

وسهلا



أهلا

يُمنع أخذ السلايدات بدون  
إذن المحرر واي اجراء  
يخالف ذلك يقع تحت طائلة  
المسؤولية القانونية  
جميع المعلومات للاستخدام  
التعليمي فقط

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

Prof. Dr. Youssef Hussein Anatomy - YouTube

الواتس 00201224904207

<https://www.youtube.com/@ProfDrYoussefHusseinAnatomy/playlists>



# Trachea

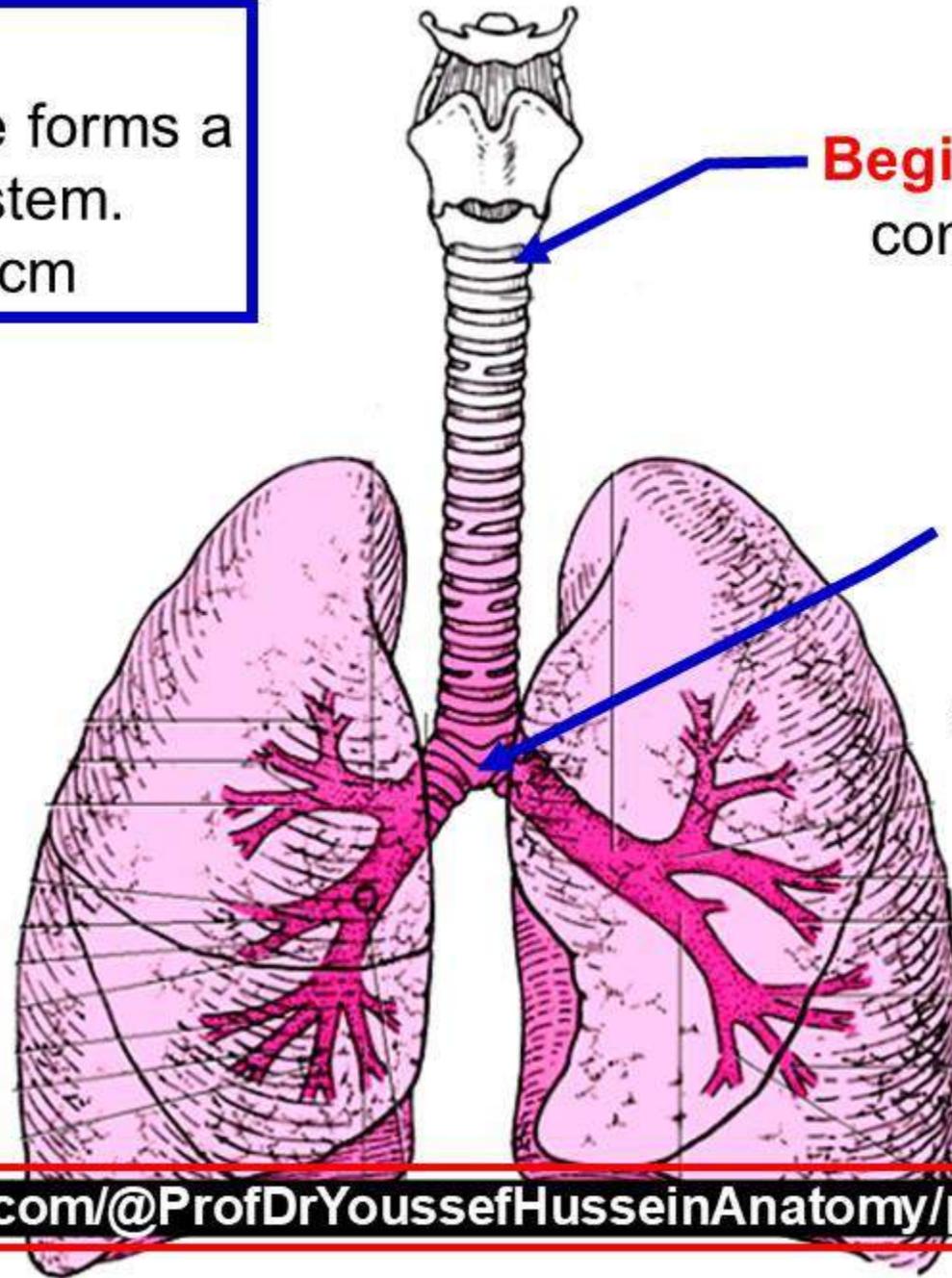
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## Trachea

- It is a cartilaginous tube forms a part of the respiratory system.

\*\*

**Length; 10 to 13 cm**

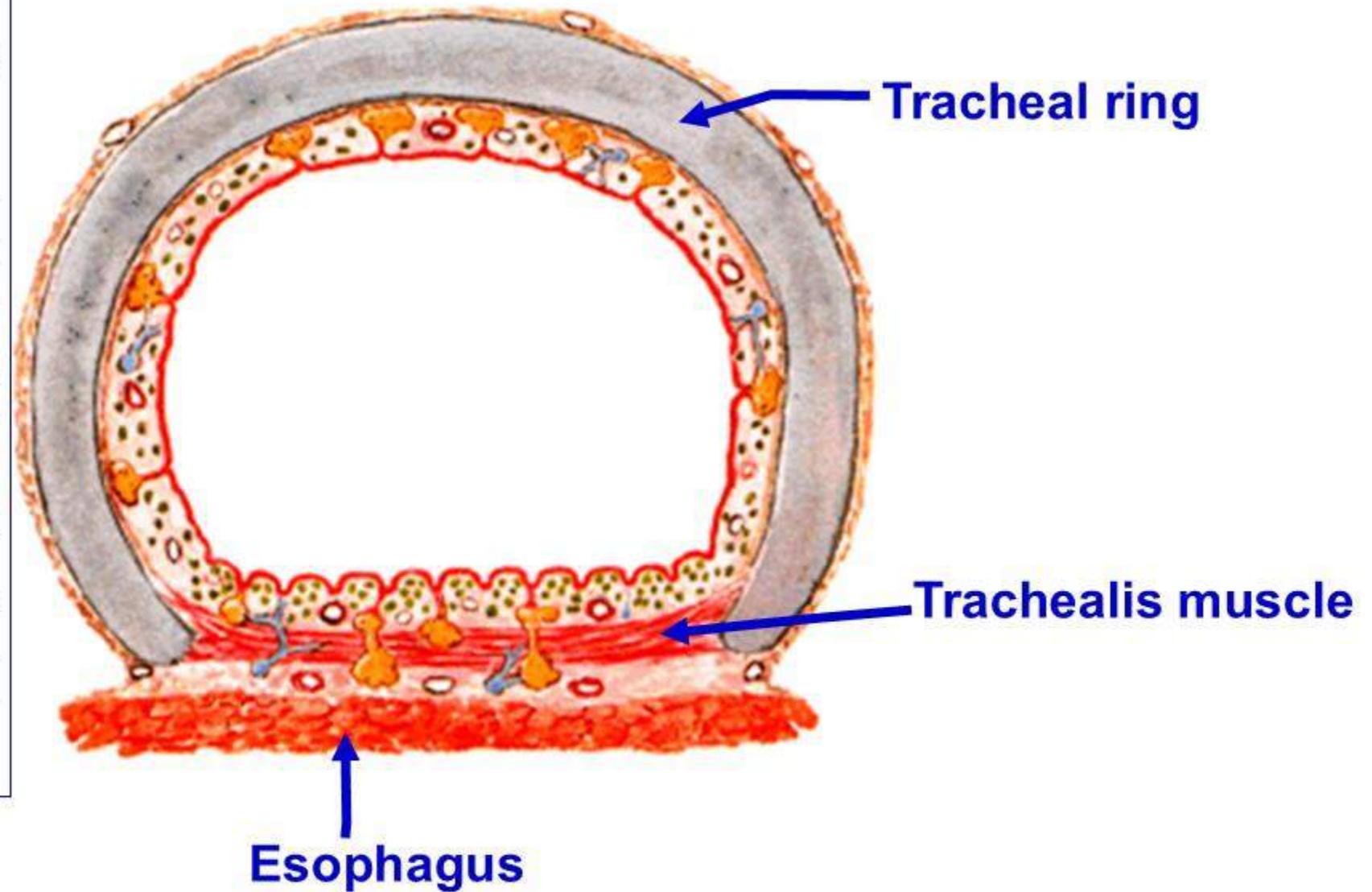


**Begin** at the level of **C6** as a continuation of the larynx

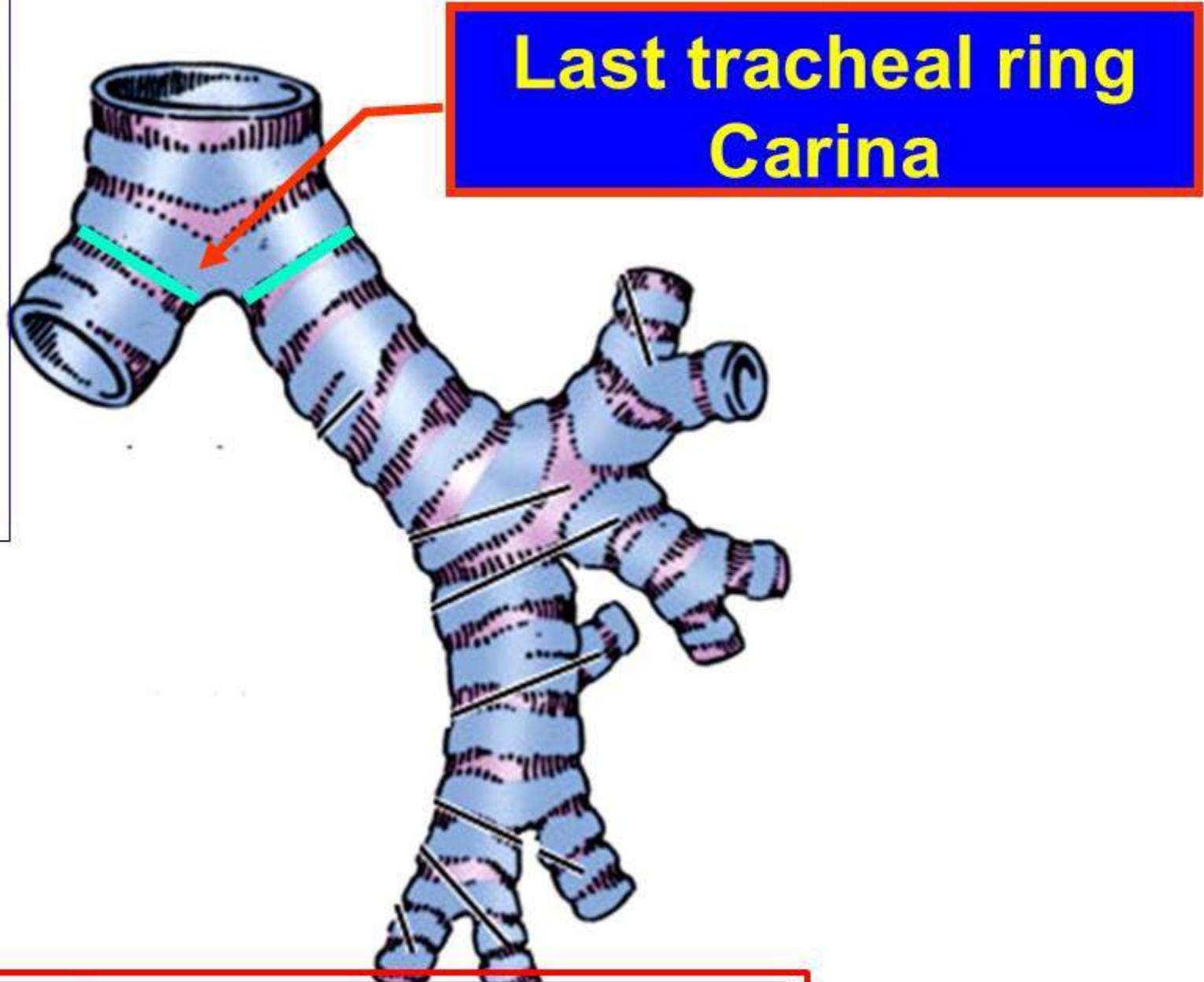
**End** in thorax slightly to the **right of the median plane** at level of sternal angle (lower border of **T4**) by dividing into right and left bronchi

- It is formed of **18-20 C-shaped** cartilaginous rings.

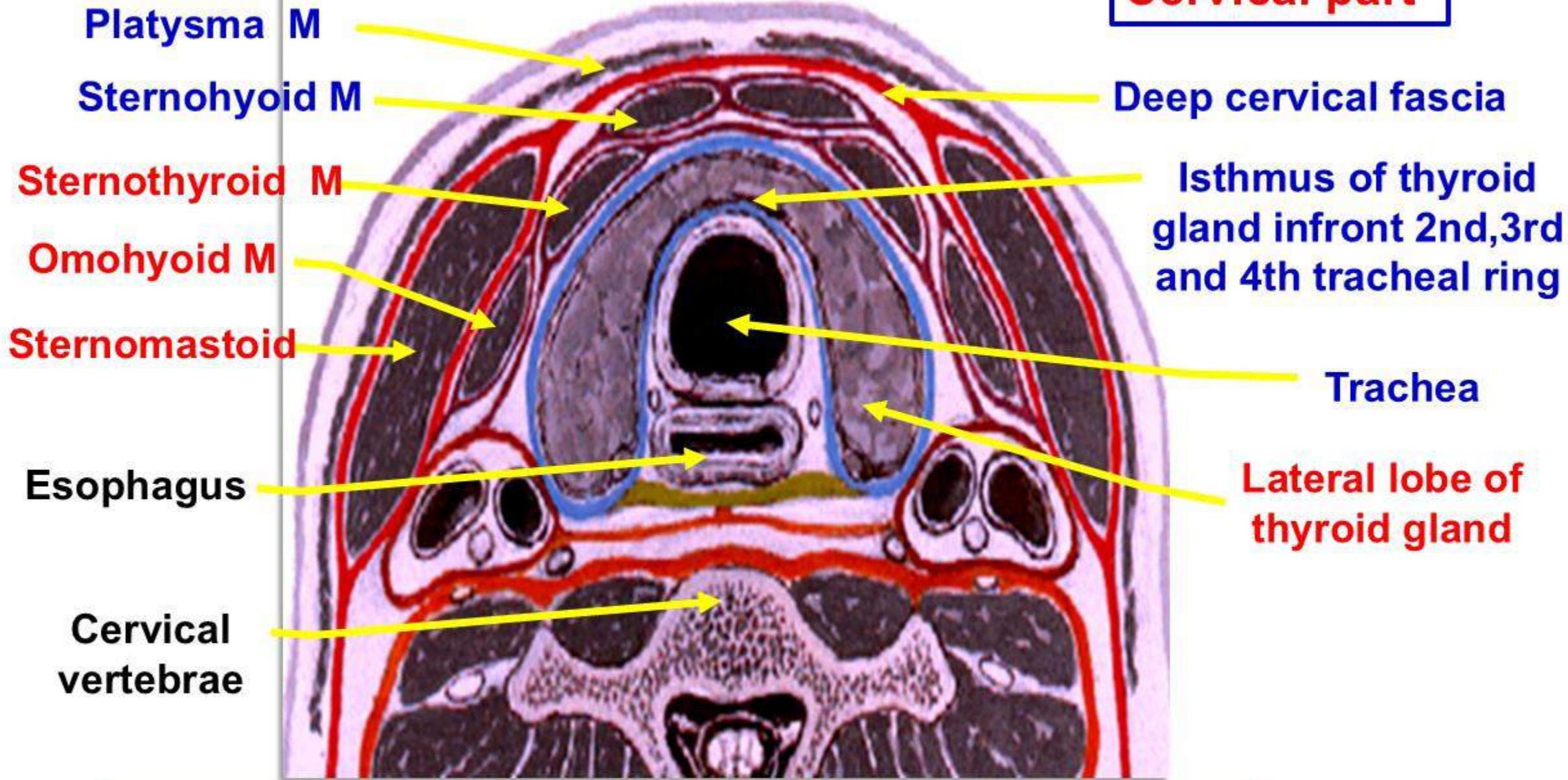
- The concavity of the ring directed posteriorly and completed by a plain muscle (**trachealis**) and fibro-elastic tissue that allow dilatation of the esophagus during deglutition.



- **Trachea** is slightly deviated to the **right of the median** plane
- The **lower tracheal ring** has a keel like extension known as **Carina**.

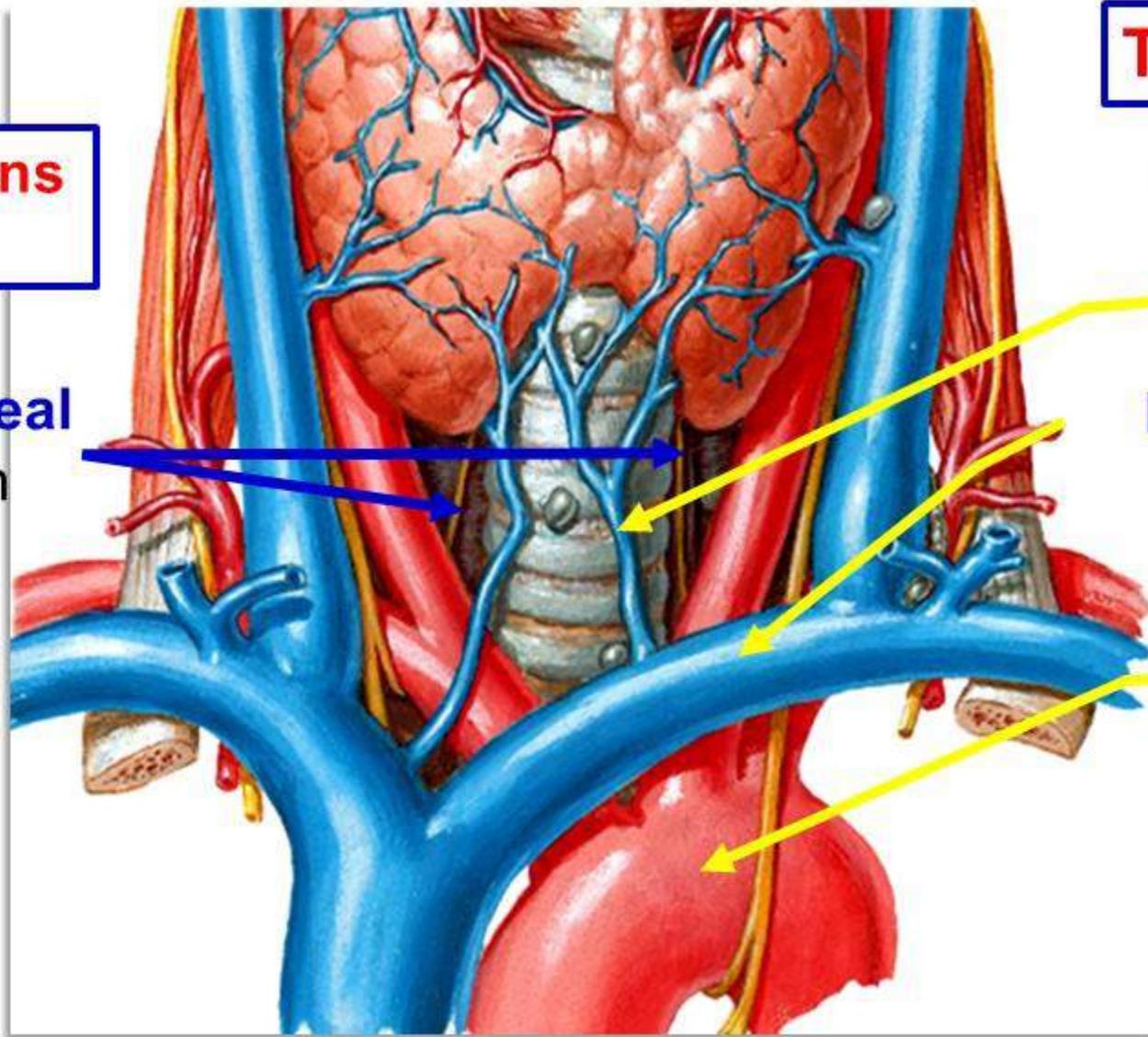


**Cervical part**



**Posterior relations  
- Esophagus**

**Recurrent laryngeal  
nerves** between  
trachea and  
esophagus



**Thoracic part**

**Anterior relations**

**Inferior thyroid vein**

**Left brachiocephalic  
vein**

**Arch of aorta**

## Right relations

## Thoracic part

## Left relations

Right pleura and lung

Right common carotid artery

Right vagus nerve

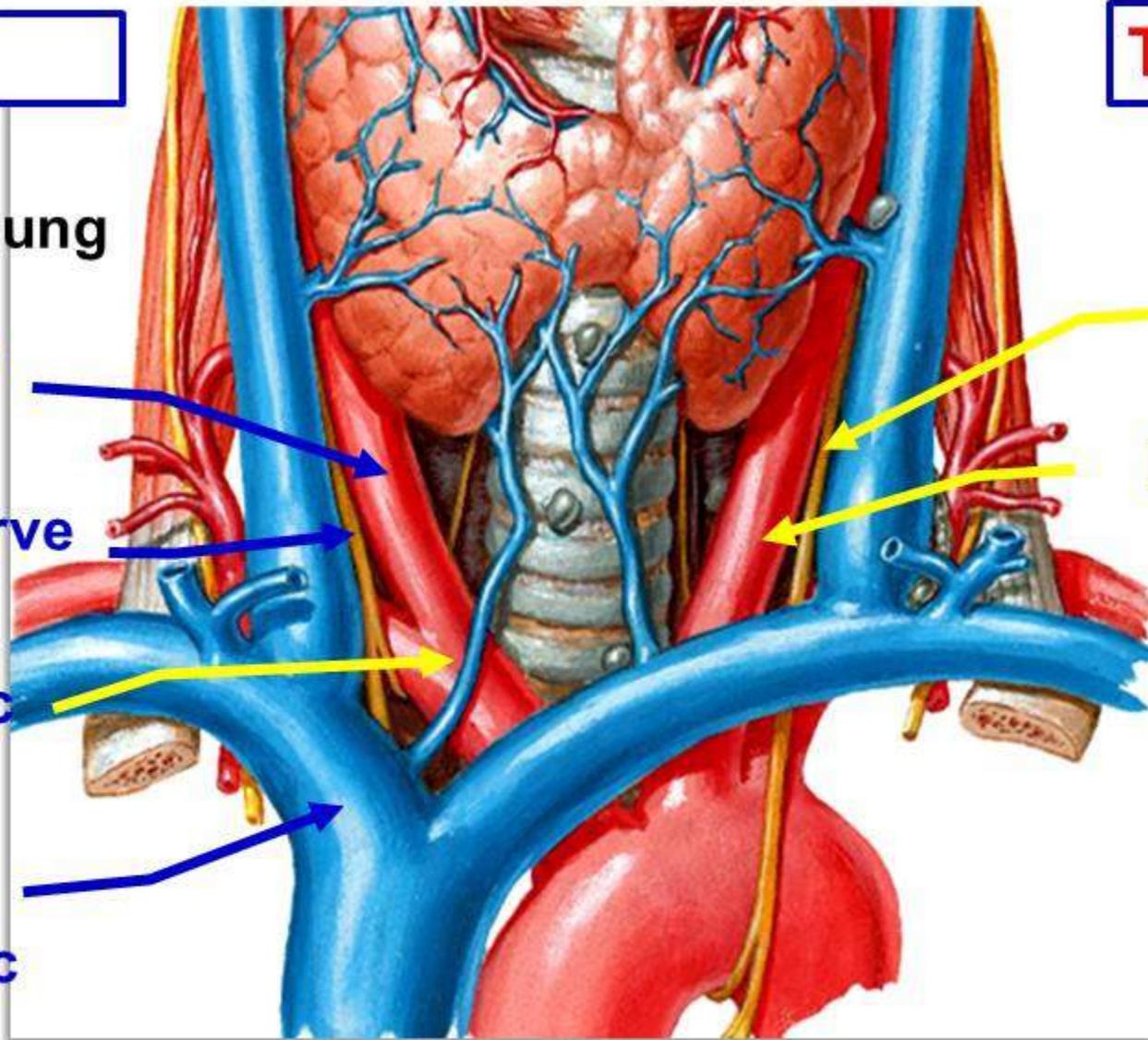
Brachiocephalic trunk

Right Brachiocephalic vein

Left vagus nerve

Left common carotid artery

Left pleura and lung



## \*\* Blood Supply:-

- a- Cervical part by the inferior thyroid vessels.
- b- The thoracic part by the bronchial vessels.

\*\* **Nerve supply**, Autonomic fibers from 2 vagi and 2 sympathetic chains.

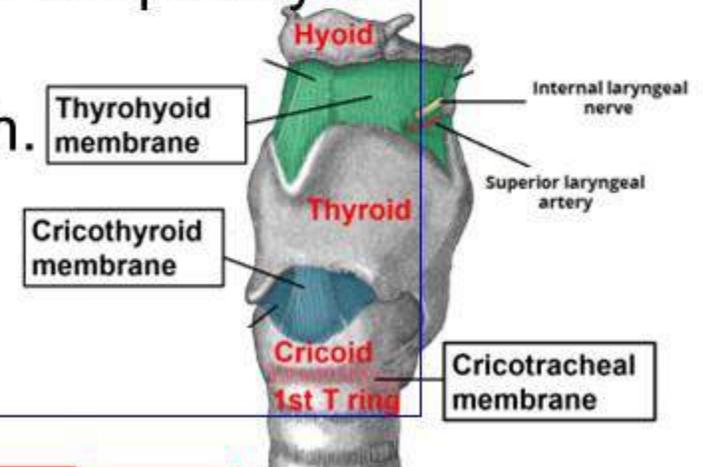
\*\* **Lymph drainage**: pretracheal and paratracheal lymph nodes

## Tracheostomy

- **Tube inserted in the trachea** approximately midway between thyroid cartilage and suprasternal notch, just below the cricoid cartilage

❖ Why a Tracheostomy Tube is Needed (The tube may be temporary or permanent)

- Airway obstruction in the upper airway, nose, or mouth.
- Long-term ventilator.
- Surgical Procedures that involve the neck or face.
- Breathing Muscle Paralysis

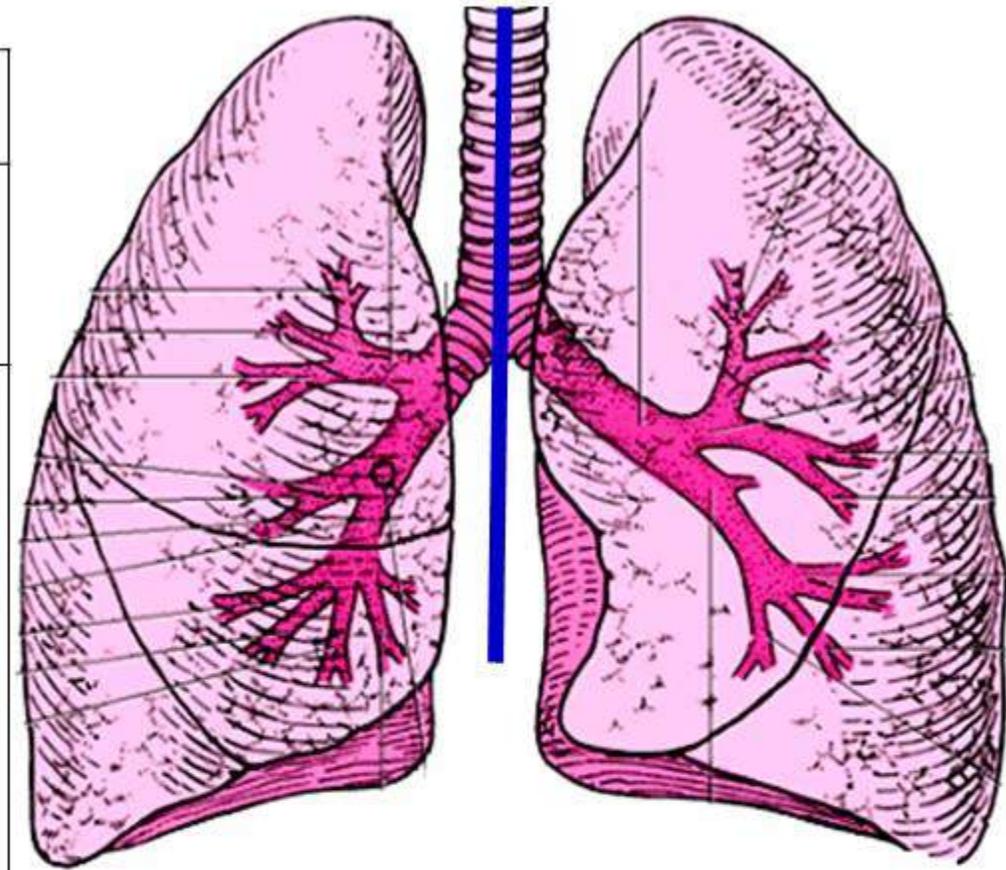




# Bronchi

<https://www.youtube.com/@ProfDrYoussefHusseinAnatomy/playlists>

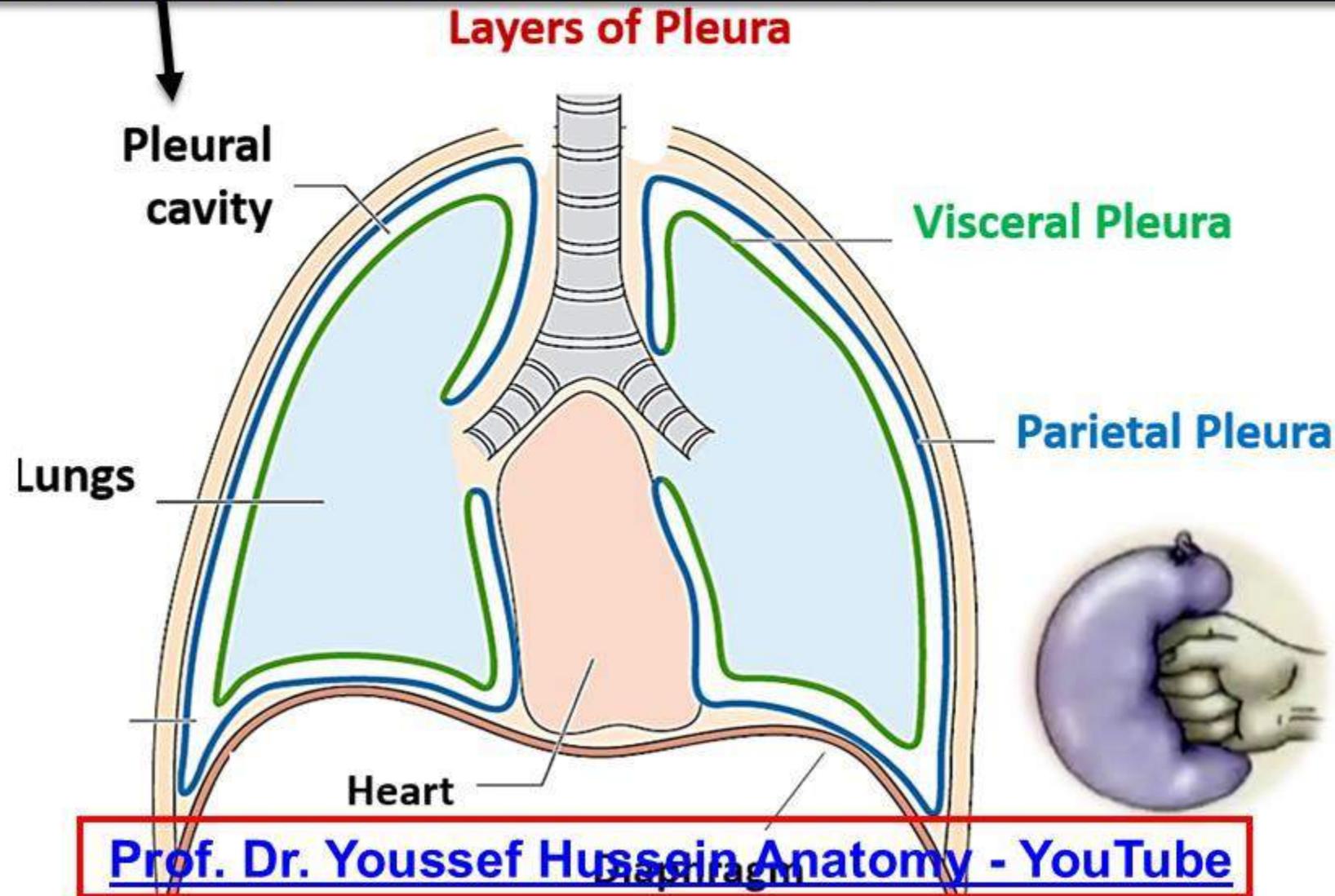
	<b>Right Bronchus</b>	<b>Left Bronchus</b>
<b>Diameter</b>	Wide & short.	Narrow & long.
<b>Direction</b>	<ul style="list-style-type: none"> <li>- It is more <b>vertical</b> and form angle about <b>15 degree</b> with the trachea</li> <li>- <b>SO</b>, the foreign bodies and aspirated material pass to the right lung</li> </ul>	<ul style="list-style-type: none"> <li>- more <b>oblique</b> and form angle about <b>45 degree</b> with the trachea.</li> </ul>



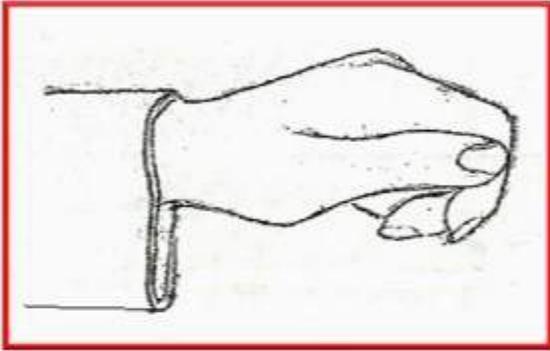
# Pleura Lungs

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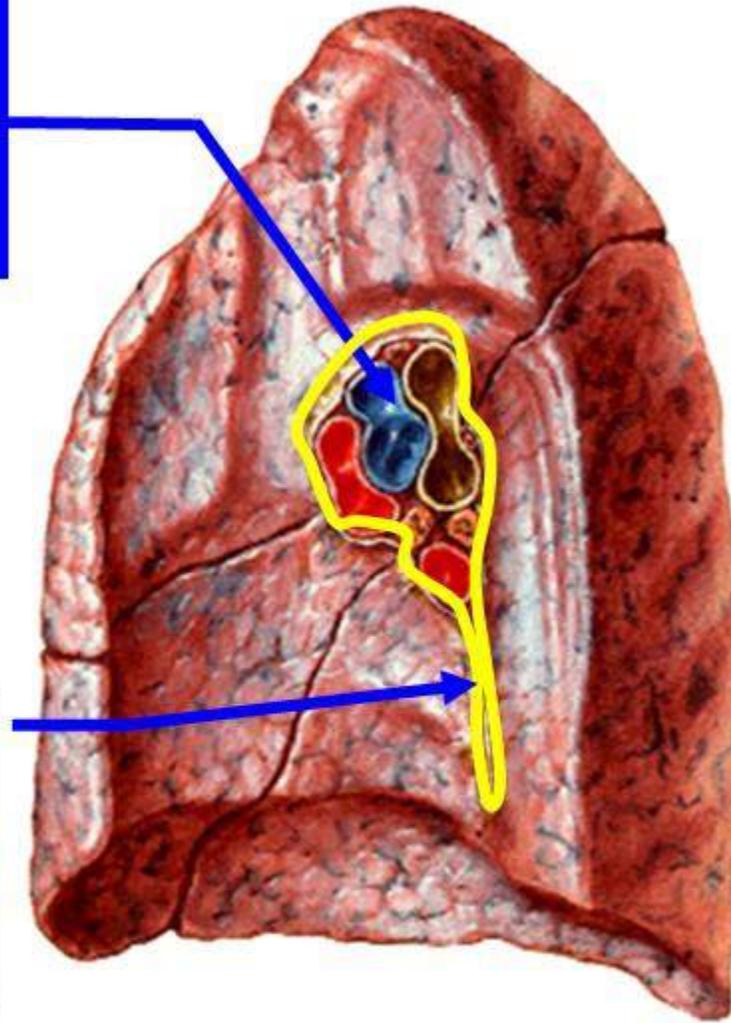
- Pleura is a closed serous sac invaginated by lung from its medial side.
- It consists of 2 layers (parietal and visceral).
- It contains serous fluid, that acts as a lubricant.



**Hilum (Root) of lung  
(Bare area of the lung  
not covered by pleura)**



**Pulmonary ligament  
thickened part of the pleura  
below the root of the lung**



**Functions of pulmonary  
ligament**

1. Allows free movement of the root of the lung during deep inspiration
2. Acts as dead space for distention of pulmonary veins during increased blood return from lung.

**Cervical  
pleura**

**costal  
pleura**

**C3,4,5**

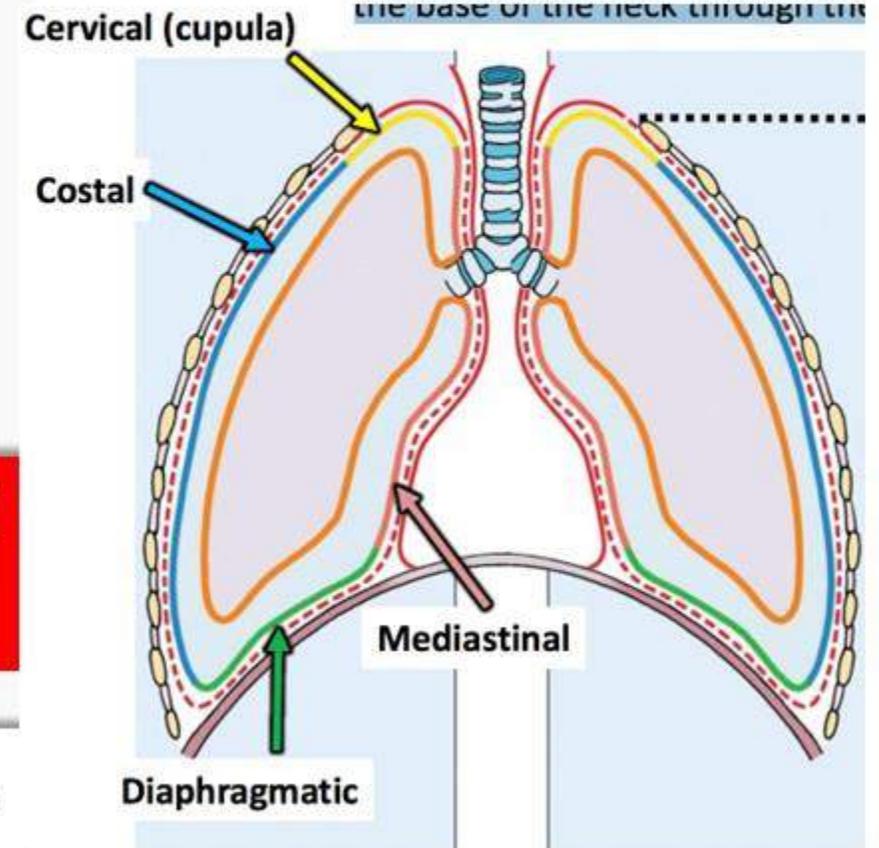
**phrenic  
nerve**

**Pericardium**

## Parts of the parietal pleura

**mediastinal  
pleura**

**diaphragmatic  
pleura**



- **Cervical pleura:**

- It covers the apex of the lung.
- It bulges through the thoracic inlet to the neck.
- It is covered by **supra-pleural membrane** (*Sibson's fascia*).

- **It is related to:-**

- 1- Anteriorly:** subclavian artery.

- 2- Posteriorly:**

- Neck of the 1<sup>st</sup> rib separated from it by;
  - \* 1<sup>st</sup> intercostal nerve.
  - \* Superior intercostal artery.
  - \* Sympathetic trunk.

- **Nerve supply of pleura**

**A) Parietal pleura:**

1) **Costal pleura:** by intercostal nerves.

2) **Mediastinal pleura:** by phrenic nerves.

3) **Diaphragmatic pleura:** by phrenic and intercostals nerves.

**B) Visceral pleura:** by autonomic (anterior and posterior pulmonary plexus).

- **Blood supply of pleura**

**A) Parietal pleura:**

1) **Costal pleura:** by intercostal vessels.

2) **Mediastinal pleura:** by pericardio-phrenic vessels.

3) **Diaphragmatic pleura:** by pericardio-phrenic and intercostals vessels.

**B) Visceral pleura:** by bronchial vessels.

# Clinical anatomy

- The **pleurisy** (inflammation of the pleura) → causes **roughness of the pleural surfaces** → **which causes friction during respiration** → creates **severe pain** on inspiration.
- **A pleural rub** (a friction sound) can be heard with the stethoscope on respiration.
- Irritation of the **costal pleura** (**pleurisy**) leading to **referred pain** to the thorax wall and anterior abdominal as intercostals nerves supplied them, **So** it can mistake with acute abdominal pain
- Irritation of the **mediastinal pleura** leading to **referred pain** to the shoulder as they supplied by the supraclavicular nerves (C3-C4).

<https://www.youtube.com/c/ProfDrYoussefHusseinAnatomy/featured>



# Lungs

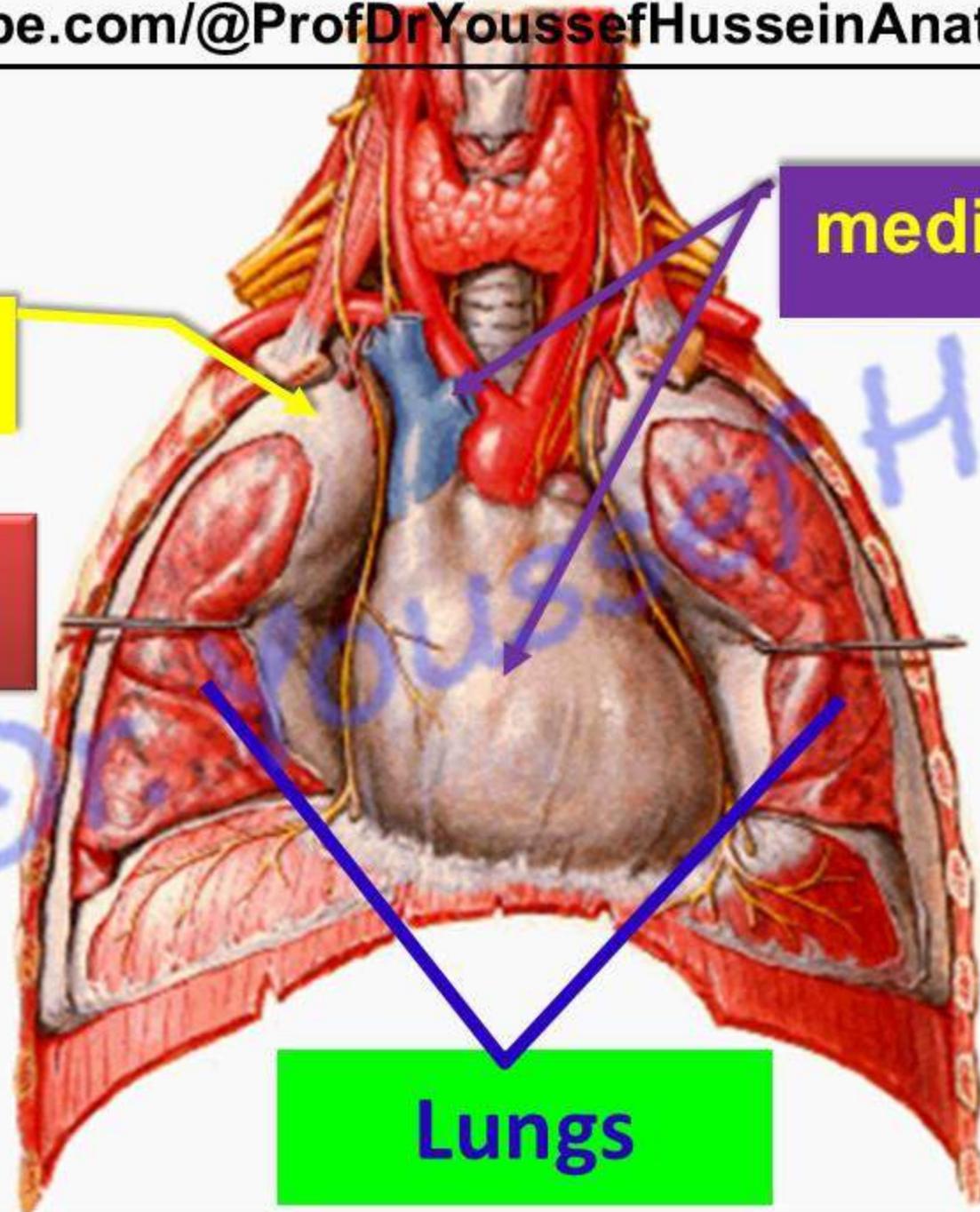
<https://www.youtube.com/@ProfDrYoussefHusseinAnatomy/playlists>

**Pleura**

**Position**

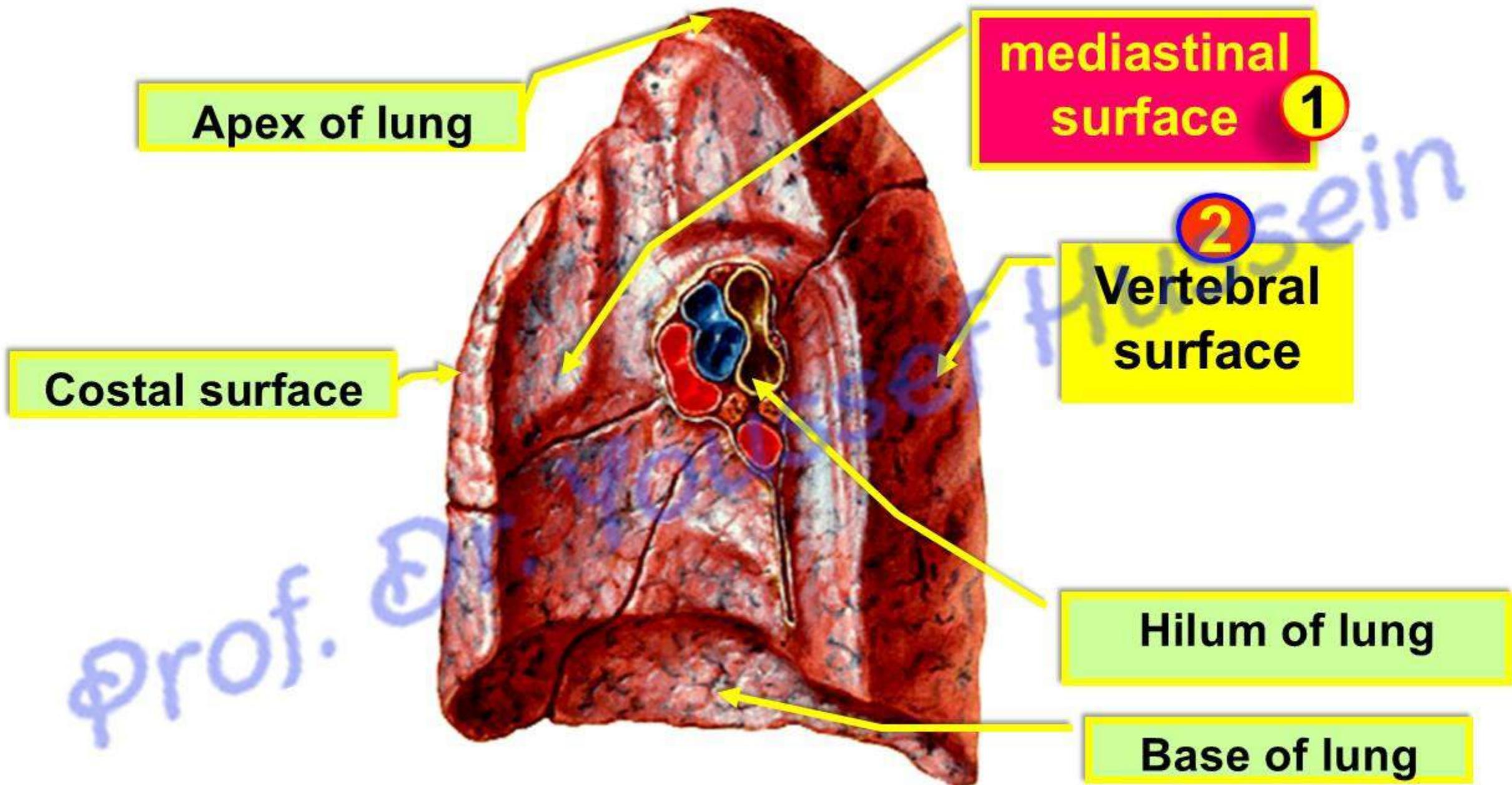
**mediastinum**

**Lungs**



prof. @

Hussein



Right

Apex

Upper lobe

Posterior border

Horizontal fissure

Upper lobe

Oblique fissure

Middle lobe

Cardiac notch

Lower lobe

Lingula

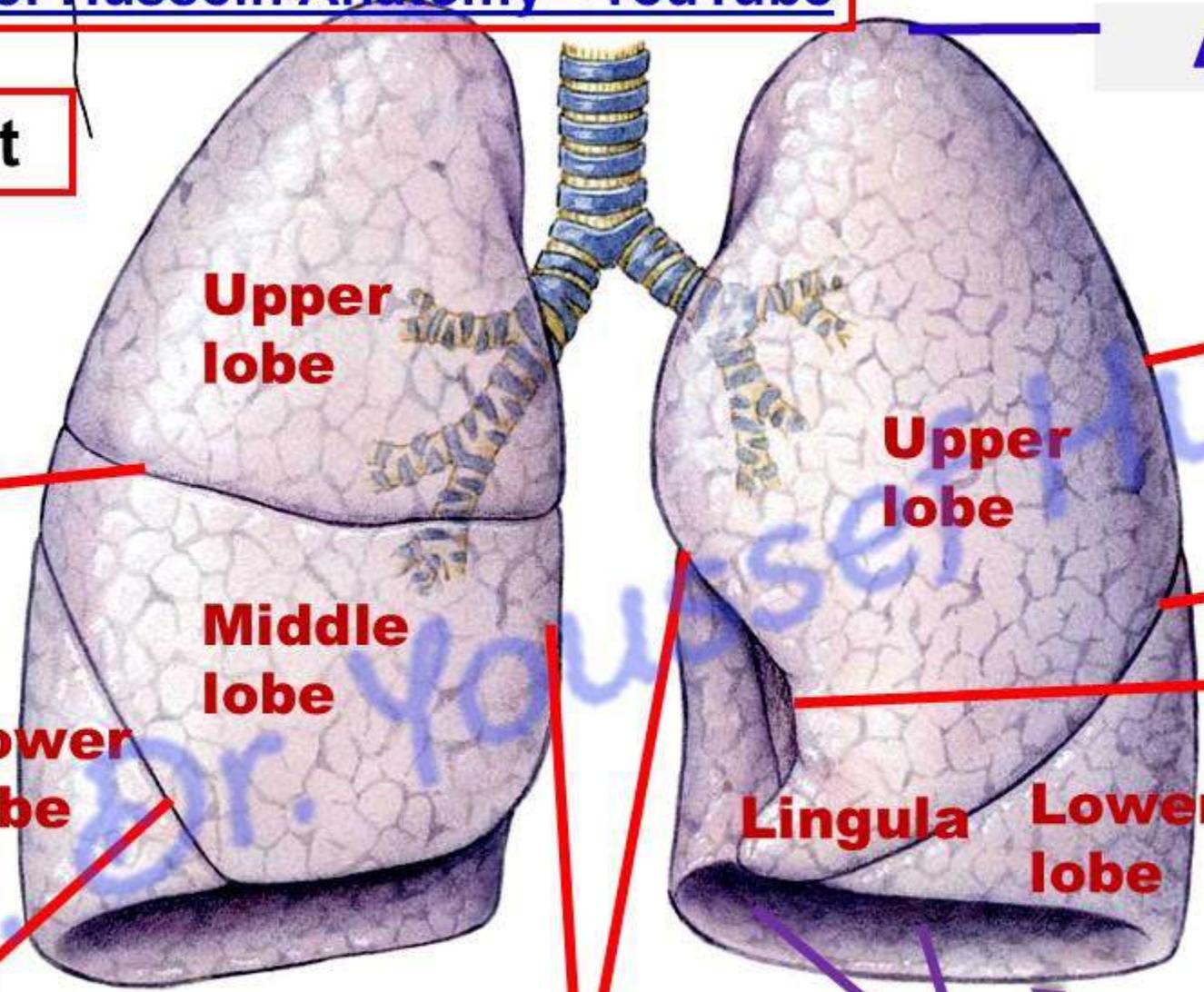
Lower lobe

Inferior border

Oblique fissure

Anterior border

Base



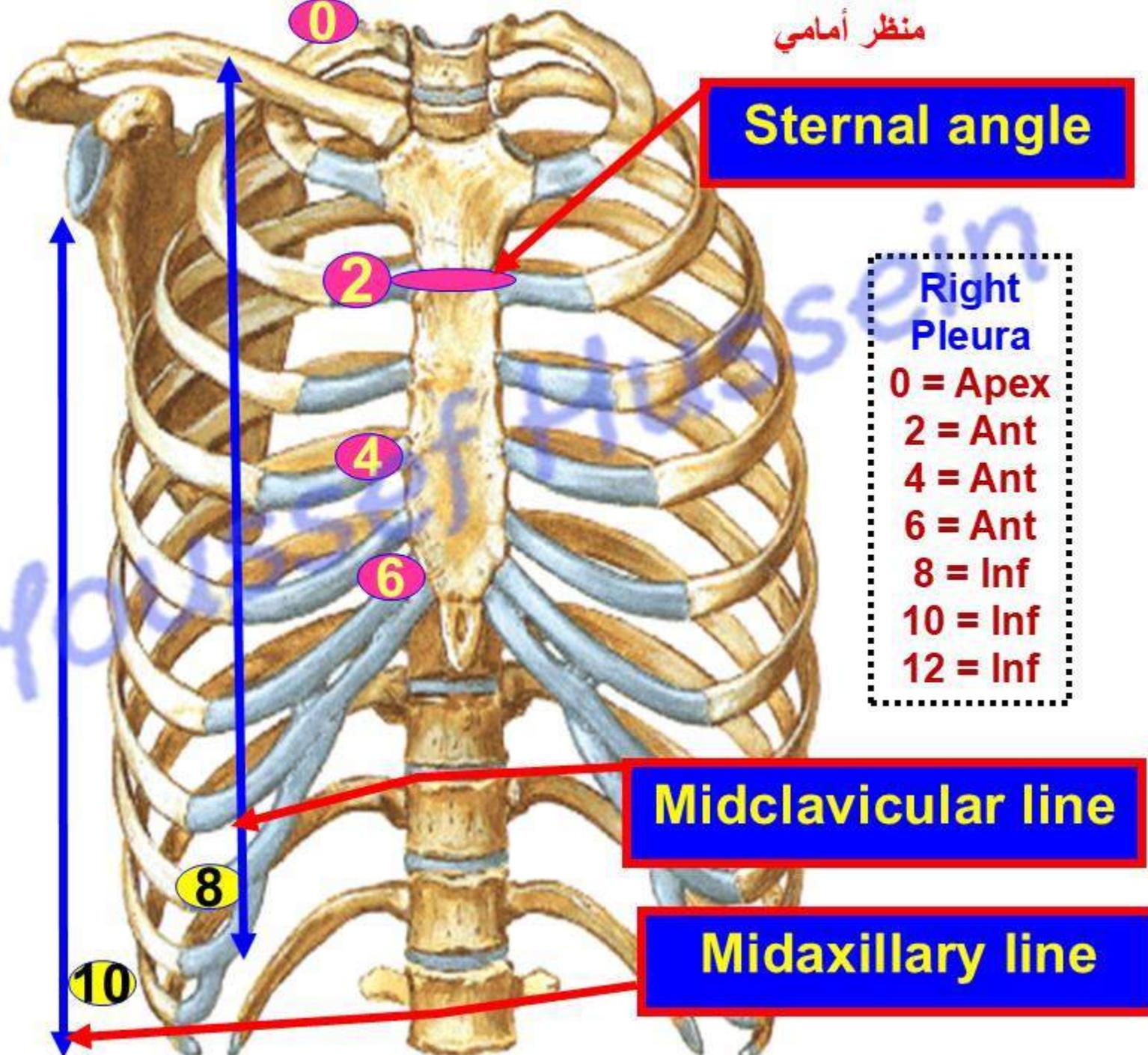
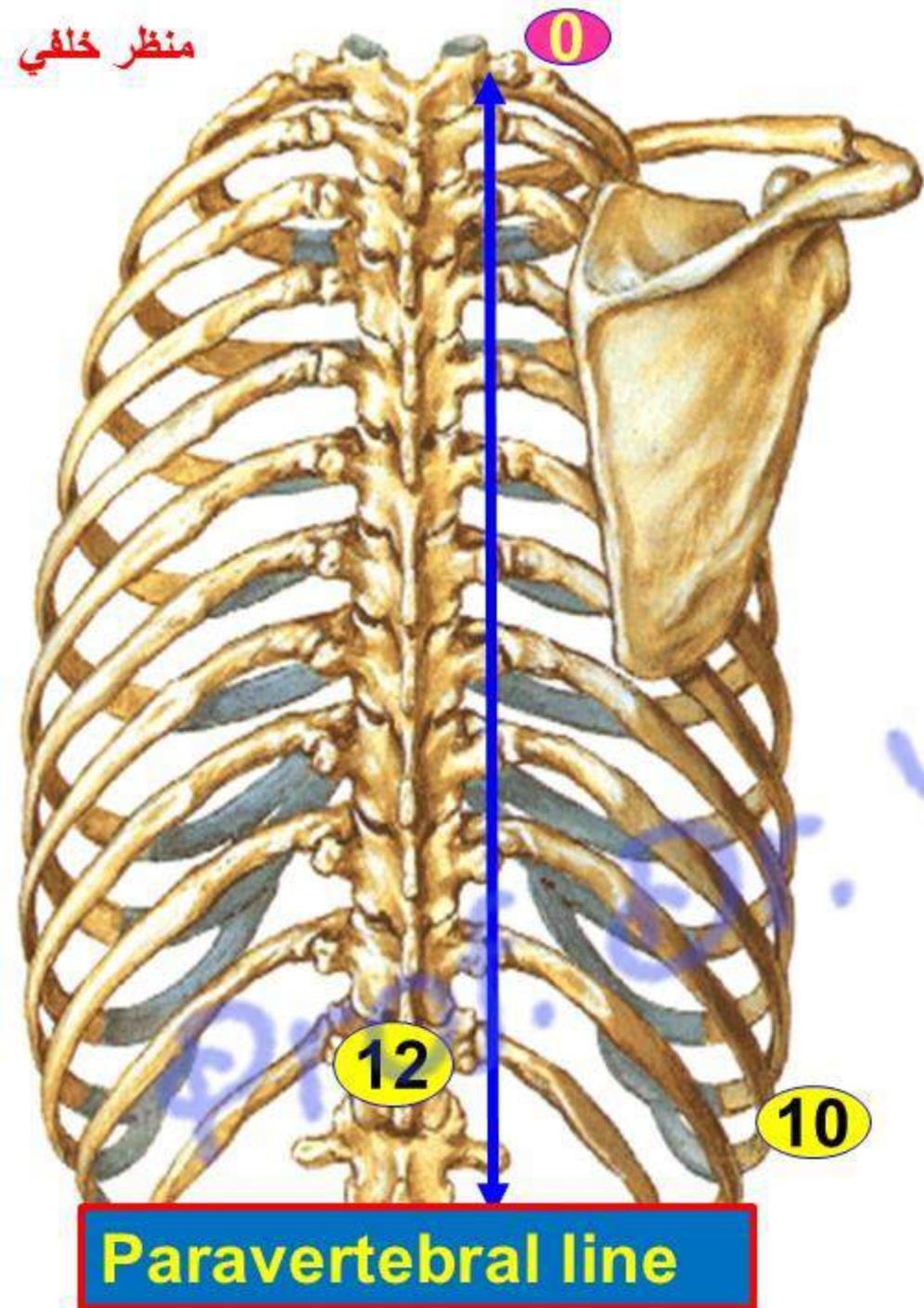
	<b>Right lung</b>	<b>Left lung</b>
1-Size	Larger	Smaller
2- Length and Breadth	Shorter and wider	Longer & narrower
3- Anterior border	Straight	cardiac notch & lingula below notch
4- Fissures	2 (oblique & horizontal)	1 (oblique)
5- Lobes	3 (upper, middle & lower)	2 (upper & lower)

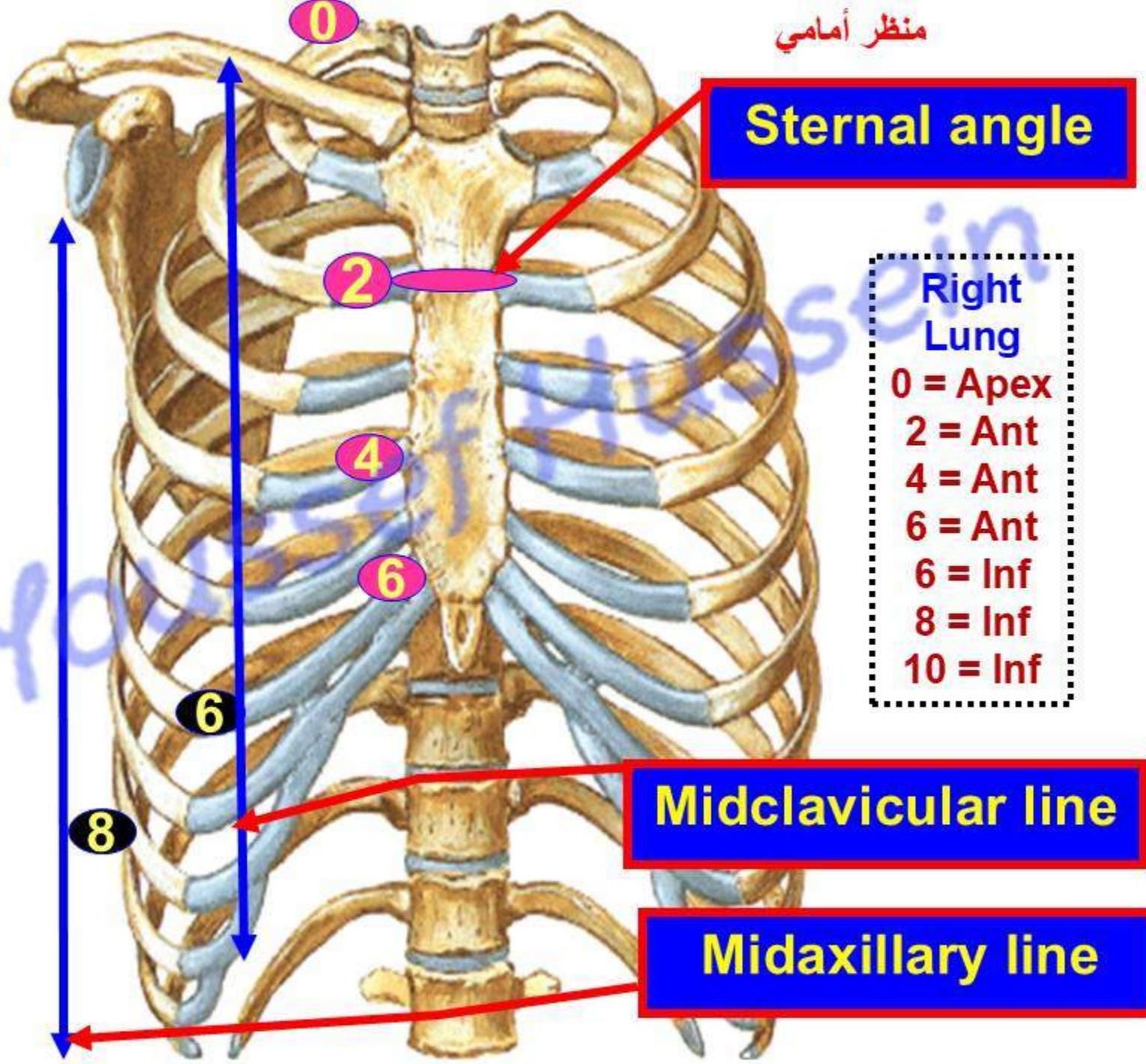
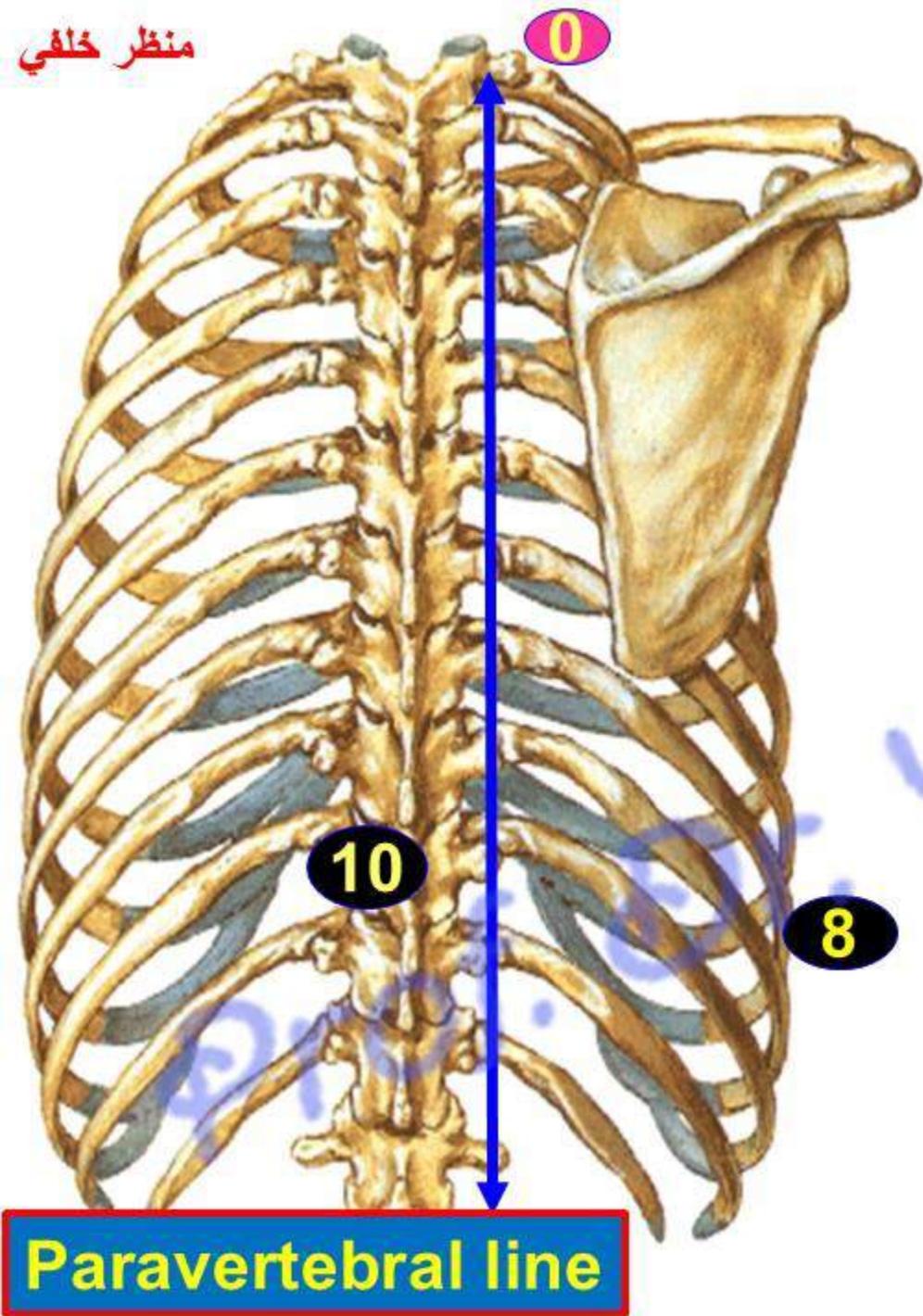
# Surface anatomy

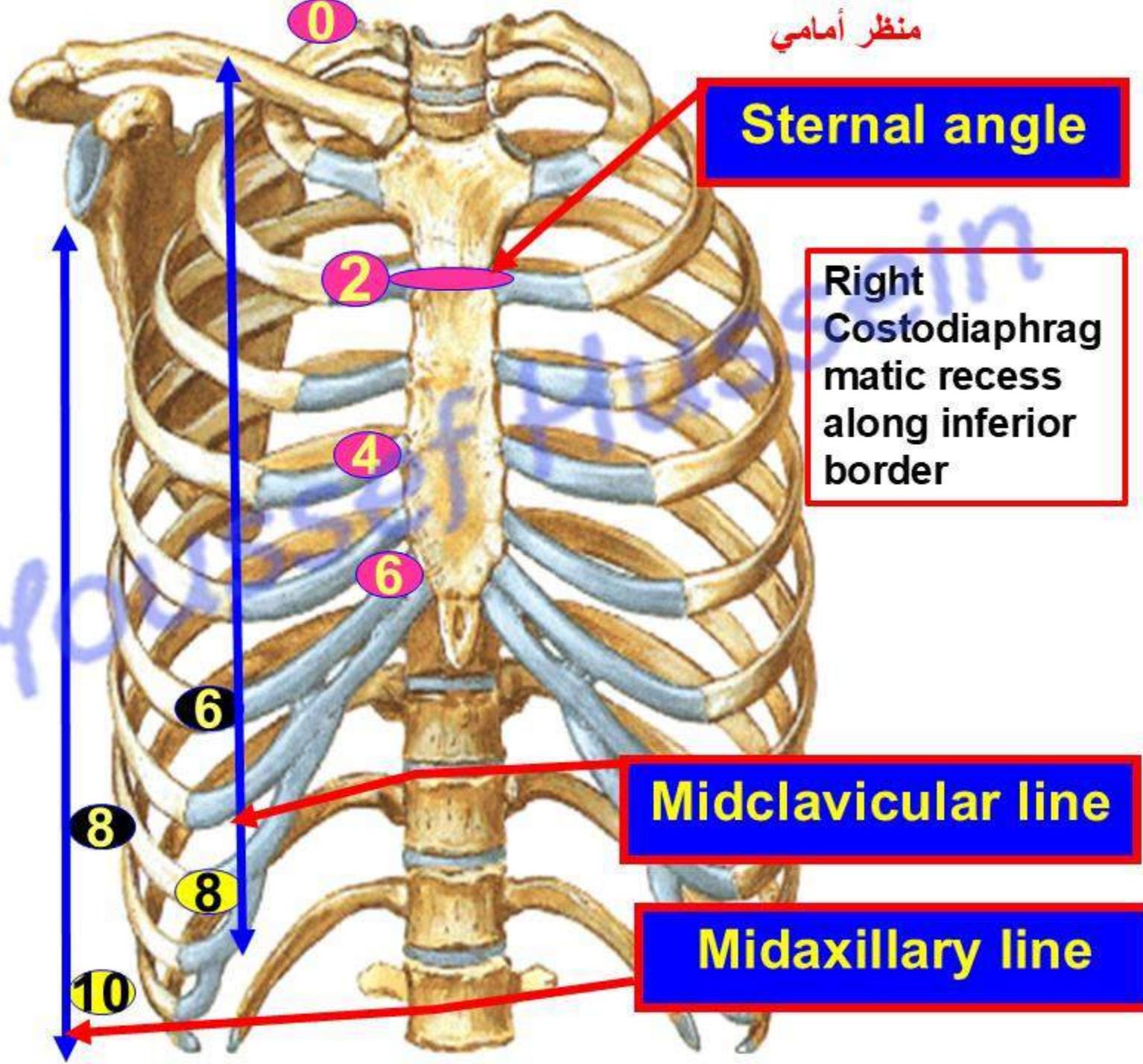
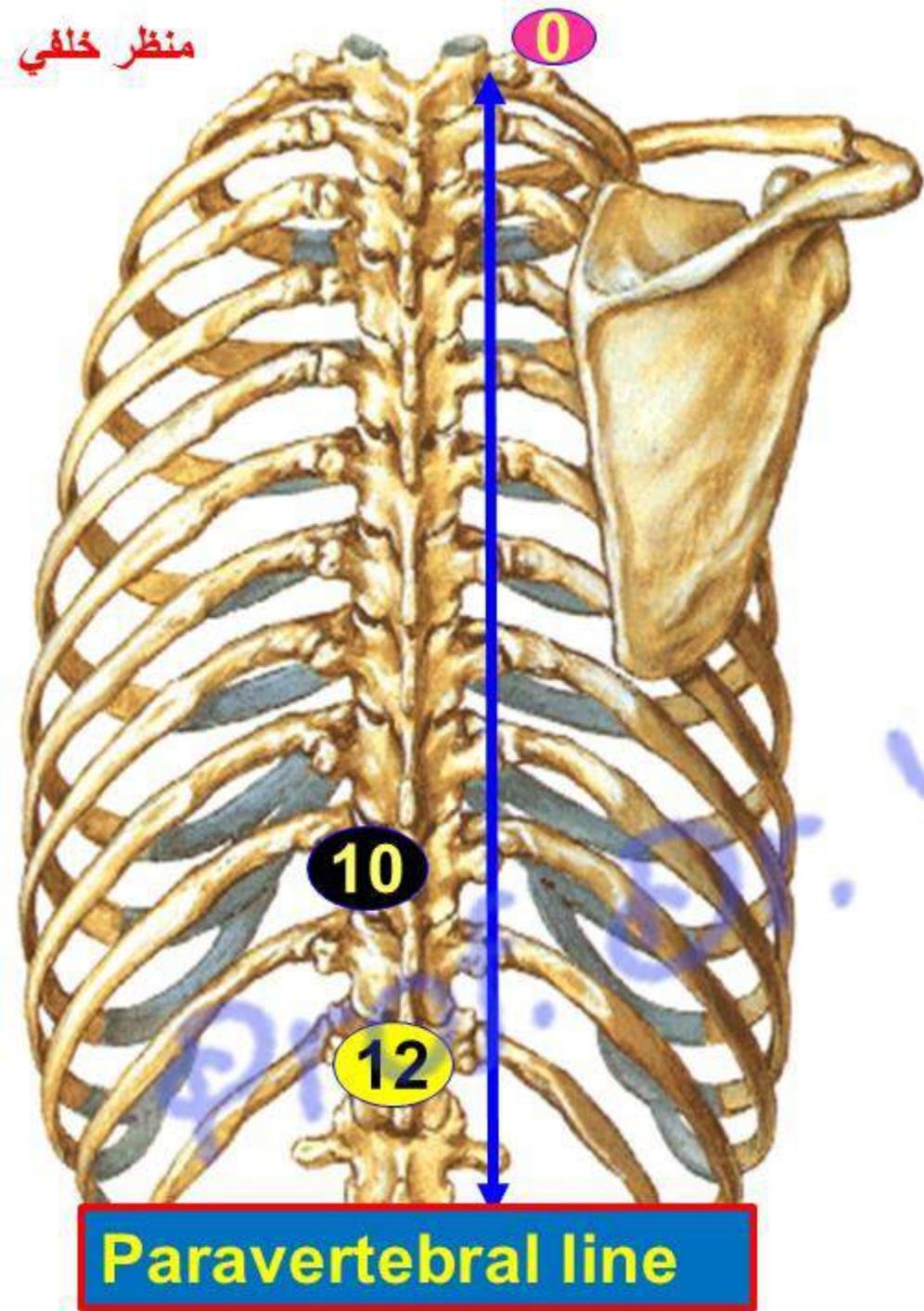
## Pleura

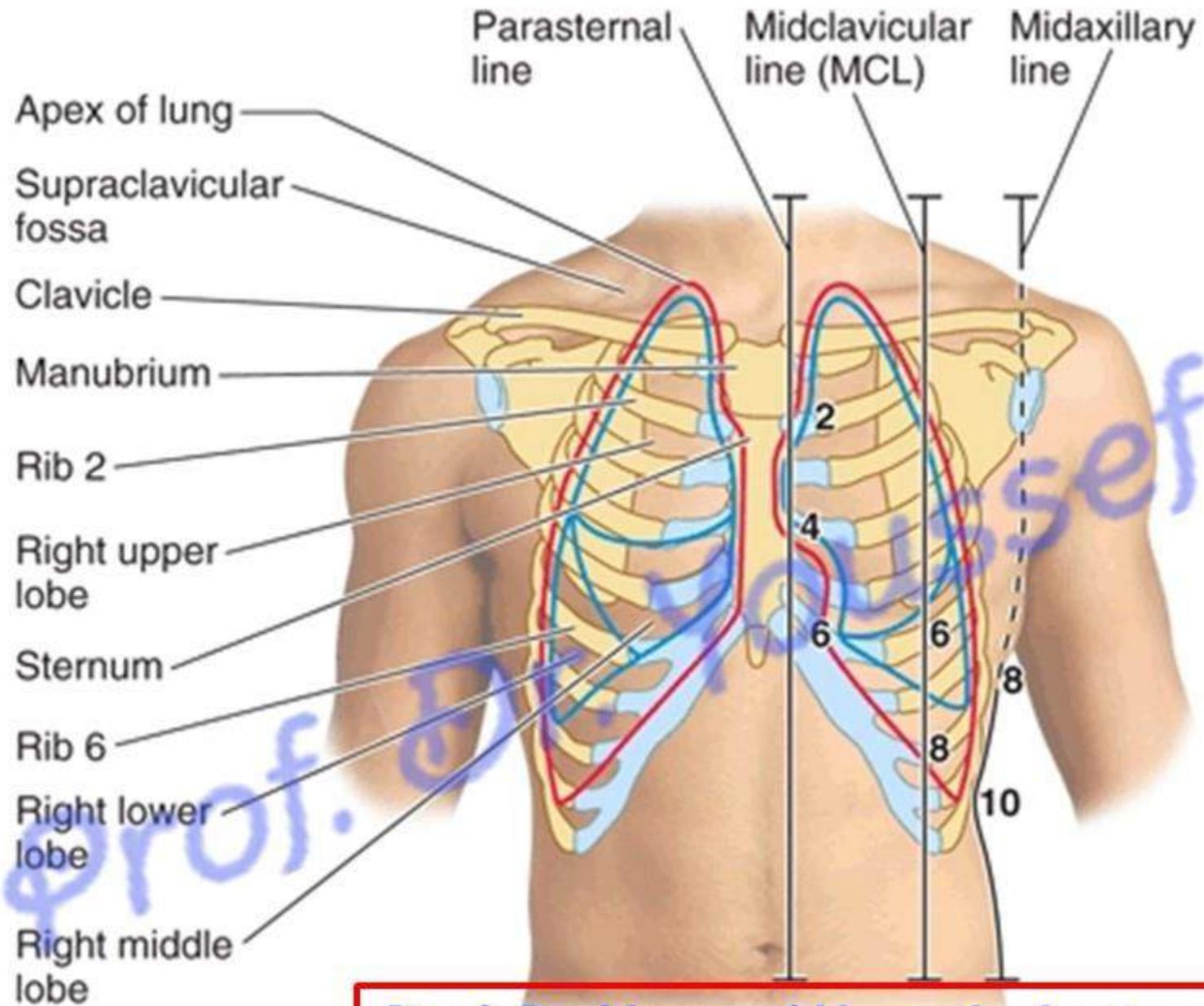
## Lungs

<https://www.youtube.com/@ProfDrYoussefHusseinaAnatomy/playlists>









**Surface anatomy  
left & pleura lung**

**Left Pleura = 0, 2, 4, 6, 8, 10, 12**  
**Left Lung = 0, 2, 4, 6, 6, 8, 10**

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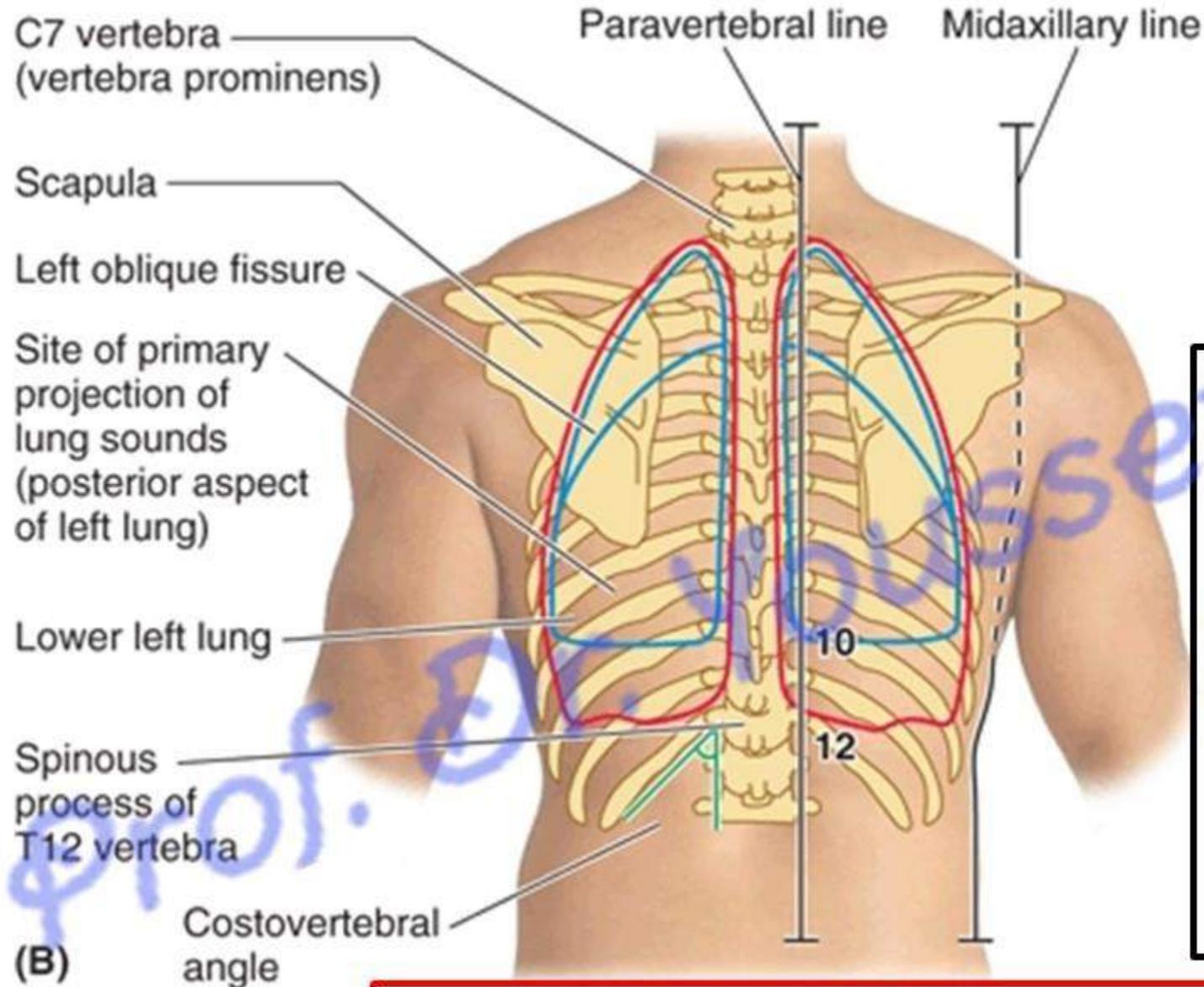
(A)

## Surface anatomy left & pleura lung

Left Pleura = 0, 2, 4, 6, 8, 10, 12

Left Lung = 0, 2, 4, 6, 6, 8, 10

- **The cervical dome of the pleura and the apex of the lungs** extend up into the neck, covered by suprapleural membrane.
- Consequently, they are vulnerable to stab wounds in the root of the neck or to damage by an anesthetist's needle when a nerve block of the lower trunk of the brachial plexus is being performed.



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## • Surface anatomy of the Pleura

**1- Apex:-** one inch above the middle of the medial 1/3 of the clavicle

### **2- The anterior border:-**

- From the apex draws a line downward and medially passing behind sternoclavicular joint to the sternal angle at the level of the **2nd costal cartilage (median plane)**. The 2 borders meet each other.

- **On the right side,**

- It descends vertically downward in the median plane to the level of **6th costal cartilage**.

- **On the left side,**

- It descends vertically to the level of the ( **4th costal cartilage**, in the median plane)

- Then, the anterior border deviates laterally to the left side of the sternum to reach the left **6th costal cartilage at the side of the sternum**.

### **3- The inferior border (on both sides):-**

- From the last point, draw a line reaching;

\* The **8th rib** in the midclavicular line.

\* The **10th rib** in the midaxillary line.

\* The **12th thoracic spine** one inch lateral to the median plane, paravertebral line.

**Pleura = 0, 2, 4, 6, 8, 10, 12**

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**4- The posterior border (on both sides):-** a line upward from last point to apex.

## • Surface anatomy of the Lung

**1- Apex:-** one inch above the middle of the medial 1/3 of the clavicle

### **2- The anterior border:-**

- From the apex draws a line downward and medially passing behind sternoclavicular joint to the sternal angle at the level of the **2nd costal cartilage** in the median plane. The 2 borders meet each other.

- **On the right side,**

- It descends vertically downward to the level of **6th costal cartilage**, in the median plane

- **On the left side,**

- It descends vertically to the level of the **4th costal cartilage**.

- Then, the anterior border deviates laterally to the left side of the sternum to reach the left **6th costal cartilage at the side of the sternum**.

### **3- The inferior border (on both sides):-**

- From the last point, draw a line reaching;

**Lung = 0, 2, 4, 6, 6, 8, 10**

\* The **6th rib** in the midclavicular line.

\* The **8th rib** in the midaxillary line.

\* The **10th thoracic spine** one inch lateral to the median plane , paravertebral line.

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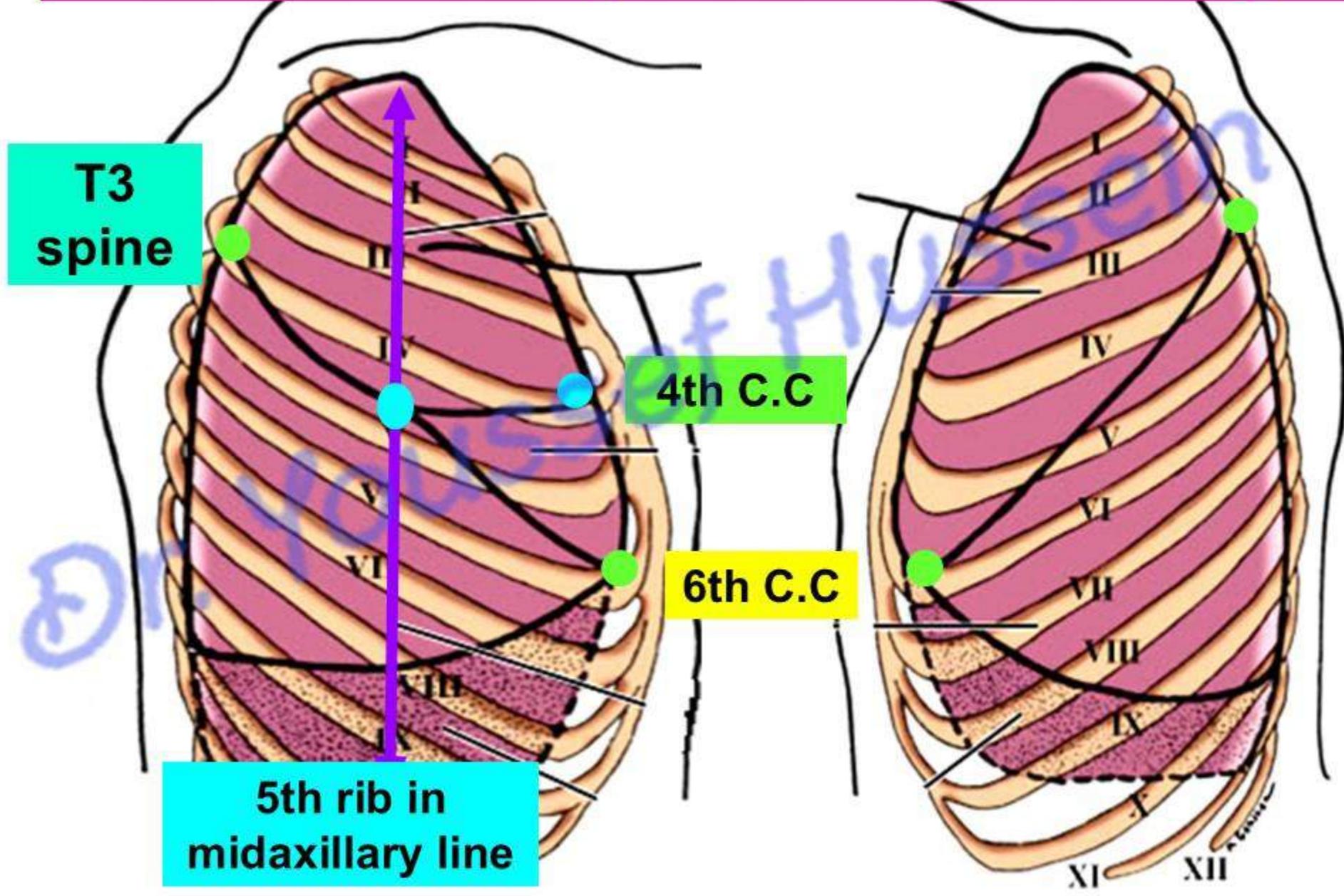
**4- The posterior border (on both sides):-** a line upward from last point to apex.

# Surface anatomy of the fissures of lung

T3



Abduction



## **\*\* B- Surface anatomy of the fissures of the lungs**

### **1- The oblique fissure:** (in both right and left lungs)

- Draw a line extends from the posterior border at A point at the level of the **3rd thoracic spine** (Opposite the root of the spine of the scapula).
- The line directed downward and forward to inferior border at **6<sup>th</sup> costochondral junction**.
- **Roughly**, the oblique fissure corresponds to the medial border of the scapula by placing the hand on the back of the head (Abduction).

### **2- The horizontal fissure** (only in the right lung)

- From a point at the anterior border opposite the **4th costal cartilage** draws a line horizontally backward to meet the oblique fissure at the **right 5<sup>th</sup> rib** in the **mid-axillary line**.

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- **Upper lobe** is the apex, upper part of **anterior**, greater of mediastinal surface and part of the costal surface
- **Lower lobe** is greater part of the **posterior** and most of costal surface
- **Middle lobe** is lower part of **anterior** surface of the right lung

# Pleural recesses

Costomediastinal recess

Costodiaphragmatic recess

Costodiaphragmatic angle

## • Pleural Recesses

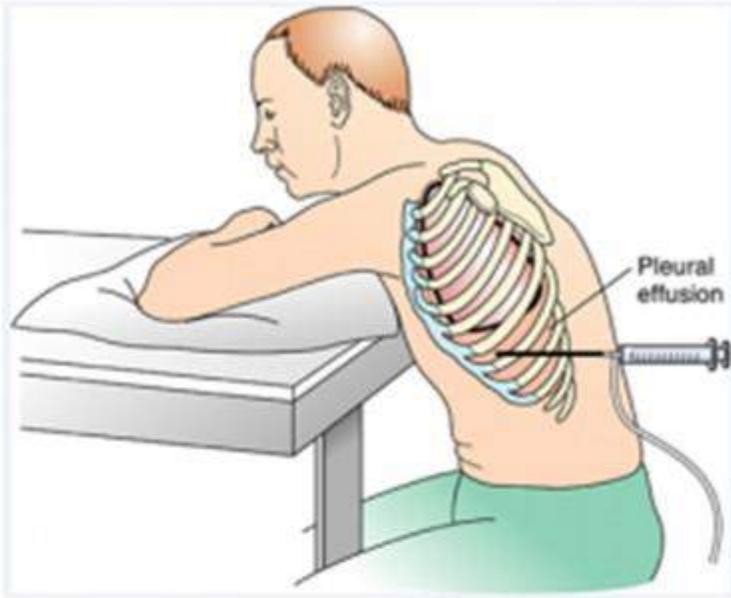
- These are narrow space inside the pleural cavity contain serous fluid **to lubrication**
- **Importance**: They allow distension of the lungs during full inspiration

1- **Costodiaphragmatic recess**: between thoracic wall and diaphragm along the **inferior** border of the lung (larger and important).

2- **Costomediastinal recess**: between the thoracic wall and mediastinum along the **anterior** border of the lung.

- **An accumulation of serous fluid in the pleural cavity → Hydrothorax (pleural effusion)**
- **An accumulation of lymph in the pleural cavity → Chylothorax**
- **An accumulation of blood in the pleural cavity → Hemothorax**
- **An accumulation of pus in the pleural cavity → Pyothorax (Empyema)**
- **An accumulation of air in the pleural cavity by Stab wounds of the thoracic wall → Pneumothorax**
- Air in the pleural cavity associated with serous fluid is known as **Hydropneumothorax**, associated with pus as **Pyopneumothorax**, and associated with blood as **Hemopneumothorax**.

## Pleural aspiration (thoracentesis)



- It is a medical procedure involving the insertion of a needle or a catheter into the pleural space to remove excess fluid
- **The best thoracentesis position** is sitting on a chair or bed with your arms resting on a table.
- **Site Selection:** in an intercostal space below one or two spaces from the space of dullness (upper level of the fluid), in the midaxillary line either in the mid posterior line
- The doctor will insert the needle or catheter directly above a rib to avoid injury of the neurovascular bundle
- Often, doctors use ultrasound guide during this process.

## • Relations of the lungs

**1- Apex:** It is covered by suprapleural membrane

**2- Base:** is related to:

\* **Right lung:** right cupola of diaphragm and right lobe of liver.

\* **Left lung:** left cupola of diaphragm, left lobe of the liver, spleen and fundus of the stomach.

**3- Costal surface:** smooth and convex.

- It is related to a- the ribs and their costal cartilages.

b- The intercostal muscles, nerve and vessels.

**4- Medial surface:** It contains the hilum and is divided into two parts:

**1- Posterior part (vertebral surface)** is related to,

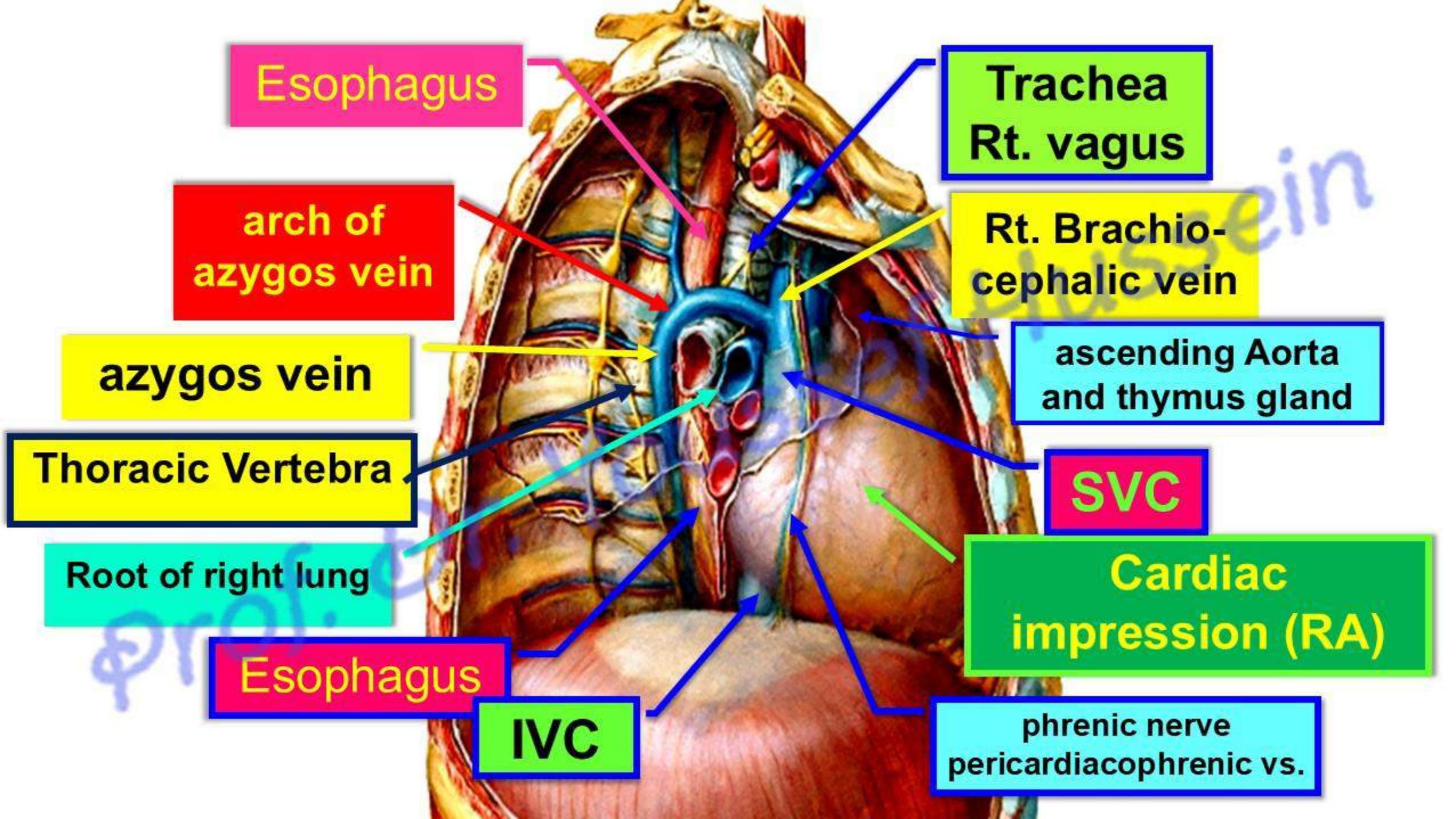
a) Vertebral column and intervertebral discs.

b) Sympathetic chains and splanchnic nerves.

c) Posterior intercostal nerve and vessels.

**2. Anterior part (mediastinal surface)**

**Relations of  
mediastinal  
surface of the  
lungs**





- **Mediastinal surface of the right lung**

- **In front the hilum;**
  - a) **Pericardial impression:** related to pericardium and right atrium.
  - b) **Groove for (SVC):** vertical groove in front of upper part of the hilum and right phrenic nerve. It is continuous above with right brachiocephalic vein.
  - c) **Ascending aorta and thymus gland,** related to the anterior border in front of the groove of S.V.C.
- **Above the hilum;**
  - a) **Groove for arch of azygos vein:** direct above the hilum.
  - b) **Above arch;** 3 vertical impressions arranged from anterior to posterior;
    - 1- **Groove for right brachiocephalic vein** and right phrenic nerve.
    - 2- **Groove for the trachea** and right vagus nerve.
    - 3- **Groove for the oesophagus.**
- **Behind the hilum;**
  - a) **Groove for azygos vein:** behind the upper part
  - b) **Oesophagus** behind the lower part.
- **Below the hilum;** **Groove for inferior vena cava** and right phrenic nerve.

Left common carotid a.

Left Subclavian artery

Arch of Aorta

Esophagus  
thoracic duct

Thymus gland  
& pulmonary trunk

L recurrent laryngeal  
N

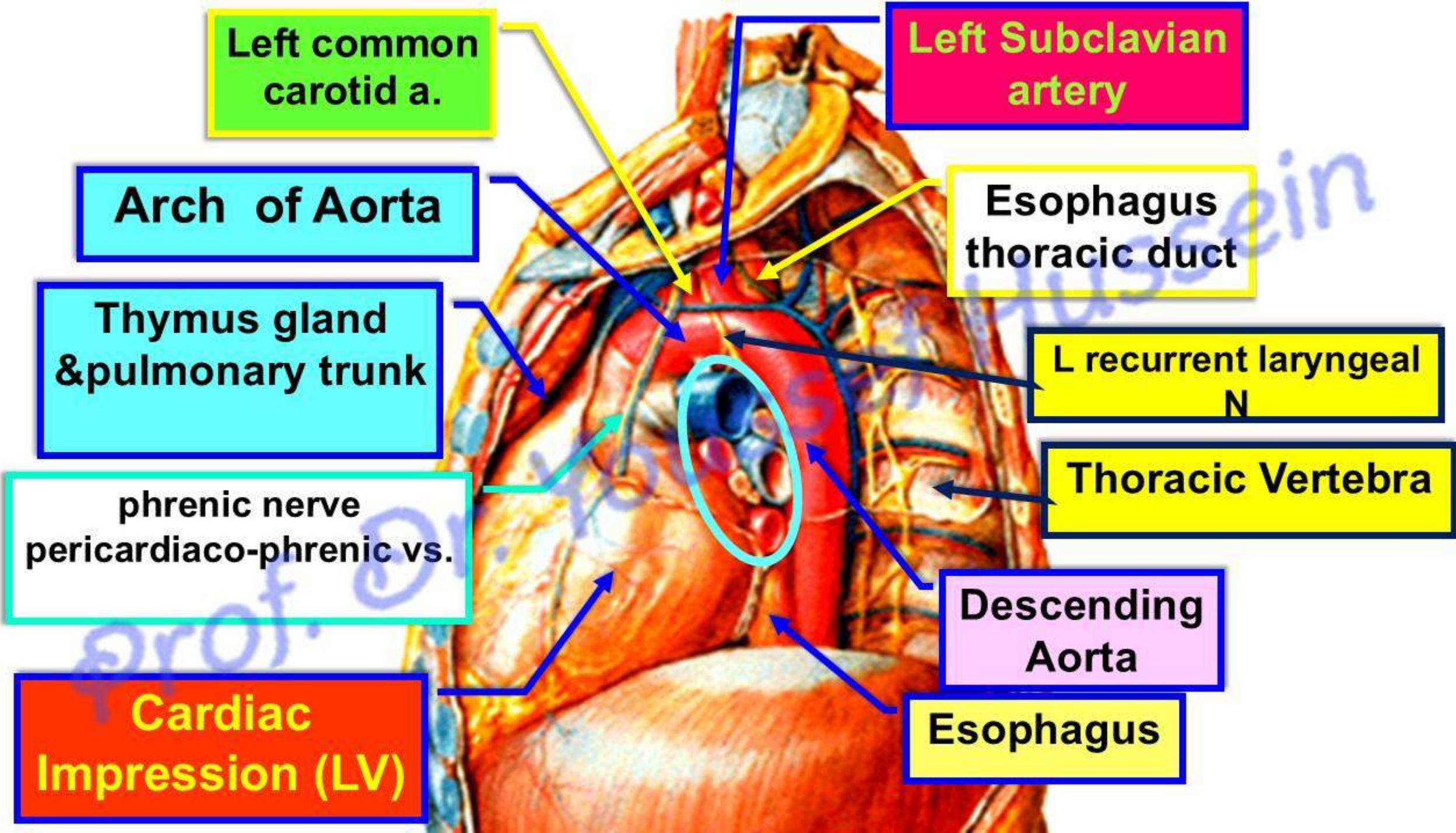
phrenic nerve  
pericardiaco-phrenic vs.

Thoracic Vertebra

Cardiac  
Impression (LV)

Descending  
Aorta

Esophagus



# Left lung

Groove for esophagus, thoracic duct

Groove for arch of Aorta

Groove for descending thoracic Aorta

Groove for esophagus

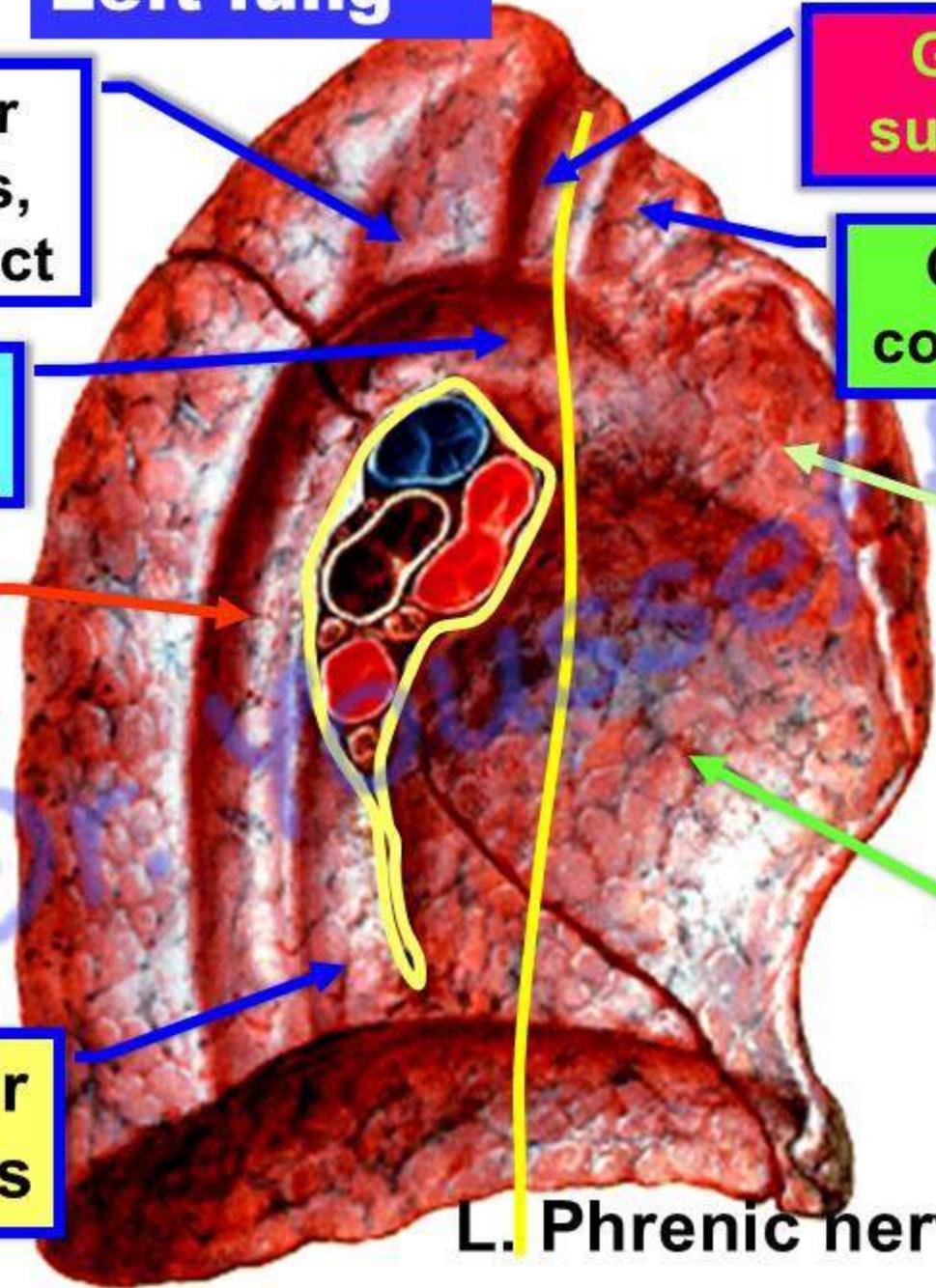
Groove for left subclavian artery

Groove for left common carotid a

Groove for pulmonary trunk and thymus gland

Cardiac impression

L. Phrenic nerve



- **Mediastinal surface of the left lung**

- **In front the hilum;**

- a) **Pericardial impression:** related to pericardium and left ventricle.

- b) **Pulmonary trunk and thymus gland,** related to the anterior border of the lung above the pericardial impression.

- **Above the hilum;**

- a- **Groove for arch of aorta** directly above the hilum.

- b) **Above arch;** 3 vertical impressions arranged from anterior to posterior;

- 1- **Left common carotid artery.**

- 2- **Left subclavian artery.**

- The left phrenic and left vagus nerves descend between them.

- 3- **Groove for oesophagus and thoracic duct.**

- **Behind the hilum;**

- a- **Oesophagus** behind the lower part.

- b- **Groove for descending aorta:** behind the hilum and oesophagus.

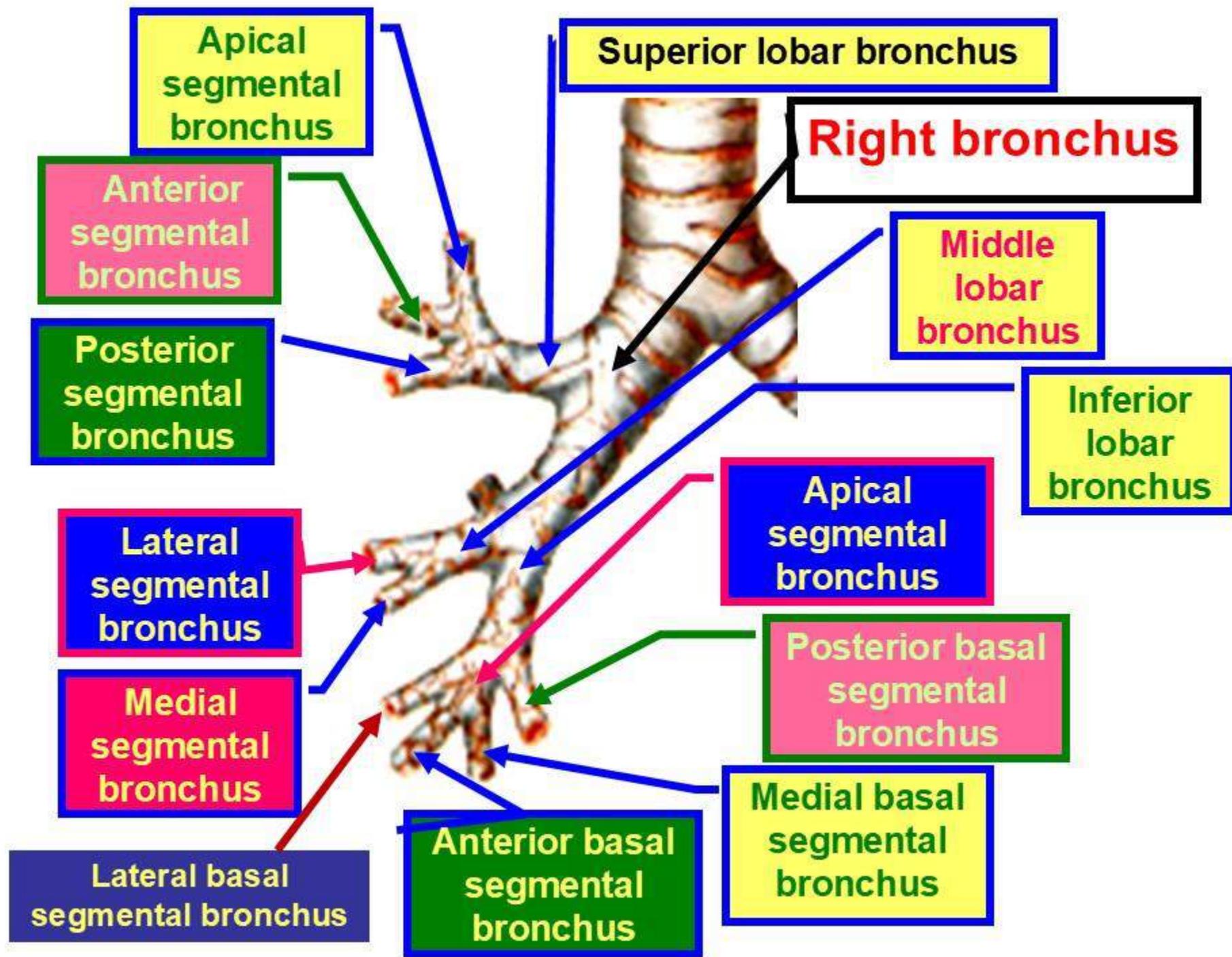


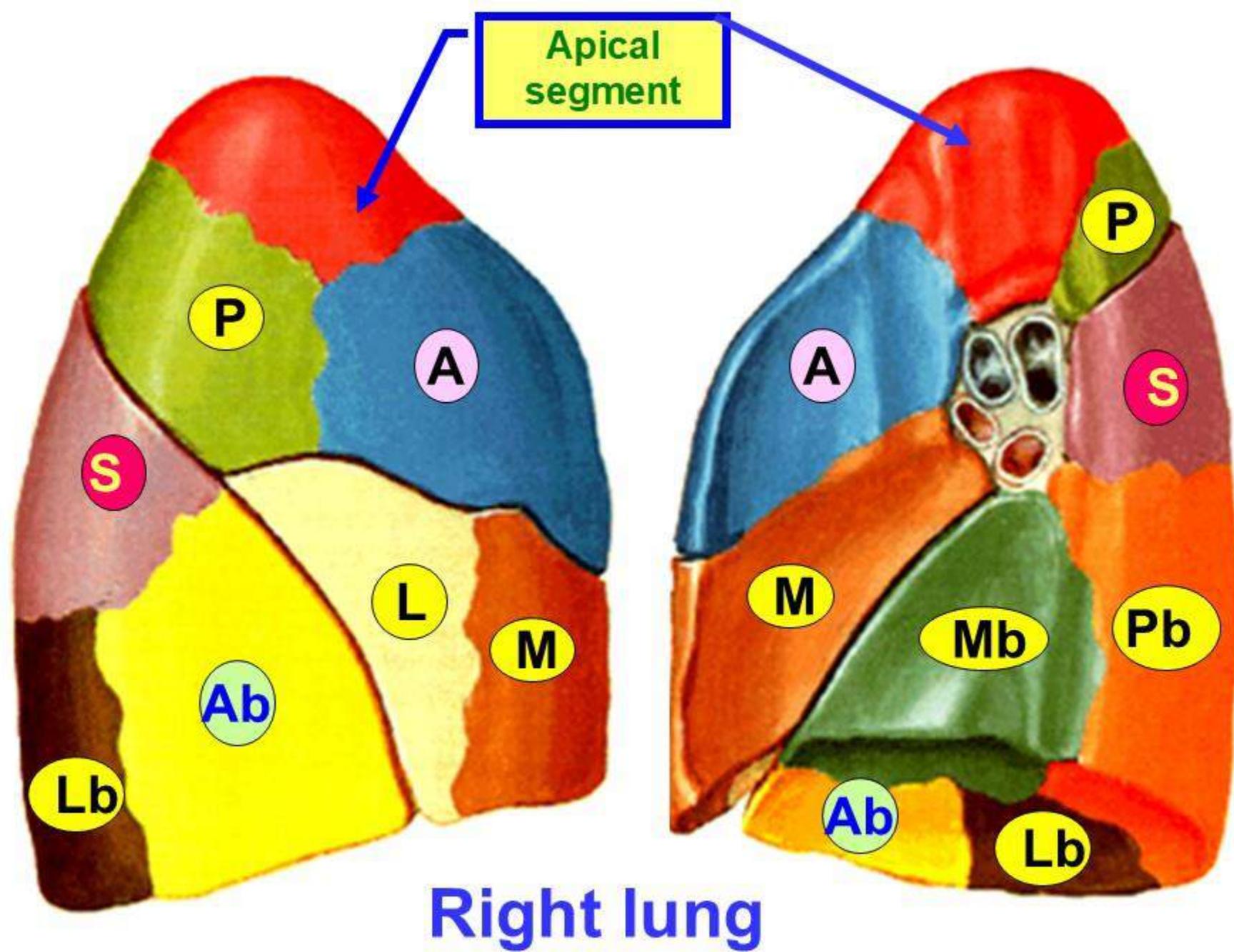
	Hilum of Right lung	Hilum of Left lung
<b>Bronchus</b>	<b>2 bronchi;</b> a) Eparterial (behind and above pulmonary artery). b) Hyparterial (behind and below pulmonary artery).	<b>Only one bronchus</b> (Behind and below pulmonary artery).
<b>Pulmonary A</b>	One artery	One artery
<b>2 pulmonary veins</b>	<ul style="list-style-type: none"> <li>- Superior in front of pulmonary artery.</li> <li>- Inferior (lower).</li> </ul>	<ul style="list-style-type: none"> <li>- Superior in front of pulmonary artery.</li> <li>- Inferior (lower).</li> </ul>
<b>bronchial vessels</b>	Posterior to bronchi	Posterior to bronchi
<b>Lymph nodes</b>	Broncho-pulmonary lymph nodes.	Broncho-pulmonary lymph nodes.

<https://www.youtube.com/c/ProfDrYoussefHusseinAnatomy/featured>

# **Segmental Branches of right Bronchus**

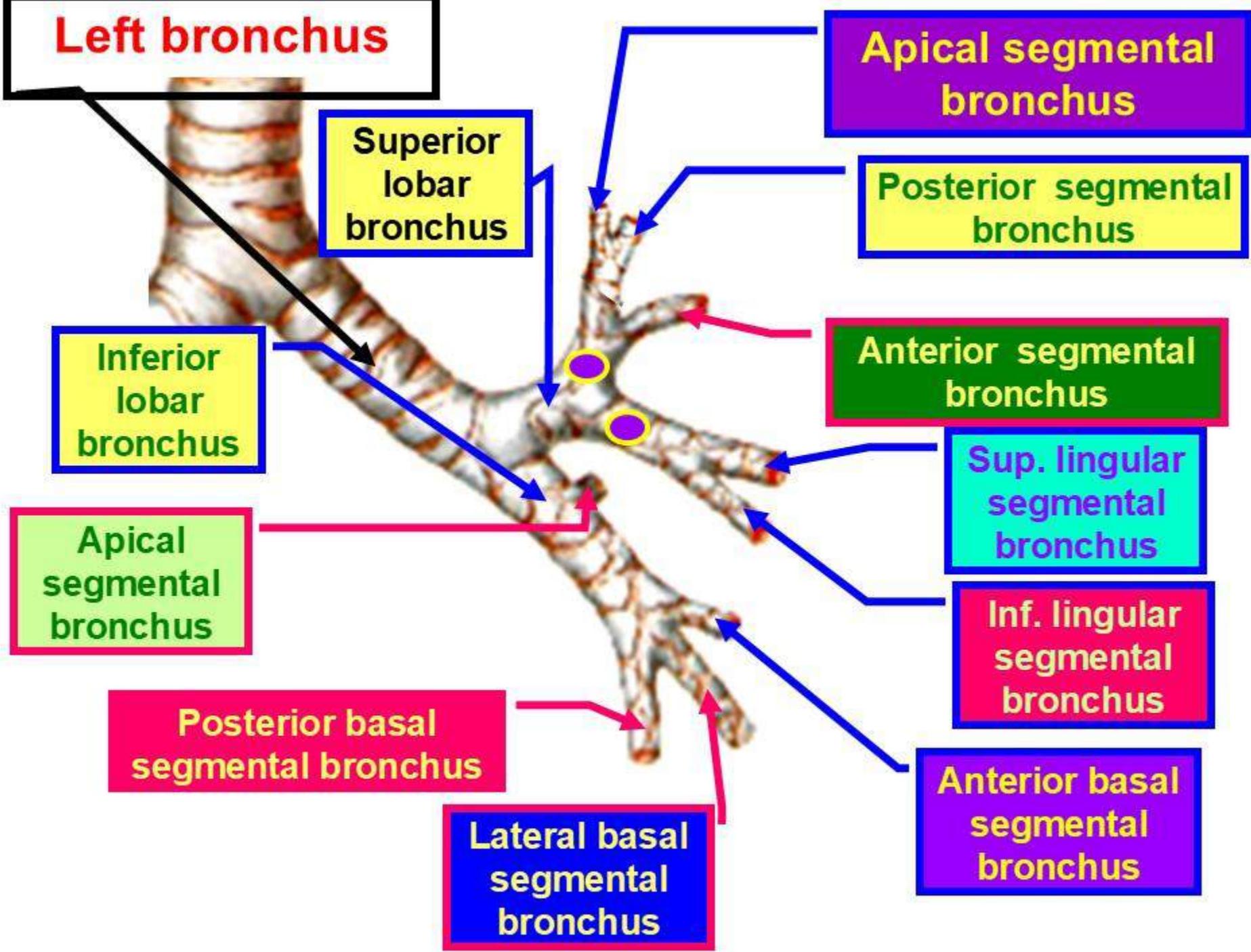
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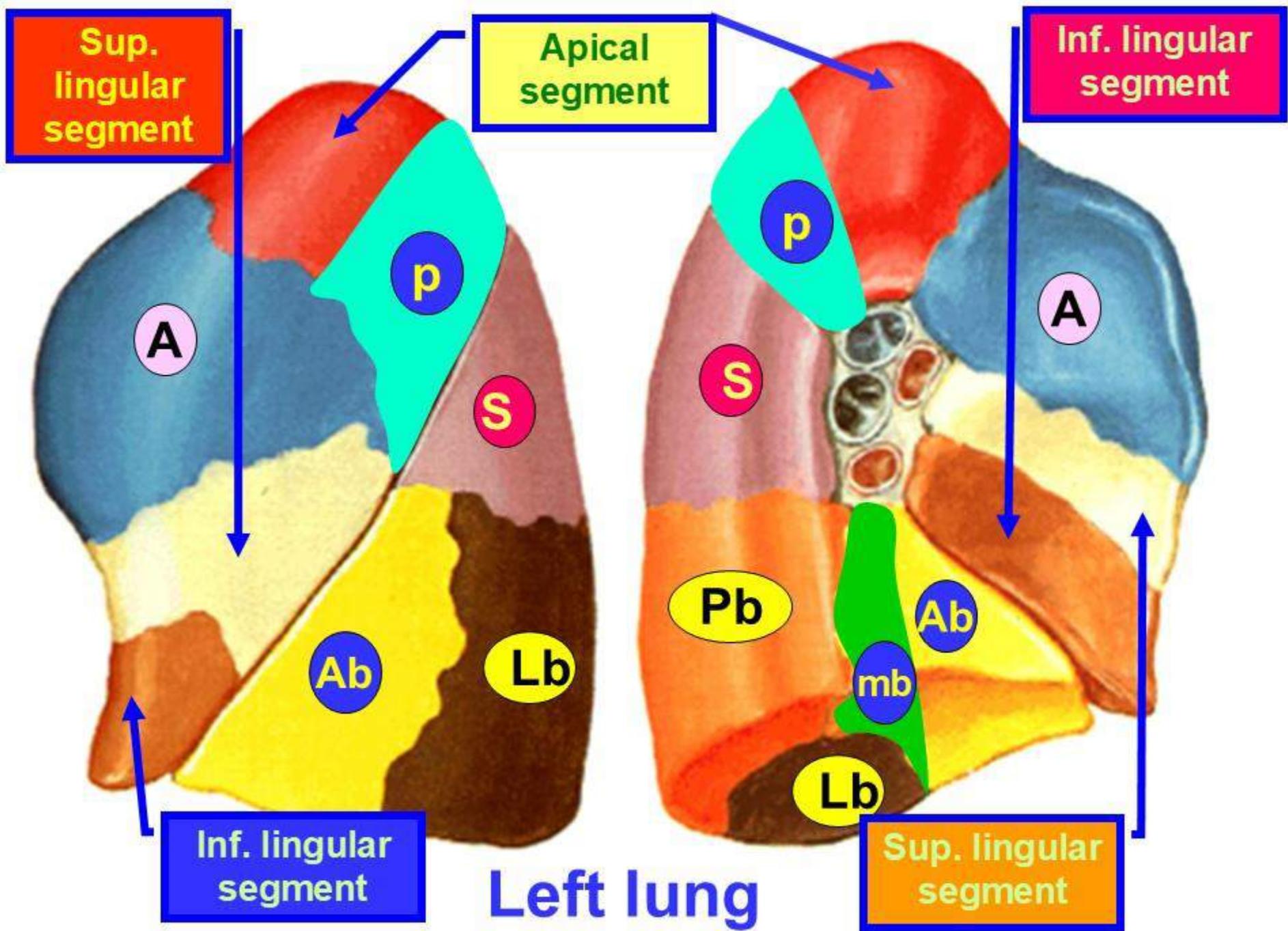






**Segmental  
branches  
Of left Bronchus**





• Segmental Branches of Right Bronchus

Apical segmental bronchus

Anterior

Posterior

Lateral

Medial

Apical

Lateral basal

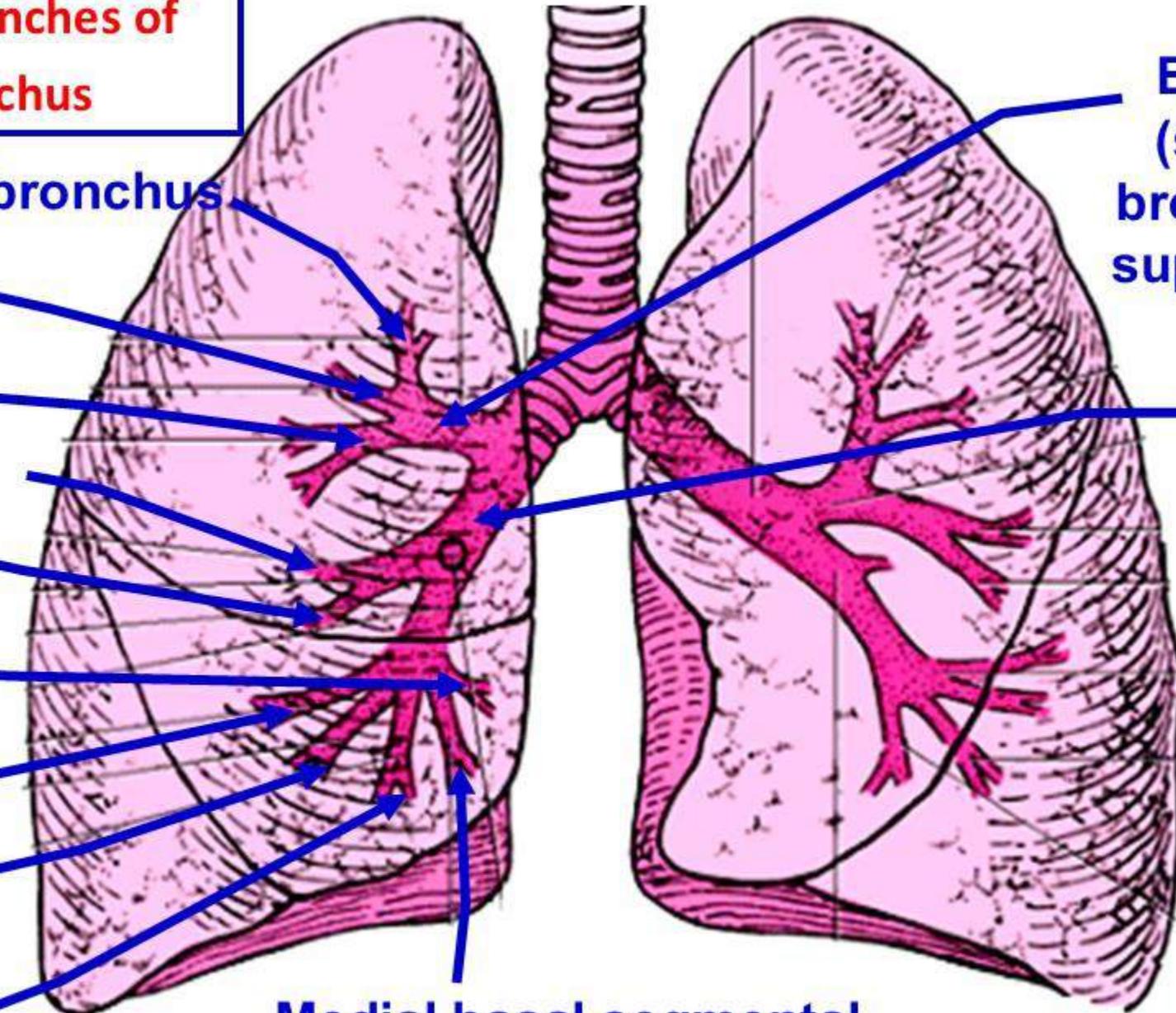
Anterior basal

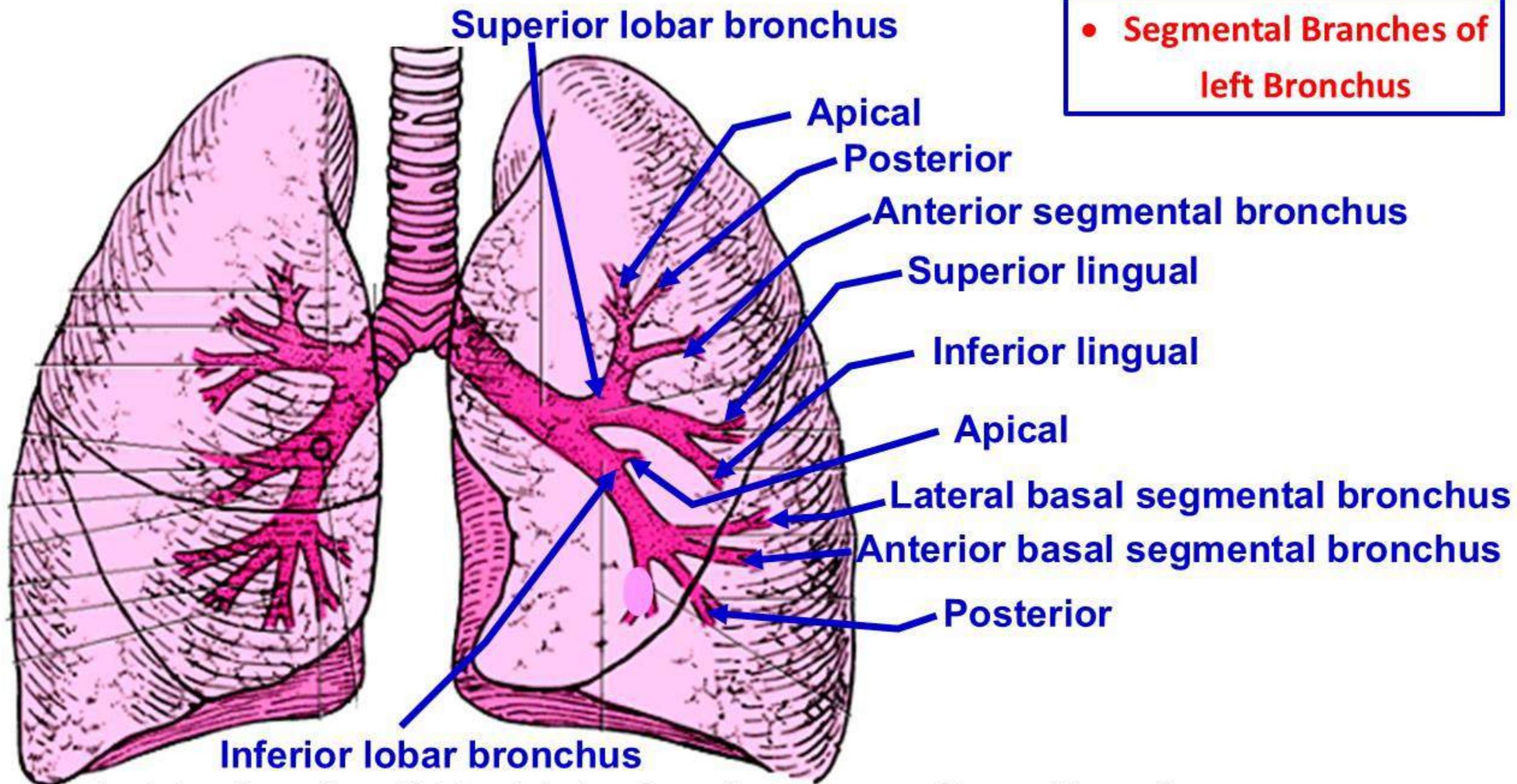
Posterior basal

Medial basal segmental bronchus

Eparterial (superior) bronchus for superior lobe

Hyparterial (inferior) bronchus for middle and inferior lobes





superior lobar bronchus divides into two branches upper and lower (lingual)

## Broncho-pulmonary segments

- **Definition:** the anatomical, functional and surgical units of the lungs.
- The **right** lung is divided **10** segments while the **left** divided into **9** segments.
- **Each segment** is **pyramidal** shaped with its **apex at the hilum** and base at the lung outer surface.
- **Each segment** is separated from each other by fibrous septa and supplied by **VAB**.
- **The clinical importance**, each segment can be removed without interruption of the other.

## **\*\* Blood supply of the lung**

### **\*\* Arterial supply:**

**a- Left lung:** upper and lower left bronchial arteries from the descending thoracic aorta.

**b- Right lung:** Right bronchial artery arises either: from The right 3<sup>rd</sup> posterior intercostal artery.

- Or from the upper left bronchial artery.

### **\*\* Venous drainage:**

- Right bronchial veins end into the arch of azygos vein.

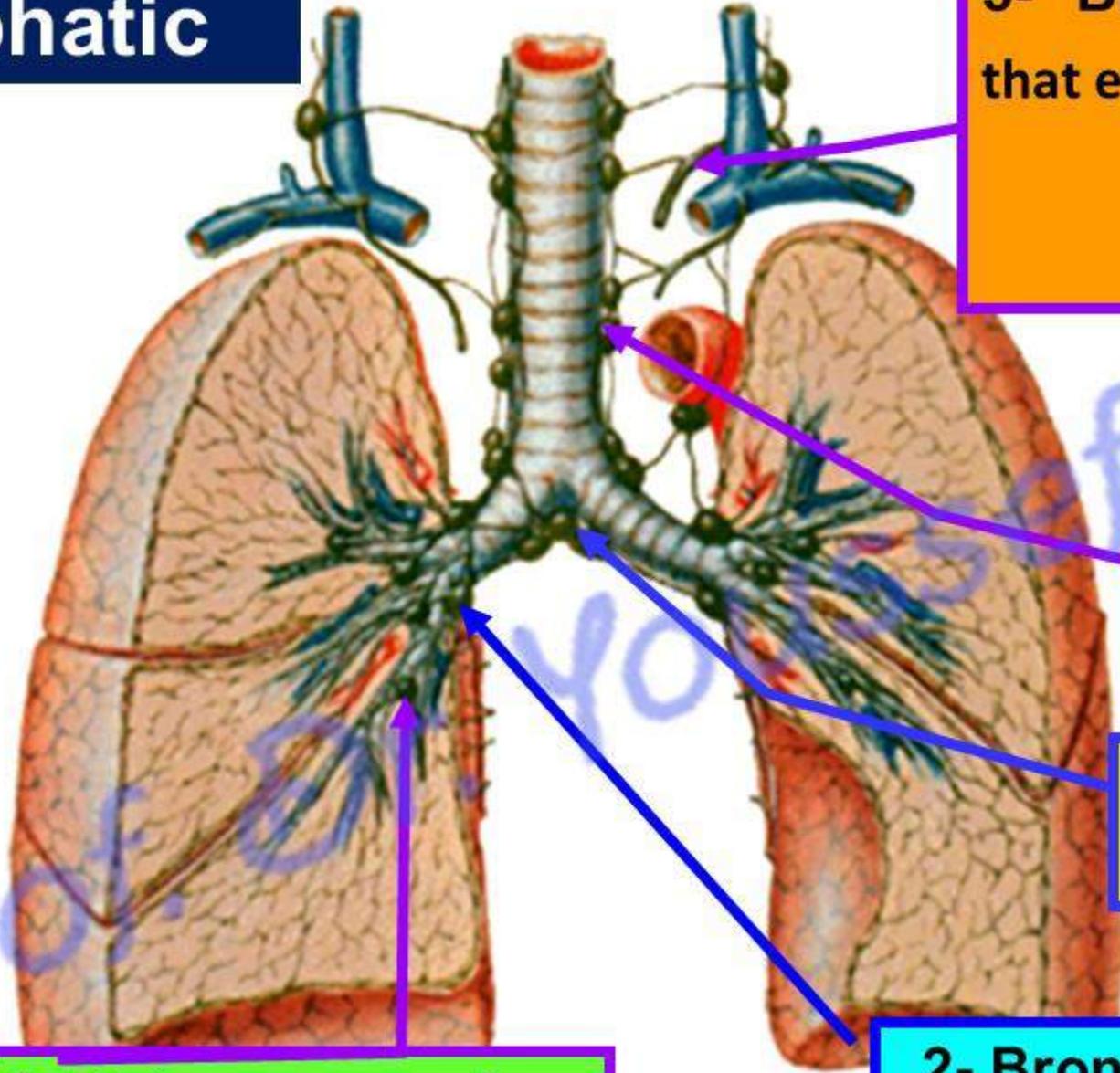
- Left bronchial veins end into accessory hemiazygos vein.

### **\*\* Nerve supply**

- Anterior and posterior pulmonary plexuses which are formed of:

- 1) Sympathetic fibers 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> ganglion of the sympathetic thoracic chain.
- 2) Parasympathetic from the vagus nerve.

# Lymphatic



1- Pulmonary nodes  
in the hilum

2- Bronchopulmonary nodes  
at the termination of the bronchi

3- Tracheobronchial nodes  
at the bifurcation of the trachea

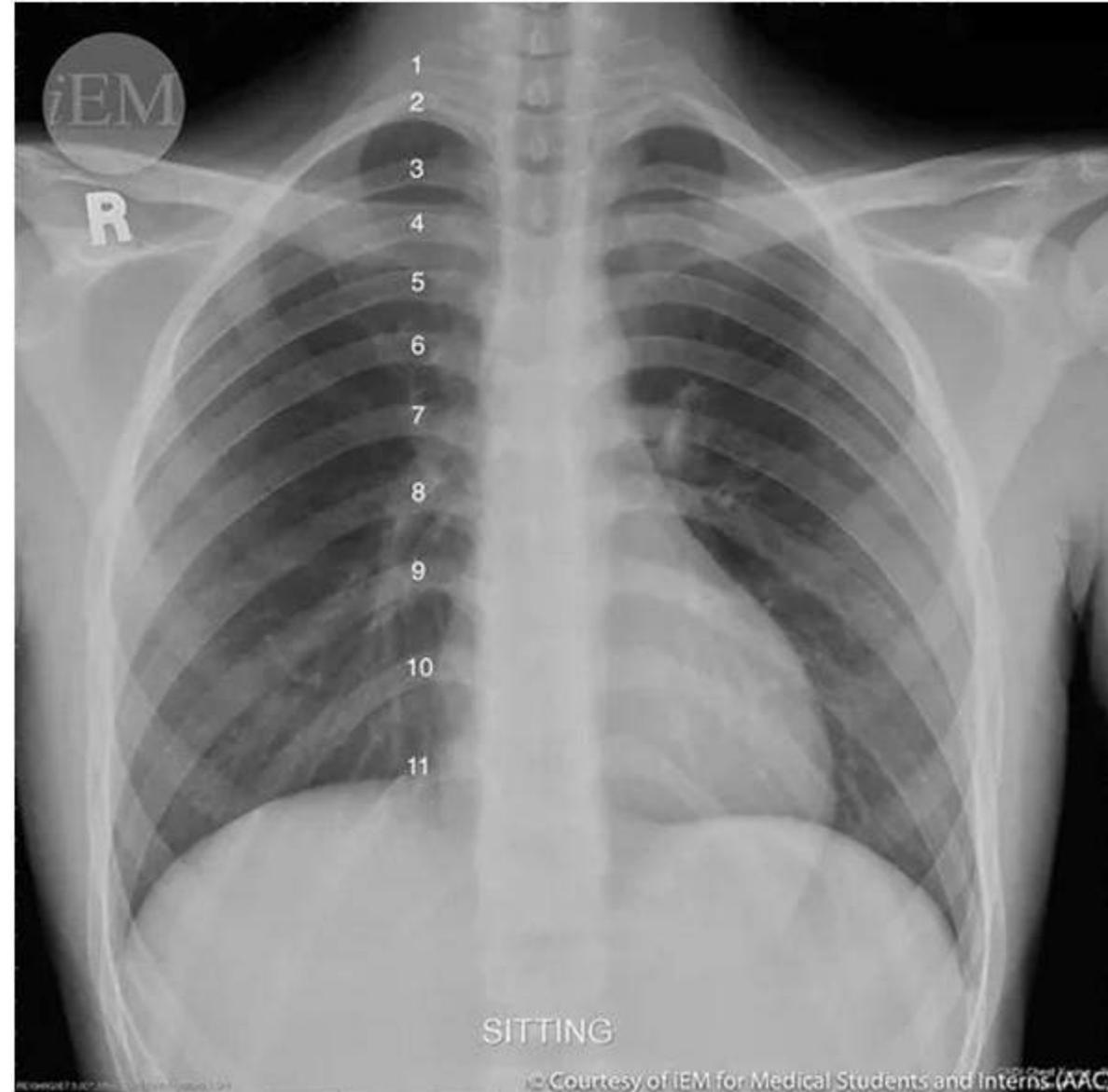
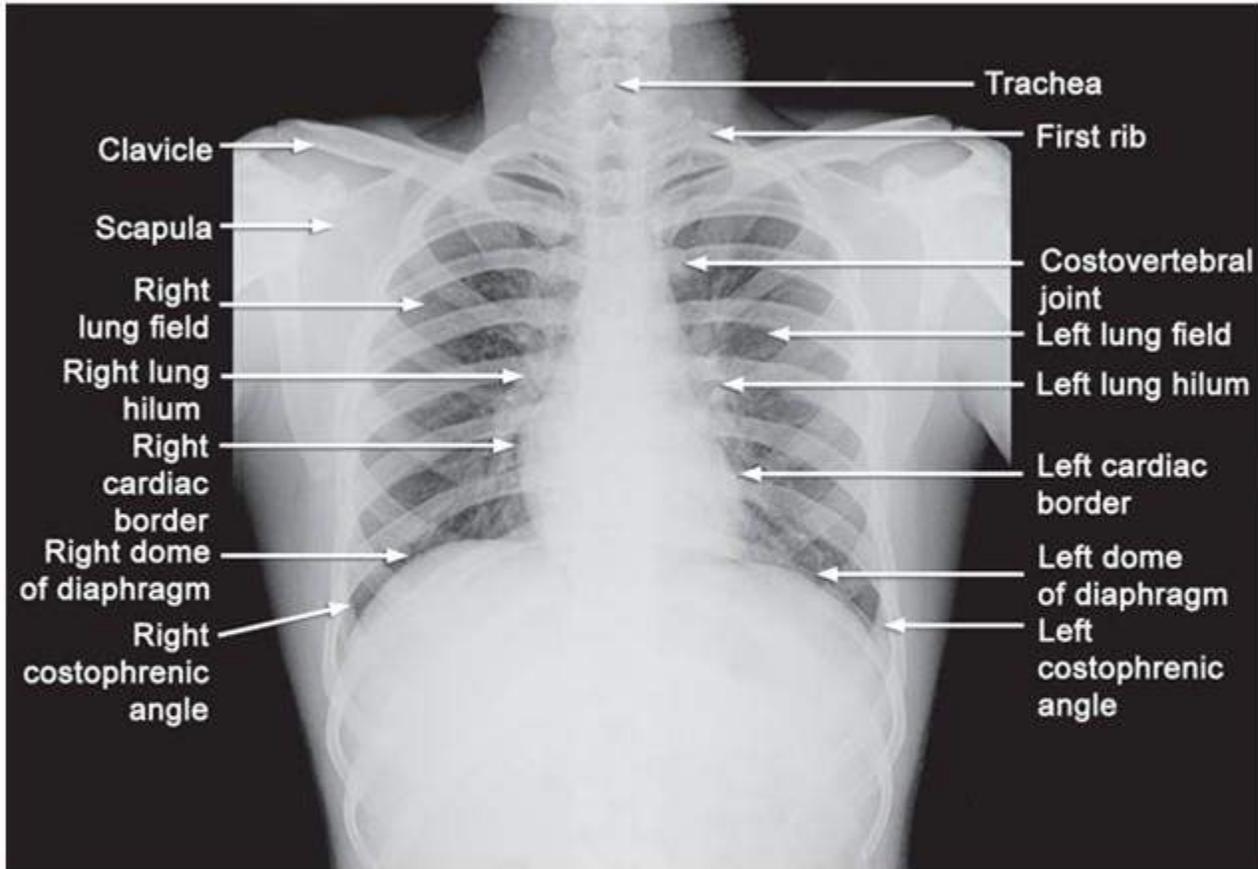
4- Pre and Paratracheal  
nodes in front and on each  
side of trachea

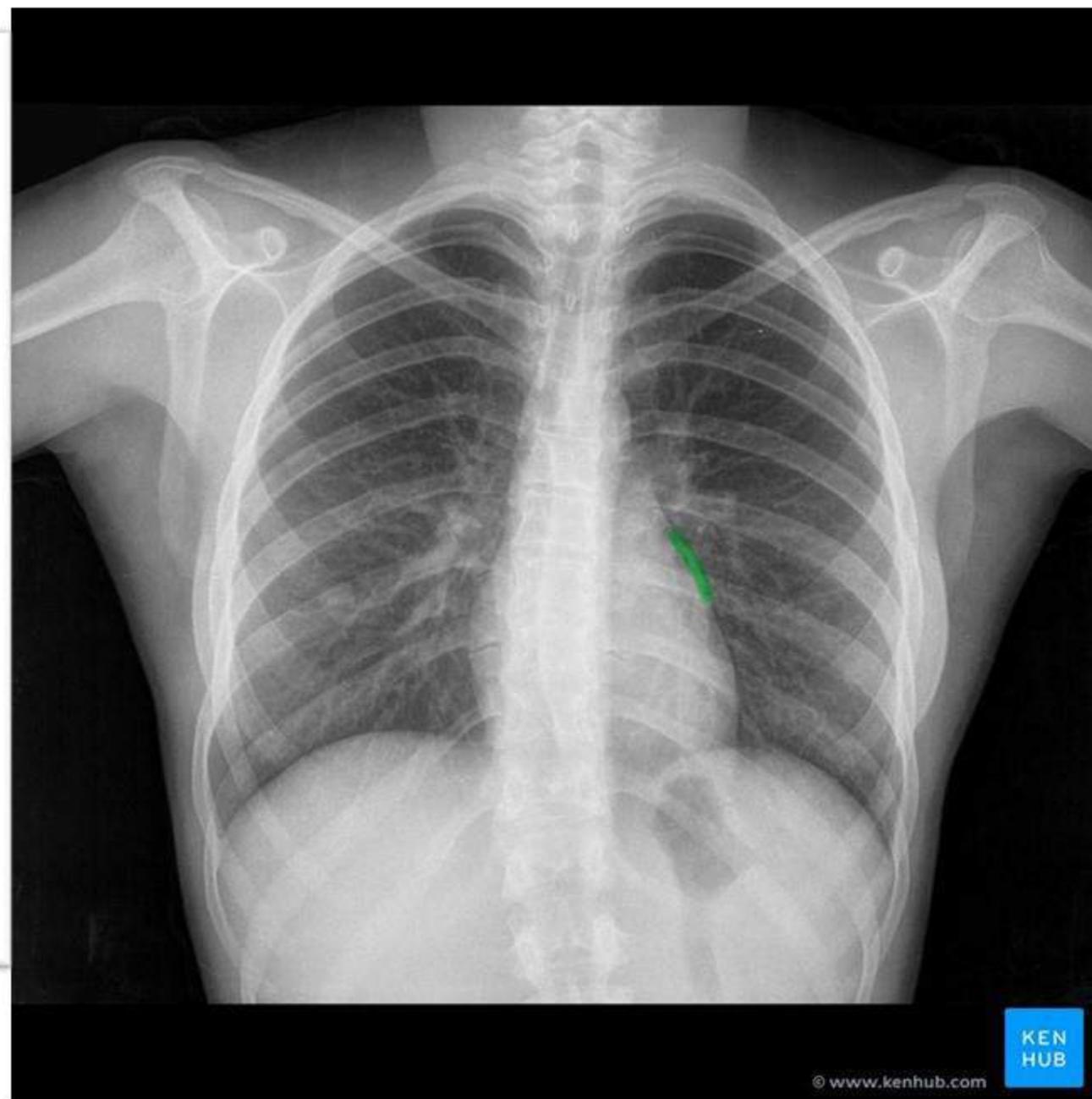
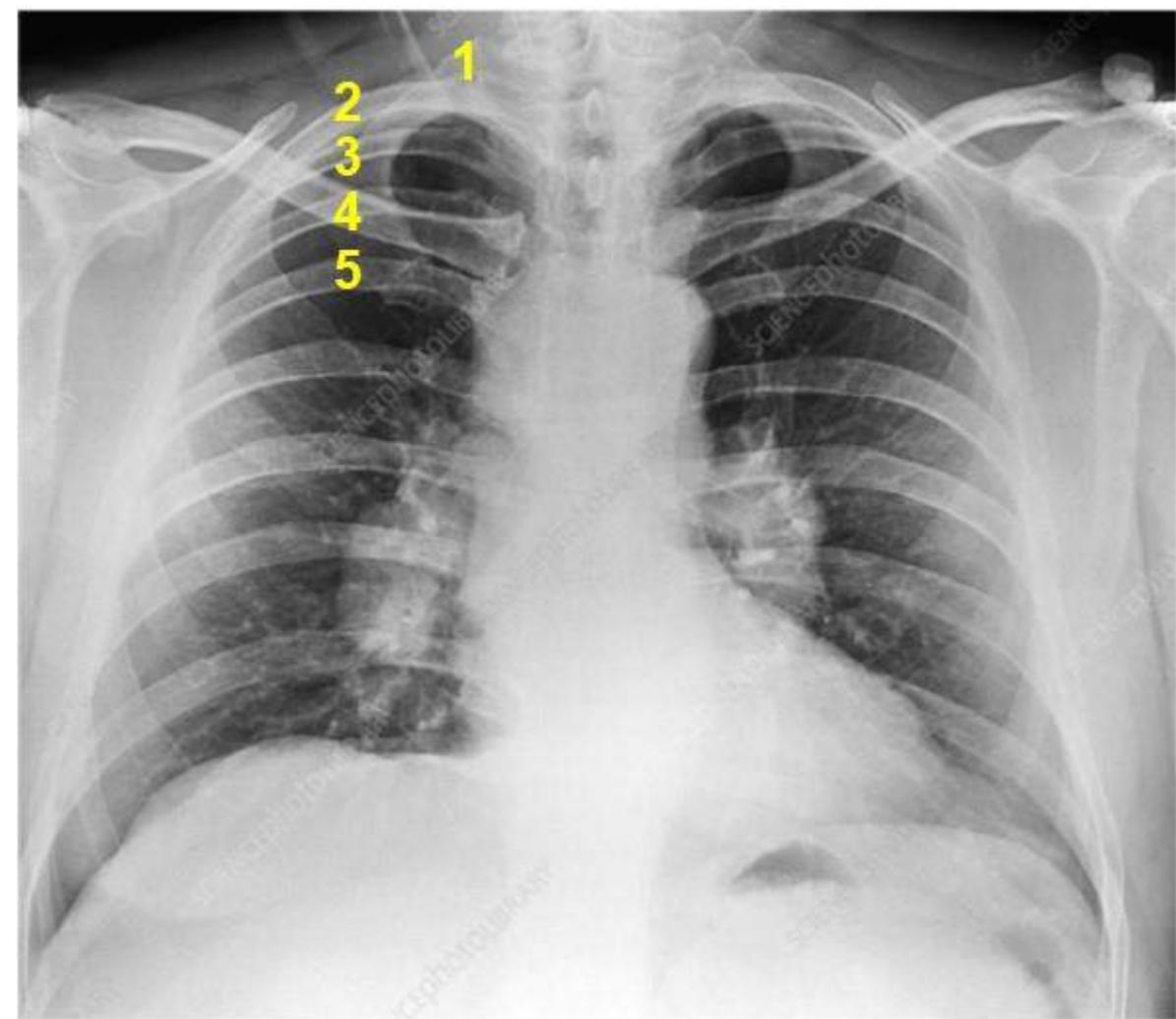
5- Bronchomediastinal lymph trunk  
that ends in:

a- Thoracic duct (Left side).

b- Right lymph trunk (Right side)

# Chest x-ray





[https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd\\_cn0PQ](https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd_cn0PQ)

يُمنع أخذ السلايدات بدون  
إذن المحرر واي اجراء  
يخالف ذلك يقع تحت طائلة  
المسؤولية القانونية  
جميع المعلومات للاستخدام  
التعليمي فقط

اليوتيوب د. يوسف حسين



Thank You  
Questions

<https://www.youtube.com/@ProfDrYoussefHusseinAnatomy/playlists>