

Adult Pneumothorax

Overview

Pneumothorax is a condition characterized by the accumulation of air in the pleural space (the space between the lung and chest wall, [Image](#)). The air exerts pressure on the lungs, causing them to collapse. Unilateral pneumothorax involves one lung, while bilateral pneumothorax pertains to both lungs.

Classification²

- Spontaneous - occurring in the absence of underlying lung disease
- Iatrogenic - occurs in the presence of preexisting **lung disease** (such as COPD, cystic fibrosis, pneumonia, etc.)
- Traumatic - occurs due to penetrating or blunt trauma (for example car crash, rib fracture, diving, etc.)

*****Tension pneumothorax** is a life-threatening condition where air gets trapped in the chest displacing vital internal organs requiring immediate intervention.

Risk factors²

- Gender: Men are far more likely to have a pneumothorax than women
- Smoking: The risk increases with the length of time and the number of cigarettes smoked
- Genetics: Certain types of pneumothoraxes appear to run in families
- Previous pneumothorax: Anyone who has had one pneumothorax is at increased risk of developing another

Signs & Symptoms³

- Sudden Chest pain minimal to severe on the affected side by deep breath or cough
- Shortness of Breath
- Chest Tightness
- Easy fatigue
- Rapid heart rate
- Bluish color of the skin caused by a lack of oxygen

Diagnosis

- Blood work: Arterial blood gas test shows low oxygen levels and imbalances in the body's acid-base levels
- Chest X-ray: A scan to show whether there is air outside the lung
- Decreased or absent breath sounds on the affected side when heard through a stethoscope

Prognosis

Approximately half of pneumothorax patients may experience recurrence, yet successful treatment does not lead to any lasting complications in the long run.³

Treatment²

Depending on the severity of the pneumothorax the following treatment options for managing a pneumothorax are:

- **Oxygen therapy:** Extra oxygen administered through the nose increases the resolution of a small pneumothorax, it helps the air around the lung be absorbed quickly³.
- **Needle Aspiration (Thoracostomy):** A small flexible tube is inserted between the ribs into the air-filled space that's pressing on the collapsed lung. The physician then removes the needle, attaches a syringe to the tube, and pulls out the excess air. The catheter may be left for a period of time to ensure the lung is re-expanded and the pneumothorax does not recur.
- **Chest Drain:** A chest tube is inserted between ribs into the pleural space to remove excess air, blood, or other fluids around the lungs until the lungs re-expand and heal. This can be achieved while the patient is awake, under sedation, or under general anesthesia.
- **Pleurodesis:** Chemical substances are injected through a tube into the pleural space to irritate the tissues around the lung so that they can stick together and seal any leaks.
- **Autologous Blood Patch:** Blood is drawn from the patient's own arm and placed into the chest tube. The blood creates a fibrinous patch on the lung, sealing the air leak.
- **Bronchoscope:** A thin tube is passed down the throat and into the lungs to look at the lungs and air passages constructing a one-way valve. The valve allows the lung to re-expand and the air leak to heal.
- **Video-assisted thoracoscopic Surgery:** Small incisions are made using a small fiber-optic camera, to look for leaking area and close it off. A surgeon may have to make a larger incision between ribs to get better access to multiple or large air leaks.

Dry vs. water seal drainage

Both wet and dry suction drainage systems are used to reestablish negative pressure within the pleural space. In the water seal drainage system, the chest tube is connected to the first bottle of water, and all subsequent chambers are connected in a series to a suction device. The first chamber collects drainage from the chest; the second chamber acts as the water seal preventing air and fluid from moving back into the chest, and the third acts as suction control. Vigorous bubbles indicate a leak in the system. The drainage system may be draining to gravity (during patient transfer for example) or used with a wall suction, this depends on physician preference and other factors such as patient tolerance level. Water seal drainage is the traditional method that is still in practice, dry seal drainage is an evolved version. Dry seal drainage uses a mechanical valve to ensure a seal. It allows for high suction pressure levels and easy set-up, and there is no fluid to evaporate which would decrease the amount of suction applied to the patient, considered a self-compensating regulator⁴.

New technology on the horizon

A new study published by [JAMA Network Open](#) shows that an artificial intelligence (AI) model can accurately detect simple and tension pneumothorax on chest radiographs. The model's use in the clinical workflow could lead to earlier identification and improved care for patients with pneumothorax. These studies have not been validated by Vizient.

Clinical Resource Guide

Pediatric considerations

Spontaneous pneumothorax is rare in the age group between neonatal and adolescence, as developmental causes are likely to have caused a pneumothorax shortly after birth and adolescence. Specific guidelines for pediatric patients are not available and an agreement on the optimal management has not been reached.⁵

Regulatory

Hospital-Level Patient Safety Indicator (**PSI 06**): The US Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ)- monitors incidents of **Iatrogenic Pneumothorax**.

ISO 10079-3:2022 Medical suction equipment: Suction equipment powered from a vacuum or positive pressure gas source.

FDA Product Classification

880.6740 Chest Drainage Kit ; K913733 Sterile Chest Tube; K863142 Thoracic Catheter (Chest Drainage Tube).

Resources

Here are a few references that provide further information on the topic of pneumothorax.

[American Thoracic Society](#)

[JAMA Network](#)

[National Lung Association](#)

[U.S. National Library of Medicine](#)

[Up To Date](#)

Vizient contract resources

Vizient provides access to these products from the following supplier(s):

Product Category	Supplier	Contract #	Expiration Date
Chest Drainage	Getinge USA Sales, LLC	MS6101	12/31/2023
	Teleflex LLC	MS6102	12/31/2023
	Bearpac Medical, LLC	MS7123	03/14/2025
Thoracostomy Tray	Merit Medical Systems Inc.	MS1009	12/31/2024
Pulse Oximetry	Covidien Sales LLC	MS9141	08/31/2025
	Masimo Corporation	MS9142	08/31/2025

Refer to [Vizient Catalog](#) for a complete list of related contracts such as oxygen therapy delivery systems, suction canister systems, imaging, etc.

[See all resources](#)

For more information, [contact us](#).

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