Chest Tubes and Pneumothorax

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

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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 medicbasics.com/sheets/chest-tubes.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. Medic Basics is an independent study aid not affiliated with any certifying body.