum, or chest bone) in females.
5. Cleanse the site with an antiseptic solution.
6. Put on sterile gloves.
7. Drape the area.
8. Liberally infiltrate the area with the 1% lidocaine solution (with epinephrine if available) using a 23-gauge, 1.5-inch needle subcutaneously and in the underlying interspace that the chest tube will enter.
   NOTE: Keep the total amount of Lidocaine used under 0.5 mL/kg of 1% lidocaine
9. Make an incision into the skin that is parallel to the rib.
   (a) Incision should be a 2 to 3 centimeters (cm) parallel to the rib over the selected site (or directly over the rib) and extend down to the intercostal muscles and 1 to 2 cm below the interspace through which the tube will be placed.
   CAUTION: Avoid puncturing the lung. Always use the superior margin of the rib to avoid the intercostal nerves and vessels.
   (b) With Kelly clamp, perform a blunt dissect through the soft tissue passing over the superior aspect of the rib and into the chosen intercostal space and puncture the parietal pleura.
   (c) Listen for and feel a "pop" as the points go into the cavity.
   (d) Place the Kelly clamp, jaws closed on the rib and pointed toward the ICS above the rib.
   (e) Spread the Kelly clamp, forcing the tissue apart.
   (f) With the jaws of the clamp holding the hole open, carefully insert a gloved finger through the incision and into the pleural space to verify position.
   (g) Once the finger is in place, remove the clamp.
   (h) Widen the pleural opening and ensure there are no adhesions.

(i) Feel for lung tissue.

(j) Be sure there is air and the pink, spongy lung is immediately inside the chest. If not, you may be in the abdominal cavity.

NOTE: Do not remove your finger from hole until the tube has been inserted.

(k) Clamp the proximal end of the chest tube with a Kelly clamp.

(l) Grasp the tip of the chest tube with the other Kelly clamp.

(m) Insert the tip of the tube into the incision as you withdraw your finger in a posterior and cephalad motion (back and towards the head)

NOTE: Advance insertion of tube until the pleural cavity is reached. Drain insertion and positioning (aim apically for the pneumothorax or basally for hemothorax (fluid)).

(n) Advance the tube until the last fenestration is 2.5 to 5 cm inside the chest wall.

10 Connect the proximal end of the tube to a one-way drainage valve (e.g., Heimlich valve) and remove the proximal Kelly clamp.

11 Secure the chest tube with the 0 silk suture material using the purse string method.

12 Apply an occlusive dressing or commercial chest seal.

NOTE: Open the packages containing the petroleum gauze, 4 x 4 drain dressings, and gauze pads, then place the petroleum gauze and two 4 x 4 drain dressings around the insertion site, one from the top and the other from the bottom. Place several 4 x 4 gauze pads on top of the drain dressings. Tape the dressings, covering them completely to form an occlusive dressing.

13 Check the status of drainage (if any) by visualizing the amount collected through the one-way valve or chest tube drainage system (e.g. Pleurovac) if available.

14 Reassess the casualty.

(a) Check for bilateral breath sounds.

(b) Misting in the chest tube indicating proper placement and no fenestration obstructions.

(c) Clinical improvement e.g. respiratory distress improves and/or O2 SAT increases to 90% or greater.

(d) Monitor and record vital signs every 15 minutes.

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

Developed by the

JOINT TRAUMA SYSTEM

A Combat Support Division of the

DEFENSE HEALTH AGENCY