# Chest Tubes and Pneumothorax

Tension pneumothorax, the drainage system, bubbling and tidaling, troubleshooting and removal



## PNEUMOTHORAX AND HEMOTHORAX

| TYPE | CLUES | ACTION |
|---|---|---|
| **Tension** | Hypotension, absent breath sounds, JVD, rising airway pressures; tracheal shift is late | Decompress now (needle or finger), then chest tube |
| **Simple** | Pleuritic pain, decreased breath sounds | Observe, aspirate or tube by size and symptoms |
| **Massive hemothorax** | 1,500 mL at insertion, or 200 mL/h for 2–4 h | Surgery (thoracotomy) |

Needle site (ATLS): 4th or 5th intercostal space just anterior to the mid-axillary line in adults; 2nd space mid-clavicular in children. ATLS 11 teaches finger and tube thoracostomy as the core skills.

**SAFETY** Ventilated patient with sudden hypotension and high peak and plateau pressures: think tension pneumothorax first.

## THE DRAINAGE SYSTEM

*On positive-pressure ventilation, tidaling reverses (falls with inspiration).*

| CHAMBER | NORMAL | ABNORMAL |
|---|---|---|
| **Collection** | Drainage slows over time | Over 100–200 mL/h, or bright red: report |
| **Water seal (2 cm)** | Tidaling: rises with spontaneous inspiration | Continuous bubbling = air leak |
| **Suction control** | Wet: gentle steady bubbling at set level; dry: indicator showing | Vigorous bubbling only evaporates water |

- Intermittent bubbling on exhalation or cough: expected with a pneumothorax (air leaving the pleura)
- Continuous bubbling: find the leak; brief clamping from the chest wall outward shows whether it is the patient or the tubing
- No tidaling: lung re-expanded, or the tube is kinked, clotted or blocked
- Keep the unit below the chest, upright, with no dependent loops; do not strip tubes routinely

## TROUBLESHOOTING

| EVENT | FIRST MOVES |
|---|---|
| **Tubing disconnects** | Put the tube end 2–3 cm under sterile water (or reconnect a new system); avoid clamping |
| **Unit tips over** | Set upright; check water seal level; refill or replace |
| **Tube pulls out of the chest** | Cover with a sterile occlusive dressing; watch for tension, lift an edge if it develops; notify |
| **New respiratory distress** | Check the patient, then the system from chest to unit |

**SAFETY** Never clamp a chest tube that has an air leak for long: air has nowhere to go and tension can develop.

## REMOVAL AND COMPLICATIONS

- Remove at end-expiration or during Valsalva (spontaneous breathing); occlusive dressing; chest x-ray after
- Re-expansion pulmonary edema: drain large effusions slowly and stop at about 1.5 L or chest discomfort
- Subcutaneous emphysema: crackling under the skin; mark and track its spread
- Infection (empyema) and bleeding at the site

**Sources** (3) are listed with links at icubasics.com/sheets/chest-tubes.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.