Pneumothorax

2023 BTS · Symptoms decide the treatment, not the size on the film

SYMPTOM-BASED
a real change

FIRST, EXCLUDE TENSION *the only pneumothorax you treat before imaging*

RECOGNIZE IT CLINICALLY

Hemodynamic compromise with respiratory distress, **tracheal deviation away** from the side, absent breath sounds, distended neck veins, hypotension and hypoxia. In a ventilated patient, a **sudden rise in airway pressures** with hypotension.

DECOMPRESS IMMEDIATELY

Do not wait for a chest X-ray. Needle decompression, then a definitive chest drain. In adults the **4th or 5th intercostal space in the anterior axillary line** is now generally preferred to the 2nd space mid-clavicular line, because chest wall thickness there causes fewer failed attempts.

CLASSIFY THE REST

Primary spontaneous (PSP) — no known lung disease, typically tall, thin, young smokers. **Secondary (SSP)** — underlying lung disease, most often COPD; **far less well tolerated**. Also **traumatic and iatrogenic**.

THE 2023 SHIFT *size no longer drives the decision*

Approach	When it applies
Conservative observation only	Can be considered for **minimally symptomatic or asymptomatic primary spontaneous pneumothorax — regardless of size**. "Minimally symptomatic" means **no significant pain or breathlessness and no physiological compromise**. Evidence shows conservative care is **non-inferior to chest drain for radiological resolution at 8 weeks, irrespective of size**.
Ambulatory	Should be considered for **initial treatment of PSP** in patients with **good support**, in centers with the **expertise and follow-up** to run it. Uses a one-way valve device, allowing discharge without an inpatient drain.
Needle aspiration or tube drainage	For patients **not suitable for conservative or ambulatory management** — significant symptoms, physiological compromise, or no reliable support and follow-up.
Secondary pneumothorax	**Lower threshold to intervene and to admit.** Limited respiratory reserve means even a small pneumothorax can be dangerous, and conservative management is far less often appropriate.

WHY THIS CHANGED

The old **"2 cm rule"** treated a radiological measurement as the decision. Trial evidence showed most primary pneumothoraces resolve without drainage and that intervention brings its own harms — pain, infection, prolonged admission and re-expansion edema. **The patient in front of you, not the film, now determines management.**

RUNNING THE DRAIN *and knowing when it is not working*

1. **Use a small-bore Seldinger drain** for most spontaneous pneumothoraces — as effective as large-bore and considerably less painful. Insert in the **safe triangle**, above the rib to avoid the neurovascular bundle.
2. **Do not clamp a bubbling drain.** Clamping a drain with an ongoing air leak can convert a simple pneumothorax into a tension pneumothorax.
3. **Do not apply suction routinely** at the outset. It may be added for persistent leak or failure to re-expand, under specialist guidance, since early high-pressure suction risks re-expansion pulmonary edema.
4. **Persistent air leak beyond 3–5 days** should prompt **thoracic surgical referral**. Options include **VATS with pleurectomy or pleurodesis**, and chemical pleurodesis where surgery is not feasible.
5. **Remove the drain** once the lung is up and the leak has stopped — no bubbling on coughing — with a check film afterwards.

BEFORE THEY LEAVE *recurrence and lifestyle advice that genuinely matters*

PREVENT RECURRENCE

Smoking cessation is the single most effective intervention — it substantially reduces recurrence, and this conversation is often skipped. Recurrence after a first PSP is common, and **definitive surgical management is usually offered after a second ipsilateral episode**, a first contralateral episode, bilateral disease, or in high-risk occupations.

ACTIVITY ADVICE

No flying until radiographic resolution is confirmed and typically for a defined interval afterwards — check the current local and airline guidance. **Diving is permanently contraindicated** after spontaneous pneumothorax unless definitive bilateral surgical prevention has been performed. Warn the patient to return immediately with recurrent breathlessness or pleuritic pain.

SPECIAL SITUATIONS *where the standard pathway does not apply*

Setting	What changes
Ventilated patient	Positive pressure means **any pneumothorax can become a tension pneumothorax**. **Always drain** — conservative management is not an option while on positive pressure. Suspect it with sudden hypoxia, rising airway pressures, or unexplained hypotension.
Iatrogenic	After central line insertion, pleural or lung biopsy, or pacemaker placement. **Get a post-procedure film**, and remember a small apical pneumothorax may appear or enlarge over hours. Many resolve with observation, but the threshold is lower if the patient needs an anesthetic or transfer.
Catamenial	Recurrent pneumothorax in a woman **within about 72 hours of menstruation**, usually right-sided, from thoracic endometriosis. Frequently missed for years — **ask about the timing relative to periods** in any woman with recurrent pneumothorax.
Underlying lung disease to look for	**COPD and emphysema** most often, but consider **cystic fibrosis, lymphangioleiomyomatosis, Birt-Hogg-Dubé syndrome, Marfan syndrome** and **Pneumocystis pneumonia**, particularly with recurrent or bilateral disease in a young patient.

PEARLS & PITFALLS

- **Tension pneumothorax is a clinical diagnosis.** Sending an unstable patient for imaging first is a recognized cause of avoidable death.
- **Size no longer decides management in primary pneumothorax.** A large but asymptomatic PSP may be managed conservatively.
- **Never clamp a bubbling drain** — you can create a tension pneumothorax.
- **Secondary pneumothorax is a different disease.** Underlying lung disease means far less reserve and a much lower threshold to intervene.
- **Smoking cessation is the recurrence intervention.** Deliver it properly rather than as a line in the discharge summary.
- **Diving is permanently contraindicated** after spontaneous pneumothorax without definitive surgical prevention.

References: British Thoracic Society Guideline for Pleural Disease, pneumothorax section (2023) · trials of conservative versus interventional management of primary spontaneous pneumothorax · ambulatory management studies.

Educational aid; verify against local protocol and patient factors.