بسم الله الرحمن الرحيم

ANATOMY

MID | Lecture 5

Trachea & Lungs

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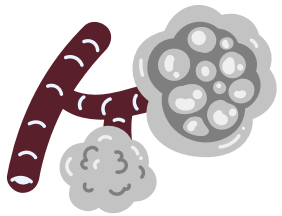
﴿وَلَقَدْ نَعْلَمُ أَنَّكَ يَضِيقُ صَدْرُكَ بِمَا يَقُولُونَ ﴿٩٧﴾ فَسَبِّحْ بِحَمْدِ رَبِّكَ وَكُن مِّنَ السَّاجِدِينَ﴾

سبحان الله وبحمده، سبحان الله العظيم



وَلِلَّهِ الْأَسْمَاءُ الْحُسْنَى فَادْعُوهُ بِهَا

المعنى: الشديد القوي الذي لا تنقطع قوته ولا تلحقه في أفعاله مشقة، ولا يمسه تعب.

الورود: ورد مرة واحدة في القرآن.

الشاهد: ﴿ذُو ٱلْقُوَّةِ ٱلْمَتِينُ﴾ [الذاريات:٥٨].

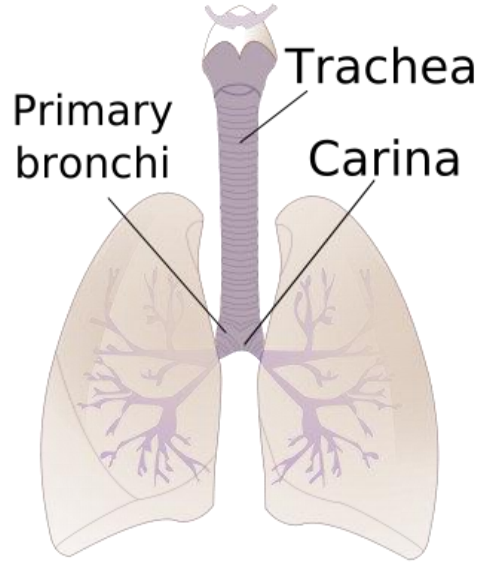
اضغط هنا لشرحٍ أكثر تفصيلًا

Trachea and Lungs

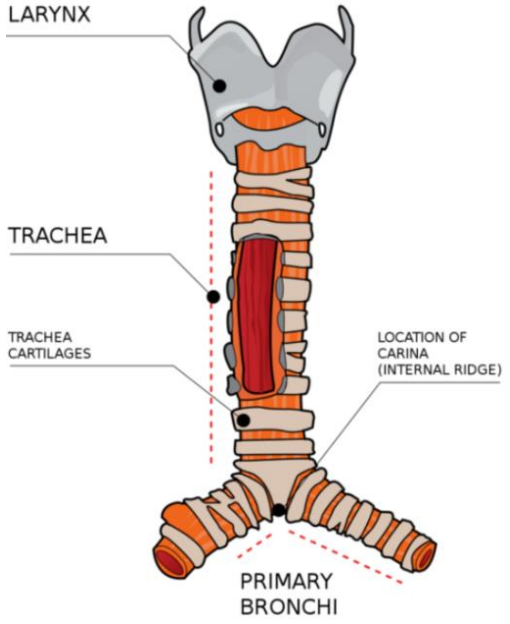
"اللهم إني أسألك فهم النبيين، وحفظ المرسلين، وإلهام الملائكة المقربين، اللهم اجعلنا من الذين يستمعون القول فيتبعون أحسنه، ويسّر علينا حفظ ما نتعلمه وفهمه والعمل به"

1- Anatomy of the Trachea

Dr.'s figure:



- **The trachea** extends from the level of the **C6** vertebra to the intervertebral disc between **T4** and **T5.**
- In adults, the trachea is approximately **5 inches** long with a diameter similar to an index finger, whereas in children, it is much narrower, similar to the diameter of a pencil.
- The trachea contains 16–20 C-shaped hyaline cartilages; they are C-shaped to keep the airway permanently open, while they are missing **posteriorly** and replaced by the **trachealis smooth muscle.**
- The trachea divides at the level between **T4** and **T5** into the **right** and **left main bronchi.**
- The point of bifurcation between them is known as the **carina**.

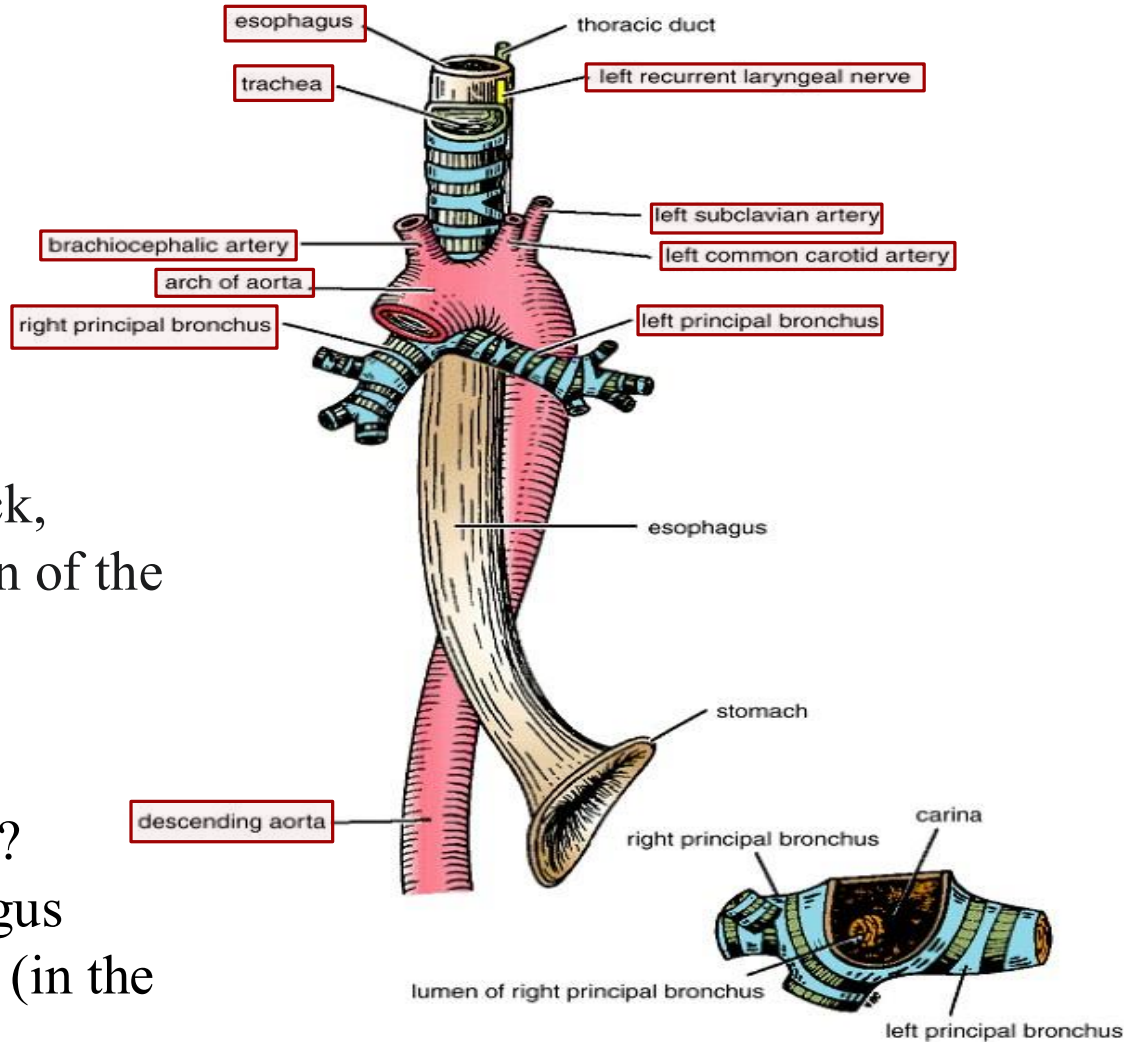


2- Relations of the Trachea

➢ Posterior relations

- ✓ Esophagus
- ✓ Left recurrent laryngeal nerve: Ascends in the tracheoesophageal groove on the left side .
- ✓ Thoracic duct
  - ○ Travels from the abdomen upwards to the root of the neck, crossing posteriorly to the left side to open at the junction of the internal jugular and subclavian veins (beginning of the brachiocephalic vein).

- ➢ Why is the recurrent laryngeal nerve different on the left?
- ✓ **Left recurrent laryngeal nerve**: Branches from the vagus nerve in the thorax and loops below the arch of the aorta (in the chest).
- ✓ **Right recurrent laryngeal nerve**: Branches from the vagus at the root of the neck and loops below the right subclavian artery.



Dr.'s figure:

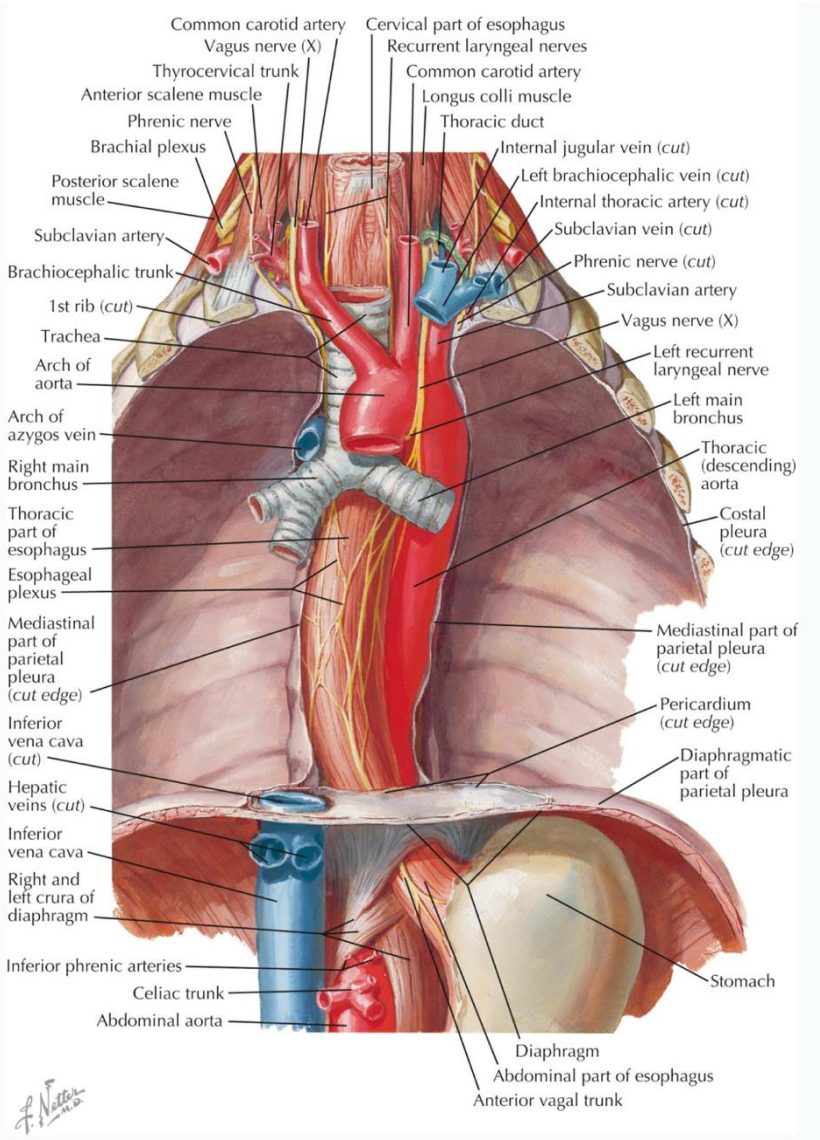
2- Relations of the Trachea

➢ Esophagus–Aorta relationship (important concept)

✓ **Upper thorax**:
- Descending aorta → left
- Esophagus → right

✓ **Lower thorax**:
- Descending aorta → moves toward the posterior midline
- Esophagus →moves approximately one inch to the left.

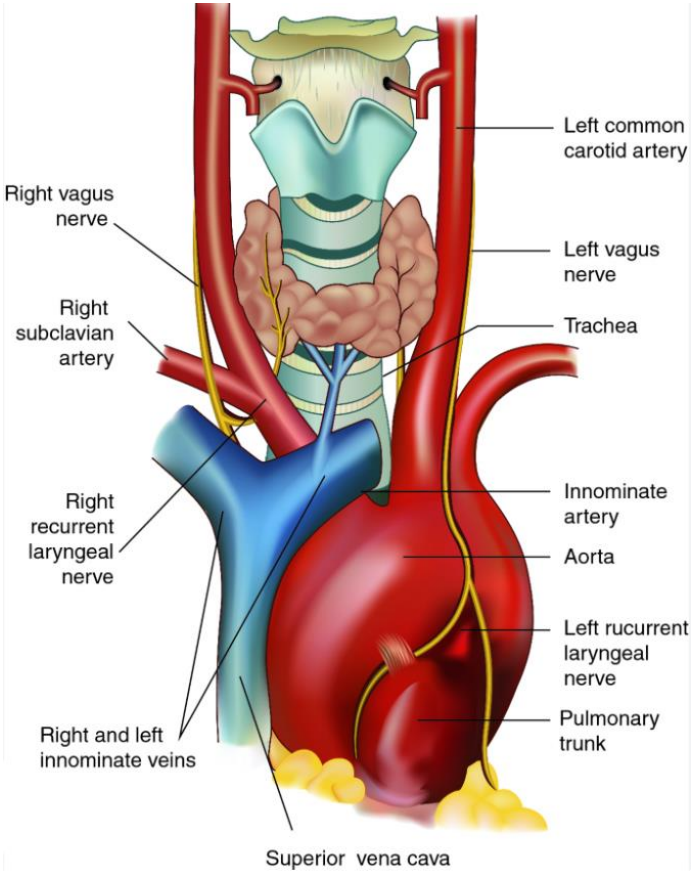
- This results in a **crossing between the esophagus and the descending aorta** and passes through the copula of the diaphragm at T10, slightly left of the midline, to enter the abdomen.



2- Relations of the Trachea

➢ Anterior relations

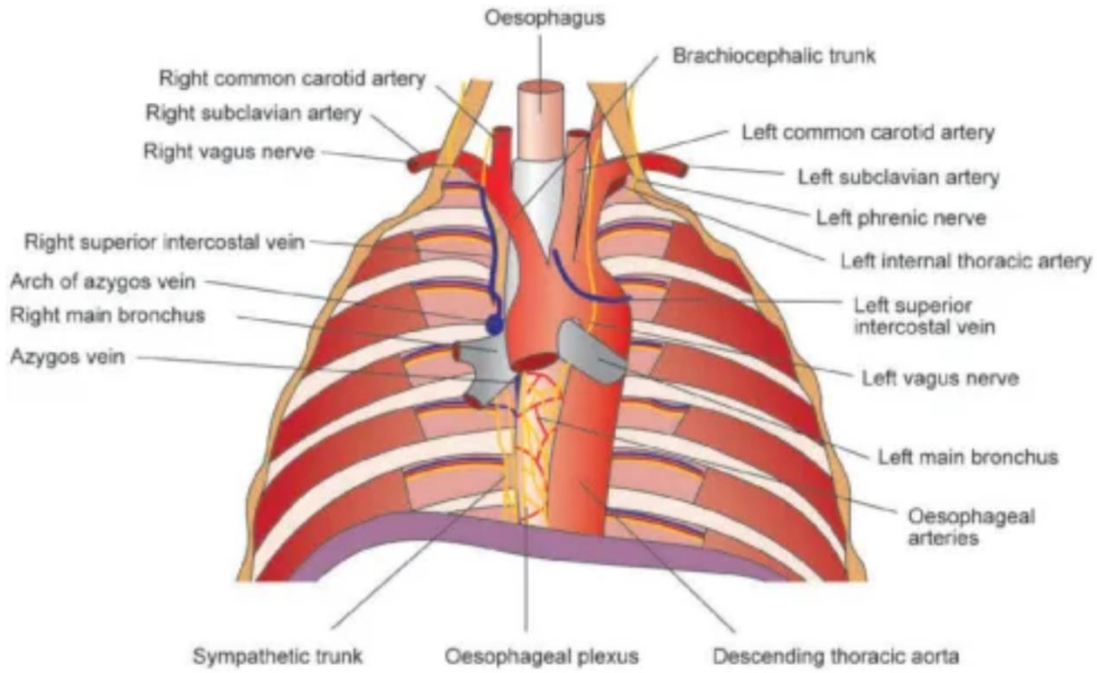
- ✓ Arch of the aorta.
- ✓ Remnants of the thymus gland.
  - In adults, the thymus undergoes involution (rudimentation) but its remains are still an anterior relation.
- ✓ Isthmus of the thyroid gland: Lies anterior to the 2nd, 3rd, and 4th tracheal rings.
- ✓ Origin of the brachiocephalic artery.
- ✓ Manubrium sterni: The uppermost part of the sternum, with the aortic arch situated immediately behind it.



2- Relations of the Trachea

➢ Right relations

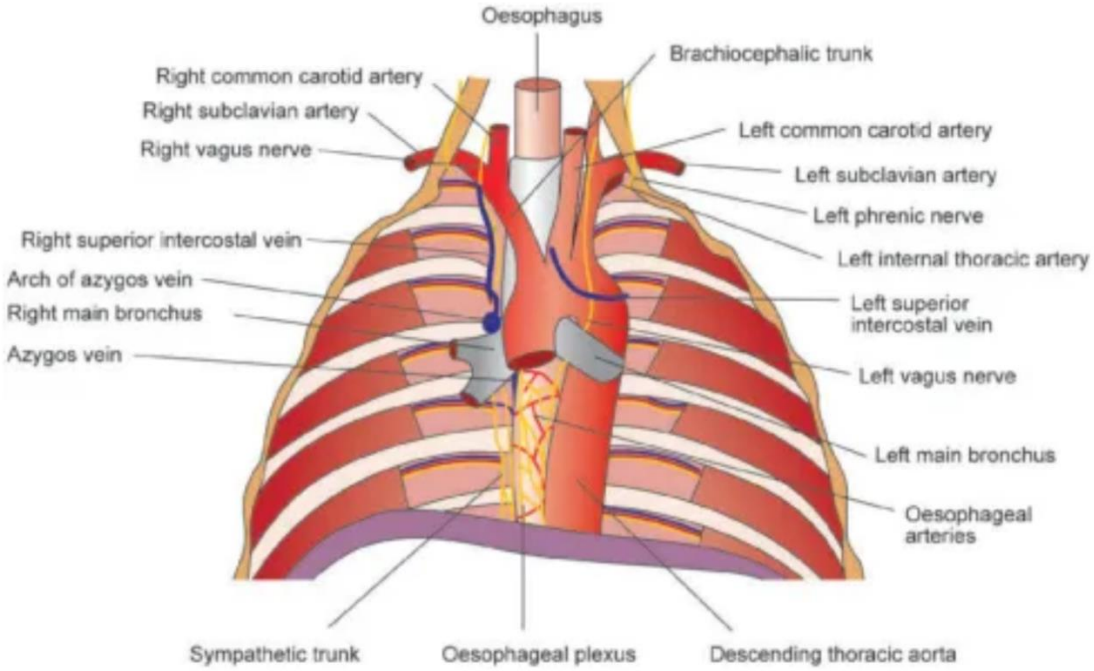
- ✓ Right Pleura and Lung.
- ✓ Azygos Arch: The main venous drainage of the thorax, which arches over the right main bronchus to enter the **Superior Vena Cava (SVC)**.
- ✓ Brachiocephalic Artery.
- ✓ Right Vagus Nerve: Located **posteriorly** to the lung hilum.
- ✓ Right Phrenic Nerve: Located **anteriorly** to the lung hilum.
- ✓ Right Main Bronchus.



2- Relations of the Trachea

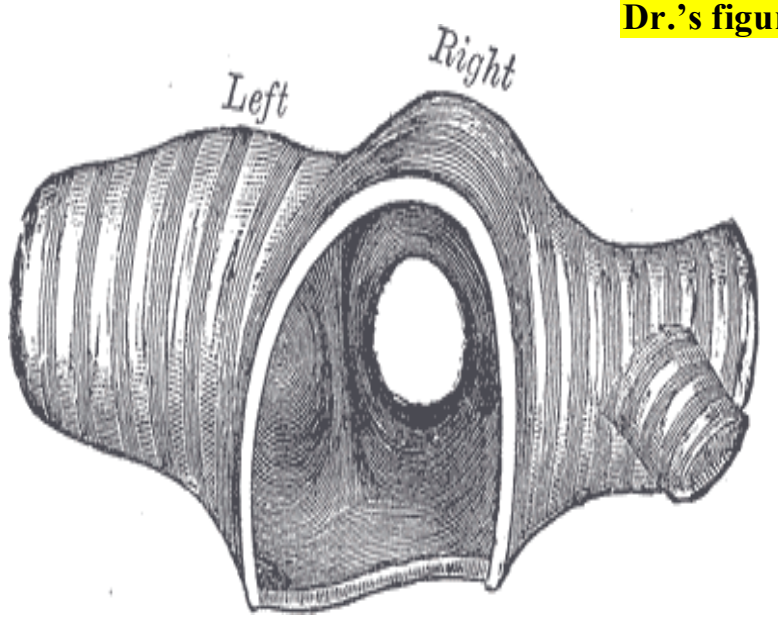
➢ Left relations

- ✓ Left Pleura and Lung.
- ✓ Arch of the Aorta.
- ✓ Left Common Carotid Artery.
- ✓ Left Subclavian Artery.
- ✓ Left Vagus Nerve: Located **posteriorly** to the lung hilum.
- ✓ Left Phrenic Nerve: Located **anteriorly** to the lung hilum.
- ✓ Left Main Bronchus.



3- The Carina

Dr.'s figure:



- **Structure:** The carina is a cartilaginous ridge located at the bifurcation of the trachea, covered by a sensitive mucous membrane.

- **Mobility:** The position of the carina is dynamic; it descends to the level of **T6** during deep inspiration and returns to **T4** during expiration.

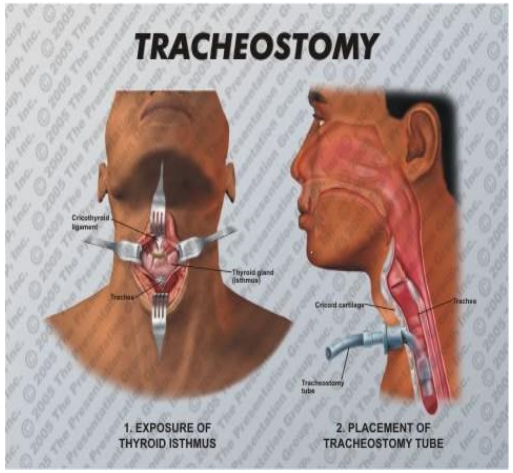
- **Related to CLINICAL:**

✓ It is highly sensitive to mechanical stimulation; touching the carina triggers a powerful **cough reflex**.

✓ During **bronchoscopy**, the clinician must remain cautious and avoid touching the carina to prevent intense coughing in the patient.

4- Tracheotomy and intubation

Dr.'s figure:



➢ Related to CLINICAL:

❖ Tracheostomy (Tracheotomy)

➢ **Definition:** This procedure involves creating an opening in the trachea to ensure a patent airway.

➢ **Emergency Tracheostomy:**

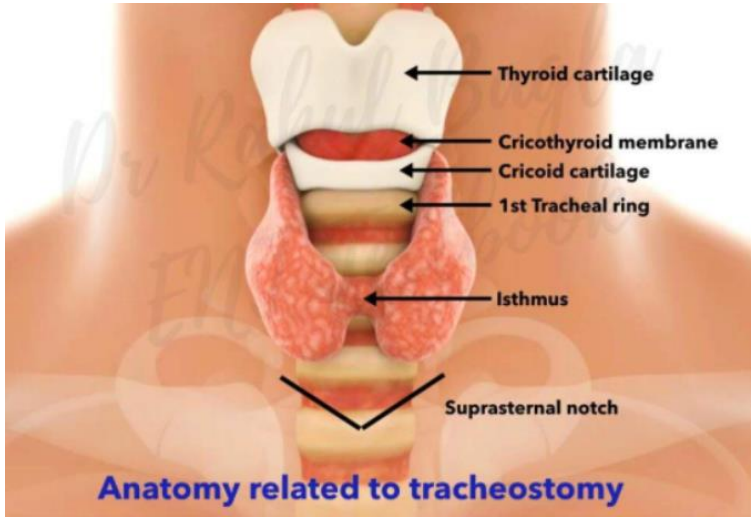
- Performed in urgent situations outside the hospital.
- The incision is typically made in the **suprasternal** region, specifically between the **5th and 6th tracheal rings** to allow air to enter the lungs.

➢ **Surgical Scenarios (e.g., Thyroidectomy):**

✓ If the **recurrent laryngeal nerves** are accidentally injured bilaterally, the vocal cords may close, leading to **suffocation**.

✓ In such cases, an opening is made in the membranes:

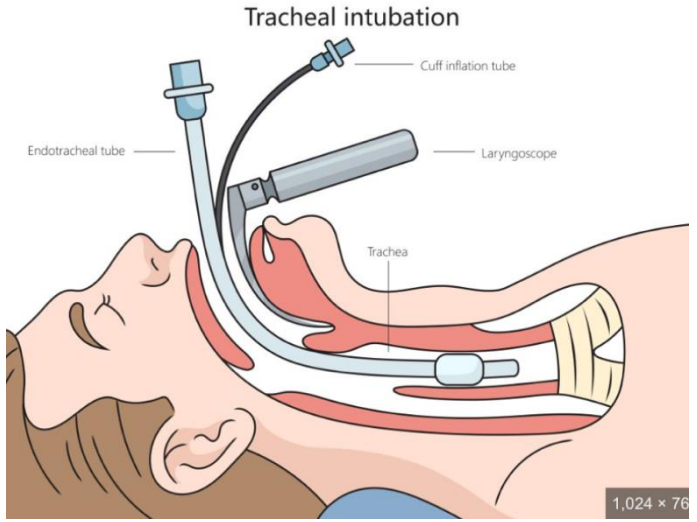
- **Cricothyroid membrane:** Located above the cricoid cartilage.
- **Cricotracheal membrane:** Located below the cricoid cartilage.



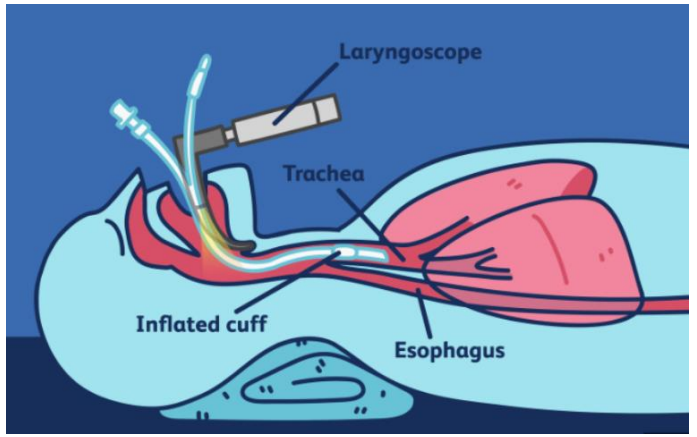
4- Tracheotomy and intubation

➢ Related to CLINICAL:

❖ Intubation



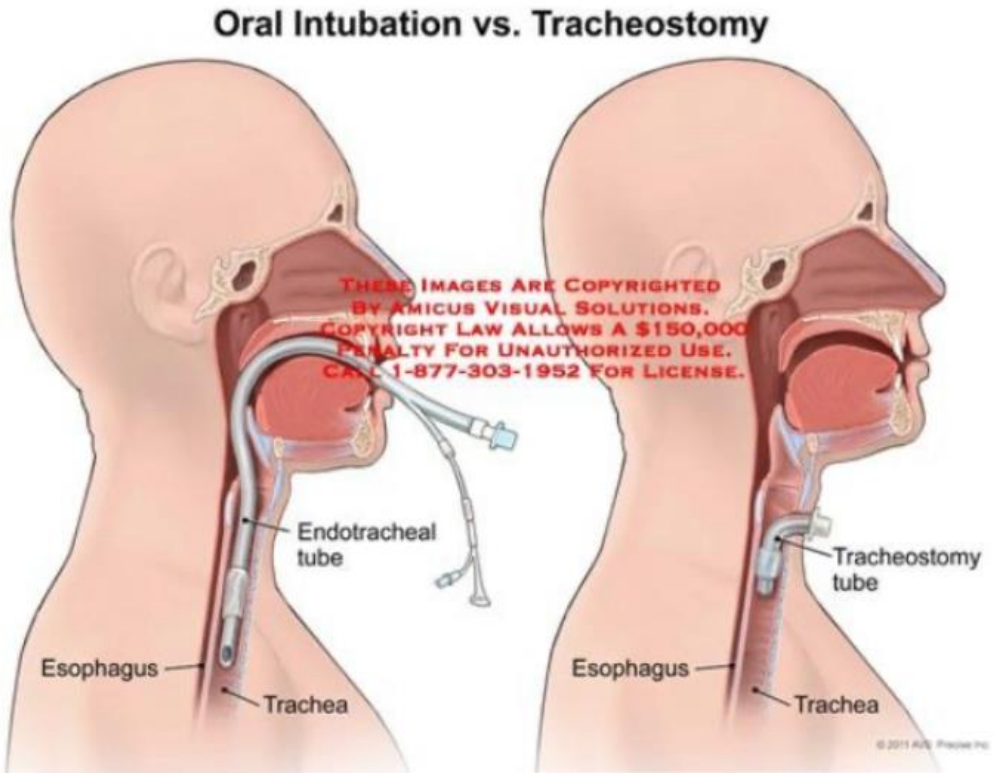
- **Definition:** An **endotracheal tube (ET tube)** is commonly used for patients undergoing general anesthesia during surgery.
- **Pathway:** The tube is inserted through the **oral cavity**, passes through the **laryngeal inlet**, and then through the **larynx**.
- **Crucial Step:** The tube must pass specifically **between the true vocal cords** into the trachea.
- **Safety:** This is essential because if the true vocal cords undergo **adduction** (close together), they will cause suffocation.



4- Tracheotomy and intubation

➢ Related to CLINICAL:

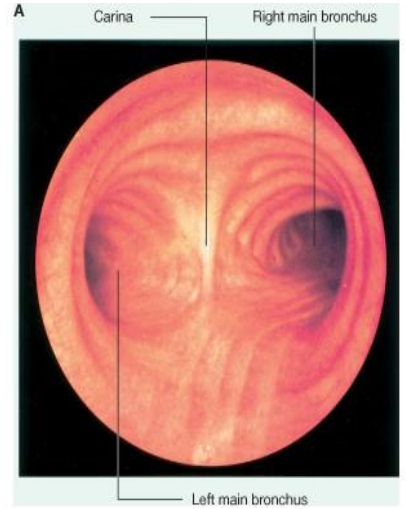
- ✓ In cases of **laryngeal cancer** where the larynx is surgically removed (laryngectomy), a permanent tube is placed directly into the trachea.
- ✓ **Maintenance:** The patient breathes through this tube permanently, and it requires regular cleaning to maintain airway patency.

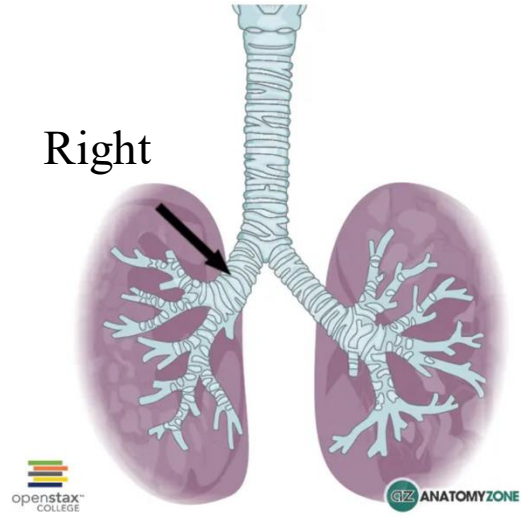


5- Bronchi and Bronchial Tree

Feature	Right main bronchus	Left main bronchus
Length	Shorter (1 inch)	Longer (2-3 inches)
Width	Wider	Narrower
Orientation	More vertical (aligned with trachea)	More horizontal
Foreign Body Aspiration	More common (due to vertical/ wider pathway)	Less common
Sedondary (Lobar) Bronchi	3 (corresponding to 3 lobes)	2 (corresponding to 2 lobes)
Cartilage	Contains plates of cartilage	Contains plates of cartilage

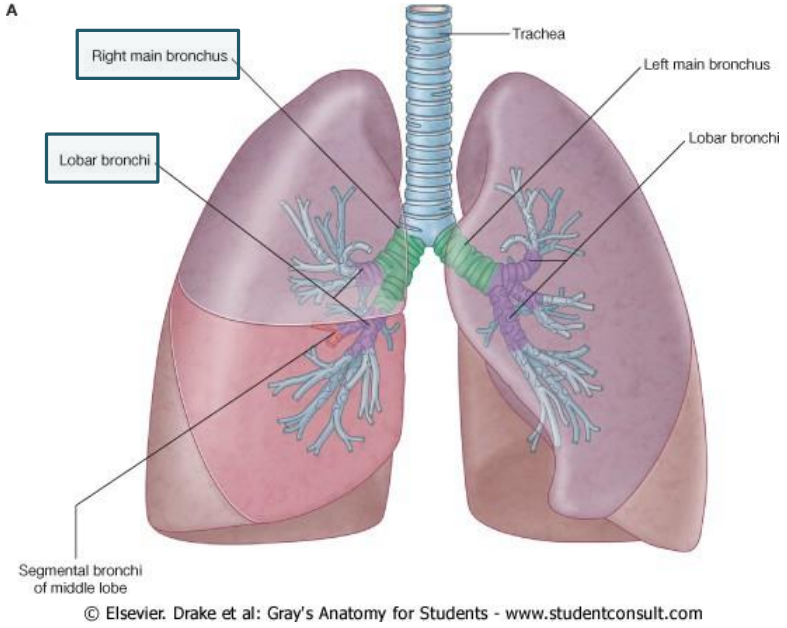
Dr.'s figure:





5- Bronchi and Bronchial Tree

Dr.'s figure:



➢ About the Lobar (Secondary) Bronchi Division

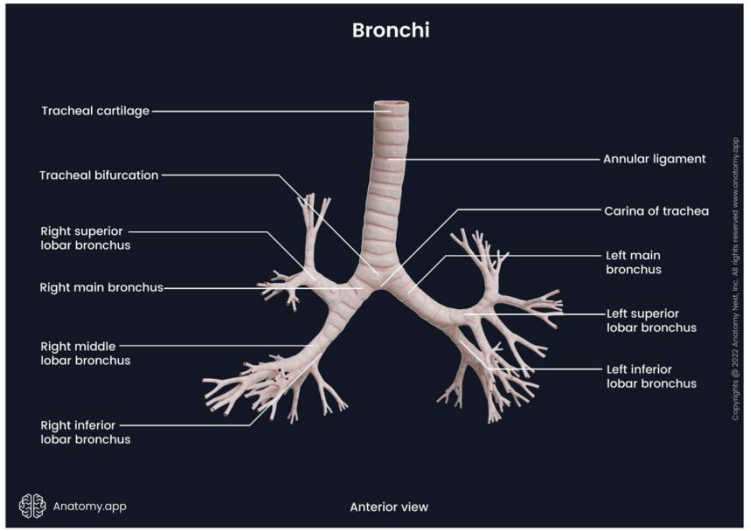
✓ **Right Main Bronchus Division:** It divides into **three secondary (lobar) bronchi** to supply the three lobes of the right lung.

- One branch supplies the **upper lobe**.
- The other part, directed toward the lower sections, further divides to supply the **middle and inferior lobes**, resulting in a total of three lobar bronchi.

✓ **Left Main Bronchus Division:** It divides into only **two secondary (lobar) bronchi**.

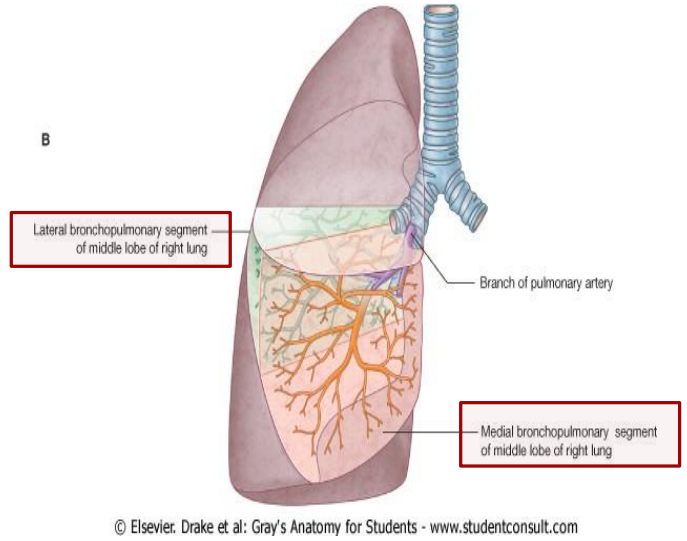
- One branch supplies the **upper lobe**
- The other supplies the **lower lobe**.

➢ Generally, this secondary branching into lobar bronchi occurs **after** the main bronchi enter the **hilum** of the lungs.



5- Bronchi and Bronchial Tree

Dr.'s figure:



➢ Bronchopulmonary Segments

- After the lobar bronchi, the airway continues to divide into **Tertiary Bronchi**, which supply specific areas known as **Bronchopulmonary Segments**.
- **Number of Segments:**

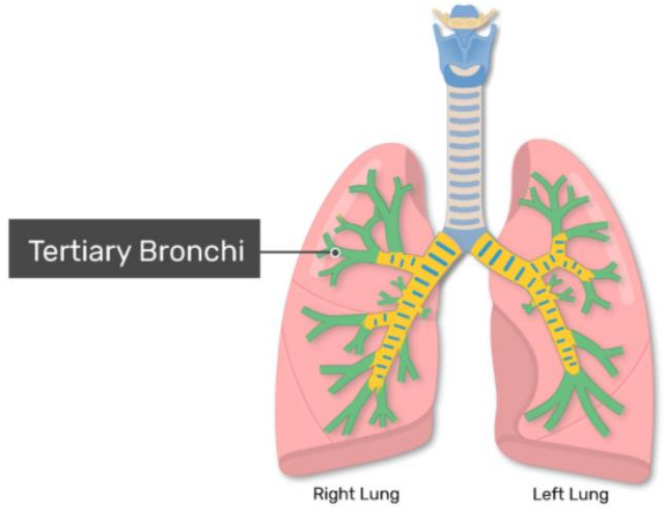
✓ **Right Lung:** Consists of **10 segments**.

✓ **Left Lung:** Consists of **10 segments** in the adult.

➢ Related to CLINICAL (Segmentectomy):

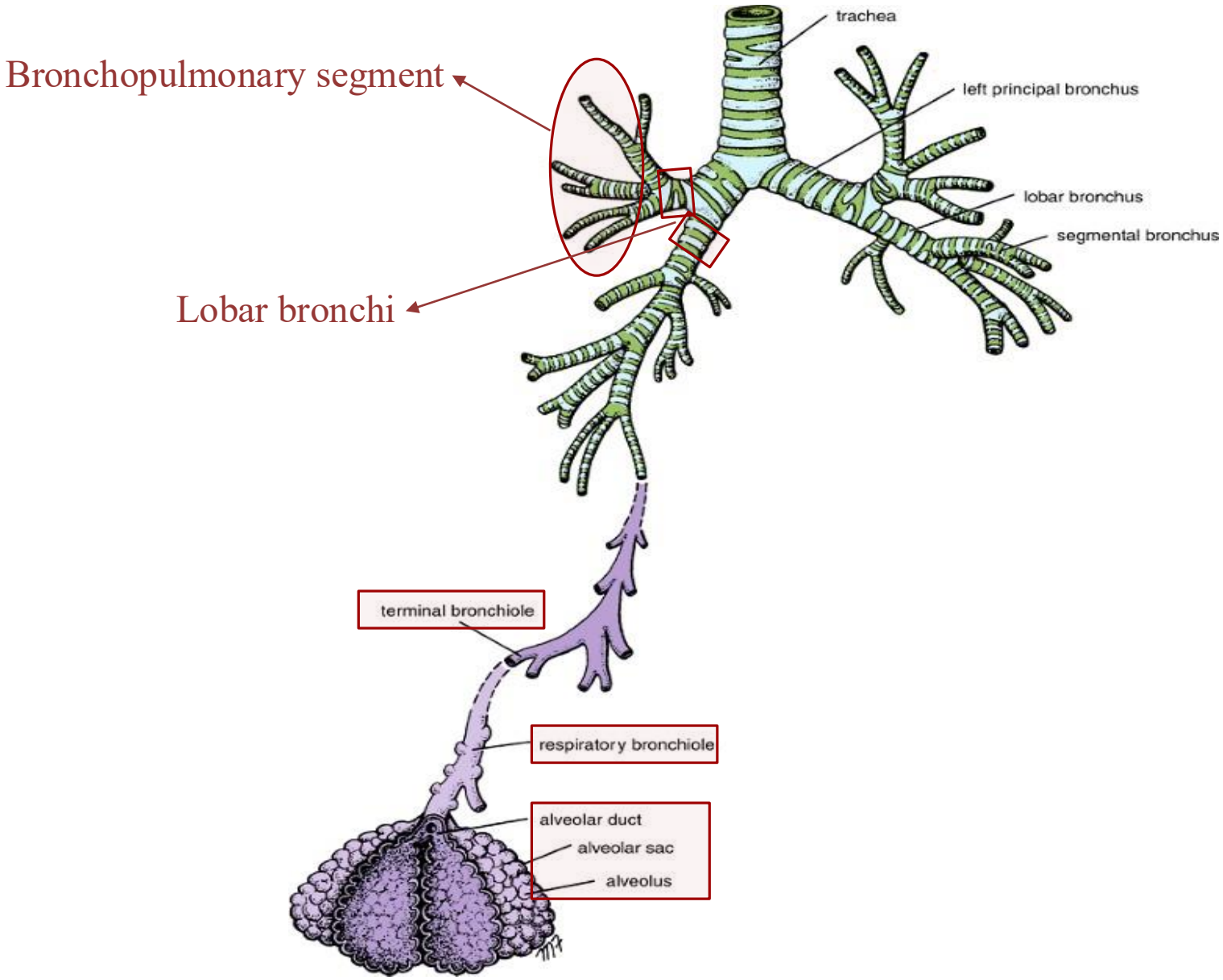
✓ These segments are functionally and anatomically independent units, each with its own bronchus and blood supply.

✓ **Surgical Impact:** Nowadays, surgeons prefer performing a **segmentectomy** (removing only the affected segment) instead of a **lobectomy** (removing the entire lobe) to preserve as much healthy lung tissue as possible.

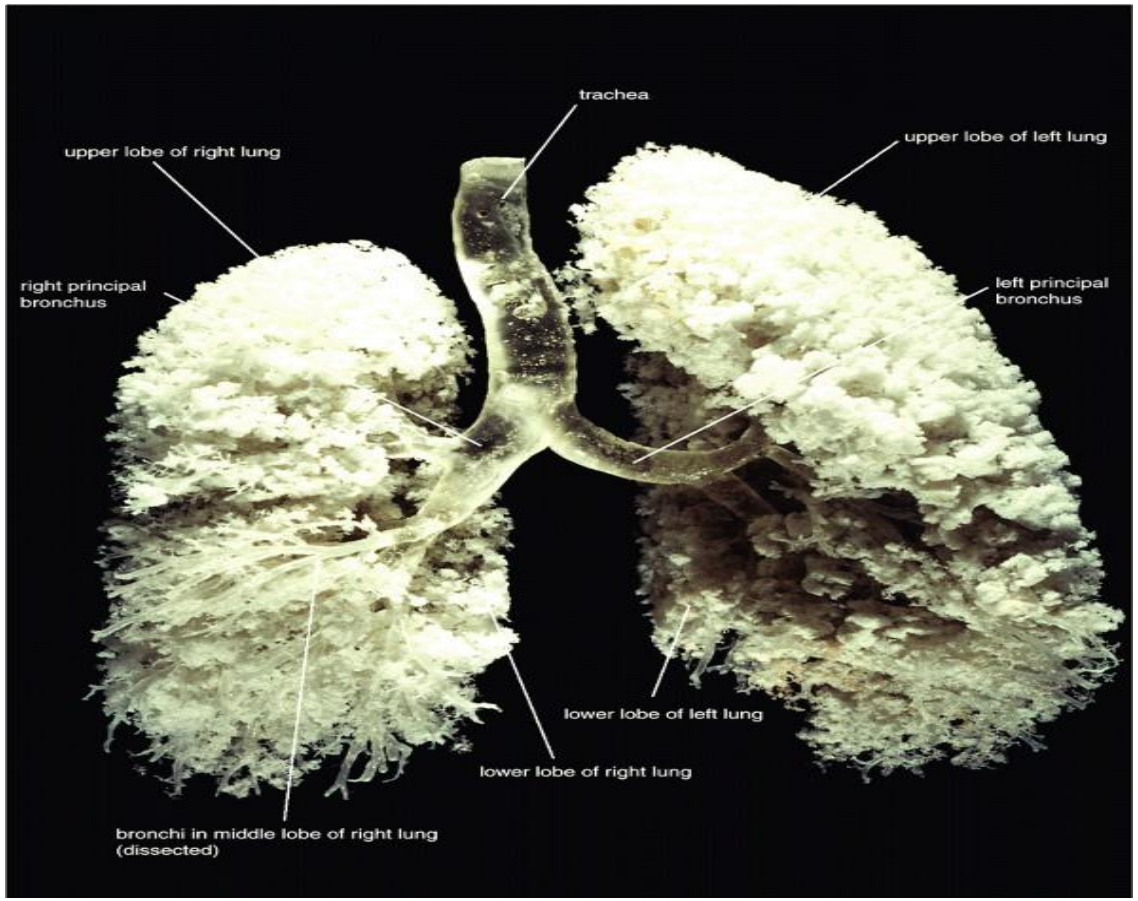


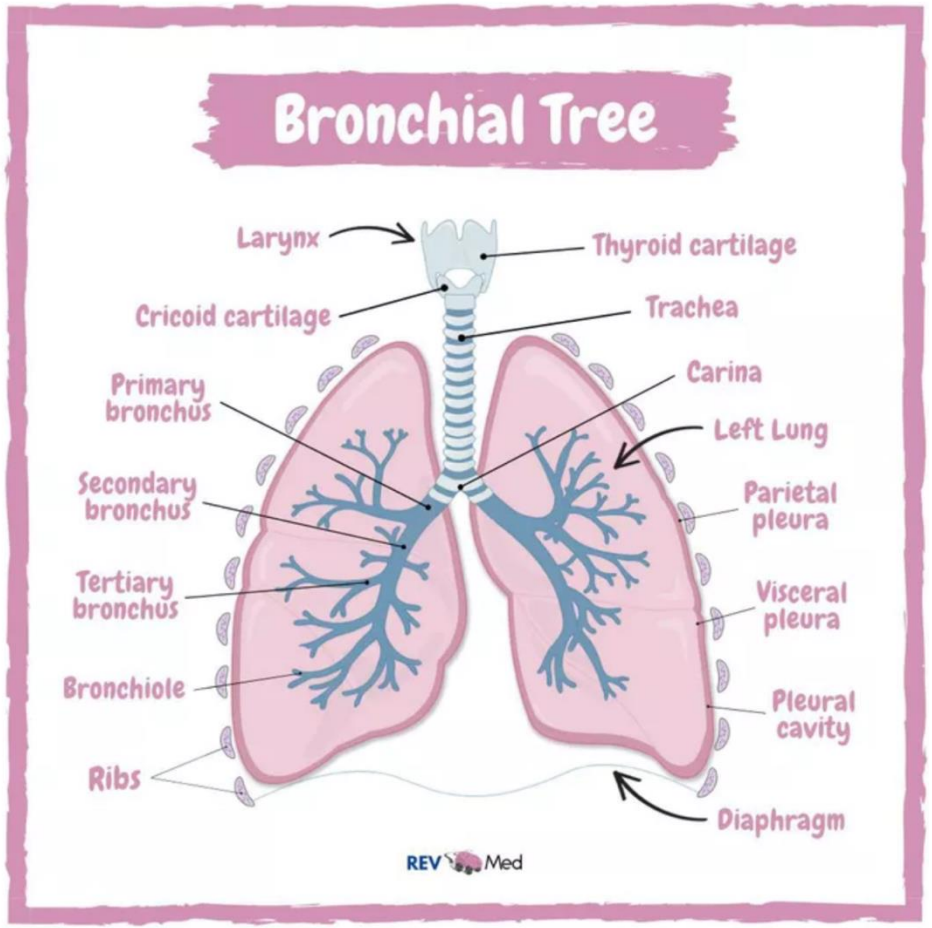
Dr.'s figure:

5- Bronchi and Bronchial Tree



5- Bronchi and Bronchial Tree





Dr.'s figure:

Bronchial Tree

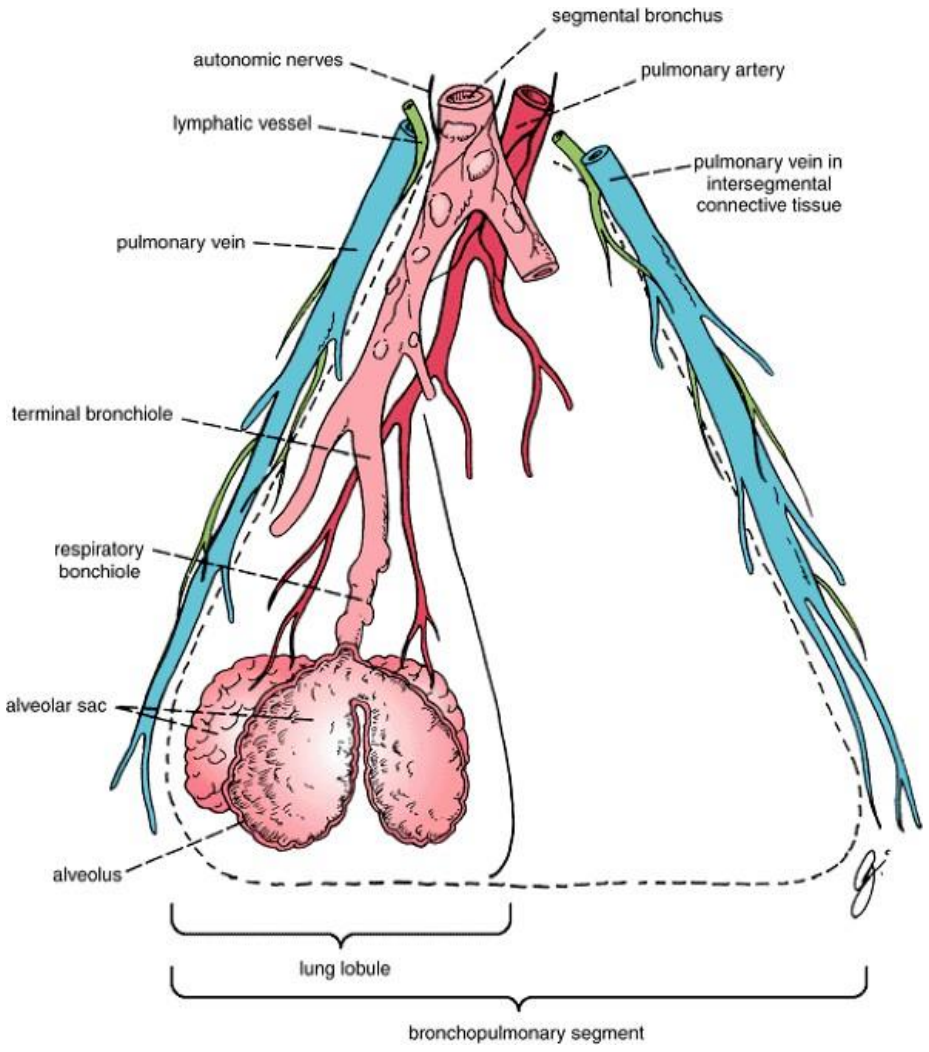
6- Bronchopulmonary Segments

Dr.'s figure:

- It's **pyramidal** in shape and has an apex and a base.

✓ **Apex:** Pointed toward the **hilum** of the lung.

✓ **Base:** Directed toward the **surface** of the lung.



- **Internal Structures (Inside the Segment):**

✓ **Airways:** Contains the segmental bronchus which branches into bronchioles and eventually alveoli.

✓ **Arterial Supply:** The **pulmonary artery** branch runs centrally within the segment.

✓ **Maintenance Systems:** Includes **lymphatic vessels** and **nerves** located inside the segment.

- **Peripheral Boundaries (At the Borders):**

✓ **Connective Tissue:** Each segment is isolated by a connective tissue septum.

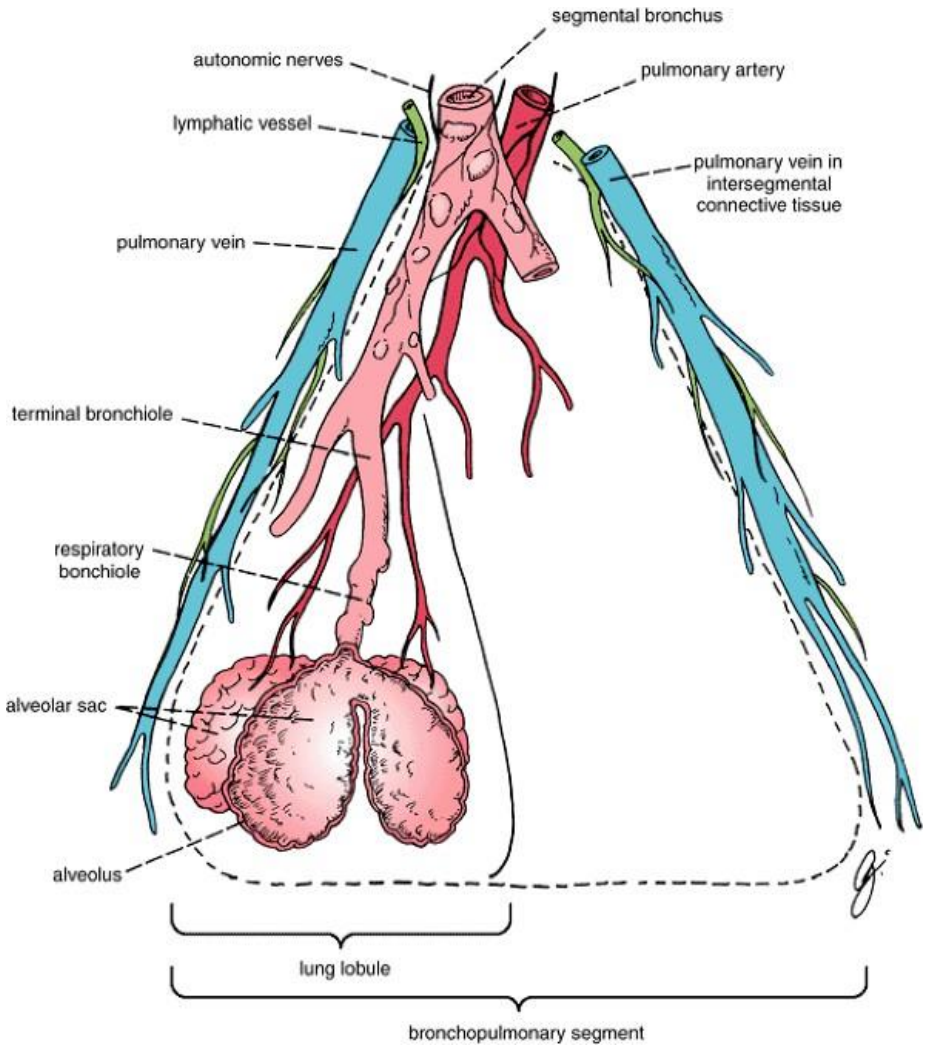
✓ **Venous Drainage:** Unlike the artery, the **pulmonary vein** runs along the **peripheral boundaries** (within the connective tissue between segments).

6- Bronchopulmonary Segments

Dr.'s figure:

➢ Related to CLINICAL (Segmentectomy):

- ✓ **Surgical Plane:** Because the segments are separated by connective tissue, surgeons can identify the correct plane for dissection.
- ✓ **Procedure:** During a **segmentectomy**, the surgeon cuts through the connective tissue beside the pulmonary vein.
- ✓ **Outcome:** This allows for the removal of the diseased segment while preserving the surrounding healthy tissue and the intersegmental veins.



6- Bronchopulmonary Segments

➢ Bronchopulmonary Segments of the Right Lung (10 Segments)

1. Upper Lobe (3 Segments)

- ✓ **Apical Segment:** Directed towards the apex of the lung.
- ✓ **Anterior Segment:** Oriented towards the anterior border.
- ✓ **Posterior Segment:** Oriented towards the posterior border.

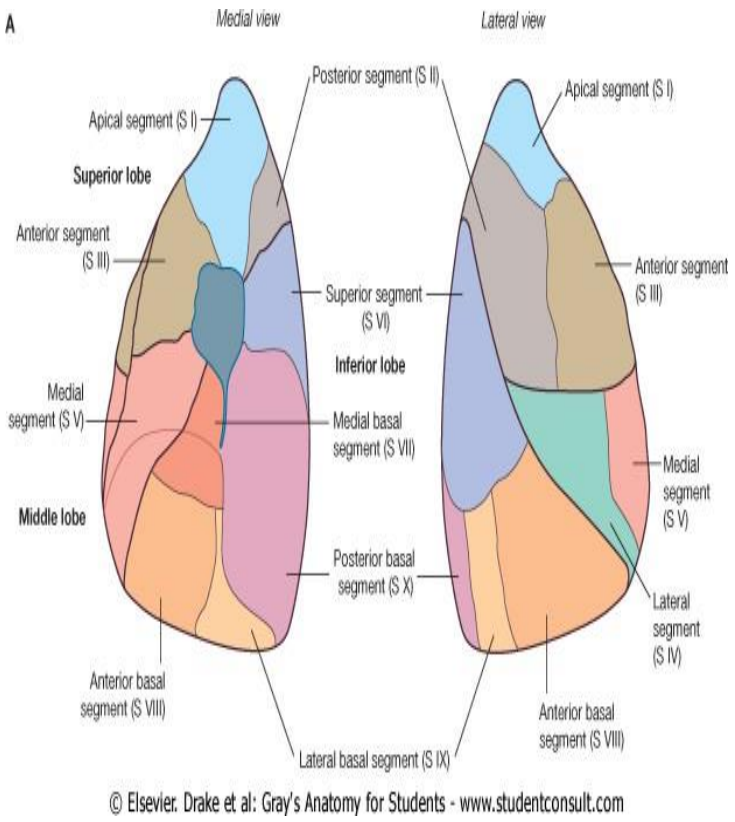
2. Middle Lobe (2 Segments)

- ✓ **Medial Segment:** Directed towards the medial (mediastinal) surface.
- ✓ **Lateral Segment:** Oriented towards the lateral surface.

3. Inferior (Lower) Lobe (5 Segments)

- ✓ **Superior Basal (Apicobasal) Segment:** Located at the uppermost part of the lower lobe (the top of the base).
- ✓ **Anterior Basal Segment:** Oriented towards the anterior border.
- ✓ **Posterior Basal Segment:** Oriented towards the posterior border.
- ✓ **Medial Basal Segment:** Directed towards the medial surface.
- ✓ **Lateral Basal Segment:** Oriented towards the lateral surface.

Dr.'s figure:



6- Bronchopulmonary Segments

➢ Related to CLINICAL:

➢ As previously established, foreign bodies are more likely to enter the **right main bronchus** due to its vertical and wider anatomy. Once inside, the specific **bronchopulmonary segment** affected depends on the patient's position at the time of aspiration:

1. Supine Position (Patient Lying Down)

✓ **Scenario:** A patient at the dentist (e.g., during a tooth extraction) who accidentally aspirates a tooth or medical fragment while lying on their back.

✓ **Target Segment:** The foreign body will likely settle in the **Apicobasal segment** of the **Right Lower Lobe**.

✓ **Reason:** When lying supine, this segment is the most posterior and "dependent" part of the lower lobe, making it the easiest path for gravity to pull the object.

2. Erect Position (Standing or Sitting Upright)

✓ **Scenario:** A child playing with a bead or a small object while in an upright position and accidentally inhaling it.

✓ **Target Segment:** The foreign body typically moves toward the **Posterior Basal segment** of the **Right Lower Lobe**.

✓ **Reason:** In the upright position, the airway path leads most directly and vertically into the posterior-lower part of the lung base.

6- Bronchopulmonary Segments

➢ Bronchopulmonary Segments of the Left Lung (10 Segments)

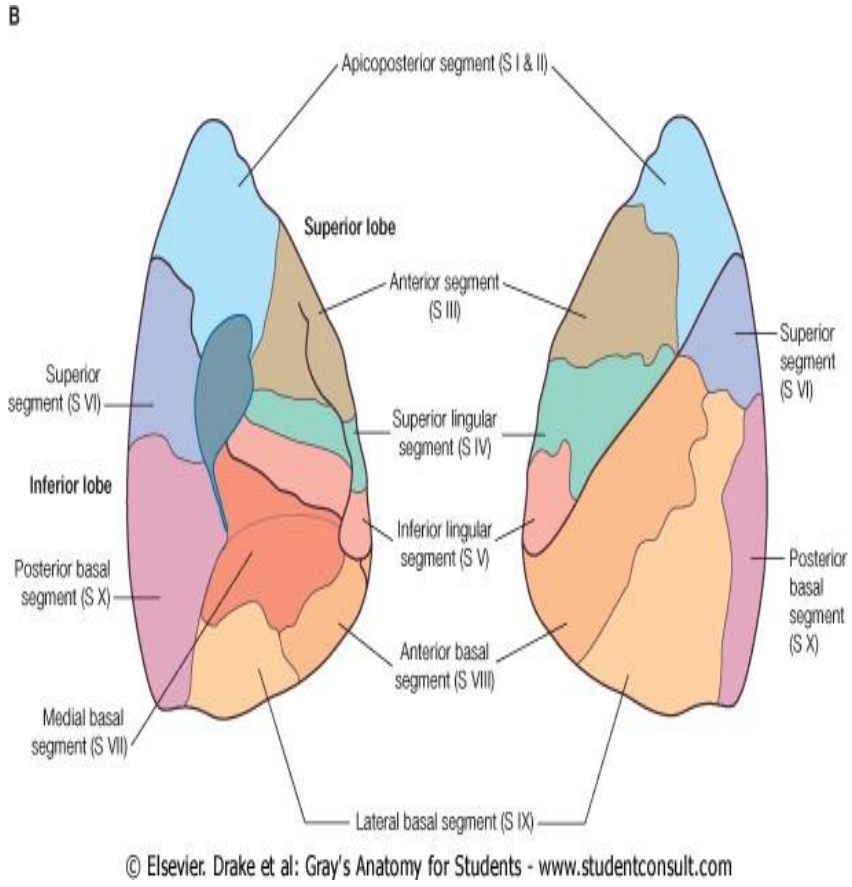
Dr.'s figure:

1. Upper Lobe (5 Segments)

- ✓ **Apical Segment**
- ✓ **Posterior Segment**
- ✓ **Anterior Segment**
- ✓ **Superior Lingular Segment**
- ✓ **Inferior Lingular Segment**

➢ What is the Lingula?

The **Lingula** is a tongue-like projection of the left upper lobe. It exists because the **Cardiac Notch** (which accommodates the heart). Will be discussed



2. Lower Lobe (5 Segments)

- ➢ The segments of the left lower lobe are identical in name and orientation to those of the right lung:

- ✓ **Superior (Apicobasal) Segment**
- ✓ **Anterior Basal Segment**
- ✓ **Posterior Basal Segment**
- ✓ **Medial Basal Segment**
- ✓ **Lateral Basal Segment**

6- Bronchopulmonary Segments

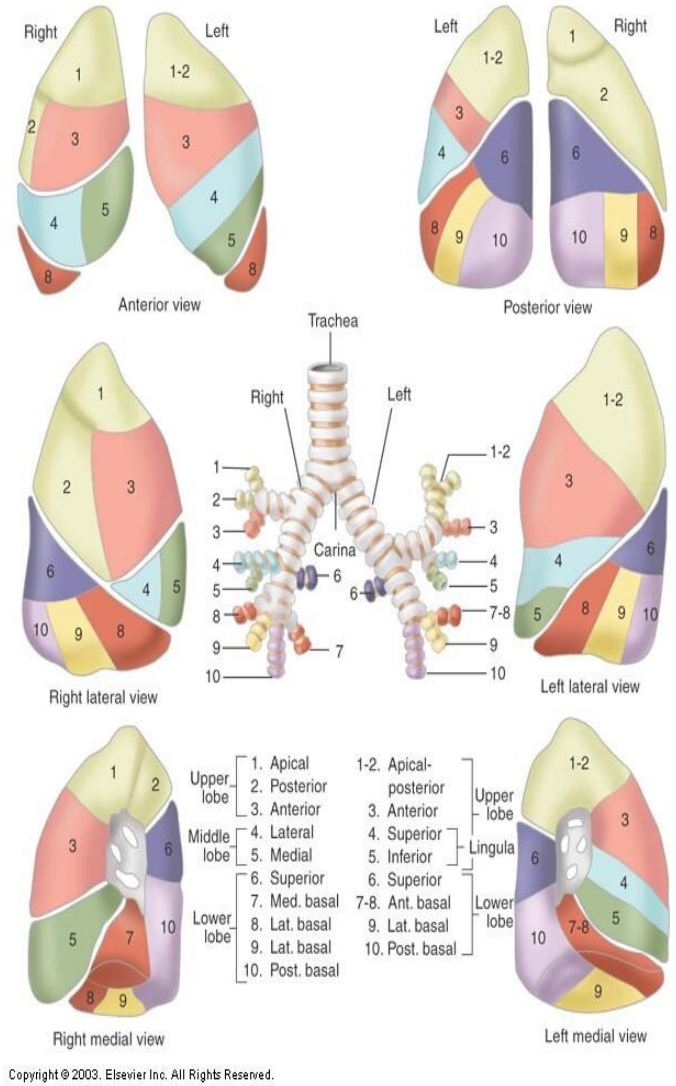
Table 7-6 Bronchopulmonary Segments*

Segment	Number	Segment	Number
Right Upper Lobe		**Left Upper Lobe**	
Apical	1	Upper division	
Posterior	2	Apical-posterior	1 and 2†
Anterior	3	Anterior	3
Right Middle Lobe		Lower division (lingula)	
Lateral	4	Superior lingula	4
Medial	5	Inferior lingula	5
Right Lower Lobe		**Left Lower Lobe**	
Superior	6	Superior	6
Medial basal	7	Anterior basal	7 and 8
Anterior basal	8	Lateral basal	9
Lateral basal	9	Posterior basal	10
Posterior basal	10		

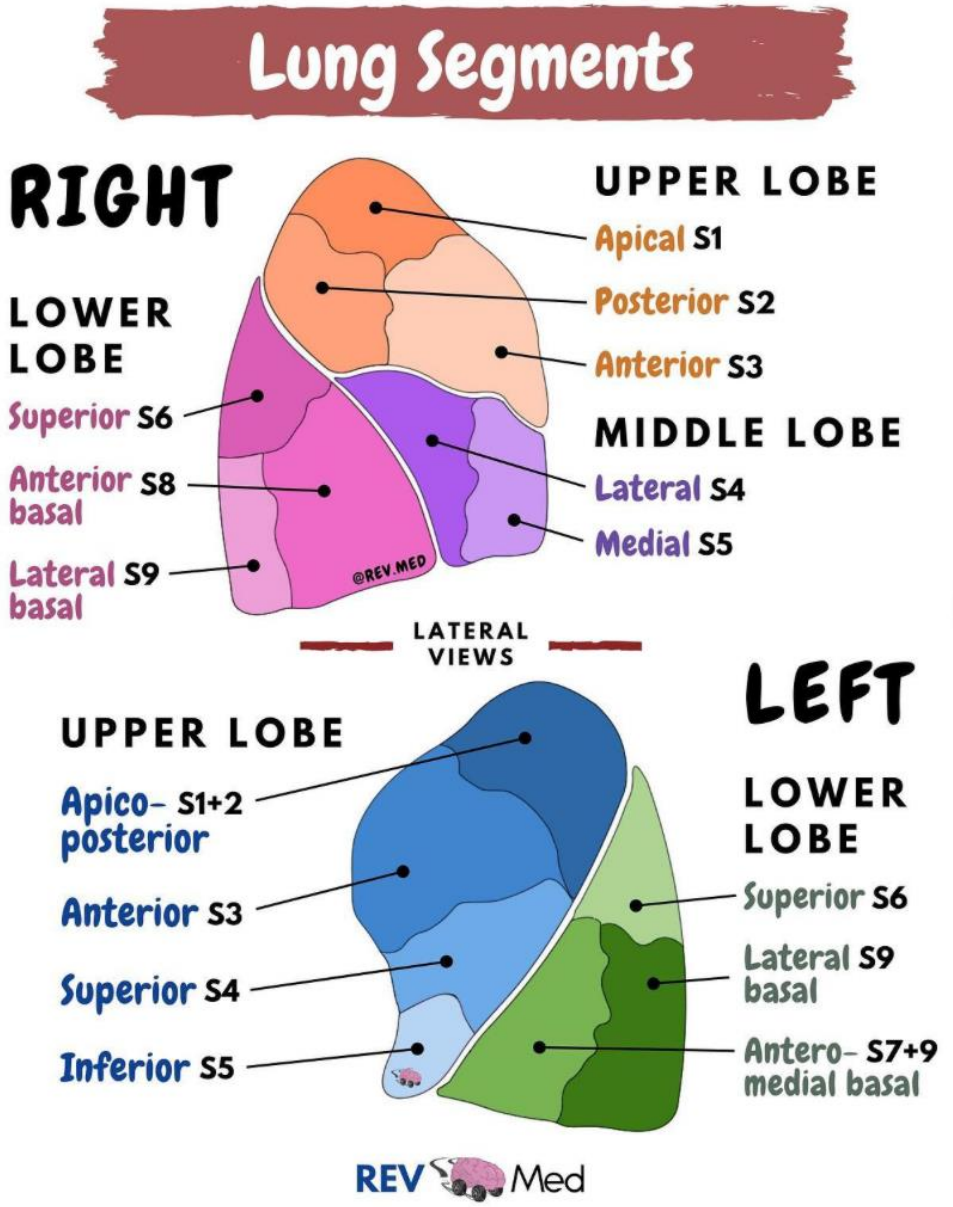
*The subdivisions of the lung and bronchial tree are fairly constant. Slight variations between right and left sides are noted by combined names and numbers.

†**Note:** Some authors feel that the left lung should be numbered so that there are eight segments, where the apical-posterior is numbered 1 and the anteromedial is numbered 6.

Dr.'s figure:



6- Bronchopulmonary Segments



6- Bronchopulmonary Segments

➢ **Before birth:**

✓ Right lung: 10 segments (no changes)

✓ Left lung: 8 segments
- Apico-posterior
- Antero-medial

➢ **After birth:** the left lung becomes 10 segments

✓ The apico-posterior segment of the upper lobe undergoes division into:
- Apical segment
- Posterior segment

✓ The basal part initially remains as a single antero-medial segment. Later, this antero-medial segment divides into:
- Anterior segment
- Medial segment

7- Clinical Importance of Pulmonary Segments

- Infections are initially localized within the segments; later, they can spread due to the absence of barriers.
- Very important surgically (segmentectomy).
- Postural drainage.
- Bronchoscopy to remove foreign bodies or to take a biopsy.

فَصَبْرٌ جَمِيلٌ ۖ عَسَى اللَّهُ أَن يَأْتِيَنِي بِهِمْ جَمِيعًا

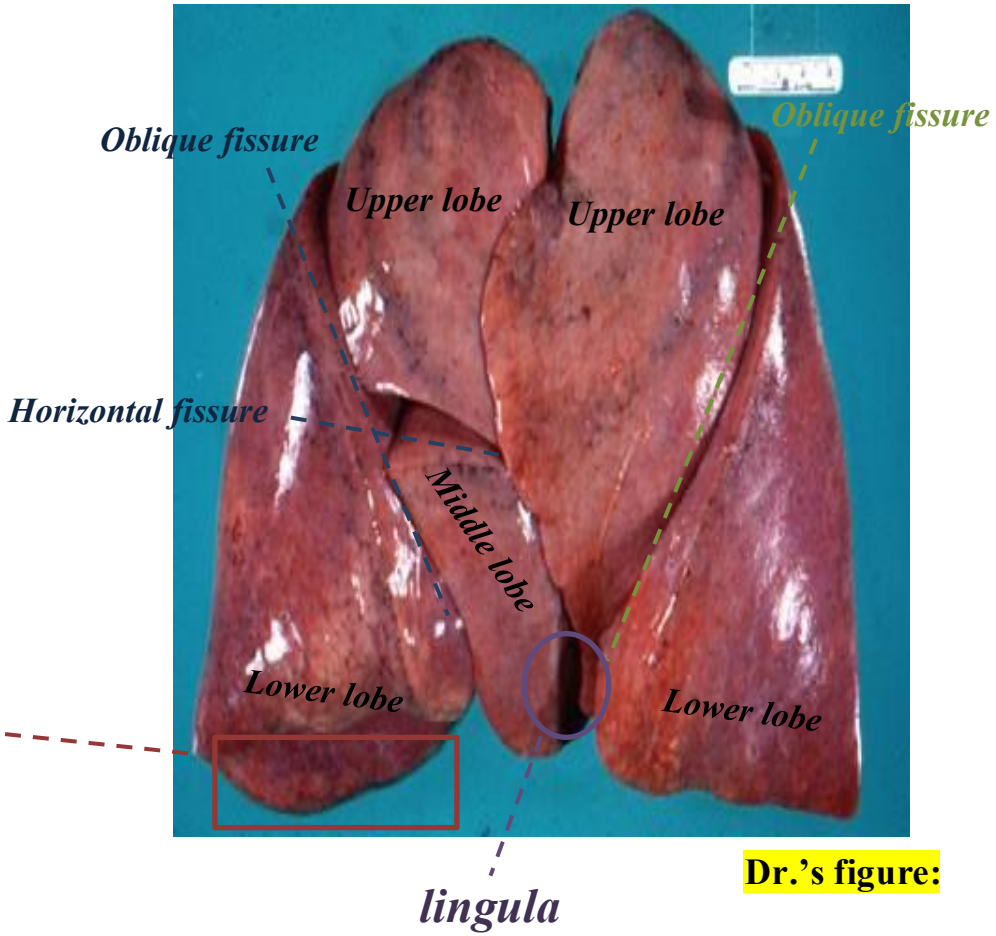
Lungs

ويُؤنِسُني أنكَ عليمٌ بِما يَخفَى..

1- Anatomy of the Lungs

- The lungs consist of a **right** lung and a **left** lung, the **right** lung has **three lobes** and **two fissures** (oblique & horizontal) while the **left** lung has **two lobes** and **one fissure** (oblique)
- The **lingula** is present in the **left lung only.**

- Each lung has an **apex** and a **base**, the **apex** extends about **one inch above** the **medial third of the clavicle** so it presence in the root of the neck, the **base** has a **sharp inferior border lies on the cupola of the diaphragm**, which explains the presence of the inferior border.

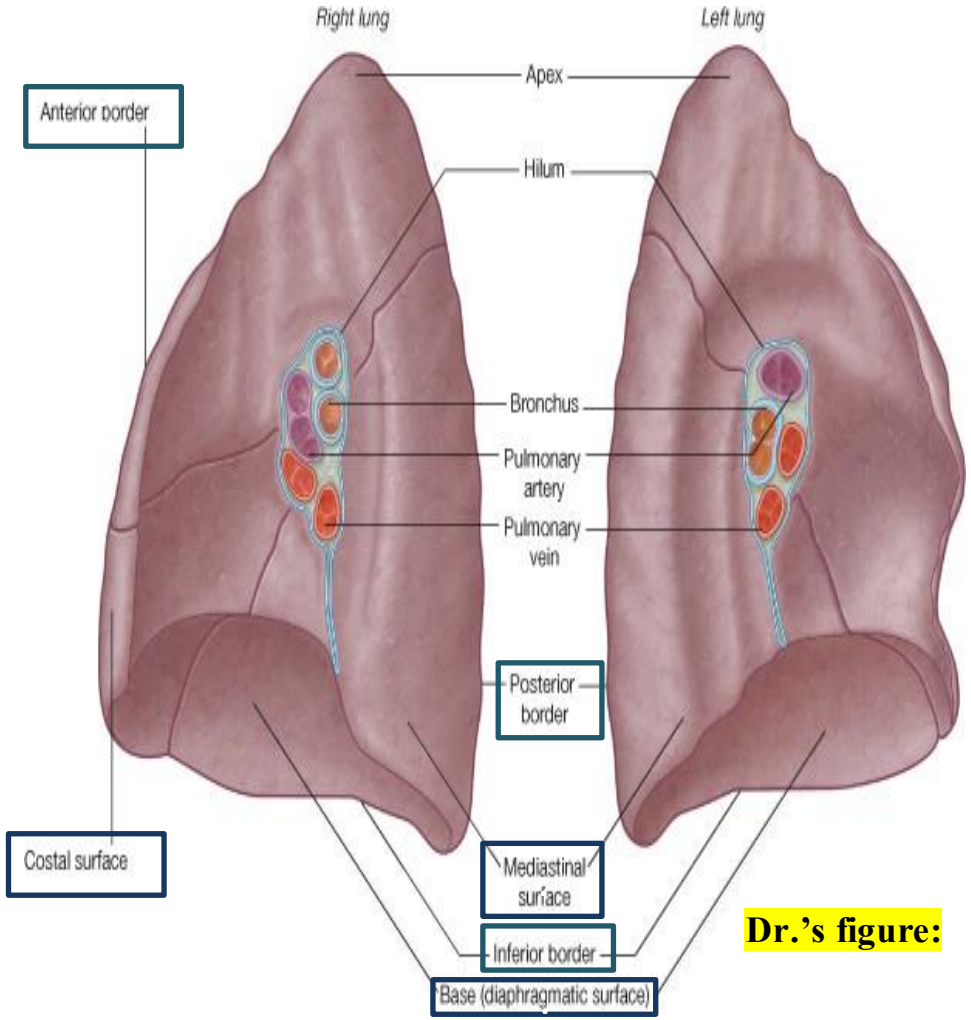


Dr.'s figure:

1- Anatomy of the Lungs

- Each lung has an **anterior** sharp border, a **posterior** rounded border and an **inferior** sharp border.

- The lung has surfaces:
- ✓ The **costal surface** is related to the costal cartilages.
- ✓ The **mediastinal surface (medial)** faces the mediastinum, which is the space between the two lungs.
  - The mediastinum is divided into superior and inferior parts.
  - The inferior mediastinum is subdivided into anterior, middle (which contains the heart), and posterior parts.
- ✓ **Diaphragmatic surface (base)**



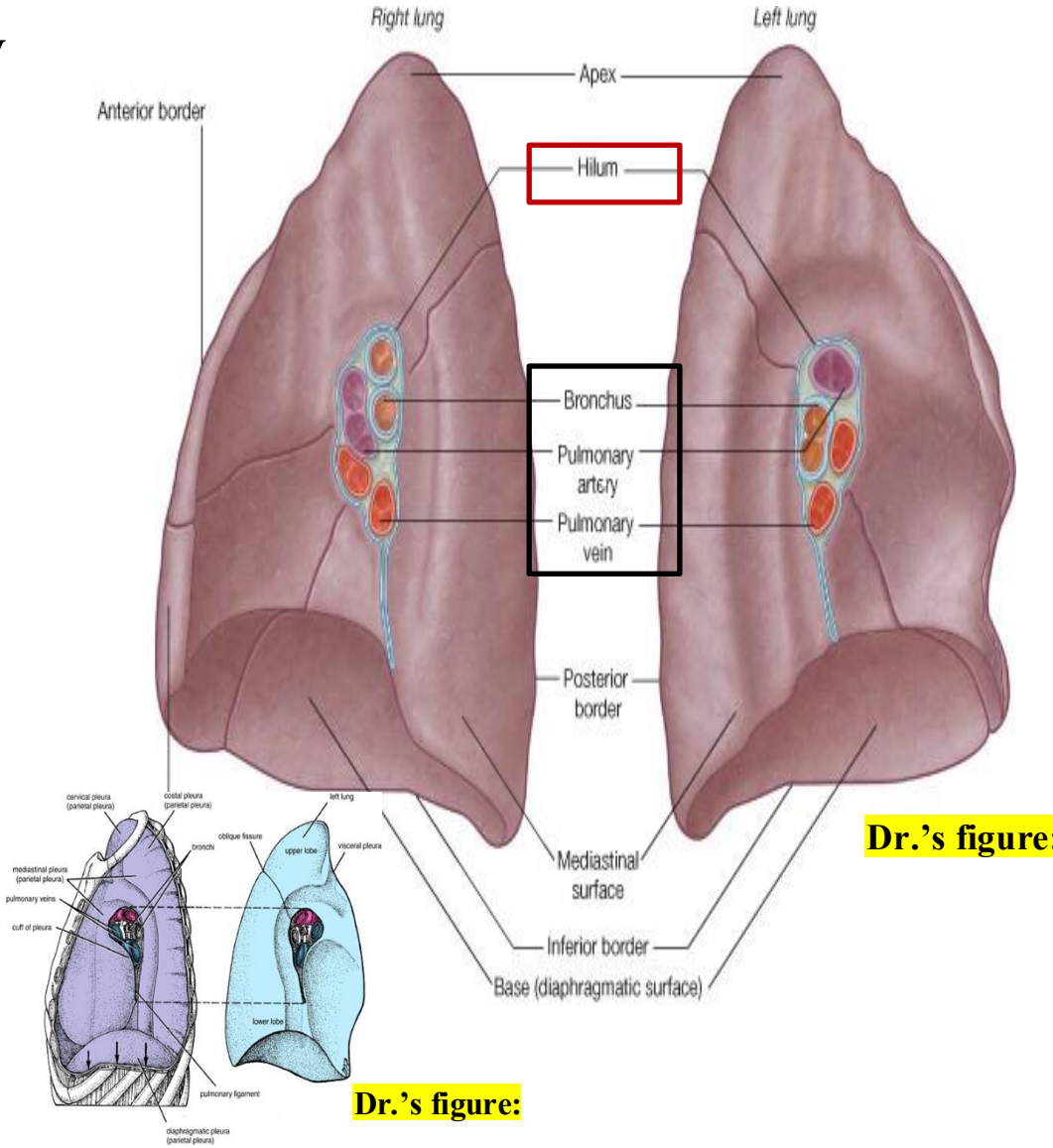
Dr.'s figure:

1- Anatomy of the Lungs

➢ Each lung has a **hilum** that contains the **pulmonary artery, pulmonary veins,** and **bronchi.**

Structure	**Right Lung**	**Left Lung**
Pulmonary artery	Located between the bronchi	Most superior structure
Pulmonary veins	Superior & inferior, located inferiorly	Superior & inferior, located anteriorly
Bronchus	Two bronchi: • Eparterial (above artery) • Hyparterial (below artery)	One bronchus in the middle, located posteriorly

✓ *The right lung can be identified by the presence of its oblique fissure.*



Dr.'s figure:

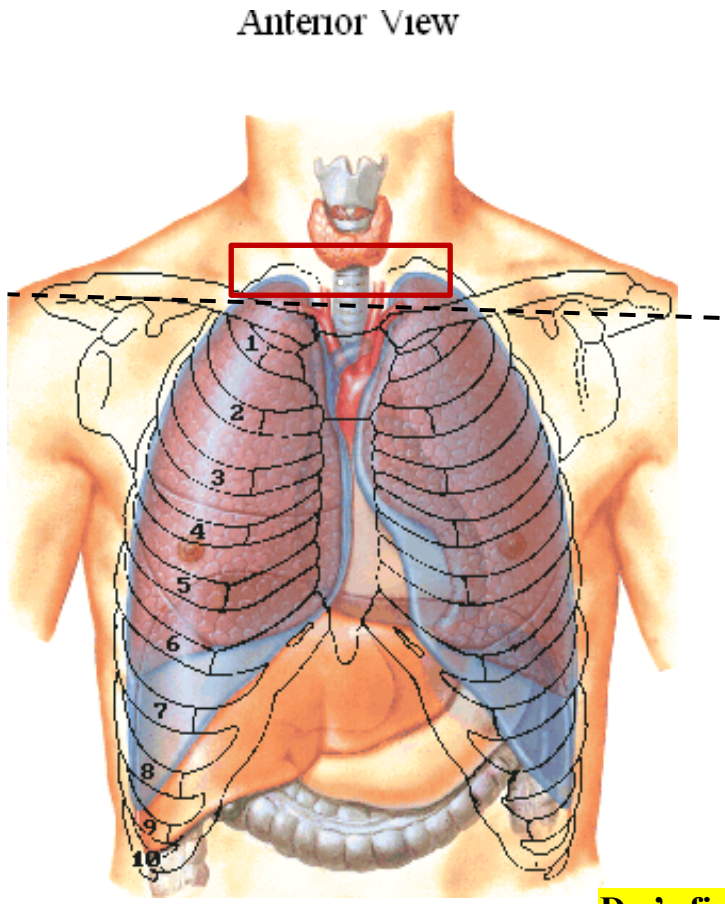
Dr.'s figure:

2- Surfaces Anatomy of the Lungs

➢ The lungs can be identified from the surface of the body by determine the apex, then the anterior border, posterior border , inferior border/surface.

✓ **Apex** of the lung:

- Extends about one inch above the medial third of the clavicle (above the first rib).
- Covered by: **Visceral pleura, Parietal pleura and Suprapleural membrane** which functions is to seal the thoracic cavity and help maintain intrathoracic pressure.



Dr.'s figure:

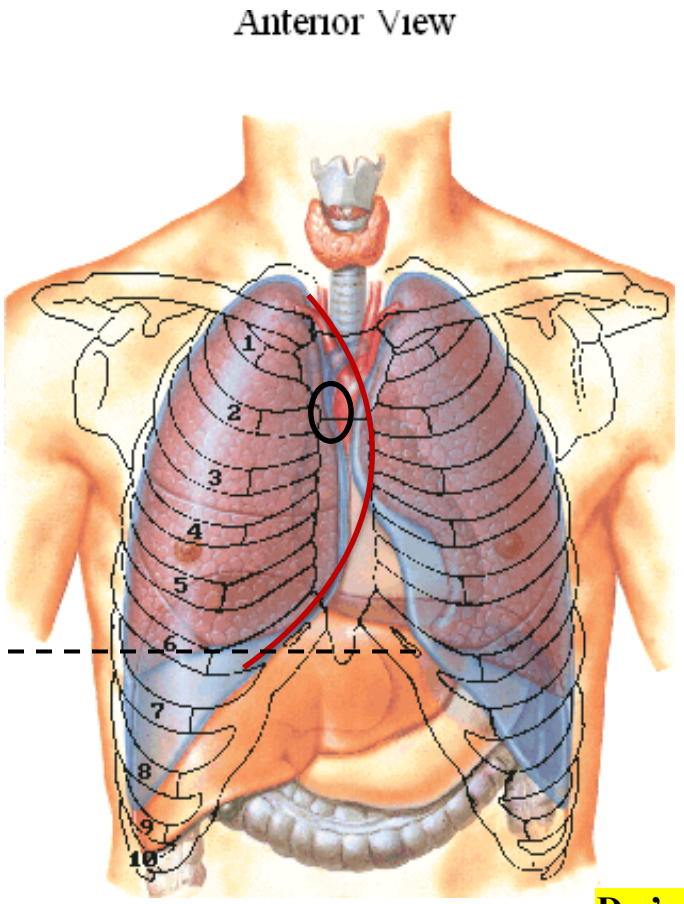
2- Surfaces Anatomy of the Lungs

✓ Anterior border:

- Starts from the apex, curves to the **sternoclavicular joint**, then passes along the **medial border of the sternal angle**, and extends to the **6th costal cartilage.**

➢ **Cardiac notch** (Left lung only):

- Semicircular indentation for the heart.
- Extends approximately 1 cm between the 4th and 6th ribs.
- Not covered by pleura, just an empty space.

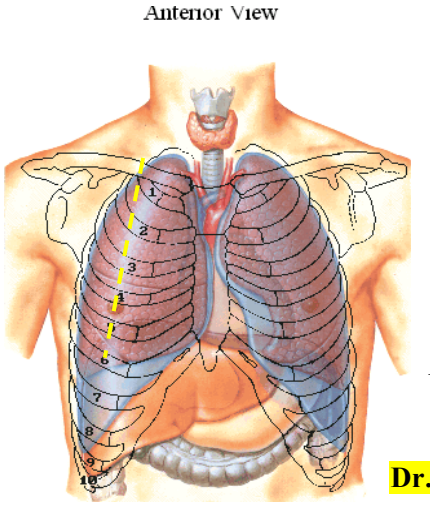


Dr.'s figure:

2- Surfaces Anatomy of the Lungs

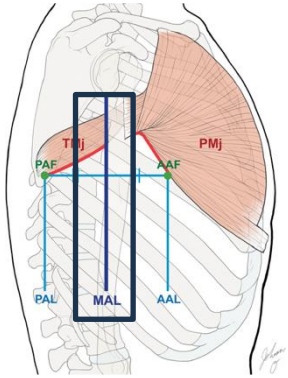
✓ The **inferior border (base)** of the lung can be identified at three reference points:

- Anteriorly (**midclavicular line**): 6th rib
- Laterally (**midaxillary line**): 8th rib
- Posteriorly: level of the 10th thoracic vertebra (**vertebral line**)
  - *If we measure 4 cm lateral from the dorsal spine, this line is referred to as the vertebral line.*

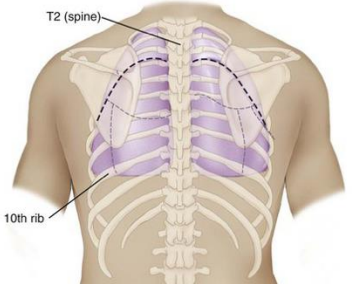


Midclavicular line

Dr.'s figure:



Midaxillary line

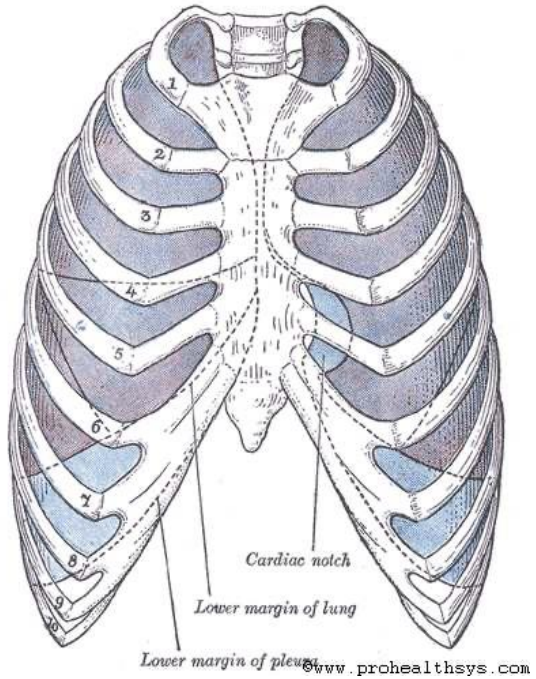


vertebral line

2- Surfaces Anatomy of the Lungs

Lung vs Pleura

Border / Line	Lung	Pleura
Apex	Same as pleura	Same as lung
Anterior border (midclavicular line)	6th costal cartilage	8th costal cartilage
Lateral (midaxillary line)	8th rib	10th rib
Posterior border (vertebral line / dorsal)	T10	T12

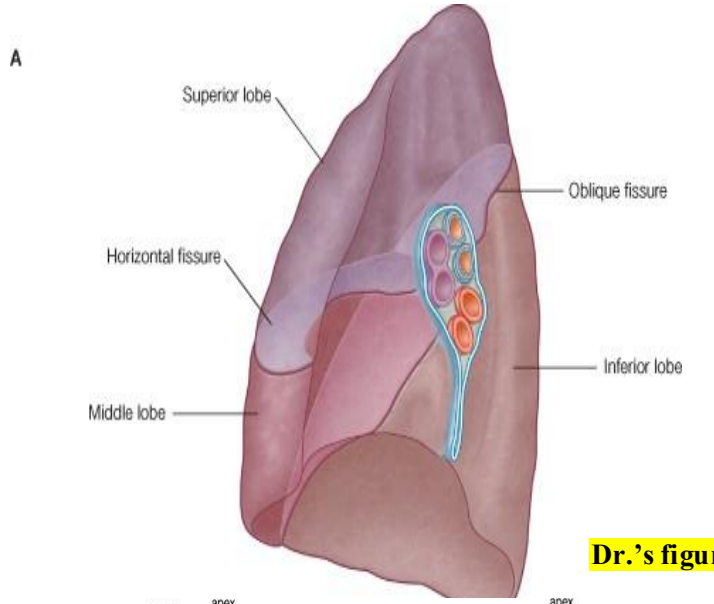


➢ Related to CLINICAL :

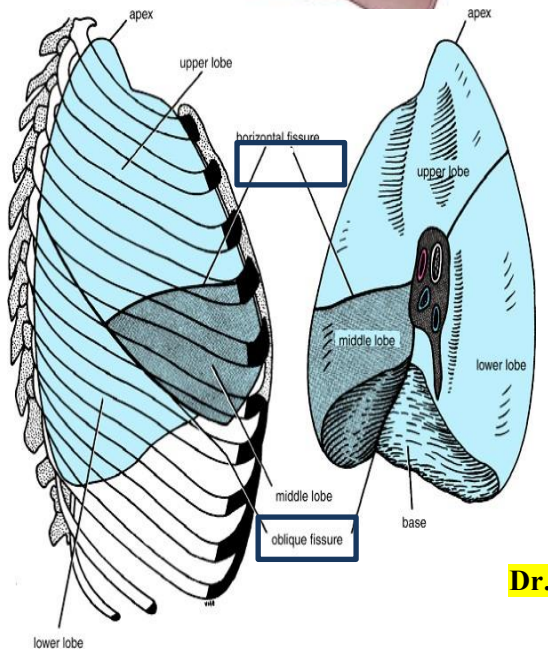
- ✓ The pleural **base** extends slightly below the lung base into the extra **two spaces**, this allows the lungs to expand downward during inflation and fill the space.
- ✓ The pleural space (between the lung and pleura) can accumulate fluid (blood effusion), pus (Empyema), or air (Pneumothorax).
- ✓ During pleural suction or drainage, the procedure targets the space between the pleura and the lung, not the lung tissue itself so the reference levels of the pleural space: (midclavicular line): extends to the **7th** ribs which lies between the 6th and 8th ribs, (midaxillary line): extends to approximately the **9th** rib, which lies between the 8th and 10th ribs.

3- Right Lung

- The right lung has two fissures: **oblique** and **horizontal**.
- The **oblique fissure** starts *posteriorly* about **4 cm** lateral to **T4,** passes through the **5th** intercostal space, and reaches the **6th** rib *anteriorly*.
- The **horizontal fissure** starts *anteriorly* at the **4th** costal cartilage, runs through the **4th–5th** intercostal space, and joins the oblique fissure at the **6th** rib.



Dr.'s figure:

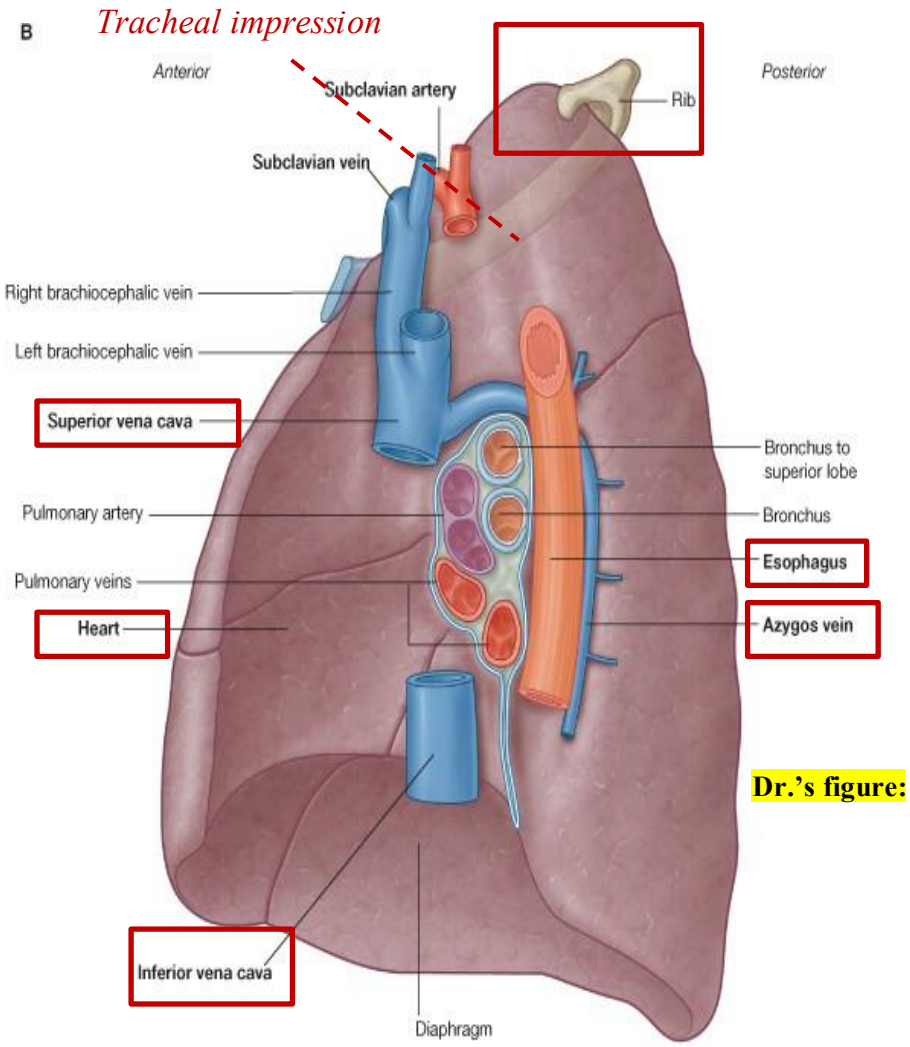


Dr.'s figure:

3- Right Lung

➢ The impressions on the right lung are mainly related to structures carrying deoxygenated blood:

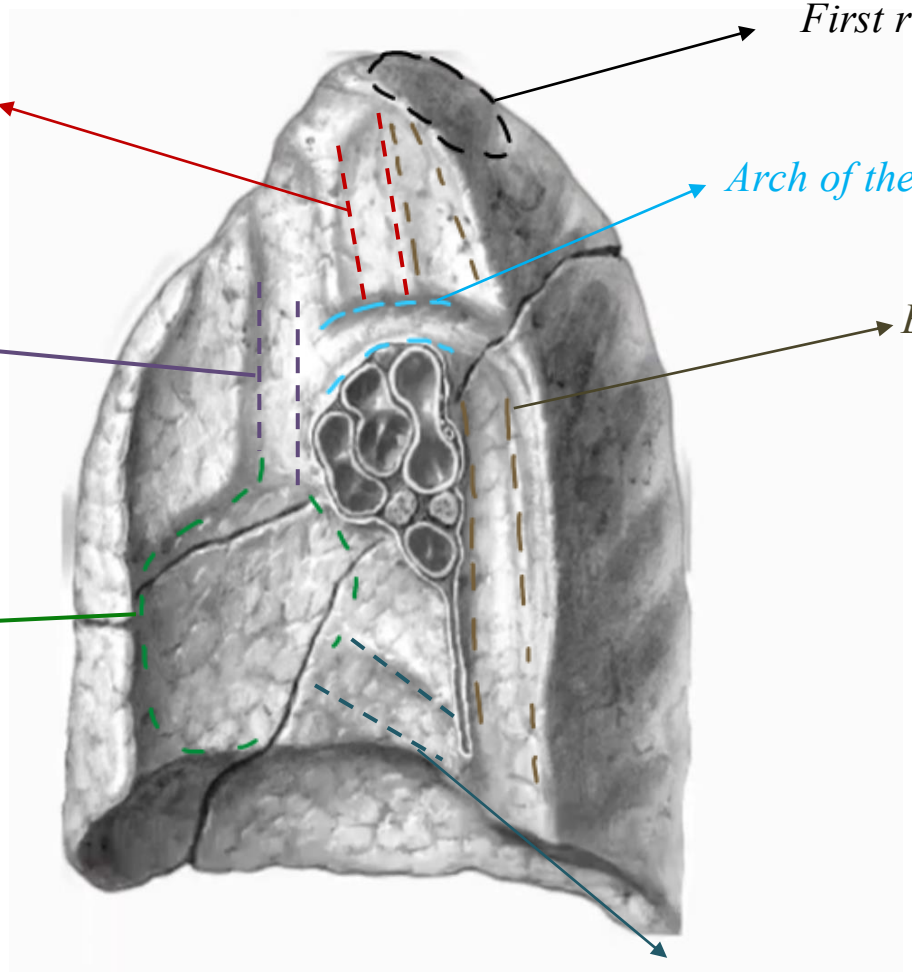
- **Right atrial impression**
  - Located anterior to the hilum.
  - Related to the right atrium, which receives the superior vena cava and inferior vena cava.
- **Superior vena cava and inferior vena cava impressions**
  - Seen anterior to the hilum, in relation to the right atrium.
- **Esophageal impression**
  - Located posterior to the hilum.
  - Extends from the apex downward along the course of the esophagus.
- **Tracheal impression**
  - Present on the right lung only due to rightward deviation of the trachea.
- **Arch of the azygos vein impression**
  - Located above the hilum and anterior to it.
- **First rib impression**
  - Located along the anterior border of the right lung.



Dr.'s figure:

For better understanding, see the next slide

3- Right Lung

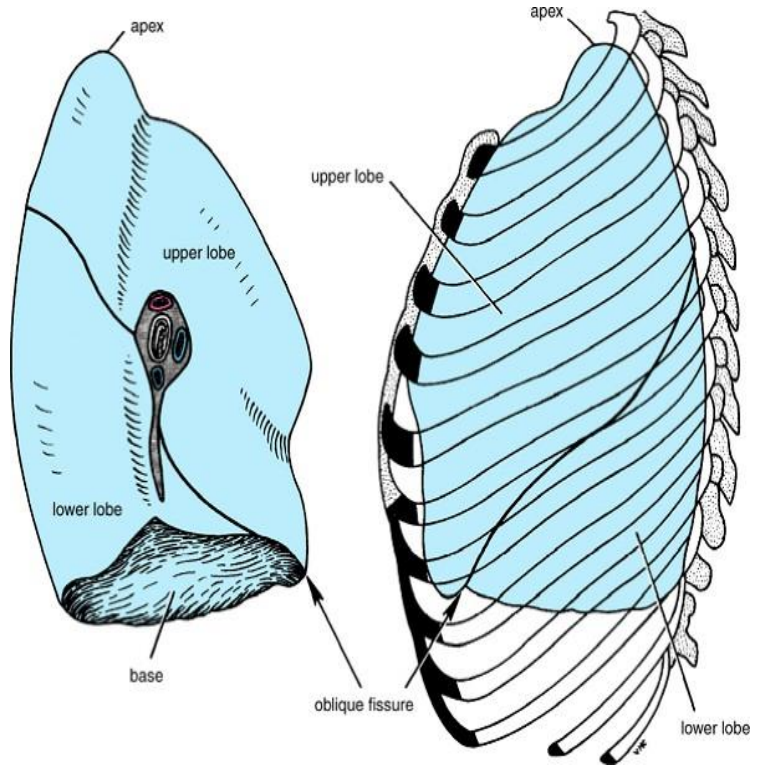

First rib impression
Tracheal impression
Arch of the azygos vein impression
Superior vena cava impression
Esophageal impression
Right atrial impression
inferior vena cava impression

4- Left Lung

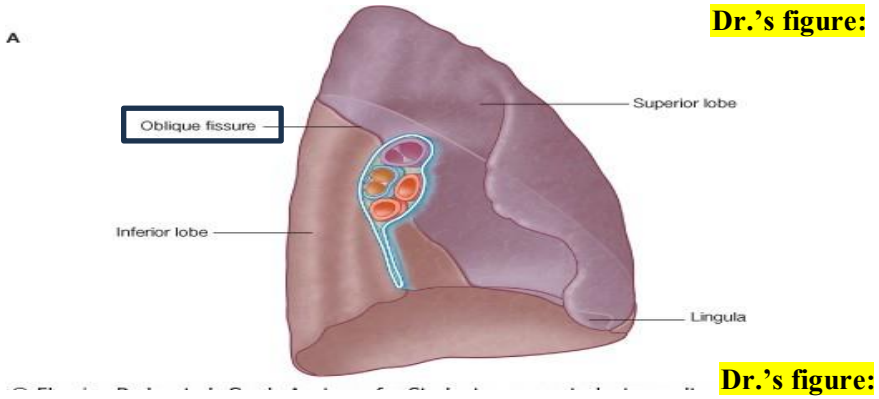
- The left lung has one **oblique fissure,** similar in surface anatomy to the oblique fissure of the right lung.

- The impressions on the left lung are mainly related to oxygenated blood:

- **Left ventricular impression**
  - Located anterior to the hilum.
- **Aortic arch and its branches impression**
  - Located above the hilum.
- **Descending thoracic aorta impression**
  - Located posterior to the hilum.
- **Esophageal impression**
  - Present only in the lower part posterior to the hilum, this is because the esophagus crosses the aorta inferiorly, becoming more anterior at lower levels.

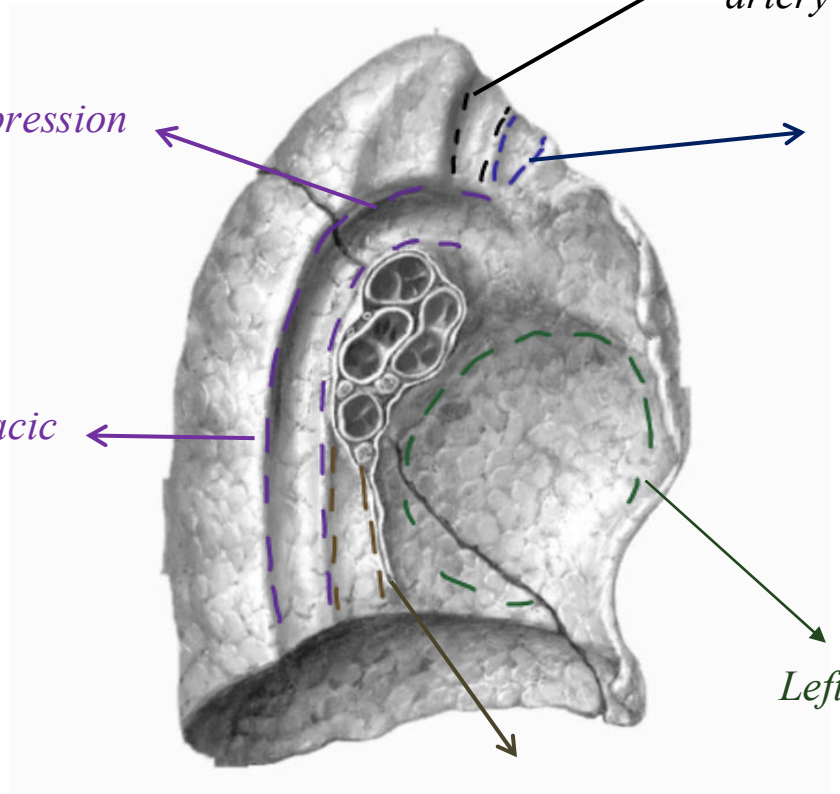


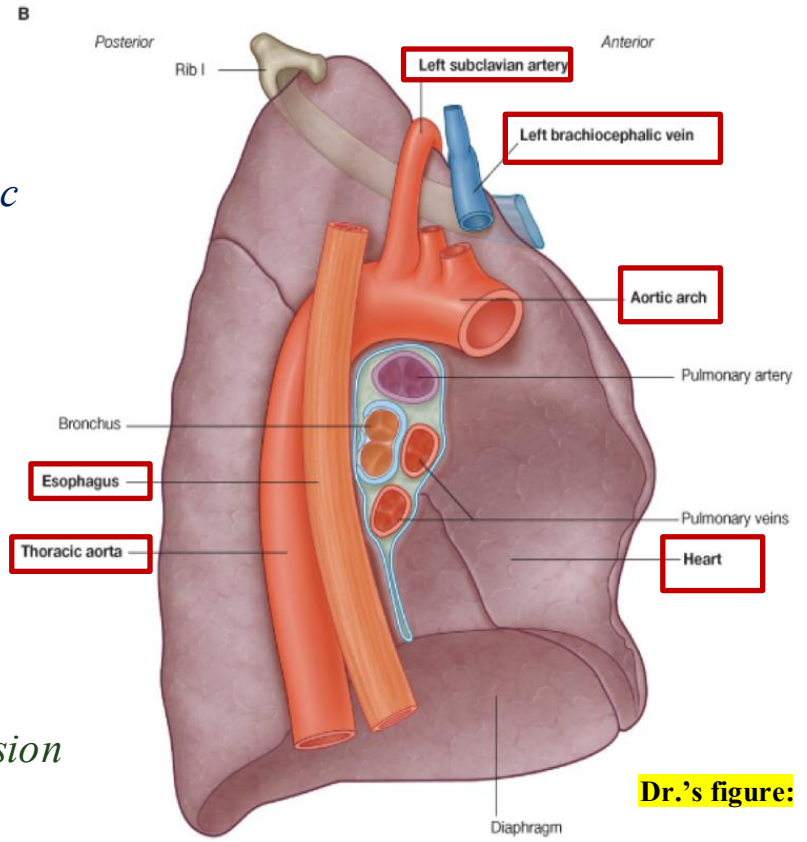
Dr.'s figure:



Dr.'s figure:

4- Left Lung



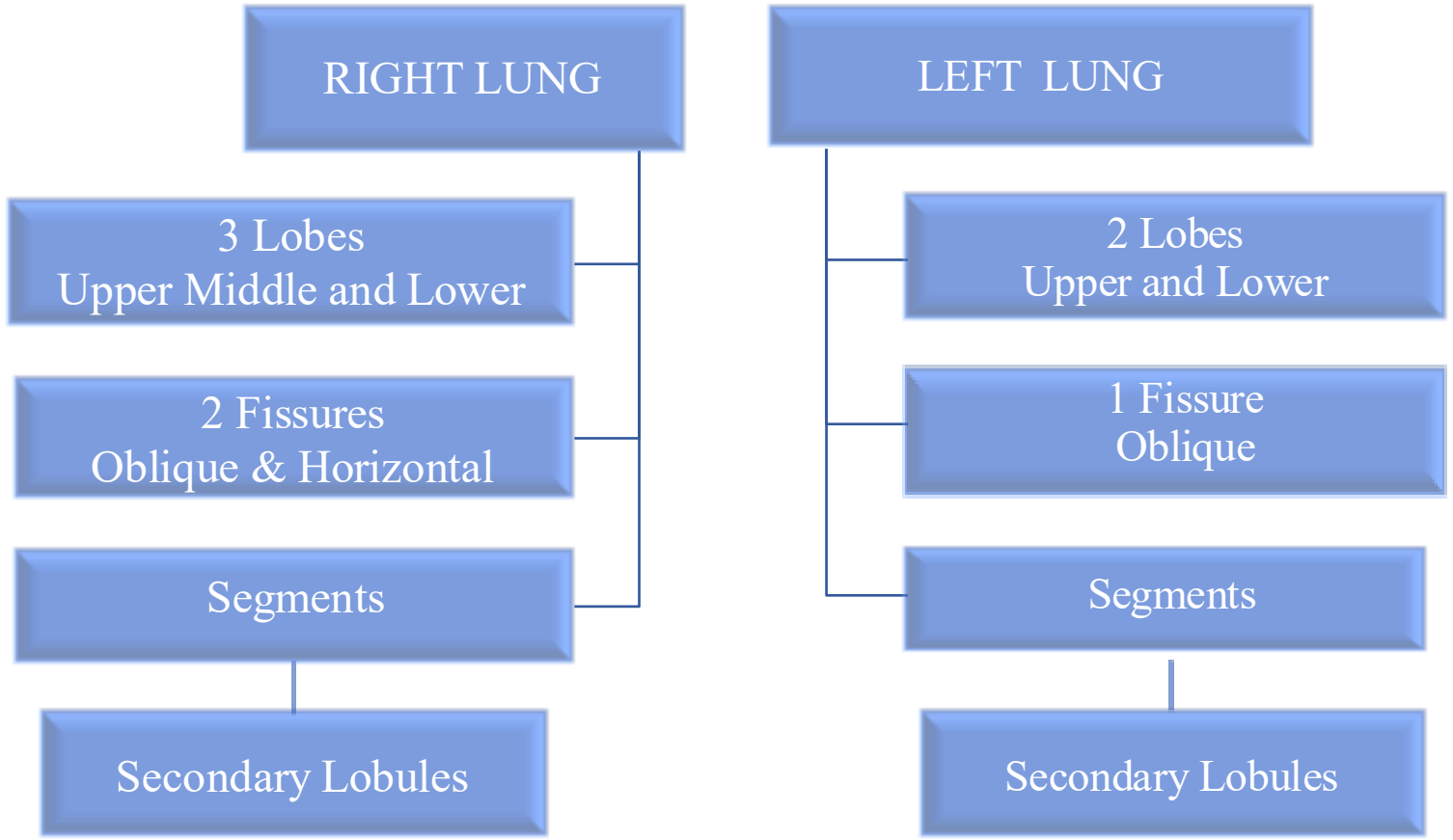


Dr.'s figure:

﴿حَسْبِيَ اللهُ وَنِعْمَ الْوَكِيل﴾

5- Left vs Right Lung

✓ The **right** lung is **shorter** and **broader** due to the presence of the liver beneath it while the **left** lung is **longer** and **narrower**.



6- Pulmonary Artery & Pulmonary Veins

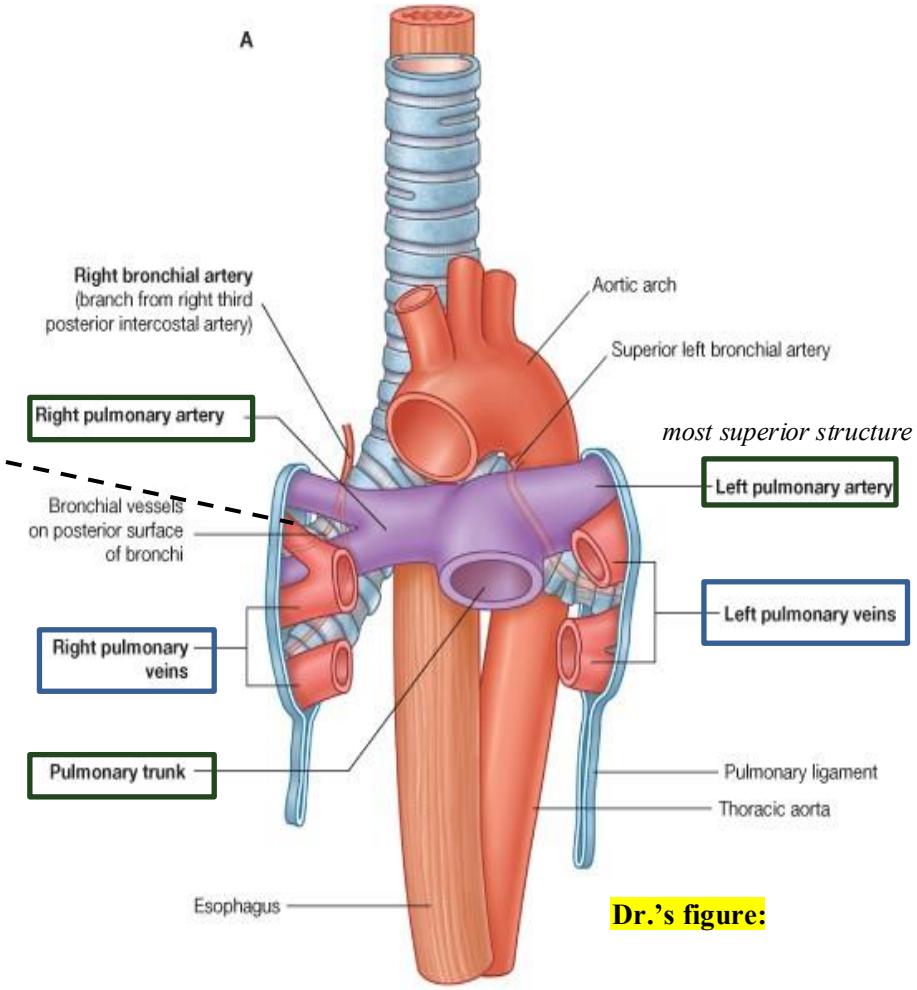
- The **pulmonary trunk** arises from the **right ventricle**, ascends to **T5,** then divides into **right** and **left pulmonary arteries**.
- ✓ The **right pulmonary artery** is *longer* because it crosses to the right side.
- ✓ Each pulmonary artery enters the hilum.

Hilum relations:

- **Right lung:** pulmonary artery is related to two bronchi, one above and one below the artery. (2)
- **Left lung:** pulmonary artery is the most **superior** structure in the hilum, with the bronchus below it. (1)

Pulmonary veins:

- Two veins from each lung (total four).
- Located in the **lower part** of the **hilum** as **superior** and **inferior pulmonary veins.**
- Drain oxygenated blood into the **left atrium.**



Dr.'s figure:

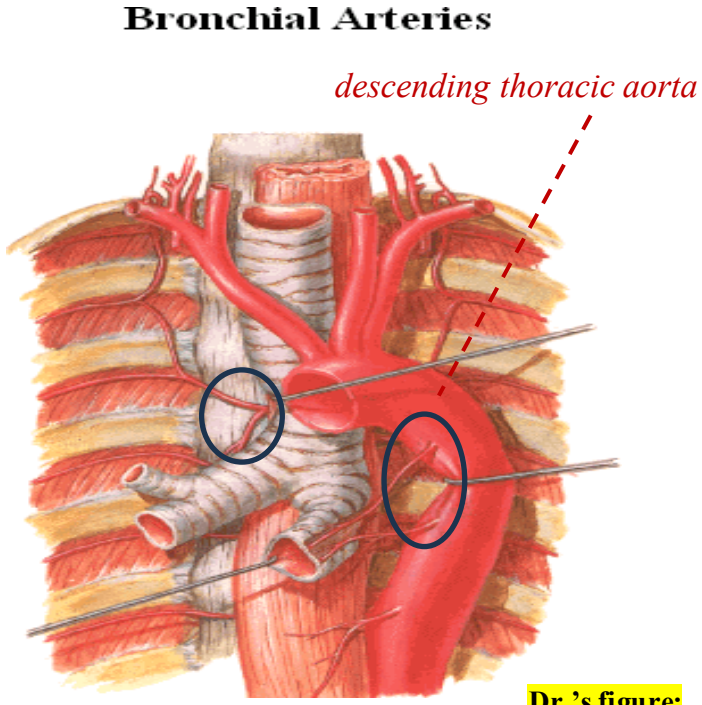
7- Bronchial arteries & Bronchial veins

➢ **Bronchial arteries:** main blood supply to lung tissue (nutritional) which carry oxygenated blood (not the pulmonary artery)

✓ **Right**: from **3rd** posterior intercostal artery

✓ **Left:** from **2nd** & **3rd** posterior intercostal arteries

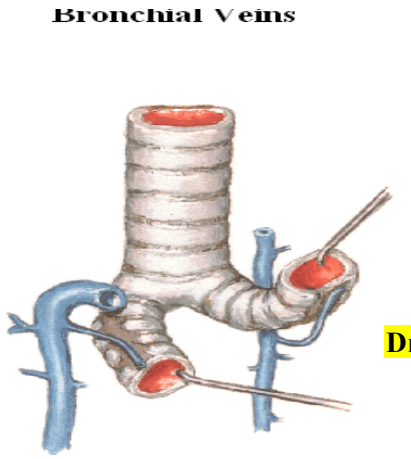
- **All branches of descending thoracic aorta, enter the hilum to supply lung tissue.**



Dr.'s figure:

➢ **Bronchial veins**

- Drainage into **right atrium** or **azygos system** which in turn drains the blood from the chest:
- Right: azygos → SVC → right atrium
- Left: hemiazygos → azygos → SVC → right atrium



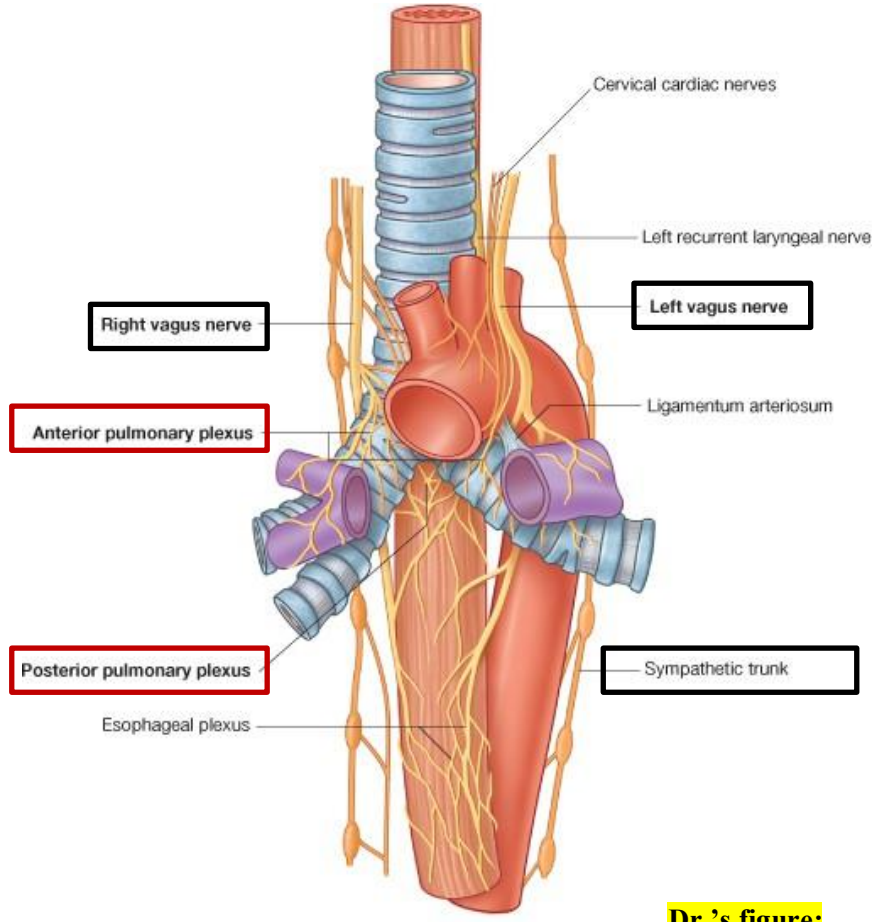
Dr.'s figure:

8- Innervation

- The lungs are innervated by the **pulmonary plexuses**, located **anterior** and **posterior** to the end of the trachea.

- ✓ **Parasympathetic fibers:** from the **vagus nerve** (CN X) → cause bronchoconstriction.
- ✓ **Sympathetic fibers:** from the **cervical sympathetic ganglia** → cause bronchodilation.

- **Vascular effects:**
- **Sympathetic** → vasoconstriction
- **Parasympathetic** (vagus) → vasodilation



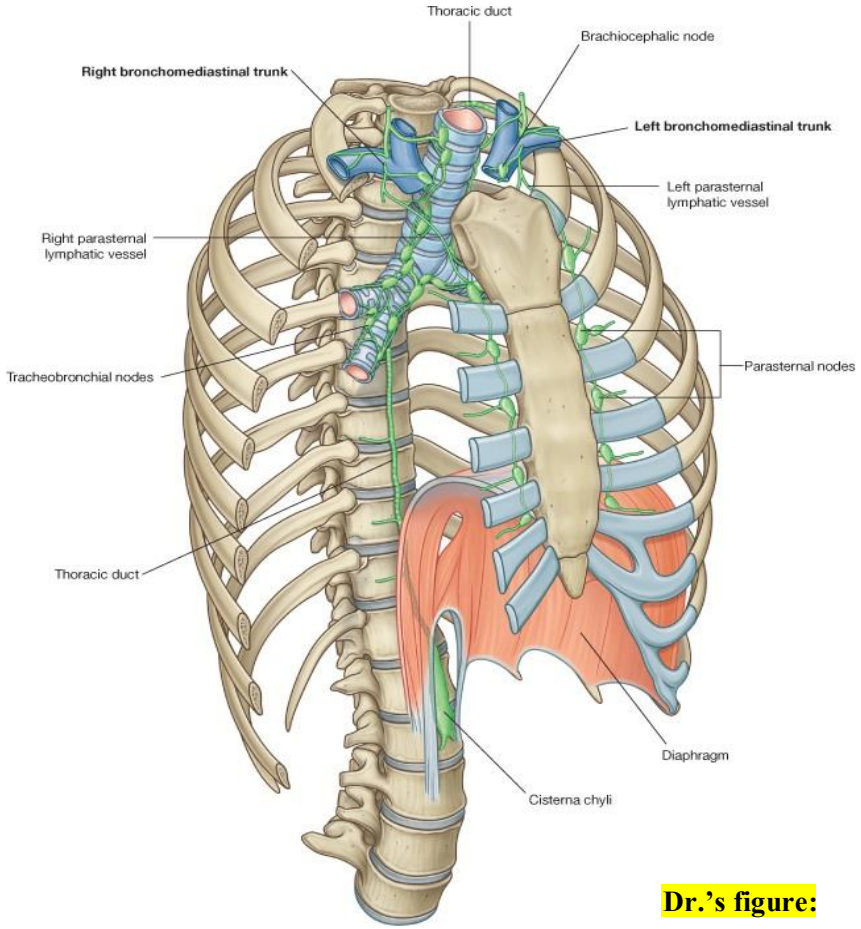
Dr.'s figure:

9- Lymphatic Drainage

- Lymph from the lungs first drains into **the hilum** (pulmonary and bronchial nodes), then to **paratracheal nodes.**

- From the paratracheal nodes, lymph flows into the **bronchomediastinal trunks:**

- **Left side** → thoracic duct → drains into the beginning of the left brachiocephalic vein
- **Right side** → right lymphatic duct → drains into the beginning of the right brachiocephalic vein



Dr.'s figure:

ANATOMY QUIZ LECTURE 5

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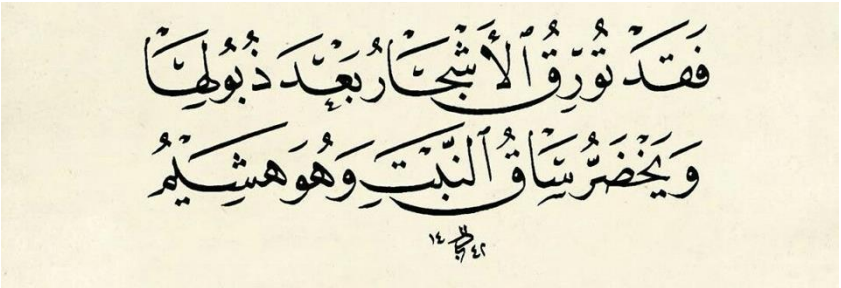

For any feedback, scan the code or click on it.

Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1	4 43	15-20 Drainage into **left atrium** or **azygos system** which ..	16-20 Drainage into **right atrium** or **azygos system** which ..
V1 → V2			