

PAEDIATRIC NURSING PRACTICE MANUAL
SECTION 7

CARE OF THE CHILD WITH A RESPIRATORY CONDITION

7.3 INTERCOSTAL CATHETER CARE

7.3.1 INSERTION OF INTERCOSTAL CATHETER

Aims

1. To remove air or fluid from the pleural space.
2. To allow lung re-expansion following surgery.
3. To restore the negative pressure in the thoracic cavity back to its normal level.

Indications:¹⁻³

- Post cardio-thoracic surgery
- Pneumothorax - air in the pleural space
- Haemothorax - blood in the pleural space
- Pleural effusion - a collection of fluid in the pleural space
- Empyema - infected fluid/pus in the pleural space
- Chylothorax - a collection of lymphatic fluid in the pleural space

Complications¹⁻³

Complications may occur during or after insertion and include:

- Incorrect placement: vascular, thoracic and/or abdominal trauma⁴
- Subcutaneous emphysema
- Tension pneumothorax
- Pain
- Infection
- Formation of a fistula
- Air leak from insertion site
- Blockage of drain tubing

Key points

1. This procedure is usually carried out under a general anaesthetic or with sedation in PICU by medical staff. Refer to theatre fasting guidelines [PNPM 8.1.3](#) and [oral conscious sedation guidelines](#).
2. This is a *surgical* aseptic non touch technique requiring full PPE and a large aseptic field.^{5,6}
3. Analgesia is recommended prior to this procedure and ongoing pain management is required for the duration of chest drainage.
4. A smaller pigtail catheter may be inserted in patients with pleural effusions instead of an intercostal catheter. The procedure for insertion, and equipment required, is similar to the insertion of an intercostal catheter. (Also refer to [PNPM 7.3.5](#) & [PNPM 7.3.6](#)).
5. *Low pressure suction* may be ordered by the medical officer to assist with pleural drainage - a thoracic low pressure gauge must be used.
6. Correction of any coagulopathy or platelet defect may be required prior to drain insertion, depending on urgency of the drain and upon the instruction of the treating Consultant.¹

Catheter Selection:**Intercostal catheter sizes: Guide only**

Newborn	8-12 Fr
Infant	12-16 Fr
Child	16-24 Fr
Adolescent	20-32 Fr
Adult	28-32 Fr

Equipment:

Sterile gown and drapes
 Sterile gloves
 Instrument tray
 Sterile kidney bowl and dish set
 Skin swabbing solution or swab (2%Chlorhexidine/ 70% isopropyl alcohol)
 Gauze
 Appropriate sized blade
 Local anaesthetic e.g. 1% Lignocaine, 2mL syringe and 23-25g needle
 Syringes 20mL
 Chest tube of appropriate size
 Underwater seal chest drainage unit (eg Oasis™ or Ocean™)
 Sterile transparent occlusive dressing
 Sterile specimen container
 Suture (2/0 or 3/0)
 Waste bag
 Cable tie gun and cable ties
 Various connections for attachment to drainage unit (available from PICU)
 2 x large chest drain clamps
 ± Thoracic **low-flow** suction gauge

PROCEDURE	ADDITIONAL INFORMATION
Record baseline vital signs. Administer analgesia / sedation as ordered. Check blood pressure after sedation is given.	Refer to oral conscious sedation guidelines.
Assemble the drainage unit according to PNPM 7.3.1.1 Assembly of an Intercostal Drainage Set.	Strict adherence to hand washing and Aseptic Non Touch Technique must be observed.
Position and support the child as directed.	

PROCEDURE	ADDITIONAL INFORMATION
<p>Observations:</p> <p>Monitor cardiac rate, rhythm, respiratory observations and oxygen saturation's during procedure and post insertion as clinically indicated/instructed.^{7,8}</p> <p>Check the blood pressure every 15 minutes.</p> <p>Observe the patient throughout the procedure for:</p> <ul style="list-style-type: none"> • tachy / bradycardia • altered respiratory rate / pattern • hypotension • colour change • desaturation <p>Report immediately any signs of respiratory distress.</p>	<p>Refer to PNPM 3.1.1 General Observations, including Respiratory Assessment.</p> <p>Patient may require oxygen administration during procedure.</p>
<p>Assist the medical officer to insert the catheter and attach it to the tubing on the underwater seal drainage set.</p> <p>If a pigtail catheter is used connect to a 3-way tap.</p>	<p>Ensure asepsis is maintained during connection of the intercostal catheter to the drainage system.</p>
<p>Ensure the tube is secure.</p>	<p>A suture may be used to stabilise location and promote a good seal.^{1, 3, 8}</p>
<p>Ensure that there are no kinks or loops in the tubing.</p>	
<p>Secure with a cable tie if necessary.</p>	<p>Cable ties ensure an airtight tubing connection.</p>
<p>If two catheters are inserted, label each catheter to identify site and date of insertion.</p>	<p>Two or more indwelling chest tubes can be attached to a single chest drain via a "Y" connector.</p>
<p>Observe the tube for:</p> <ul style="list-style-type: none"> • type of drainage • bubbling and swinging of fluid levels 	<p>Refer to PNPM 7.3.2 Management of an Intercostal Catheter.</p>
<p>Using a transparent occlusive dressing, secure the catheter to the patient.</p>	<p>An absorbent dressing may be required if there is ooze from the insertion site.</p>
<p>Secure the tubing to the bed so that the tubing falls directly from the bed into the container.⁹</p>	<p>Allow room for the patient to move.</p>
<p>Stabilise the drainage set below the level of the bed.</p>	<p>To prevent loss of underwater seal should the container fall over.</p>

PROCEDURE	ADDITIONAL INFORMATION
Set correct level of suction (if required) as ordered by the medical officer.	Refer to PNPM 7.3.1.1 Assembly of an Intercostal Drainage Set for how to set suction levels correctly.
Ensure a chest x-ray is taken. Document procedure in patient record. Prior to transfer to the ward, complete a full CEWT score.	A portable x-ray is usually taken to check the position of the catheter. Patient may return to the ward after position has been checked on x-ray and the patient is conscious.

References:

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