

# Management of Paediatric Spontaneous Pneumothorax

## DIAGNOSIS

A **diagnosis** is based on clinical suspicion and confirmed by chest x-ray (CXR) and/or lung POCUS. Pleural sliding in all zones excludes pneumothorax in most instances.

## INITIAL PATIENT MANAGEMENT

**A+B:** Initially 15L non-rebreathe mask oxygen and continuous SpO<sub>2</sub>. NIV contraindicated until chest drain inserted

**C:** Continuous ECG monitoring, regular BP and intravenous access, blood gas

**D:** Assess and treat pain

**E:** Prepare for possible chest drain insertion and/or needle aspiration

**F:** Nil by mouth, intravenous fluids if indicated

Management depends on patient stability, pneumothorax size, if it's a reoccurrence and the type (primary or secondary). These patients should be discussed with the tertiary respiratory team early to guide management. If clinically unstable phone SORT.

### \*\*PAEDIATRIC CRASH CALL\*\*

**Immediately decompress** the side of the tension pneumothorax using either *needle decompression* with a large bore (14G/16G) cannula:

■ **Option 1:** 4<sup>th</sup>/5<sup>th</sup> intercostal space (triangle of safety), mid-axillary line is preferred

■ **Option 2:** 2<sup>nd</sup> intercostal space, mid clavicular line

→ **DO** use ultrasound if available  
→ Do **NOT** insert the full length of the needle, stop advancing once air is aspirated

■ **Option 3:** In an unconscious and/or intubated patient, perform a thoracostomy

→ **DO NOT** wait for chest X-ray  
Following intervention, proceed to chest drain insertion

\*On chest x-ray estimate the percentage of hemithorax the pneumothorax occupies. In adolescents, measure the widest part of pneumothorax in cm.

### IS THIS A TENSION PNEUMOTHORAX?

Low SpO<sub>2</sub>/Hypotension/tachycardia/tracheal deviation/↓ conscious level

NO

No cardiovascular compromise, SpO<sub>2</sub> ≤ 92%, hypercapnia, respiratory distress in air

NO

SpO<sub>2</sub> >92%, normocapnia, no respiratory distress in air

YES

YES

Large  
>30%/>2cm\*

Small  
<30%/<2cm\*

**Discuss with SORT and tertiary respiratory team.** If no underlying chronic respiratory disorder, after discussion consider needle aspiration  
→ Local anaesthetic for pain management prior to inserting a large (14G/16G) cannula.  
→ Option 1: Between 4<sup>th</sup>/5<sup>th</sup> intercostal space, mid-axillary line  
→ Option 2: 2<sup>nd</sup> intercostal space mid clavicular line. Use ultrasound to guide insertion  
→ Attach tubing with a 3-way tap and 50ml syringe with saline to aspirate air fully. Stop advancing needle once bubbling is observed  
→ Observe ≥24hrs and repeat CXR

→ Admit and observe for 4-6 hours  
→ Regular pain relief prescribed  
→ Repeat CXR in 4-6 hours or earlier if clinically indicated  
→ Re-assess patient regularly  
→ Seek advice from tertiary respiratory team

Pneumothorax has reaccumulated

Discuss discharge and follow up with tertiary respiratory team

## CHEST DRAIN INSERTION

→ Phone SORT early for advice  
→ Prepare for intubation, refer to SORT: Intubation checklist in **STOP!** box (*in some compliant children, chest drains may be inserted under sedation and local anaesthetic*)  
→ Choice of chest drain insertion technique should depend on operator experience and available support. SORT recommends surgical chest drain (blunt dissection). If using Seldinger technique must use ultrasound.  
→ Chest drain Insertion technique video available on PIER website. See **STOP!** box for further guidance.  
→ Re-assess patient  
→ Chest X-ray to confirm position of drain  
→ Prescribe regular analgesia

**WARNING!** The Seldinger technique carries the risk of intraparenchymal mis-placement of the chest drain (NPSA 2008)

UNSTABLE and/or intubated

STABLE and self-ventilating

→ Re-assess ABC  
→ Consider other pathology and update SORT  
→ Prepare for retrieval and refer to relevant guidelines in **STOP!** box

→ Discuss ongoing management in local hospital vs transfer with SORT  
→ Use STOPP form if transfer indicated

### STOP! Call SORT (023 8077 5502)

→ **RE-ASSESS THE PATIENT REGULARLY.** A simple pneumothorax can evolve into a tension pneumothorax  
→ Have you got enough help and assigned roles?

[SORT: Intubation Checklist](#)  
[SORT: Caring for the Ventilated Child Checklist](#)  
[SORT: Initiation of ventilation during stabilisation](#)  
[PIER: Chest Drain Insertion video Guide](#)