Clinical Practice Procedures: Respiratory/Emergency chest decompression – COOK Emergency Pneumothorax set

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<th>Date</th>
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<tr>
<td>Purpose</td>
<td>To ensure a consistent procedural approach for Emergency chest decompression – COOK Pneumothorax Set.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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**Tension pneumothorax** is a life-threatening condition that develops when air becomes trapped in the pleural cavity under pressure. The progressive build-up of pressure in the pleural space can collapse the lung, displace the mediastinum, and obstruct venous return to the heart. This leads to compromised cardiopulmonary function and may result in cardiac arrest.[1]

Emergency chest decompression is a life-saving procedure in the setting of a tension pneumothorax.

Although this procedure is not the definitive treatment for tension pneumothorax, emergency needle decompression can prevent further deterioration and restore some cardiopulmonary function.

### Indications

- Traumatic cardiac arrest (with torso involvement)
- Suspected tension pneumothorax with respiratory and/or haemodynamic compromise
  - **Respiratory:** Chest pain, dyspnoea, tachypnoea, surgical emphysema, diminished breath sounds on affected side, tracheal deviation, cyanosis
  - **Cardiovascular:** Tachycardia, ALOC, hypotension, JVD (may not be present with hypotension)
**Procedure**

1. Identify the appropriate insertion site: 2nd intercostal space, midclavicular line of the affected side (see illustration bottom left)
2. Swab the site with a 2% Chlorhexidine/70% Isopropyl Alcohol swab.
3. Place 5 mL of sodium chloride 0.9% in the supplied syringe.
4. Connect the syringe to the needle-catheter device.
5. Remove the needle-catheter protective sheath.
6. Using the sharp edge of the needle bevel, consider making a superficial skin incision (≤2 mm) at the insertion site.
7. With the device supported (braced) by the non-dominant (ND) hand, insert the needle-catheter device perpendicular to the patient's back along the superior border of the third rib to avoid the inferior neurovascular bundle.

**Contraindications**

- Obvious non-survivable injury in the traumatic cardiac arrest

**Complications**

- Improper diagnosis and insertion of a pleural catheter may lead to the creation of a simple or tension pneumothorax
- Incorrect placement may result in life-threatening injury to the heart, great vessels, or damage to the lung.
8. As one hand advances the device through the skin, subcutaneous tissue, muscle and parietal pleura, the second hand gently applies suction on the syringe.

9. Once air is freely aspirated into the syringe, the needle should not be advanced any further.
10. With the ND hand, gently thread the catheter off the needle until the hub is flush with the skin.

11. Once the catheter is inserted into the pleural space, the needle and syringe are withdrawn leaving the catheter in place.

12. Dispose of the needle immediately into a sharps container.

13. Fit the plastic skin flange around the catheter and secure the flange to the skin.

14. Attach the connection tubing and the Heimlick valve to the catheter (flow direction is indicated by an arrow).

15. Secure the Heimlick valve to the skin.

16. Re-evaluate breath sounds and haemodynamic status.

**Additional information**

- The potential for exposure to blood and body fluids is **HIGH**. All precautions that serve to minimise risk to the clinician and patient are to be applied, including the wearing of appropriate PPE.

- If bilateral chest decompression is anticipated (e.g. traumatic cardiac arrest), then the side with the likely pathology should be decompressed first.

- Never remove a catheter once in place.

- Frequently check for redevelopment of a tension pneumothorax, especially if the patient is receiving positive pressure ventilation.