



Clinical Practice Procedures: Respiratory/ Emergency chest decompression – finger thoracostomy

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Date	July, 2022
Purpose	To ensure a consistent procedural approach to emergency chest decompression – finger thoracostomy.
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless stated otherwise.
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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.

Emergency chest decompression is a life saving procedure in the setting of a tension pneumothorax. Chest decompression can be achieved by needle decompression, finger thoracostomy or tube thoracostomy.

Unlike needle decompression, finger thoracostomy allows maximum release of air/liquid from the pleural cavity and full lung re-expansion, making it the only effective option in some patients.^[1] In addition,

simple thoracostomy allows the clinician to rapidly re-sweep

the thoracostomy site should the patient deteriorate.



Indications

- Traumatic cardiac arrest (with torso involvement)
- Positive pressure ventilation with signs of barotrauma
- 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)

Contraindications

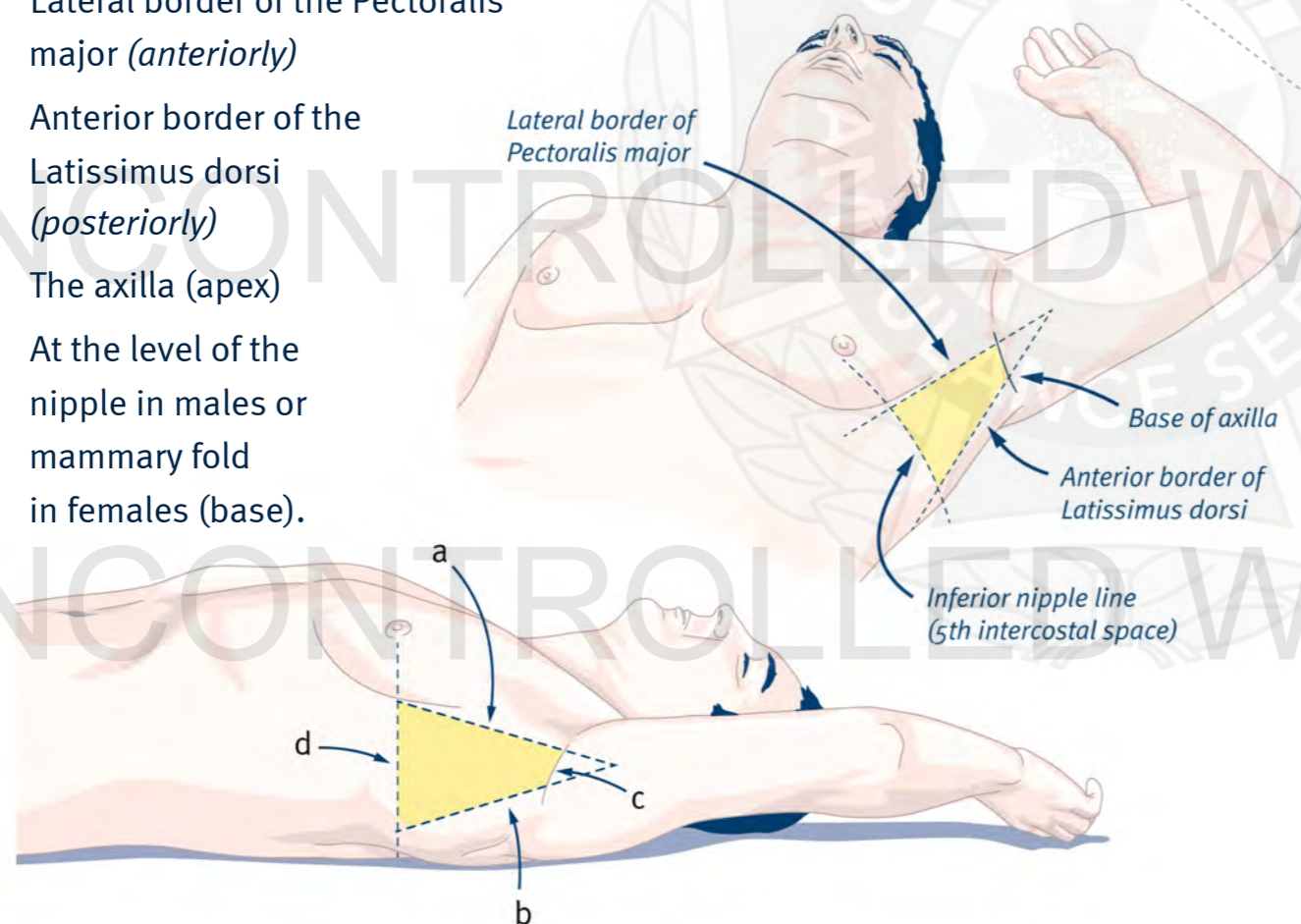
- Obvious non-survivable injury in the traumatic cardiac arrest
- Cardiac arrest with loss of vital signs > 20 minutes

Complications

- Improper diagnosis and insertion of a pleural catheter may lead to the creation of a simple pneumothorax or tension pneumothorax.
- Incorrect placement may result in life-threatening injury to the heart, great vessels, or damage to the lung.

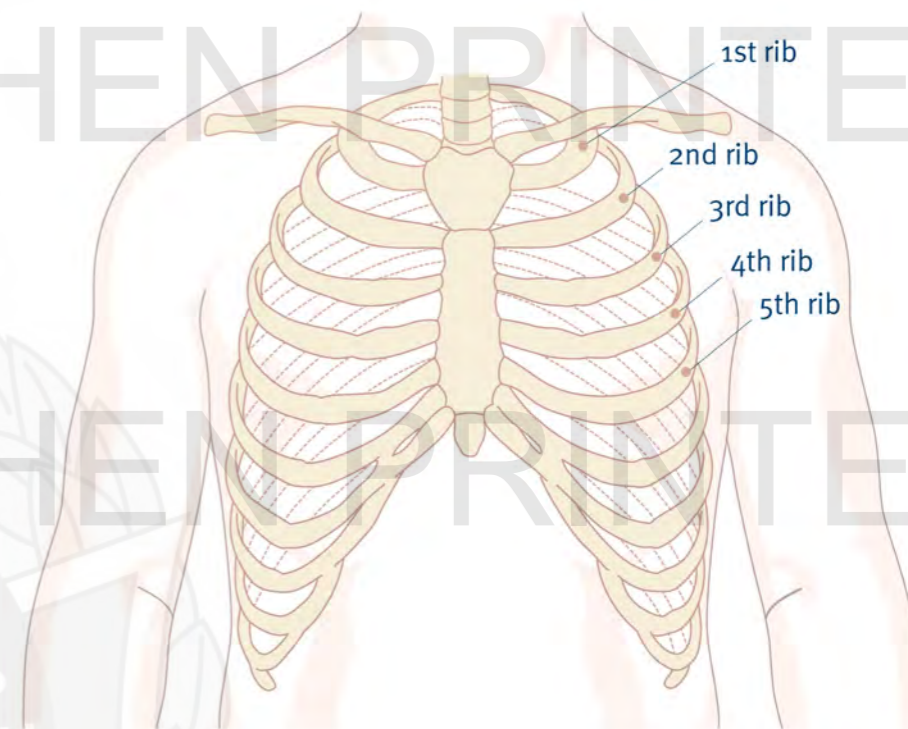
PROCEDURE

1. Apply required infection control measures (refer to QAS *Infection Control Framework*).
2. Abduct the arm(s) to $> 90^\circ$ and locate the 'triangle of safety' identified by:
 - a) Lateral border of the Pectoralis major (*anteriorly*)
 - b) Anterior border of the Latissimus dorsi (*posteriorly*)
 - c) The axilla (apex)
 - d) At the level of the nipple in males or mammary fold in females (base).



Procedure (cont.)

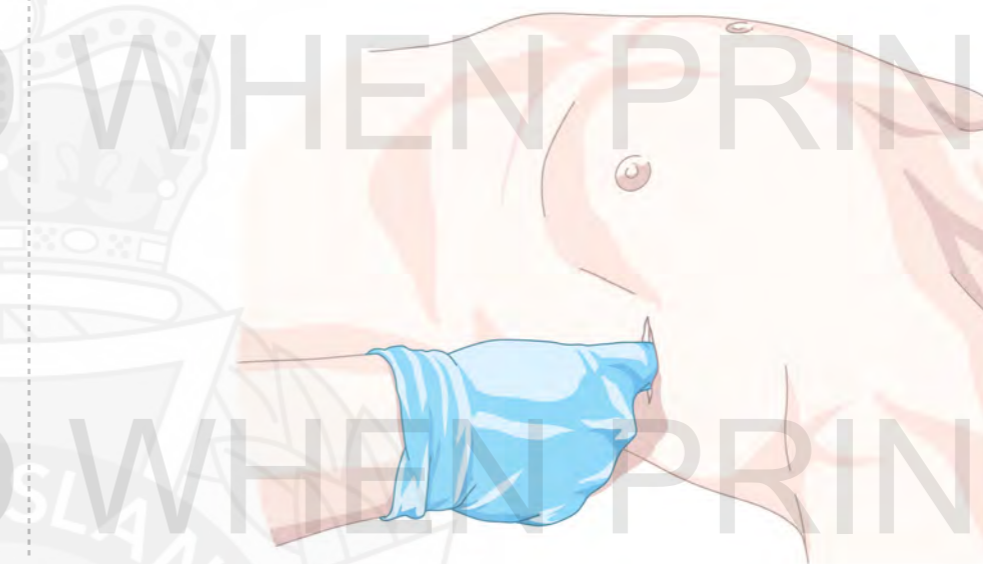
3. Identify appropriate incision site (4th intercostal space, anterior to the mid axillary line) and ensure you are within the 'triangle of safety'.



4. Prepare the incision site(s) with a BD ChloraPrep™ cutaneous solution applicator:
 - *Squeeze* – remove applicator from the wrapper and hold with the sponge facing downward, gently squeeze the wings.
 - *Prime* – saturate the sponge by repeatedly pressing gently against the treatment area.
 - *Apply* – apply the solution using a gentle back-and-forth motion.
 - *Dry* – allow the covered area to dry naturally.

Procedure – Emergency chest decompression – finger thoracostomy

5. Apply sterile gloves over gloves already being worn.
6. Using a disposable safety scalpel, make a 30–40 mm incision into the subcutaneous fat. Dispose of scalpel immediately into a sharps container.
7. With forceps supported by the non-dominant (ND) hand, gently push through the intercostal muscles and pleura. A tract capable of having a finger inserted should be achieved.
10. Perform a finger sweep to assess for the release of air and/or blood and lung inflation or deflation.



+ Additional information

- The use of medical gloves is not a substitute for hand hygiene. Hand hygiene should be performed before donning and doffing medical gloves and immediately before and after any procedure.
- Eye protection must be worn by all clinicians. The potential of blood and body fluids exposure (especially in the face and eyes) during this procedure is **HIGH**.
- The clinician must ensure that all chest decompression devices (cannulas and Pnuemodarts®) are removed prior to inserting a finger into the thoracostomy incision.
- If bilateral chest decompression is anticipated (e.g. traumatic cardiac arrest), then the side with the likely pathology should be decompressed first.
- Frequently check for redevelopment of a tension pneumothorax.

8. With the forceps in position, insert a finger into the pleural space to ensure an opening has been achieved
9. Remove forceps.