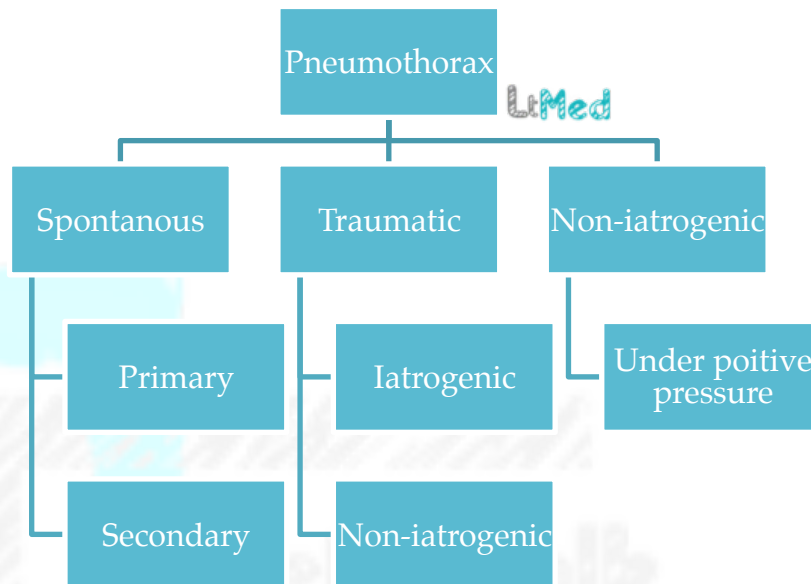


Pneumothorax



- **Definition:**
 - A disease defined as the *accumulation of air in the pleural space leading to pulmonary collapse.*
- **Types:**



- **Epidemiology:**
 - Spontaneous pneumothorax is commonest in young adult males:
 - The M-to-F ratio is 6: 1.
 - Primary Spontaneous Pneumothorax (PSP) has an incidence of 7.4 to 18 cases among males and 1.2 to 6 cases among female per 100,000 populations each year.
 - The general incidence of secondary spontaneous pneumothorax (SSP) is almost similar to that of PSP.
- **Causes and Risk factors:**
 - **Spontaneous:**
 - **Primary:**
 - *More common in tall, thin young males because of apical subpleural blebs rupture.*
 - **More threatening than secondary type, due to lack of pulmonary reserve.**
 - **Secondary:**
 - ✓ Most commonly COPD and TB; also seen in asthma, pulmonary infarcts, lung abscess, bronchogenic carcinoma, and all forms of fibrotic and cystic lung disease.
 - **Traumatic:**
 - **Iatrogenic:** secondary to transthoracic and trans-bronchial biopsy, central venous catheterization, pleural biopsy, thoracentesis.
 - **Non-iatrogenic:** secondary to blunt or penetrating chest injury.

• **Pathophysiology:**

- The pressure in the pleural space is negative with respect to the atmospheric pressure and the alveolar pressure. If there is a communication either between the alveoli and the pleural space or between the outside of the thoracic cavity and the pleural space, air will continue to enter the pleural space.
- *The increase in the pleural pressure will result in both a hyperexpanded hemithorax and a collapsed lung.*
- *Because the alveolar pressure become very positive resulting in high/positive pleural pressure, producing a tension pneumothorax.*
- *The main physiological consequences of pneumothorax are a decrease in the vital capacity of the lung and in PaO₂. Total lung capacity, functional residual capacity and diffusing capacity are also decreased but less than vital capacity.*

• **Sign & Symptoms:**

- Sudden onset of unilateral chest **pain on inspiration** and progressively increasing **dyspnea**.
- Patient with large pneumothorax may develop pallor, tachycardia, and cough.

P-THORAX summarizes the presentation of pneumothorax:

- **P**leuritic chest pain.
- **T**racheal deviation.
- **H**yper-resonance on percussion.
- **O**nset is sudden.
- **R**educed breath sounds unilaterally.
- **A**bsent fremitus
- **X**-ray shows lung collapse

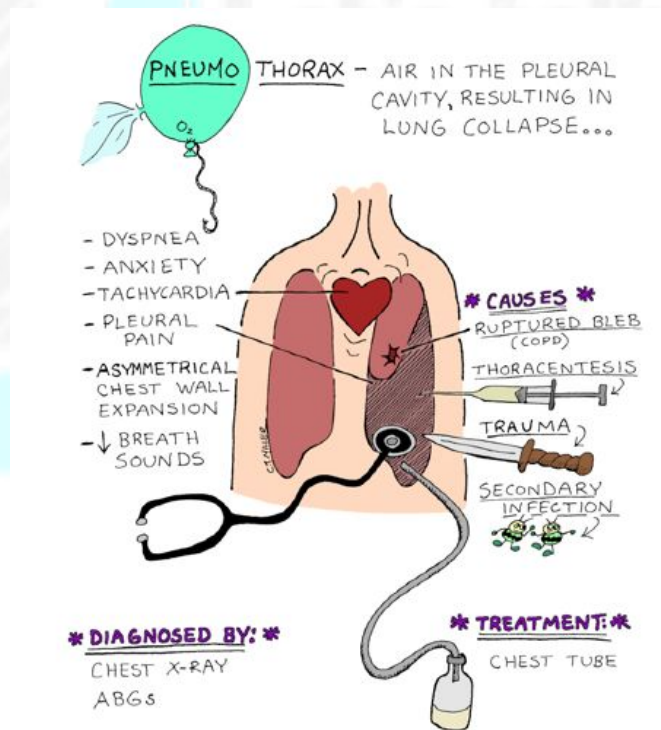


Figure 1: Pneumothorax.

- **Diagnosis:**

- *The diagnosis is done clinically due to emergent need of treatment.*
- **Chest X-ray:**
 - Reveals visible visceral pleural edge as a very thin, sharp white line with no lung markings are seen peripheral to this line.
 - The peripheral space is radiolucent compared to adjacent lung.
 - The lung may completely collapse and the mediastinum should not shift away from the pneumothorax unless a tension pneumothorax is present.



Figure 2: Tension Pneumothorax.

- **Treatment:**

- Tension pneumothorax:
 - *Immediate decompression by large bore needle in the 2nd intercostal space mid-axillary line.*
 - *Followed by chest tube placement under water seal.*
- For small pneumothoraces:
 - **Supplemental O₂** until it resolves spontaneously.
- Large symptomatic pneumothoraces:
 - Chest tube placement under water seal.

Spontaneous pneumothorax has a recurrence rate of 50% in 2 years.

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Written by: Abdulrahman Alqahtani
Format editor: Bassam AlGhamdi

Reviewed by: Salwa AlMakhdob
Areej Madani