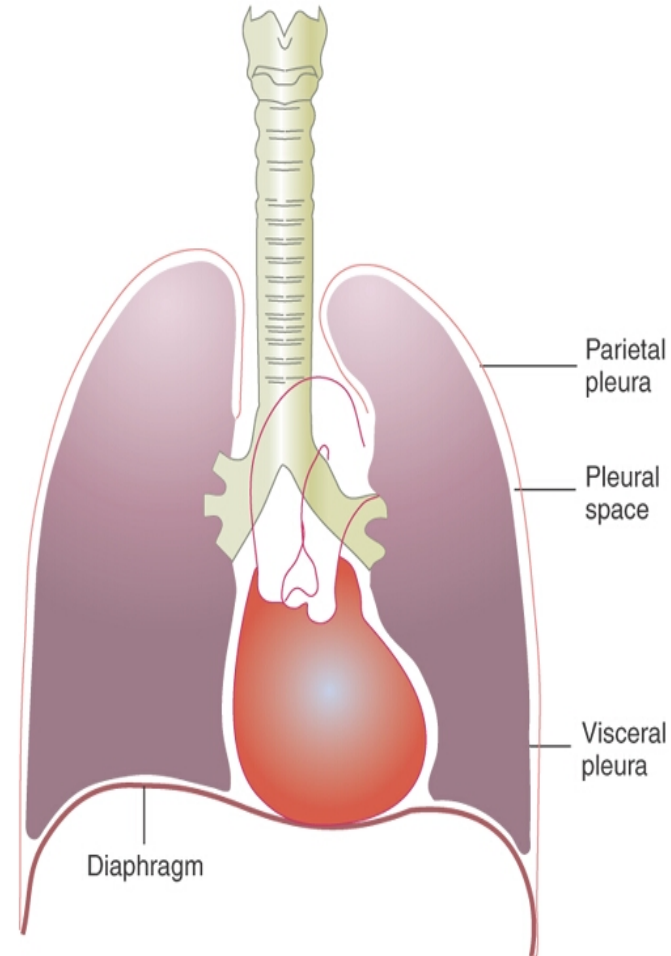


Pleura

# Pleura

- Each pleural cavity is lined by a single layer of flat cells, mesothelium, and an associated layer of supporting connective tissue; together, they form the pleura
- The **pleura** is divided into two major types, based on location:
  - pleura associated with the walls of a pleural cavity is **parietal pleura**;
  - **visceral pleura** which adheres to and covers the lung.
- Each pleural cavity is the potential space enclosed between the visceral and parietal pleurae. They normally contain only a very thin layer of serous fluid
- As a result, the surface of the lung, which is covered by visceral pleura, directly opposes and freely slides over the parietal pleura attached to the wall.



# Pleura

- **Function:**

- 1- protection

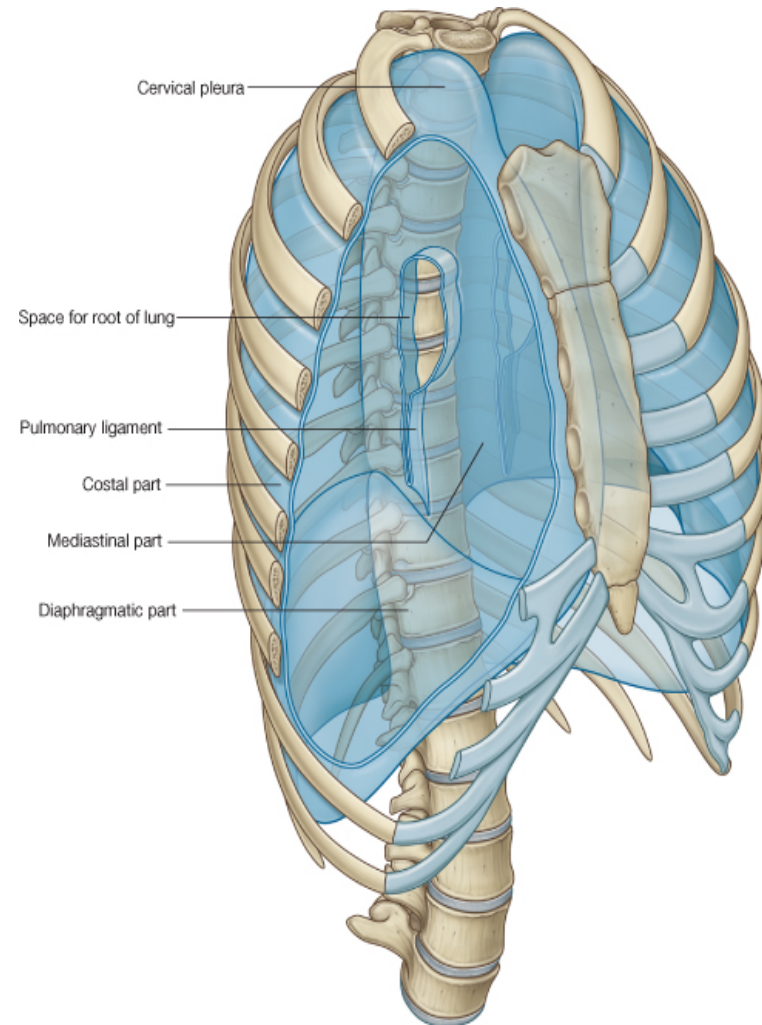
- 2- Produces fluid that allows for lubrication

- Failure to function results in difficult painful breathing

- The pleural cavity is a site for—pneumothorax, pleural effusion, Empyema & haemothorax.

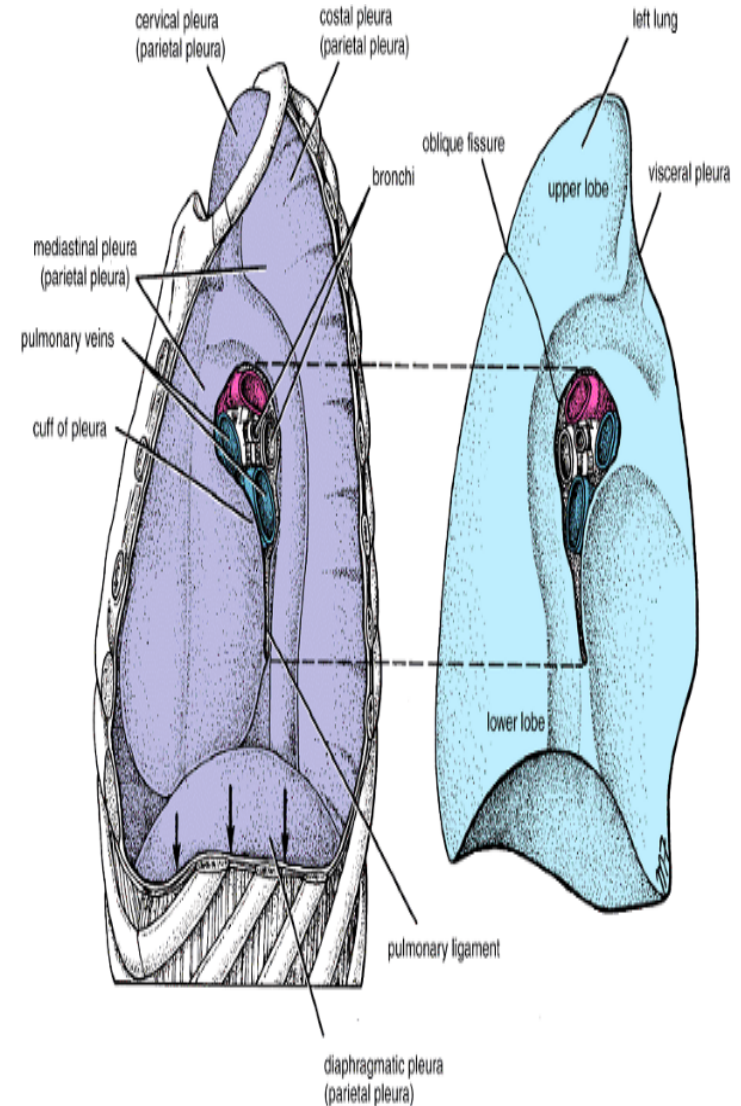
# Pleura

- The names given to the parietal pleura correspond to the parts of the wall with which they are associated
- pleura related to the ribs and intercostal spaces is termed the **costal part**;
- pleura covering the diaphragm is the **diaphragmatic part**;
- pleura covering the mediastinum is the **mediastinal part**;
- the dome-shaped layer of parietal pleura lining the cervical extension is **cervical pleura (dome of pleura or pleural cupola)** and is covered by **suprapleural membrane (sibson's fascia)**.



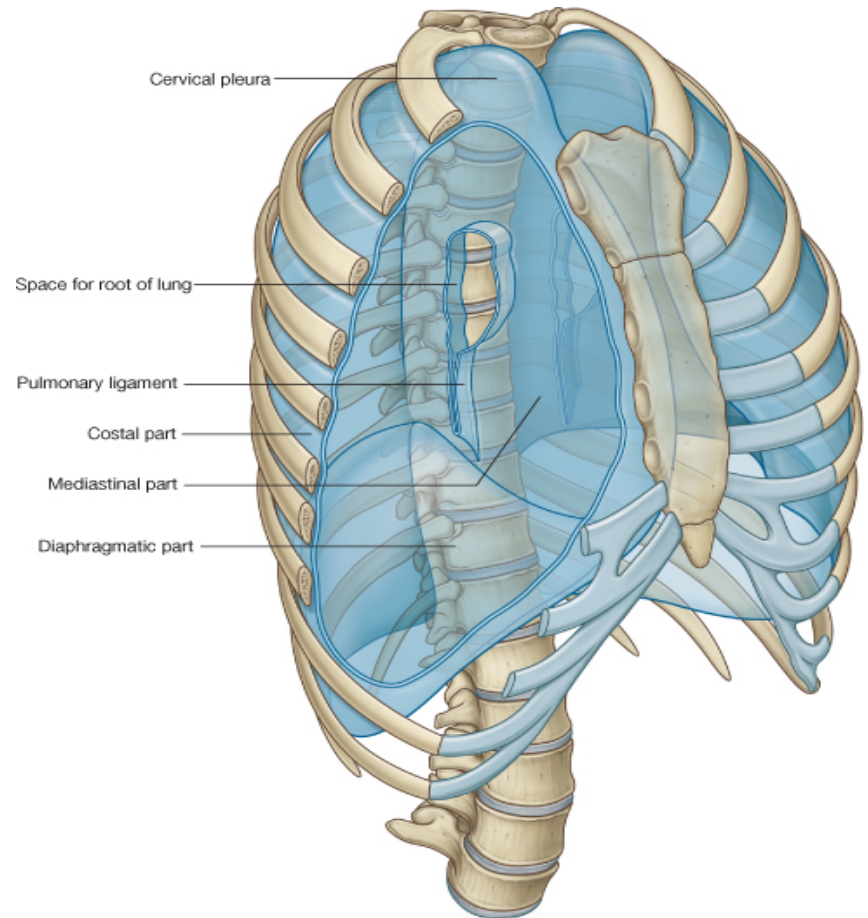
# Pleura

- in the region of vertebrae TV to TVII, the mediastinal pleura reflects, forms the **root of the lung**
- The root joins the medial surface of the lung at the **hilum**, and the mediastinal pleura becomes continuous with the visceral pleura.



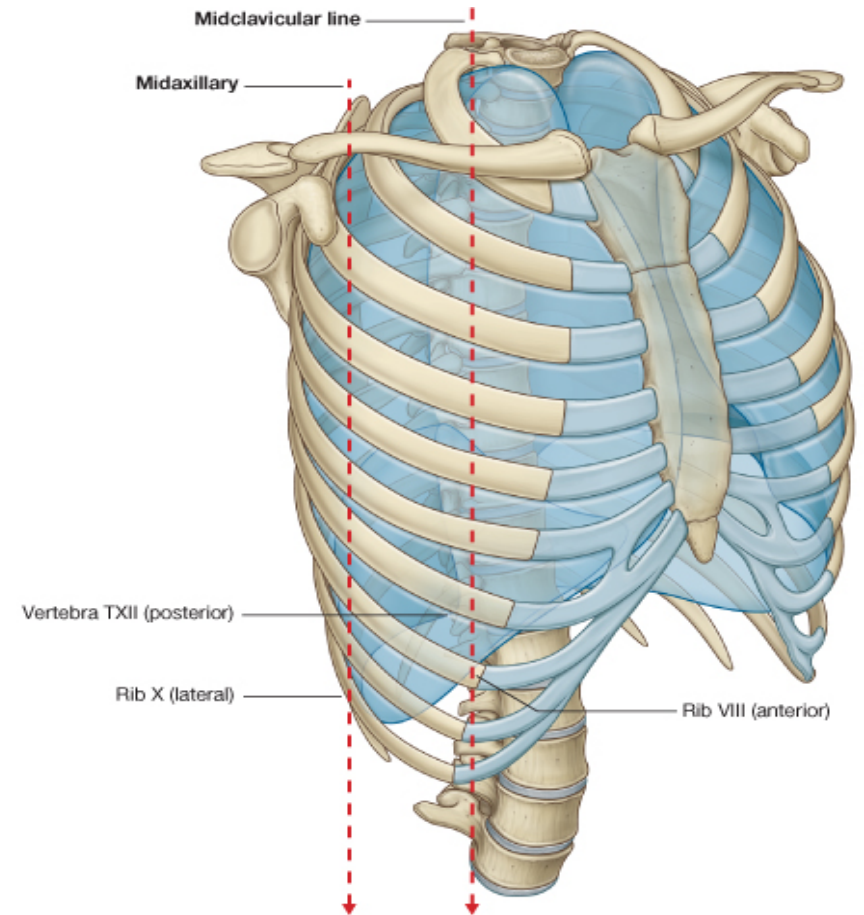
# Peripheral reflections

- The peripheral reflections of parietal pleura **mark the extent of the pleural cavities**
- Superiorly, the pleural cavity can project as much as 3-4 cm above the first costal cartilage, but does not extend above the neck of rib I.
- This limitation is caused by the inferior slope of rib I to its articulation with the manubrium.
- Anteriorly, the pleural cavities approach each other posterior to the upper part of the sternum.
- posterior to the lower part of the sternum, the parietal pleura does not come as close to the midline on the left side as it does on the right because the heart bulges to the left.



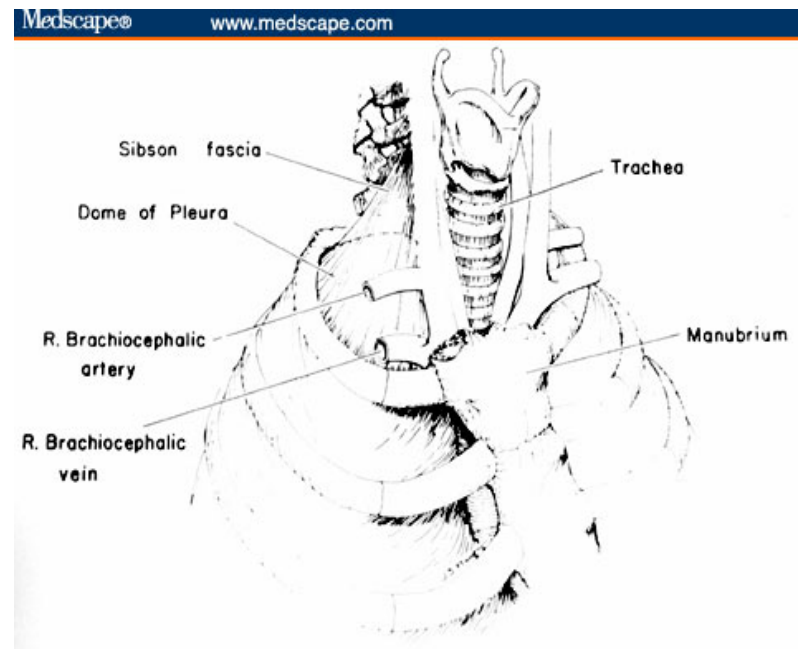
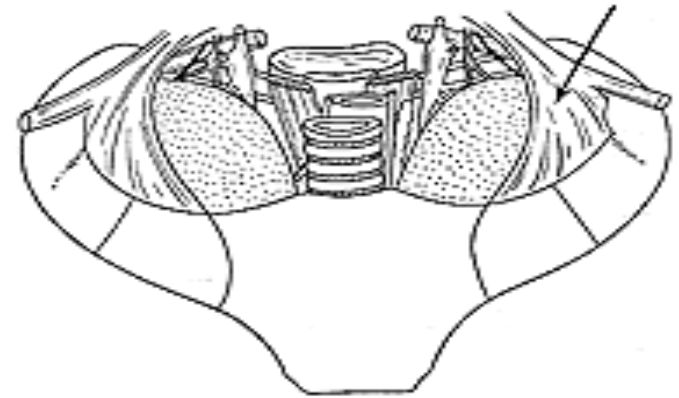
# Peripheral reflections

- Inferiorly, the costal pleura reflects onto the diaphragm above the costal margin. In the midclavicular line, the pleural cavity extends inferiorly to approximately rib VIII.
- In the midaxillary line, it extends to rib X.
- From this point, the inferior margin courses somewhat horizontally, crossing ribs XI and XII to reach vertebra TXII.
- From the midclavicular line to the vertebral column, the inferior boundary of the pleura can be approximated by a line that runs between the rib VIII, rib X, and vertebra TXII.



# Suprapleural membrane

- A fibrous sheath attached to :
- Laterally: medial border of 1<sup>st</sup> rib and costal cartilage
- Medially : blend with fascia investing the structure that pass from thorax to neck
- Apex : to the tip of the transverse process of the 7<sup>th</sup> cervical vertebra
- Action : protect the cervical pleura and lung a
- Also resist changes in the intrathoracic pressure during respiratory movements



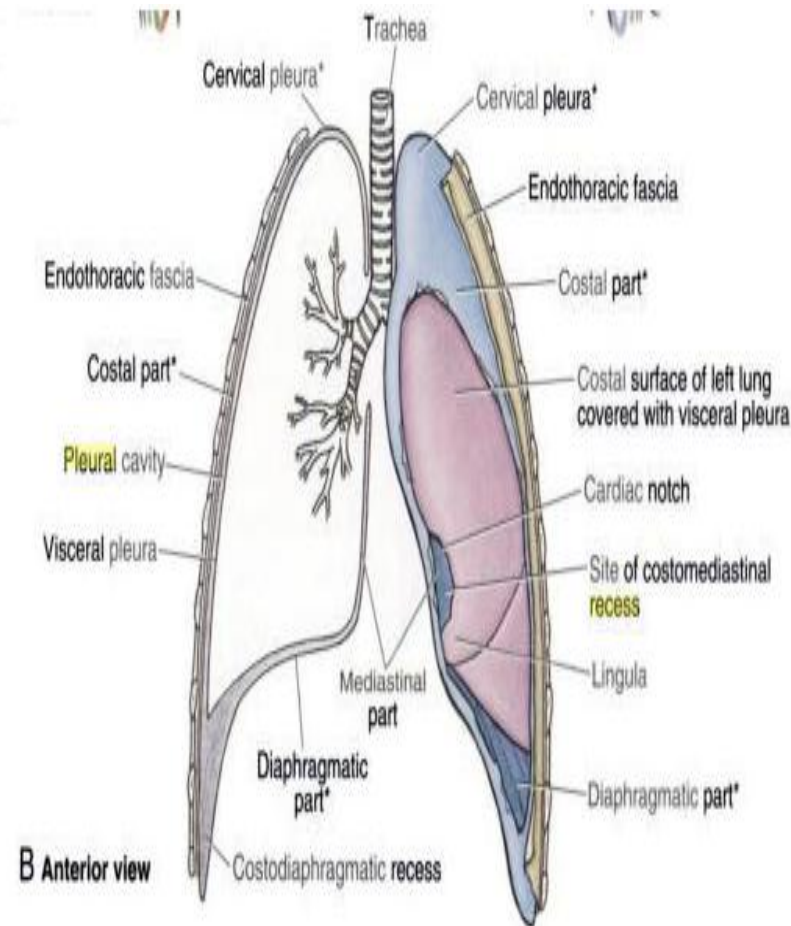


# Visceral pleura

- Visceral pleura is continuous with parietal pleura at the hilum of each lung where structures enter and leave the organ
- The visceral pleura is firmly attached to the surface of the lung, including both opposed surfaces of the fissures that divide the lungs into lobes

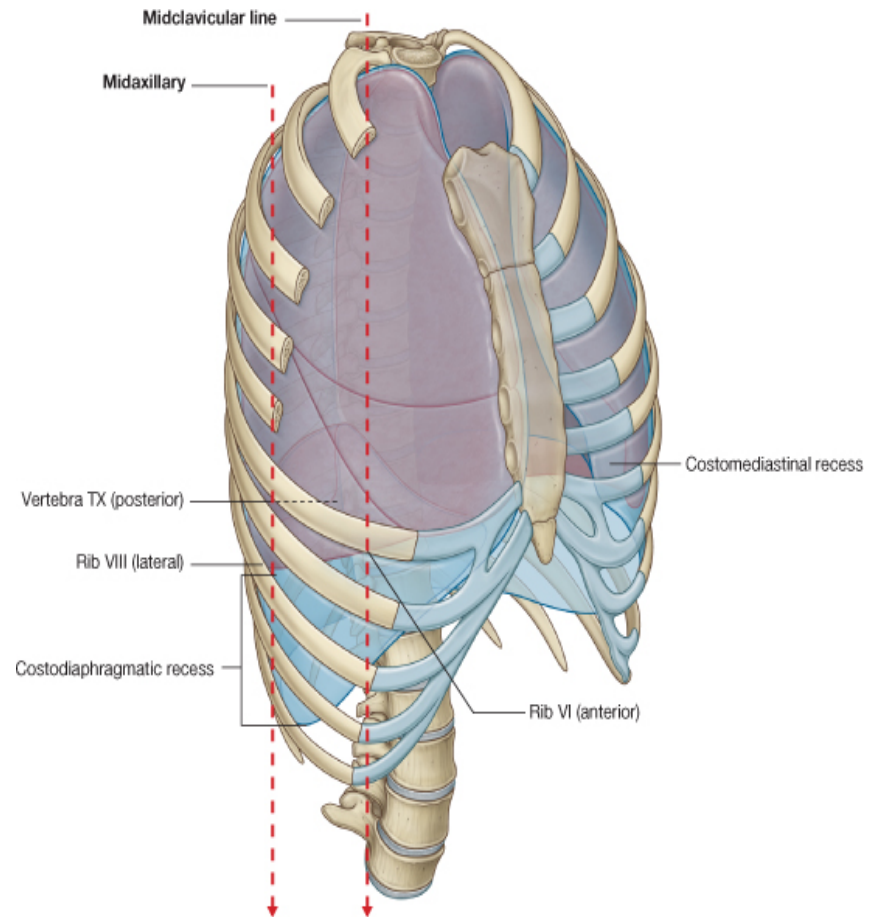
# Pleural recesses

- The lungs do not completely fill the anterior or posterior inferior regions of the pleural cavities
- This results in recesses in which two layers of parietal pleura become opposed.
- Expansion of the lungs into these spaces usually occurs only during forced inspiration
- the recesses also provide potential spaces in which fluids can collect and from which fluids can be aspirated.



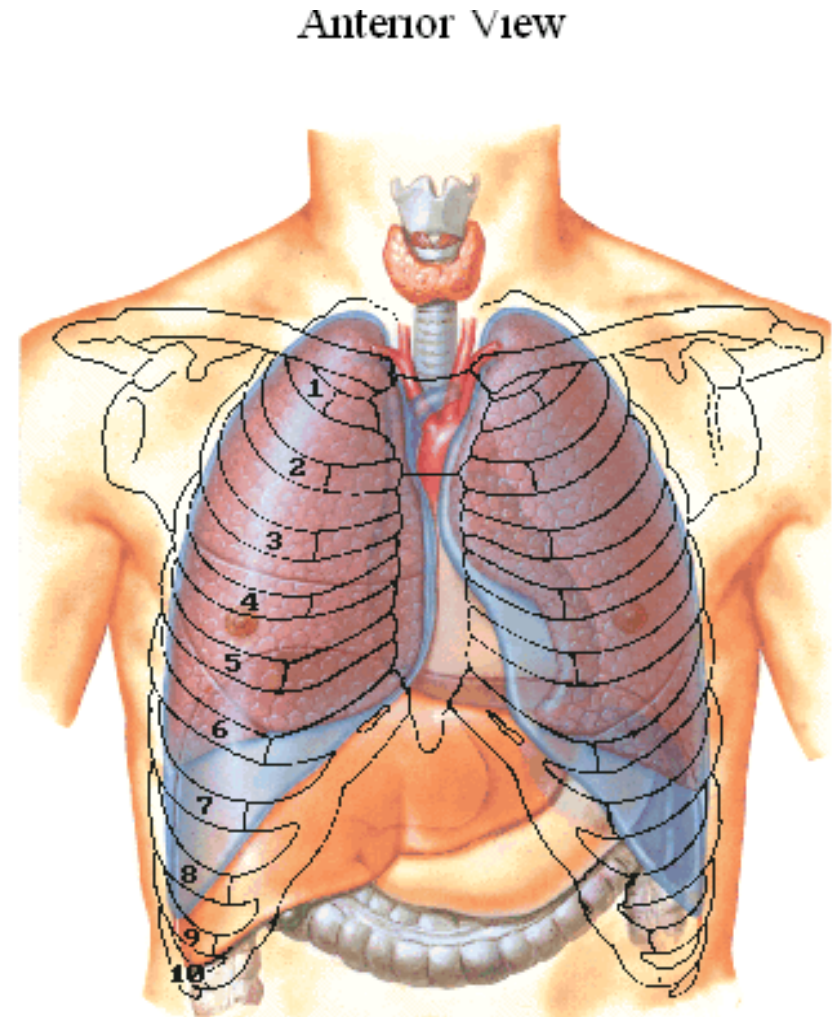
# Pleural recesses

- Costomediastinal recesses occurs on each side where costal pleura is opposed to mediastinal pleura. The largest is on the left side in the region overlying the heart.
- The largest and clinically most important recesses are the **costodiaphragmatic recesses**,
- which occur in each pleural cavity between the costal pleura and diaphragmatic pleura
- The costodiaphragmatic recesses are the regions between the inferior margin of the lungs and inferior margin of the pleural cavities

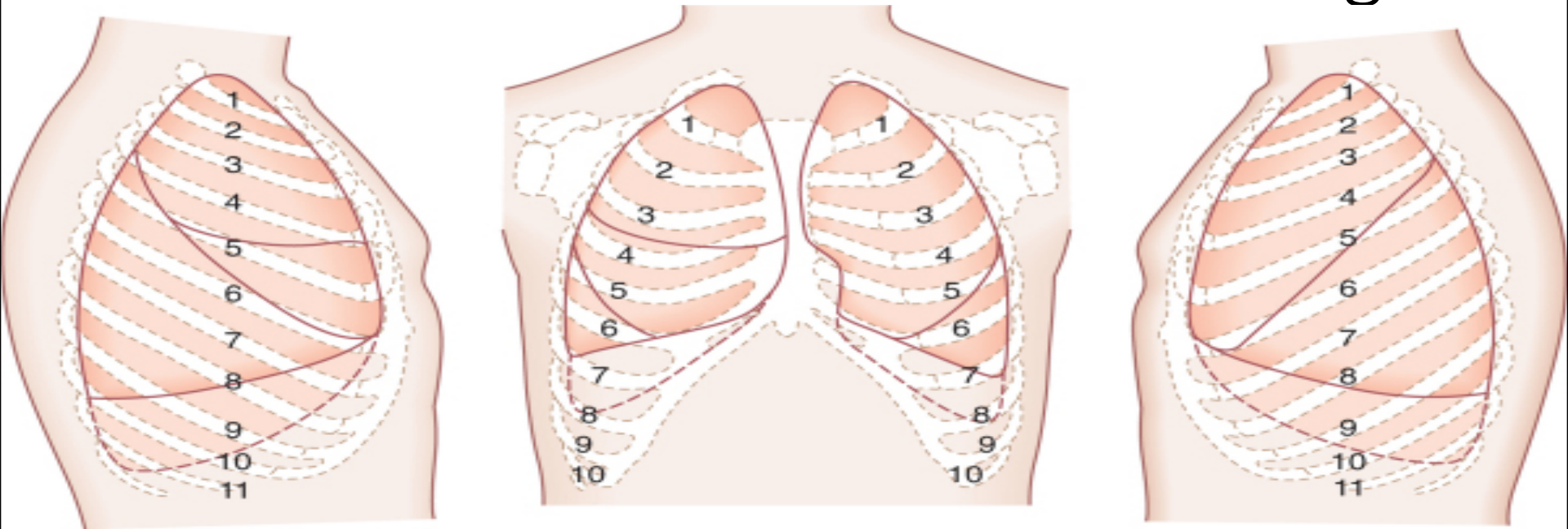


# Pleural recesses

- They are deepest after forced expiration and shallowest after forced inspiration.
- During quiet respiration, the inferior margin of the **lung** crosses rib VI in the midclavicular line, rib VIII in the midaxillary line, and then courses somewhat horizontally to reach the vertebral column at vertebral level T10
- the inferior margin of the **lung** can be approximated by a line running **between rib VI, rib VIII, and vertebra T10.**
- The inferior margin of the pleural cavity at the same points is **rib VIII, rib X, and vertebra T12.** The costodiaphragmatic recess is the region between the two margins.



# The relationships of the pleural reflections and the lobes of the lung



at the midclavicular line, the recess is between rib spaces 6 and 8,

- at the midaxillary line between 8 and 10
- at the paravertebral line between 10 and 12.

# Costodiaphragmatic recess

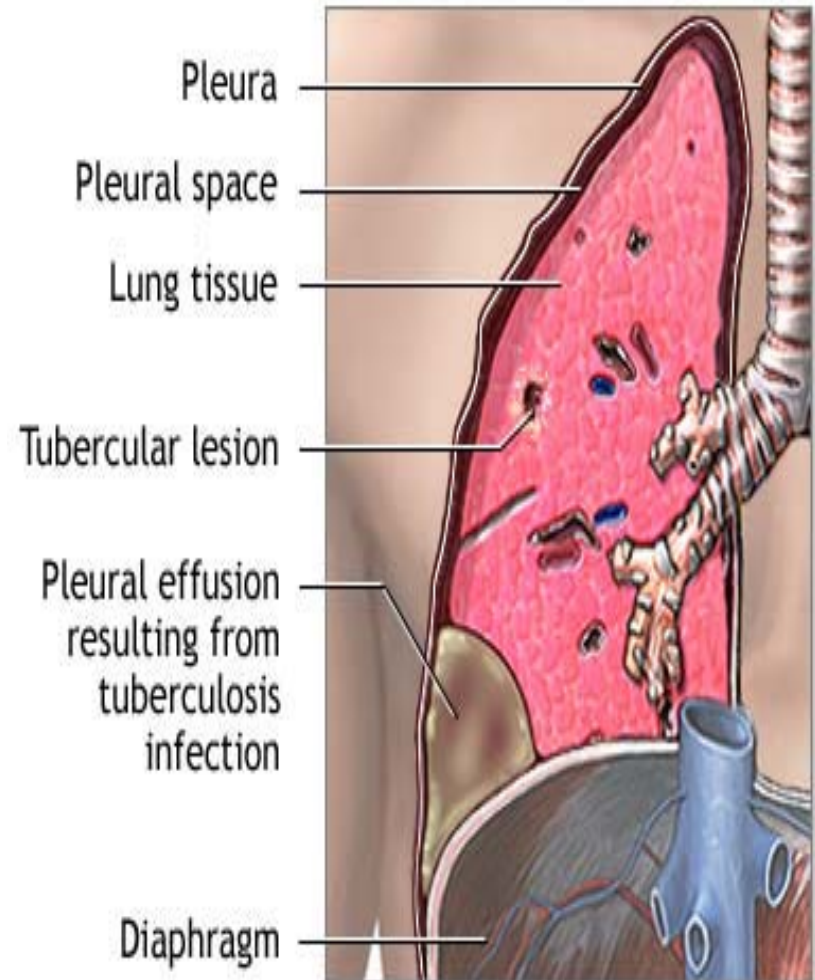
- 1" (1 inch) in the midclavicular line
- 2" in the scapular line post
- 3" in the midaxillary line

# Clinical note

- Aspiration of fluid (pneumothorax) from the pleural cavity by putting a needle through the 7<sup>th</sup> intercostal space in the midclavicular line or in any other recesses
- The needle is put in the lower border of the space.

# Pleural effusion

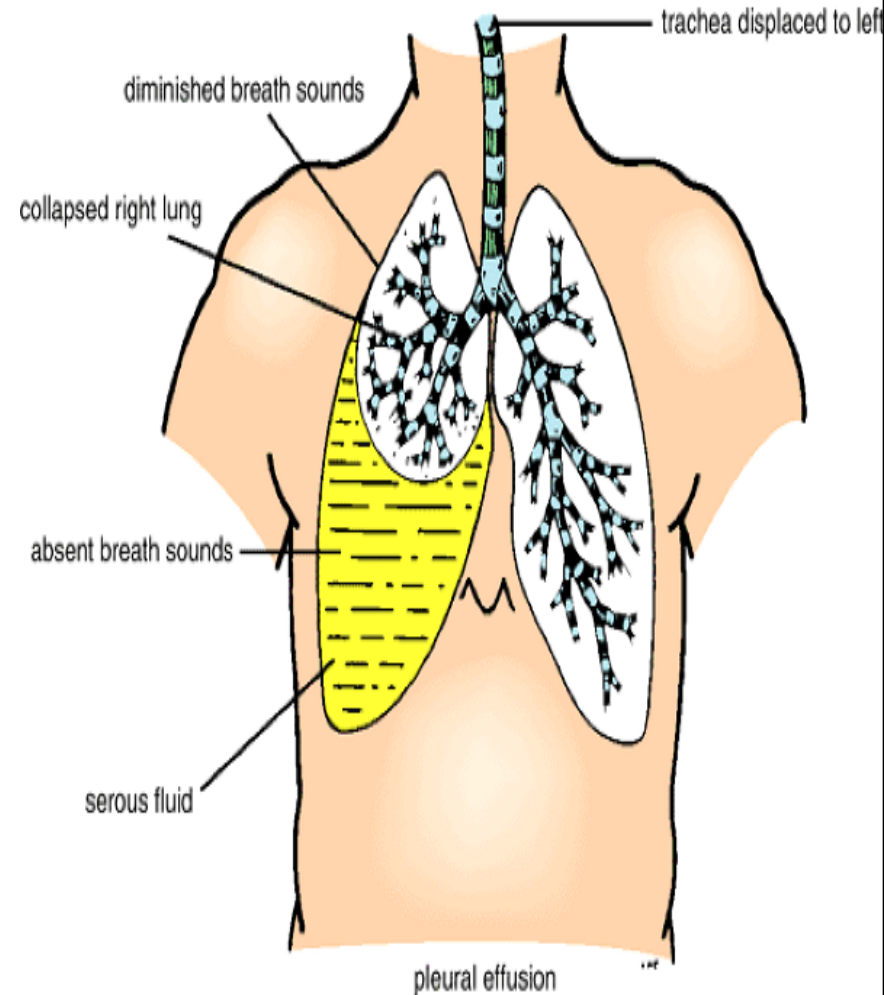
- Pleural space normally contain 5- 10 ml of clear fluid
- Absorbed normally by visceral pleura by hydrostatic and osmotic pressure
- Pleural effusion: is accumulation of excess fluid within the pleural cavity, pleural fluid increase more than 300 (ml) in costodiaphragmatic recess
- Main causes
  - 1- Infection
  - 2- Injury





# Clinical Manifestations

- Decrease in lung expansion
- Decrease breath sound
- In Percussion → Dullness
- Pain
- Cough



# Nerve supply of the pleura

## Parietal pleura:

- It is sensitive to

pain

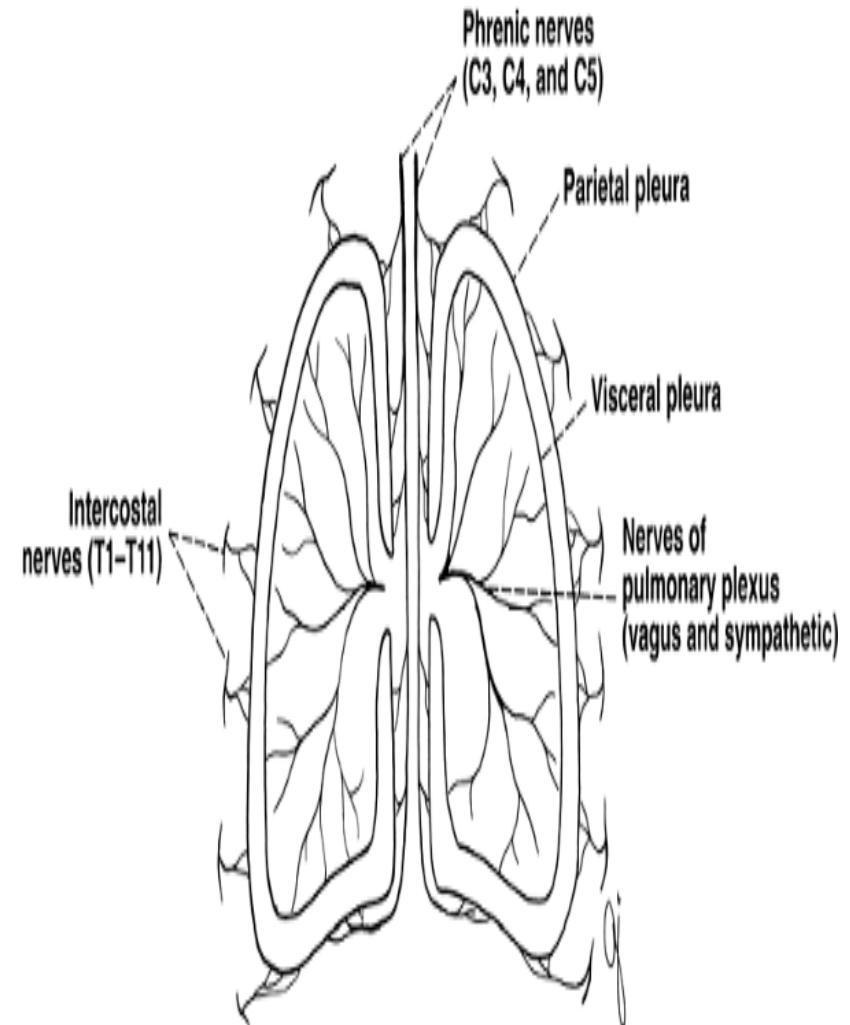
Temp

Touch & pressure

- 1- Intercostal nerves → Costal pleura (segmentally)
- 2- Phrenic nerve → Mediastinal pleura + diaphragmatic pleura
- 3- lower 6 intercostal → peripheral pleura

## Visceral pleura

- Sensitive to stretch
- Insensitive to pain, temp or touch
- Supplied by pulmonary plexus & autonomic.N.S



# *Arterial Supply of the Pleura*

- The arterial supply of the parietal pleura is from the arteries that supply the **thoracic wall**

**Intercostal arteries(ant& post)**

**Internal thoracic**

**Musculophrenic arteries.**

- The arterial supply of the visceral pleura is from the  
-**Bronchial arteries**, which are branches of the **thoracic aorta**.

Veins drain into **azygos & internal thoracic veins**.

# Lymphatic drainage of pleura

## **parietal pleura**

### **Mediastinal pleura by**

- 1- mediastinal nodes
- 2- Tracheobronchial nodes
- 3- Intercostal nodes

## **Diaphragmatic pleura**

- 1- Parasternal nodes
- 2- Post.mediastinal nodes

- **Pulmonary pleura(visceral)** :along bronchial arteries → bronchopulmonary nodes

Thank you