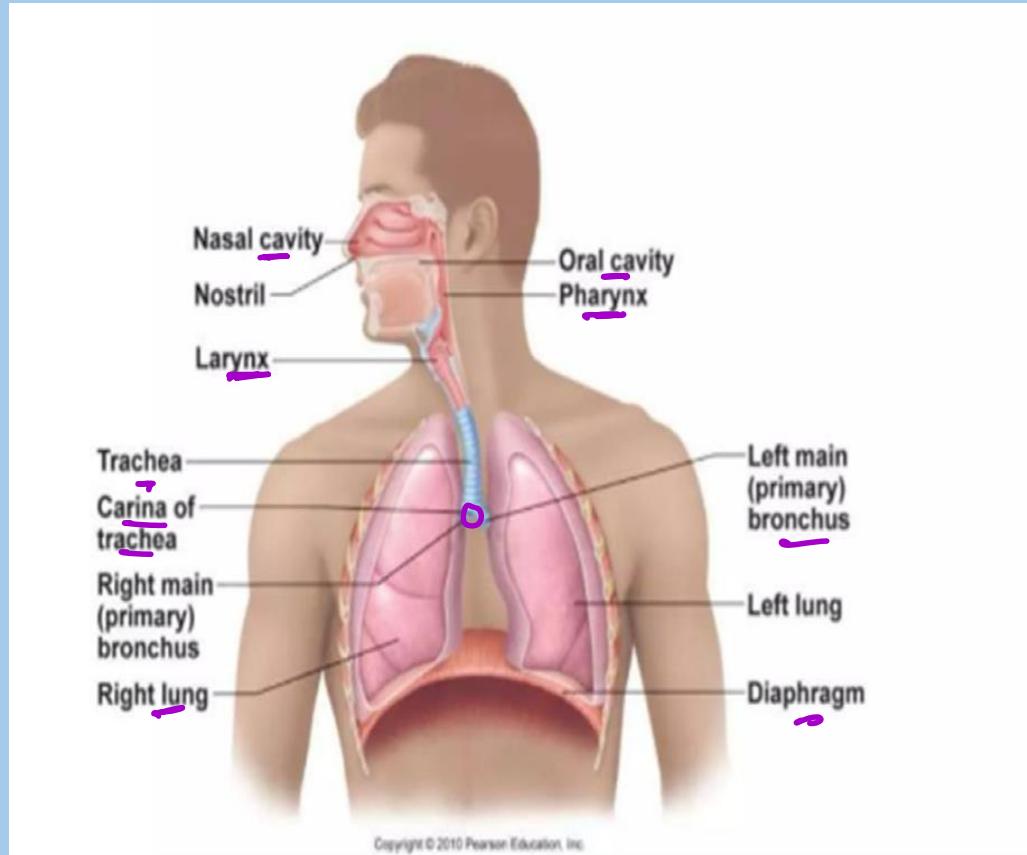


Respiratory system



من خارج السلايدات (للفهم)

Respiratory system is divided into:

Upper respiratory tract: consists of nose, pharynx & larynx.

Lower respiratory tract: consists of trachea, bronchial tree & lungs.

Upper respiratory tract

Nasal cavity

Pharynx

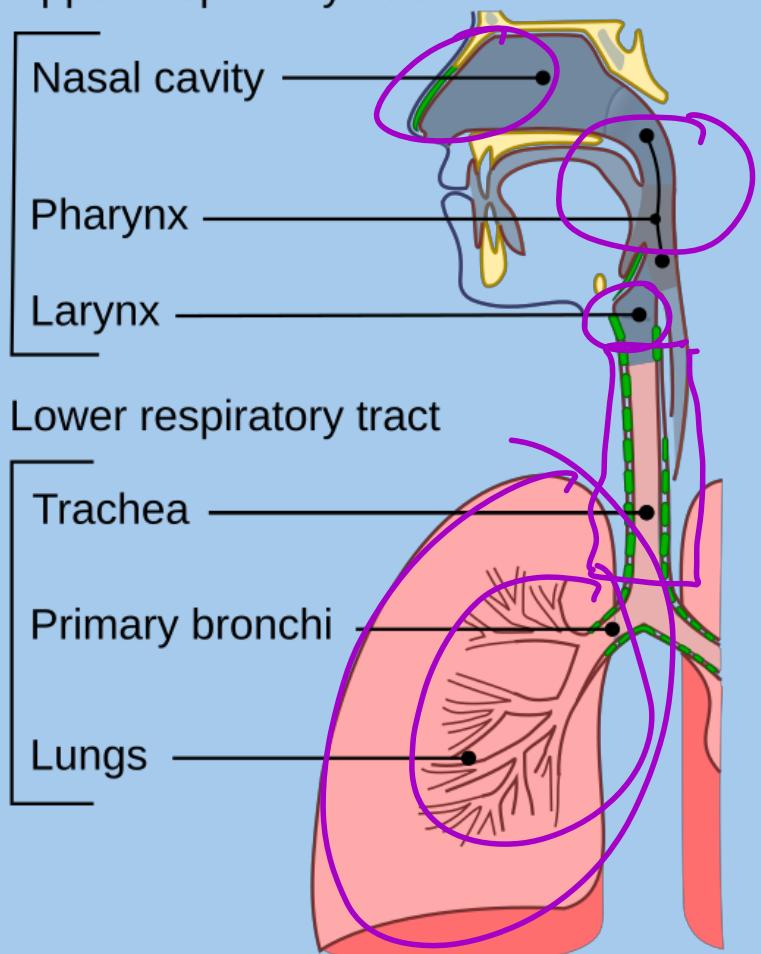
Larynx

Lower respiratory tract

Trachea

Primary bronchi

Lungs



من خارج السليفات (للفهم)

1. Nose:

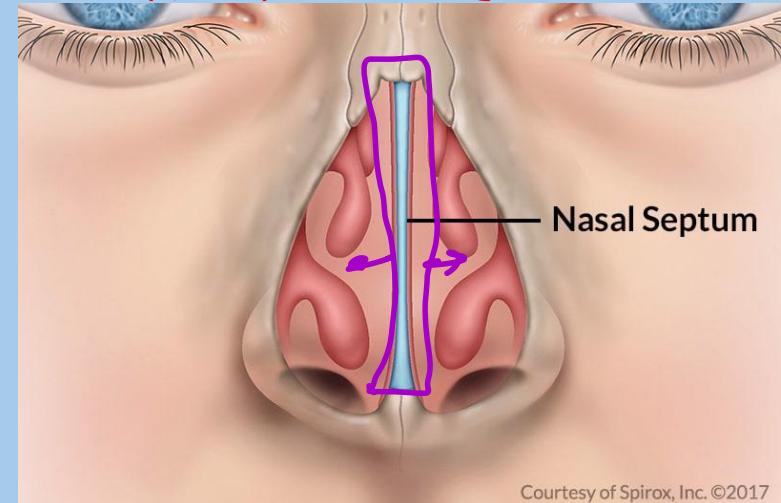
The nasal cavity is divided into two equal parts (right & left) by nasal septum

The posterior nasal openings connect the nasal cavity with the pharynx.

Functions:

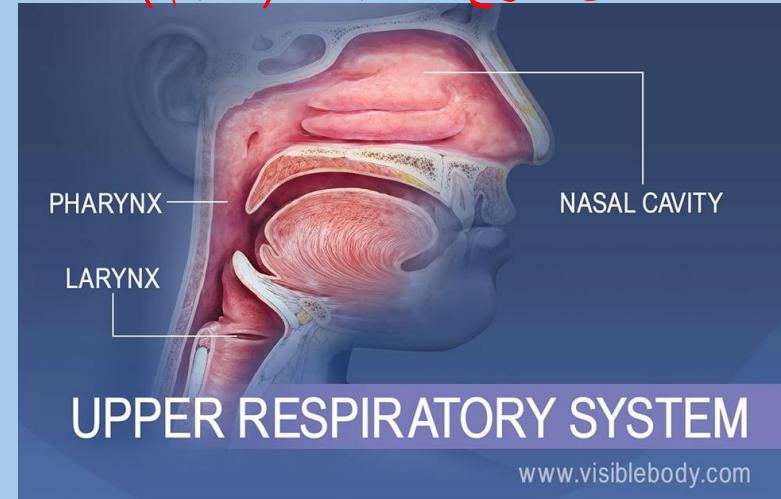
زدفنه ترطيب

- ✓ Warming, moistening & filtration of inspired air.
- ✓ Organ of smell.



Courtesy of Spirox, Inc. ©2017

من خارج السليفات (للفهم)



www.visiblebody.com

2. Pharynx:

It is a tube extending from the base of skull to the level of the 6th cervical vertebra

It is subdivided into 3 parts:

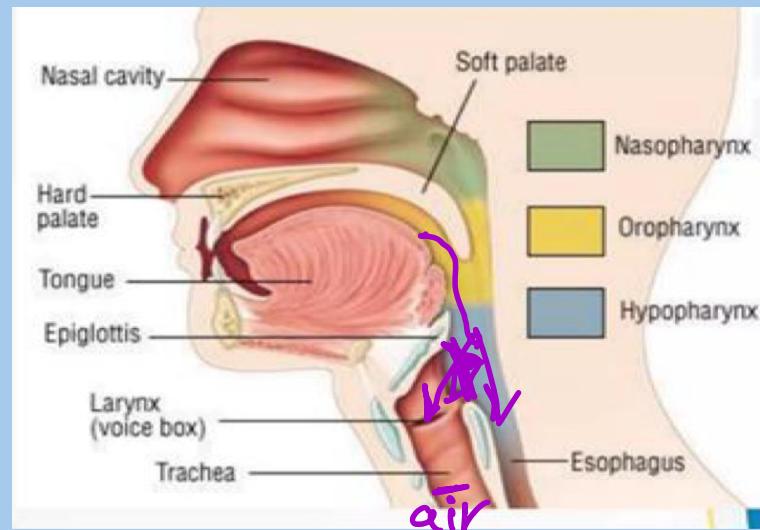
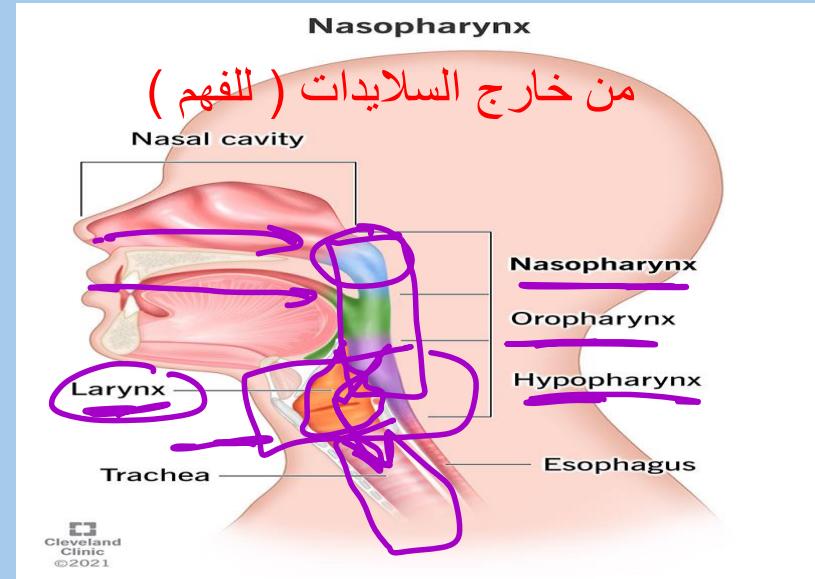
- Nasopharynx: lies behind the nose.
- Oropharynx: lies behind the mouth.
- Laryngopharynx: lies behind the larynx.

Larynx

Hypopharynx

Function:

✓ Common pathway for food & air.



3. Larynx:

➤ It connects the pharynx to the trachea.

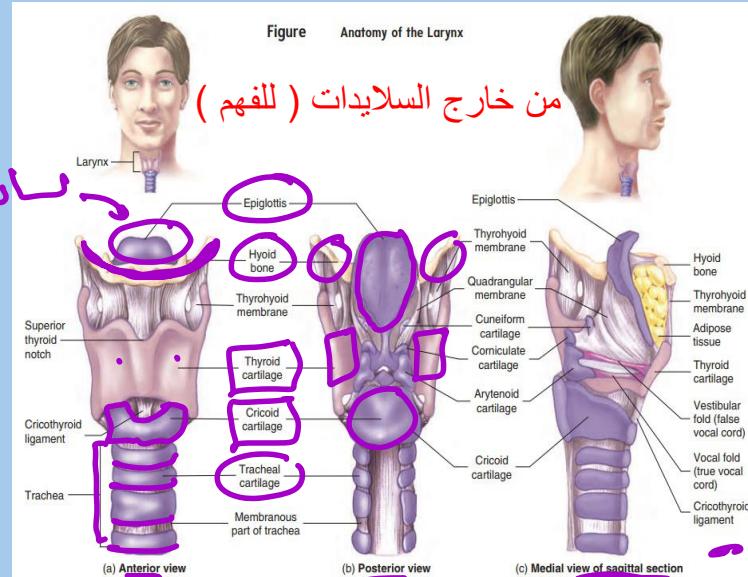
➤ It lies in the neck.

➤ Structure:

It consists of cartilages connected together by muscles and ligaments and lined by mucous membrane.

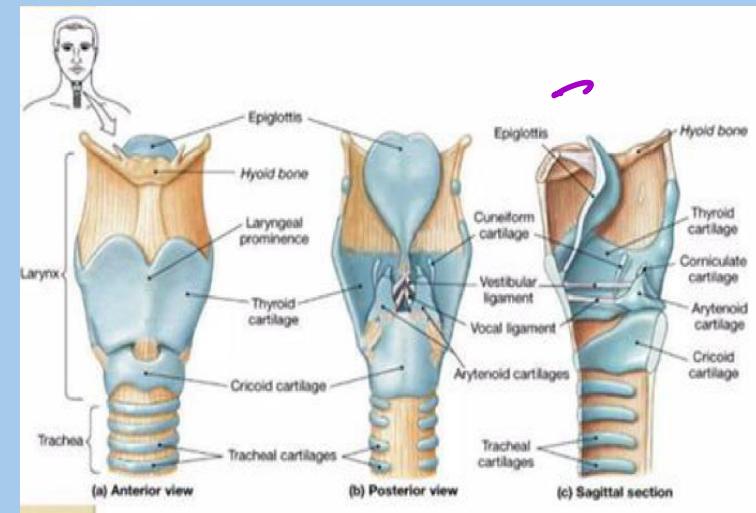
يعيها ويركتها

بان المزمل



Functions:

- ✓ Air passage. ✓
- ✓ Voice production



4. Trachea & bronchi:

It is a tube about 4 inches (10 cm) in length and one inch in diameter.

2.5 cm

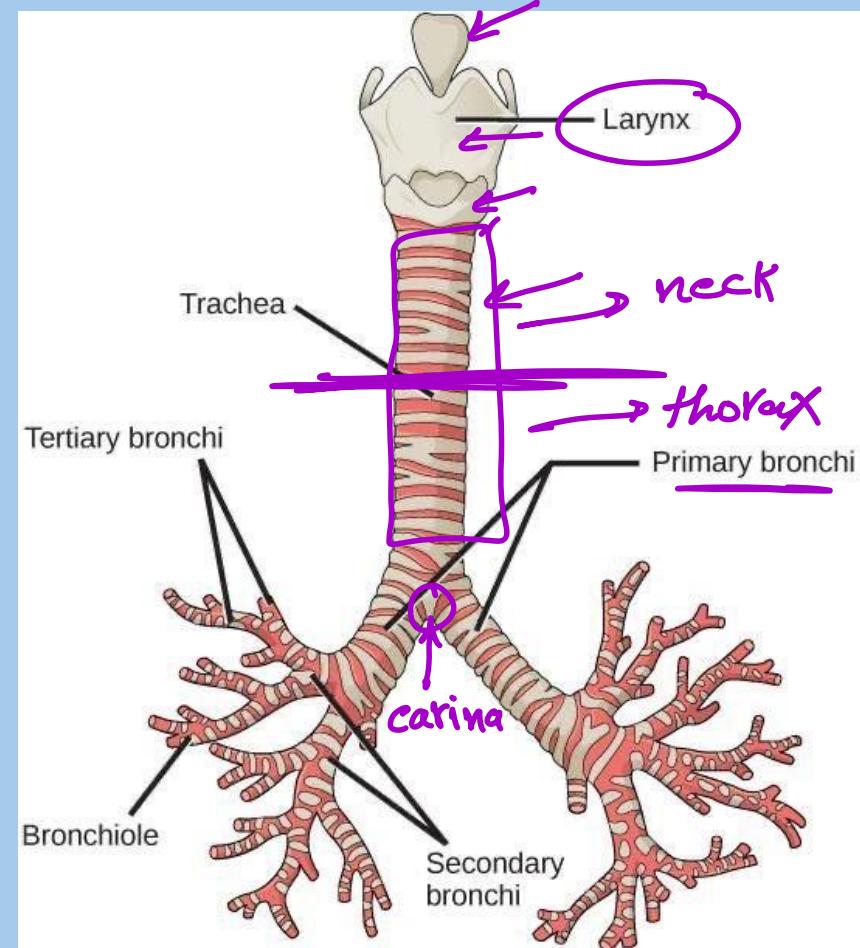
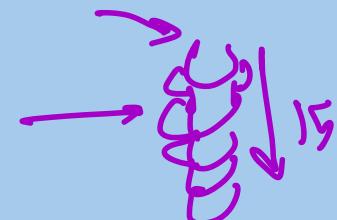
Site:

its upper half lies in the neck while, its lower half lies in the thorax.

UPPer → neck
lower → thorax

Structure:

it is composed of 15-20 C-shaped rings of hyaline cartilage connected by connective tissues, smooth muscles.



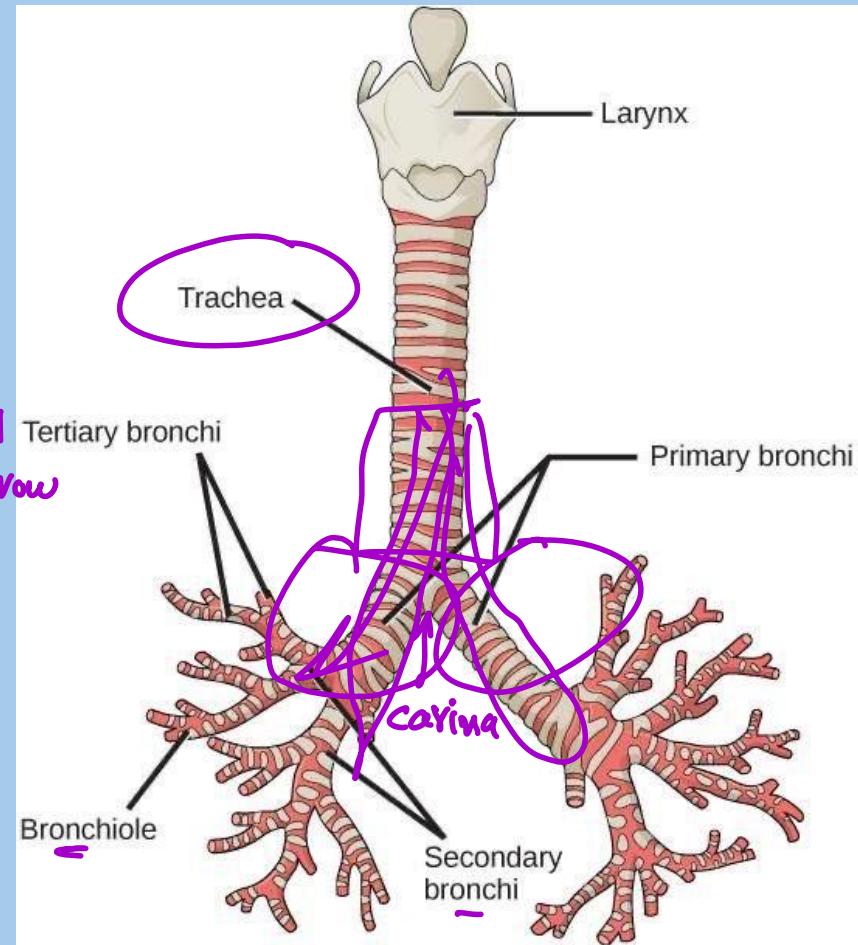
4. Trachea & bronchi:

- The lower end of trachea divides into right and left principle bronchi which enter the corresponding lungs.

- The right bronchus is shorter, wider and more in line with the trachea. So, inhaled foreign bodies usually pass to the right lung.

left → tall

→ narrow
→ less

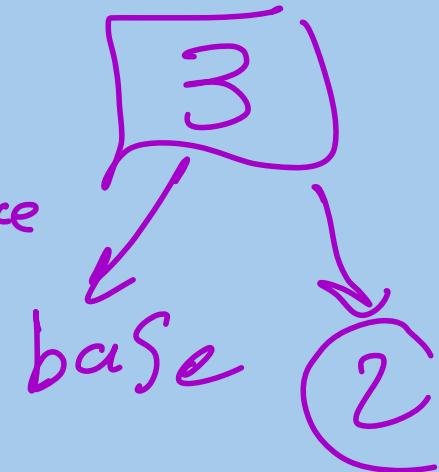


5. Lungs:

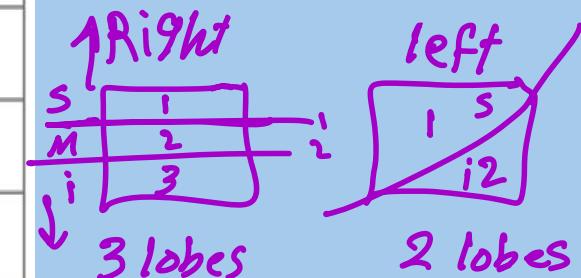
- There are two lungs, lying in the thoracic cavity.
- Shape: each lung is cone-shaped having apex, base, 2 surfaces & 3 borders.

فخر رطبی

diaphragmatic surface



	Right lung	Left lung
Length	Short	Tall
Thickness	Broad	Narrow
Fissures	Two (oblique & transverse)	One (oblique)
Lobes	Three (Superior, middle & inferior)	Two (Superior & inferior)



5. Lungs:

Surfaces :

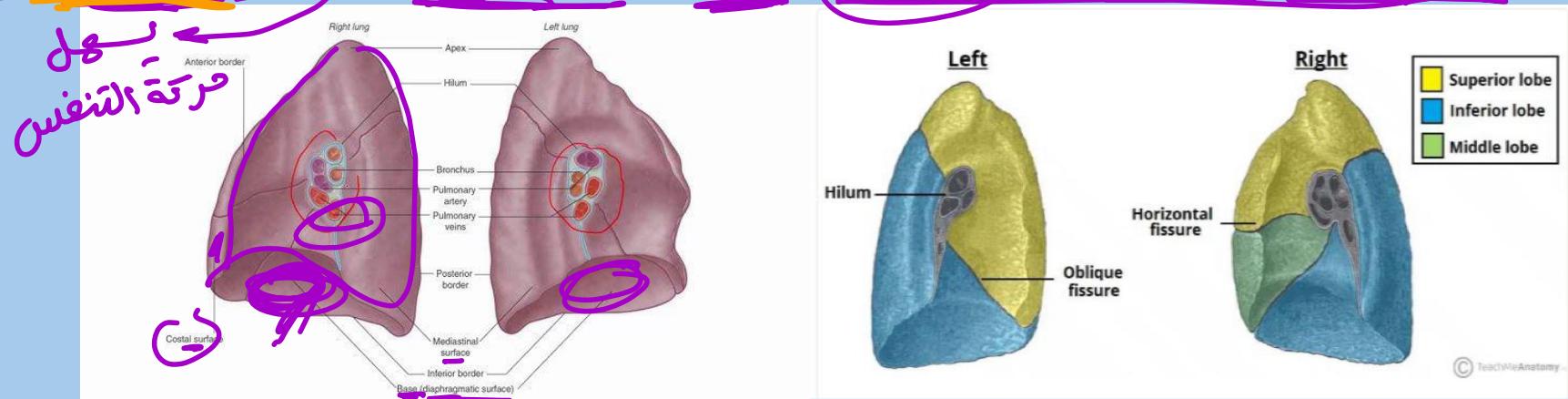
There are three lung surfaces, each corresponding to an area of the thorax.

The mediastinal surface of the lung faces the lateral aspect of the middle mediastinum.

The lung hilum (where structures enter and leave the lung) is located on this surface.

The base of the lung is formed by the diaphragmatic surface. It rests on the dome of the diaphragm, and has a concave shape. This concavity is deeper in the right lung, due to the higher position of the right dome overlying the liver.

The costal surface is smooth and convex. It faces the internal surface of the chest wall. It is related to the costal pleura, which separates it from the ribs and innermost intercostal muscles.



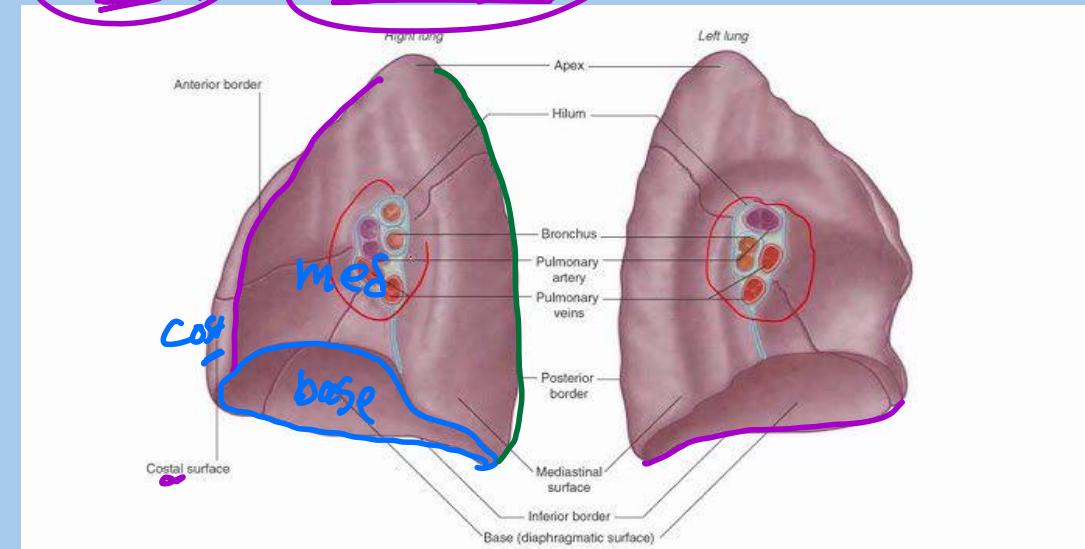
5. Lungs:

Borders :

The anterior border of the lung is formed by the convergence of the mediastinal and costal surfaces. On the left lung, the anterior border is marked by a deep notch, created by the apex of the heart. It is known as the cardiac notch.

The inferior border separates the base of the lung from the costal and mediastinal surfaces.

The posterior border is smooth and rounded (in contrast to the anterior and inferior borders, which are sharp), it is formed by the costal and mediastinal surfaces meeting posteriorly.



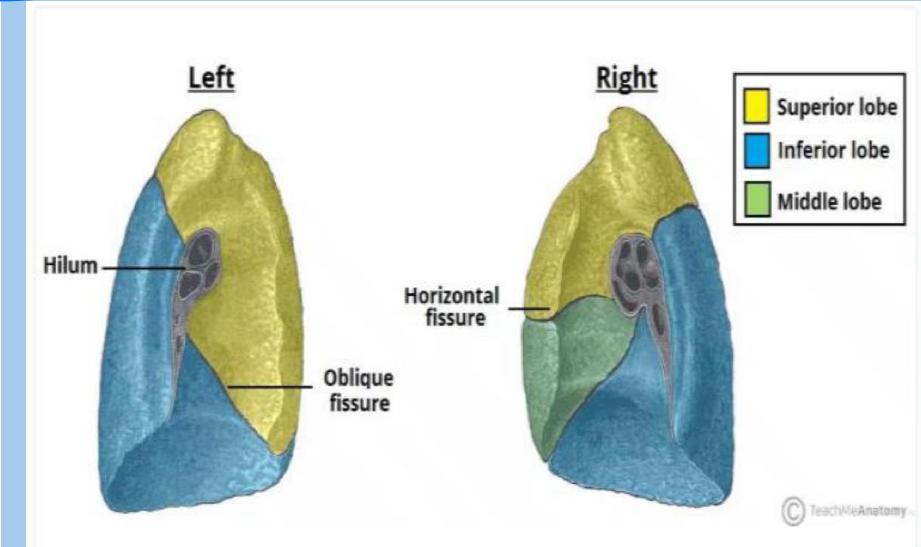
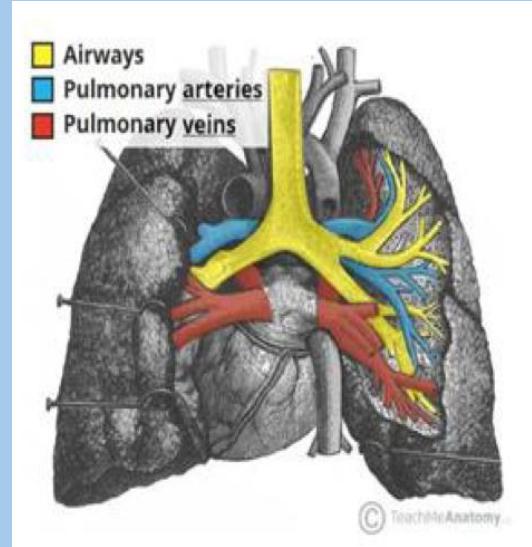
5. Lungs:

Root and Hilum :

The lung root is a collection of structures that suspends the lung from the mediastinum.

Each root contains a bronchus, pulmonary artery, two pulmonary veins, bronchial vessels, pulmonary plexus of nerves and lymphatic vessels.

All these structures enter or leave the lung via the hilum – a wedge shaped area on its mediastinal surface.



5. Lungs:

Bronchial Tree :

Bronchi

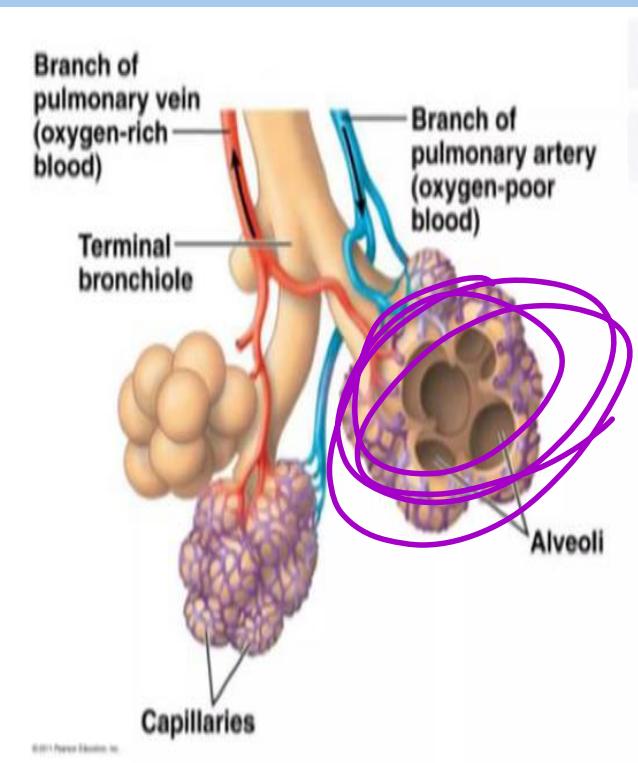
The bronchial tree is a series of passages that supplies air to the alveoli of the lungs.

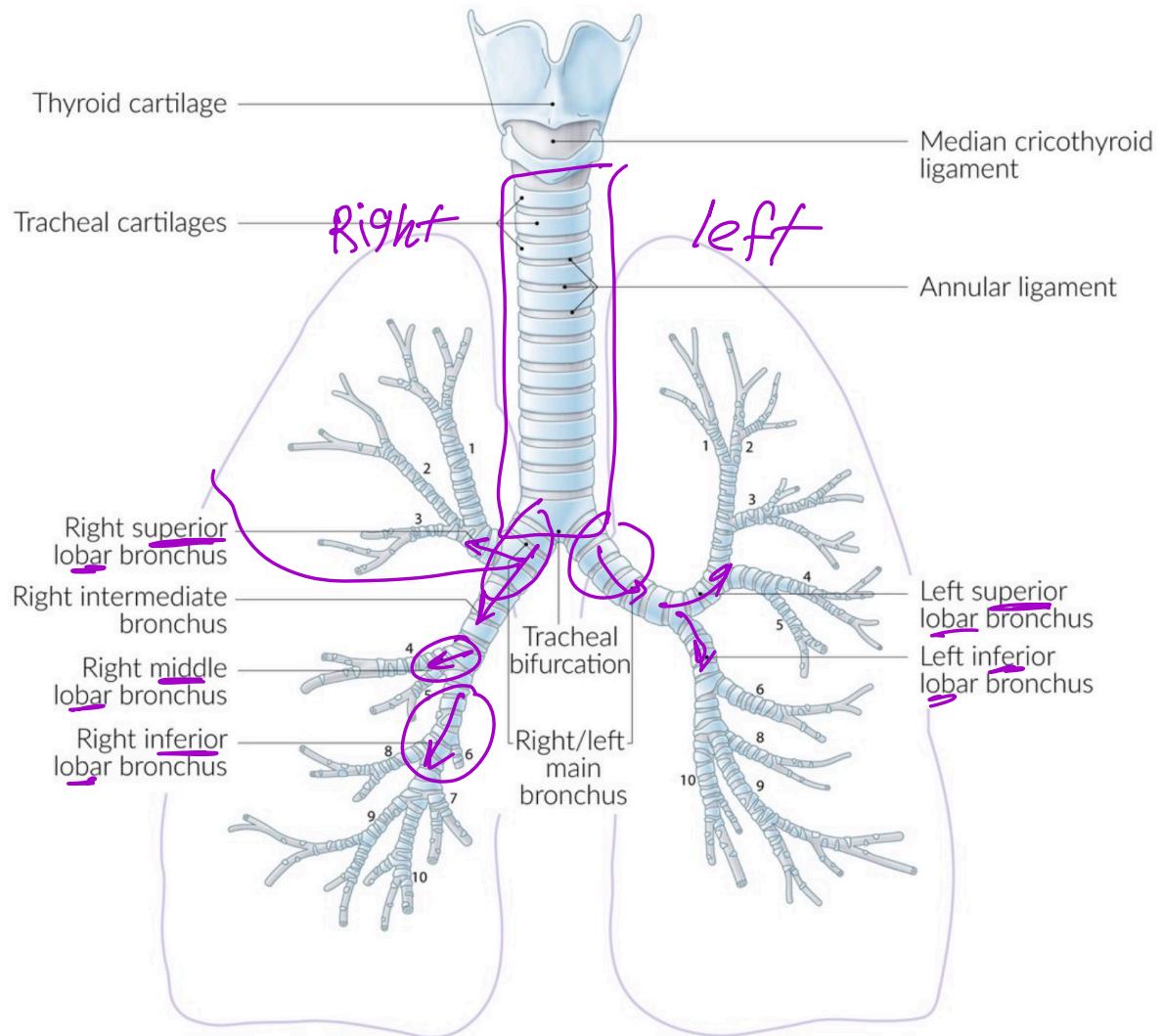
It begins with the trachea, which divides into a left and right bronchus.

Note: The right bronchus has a higher incidence of foreign body inhalation due to its wider shape and more vertical course.

Each bronchus enters the root of the lung, passing through the hilum. Inside the lung, they divide to form lobar bronchi – one supplying each lobe.

lobe





5. Lungs:

Bronchial Tree :

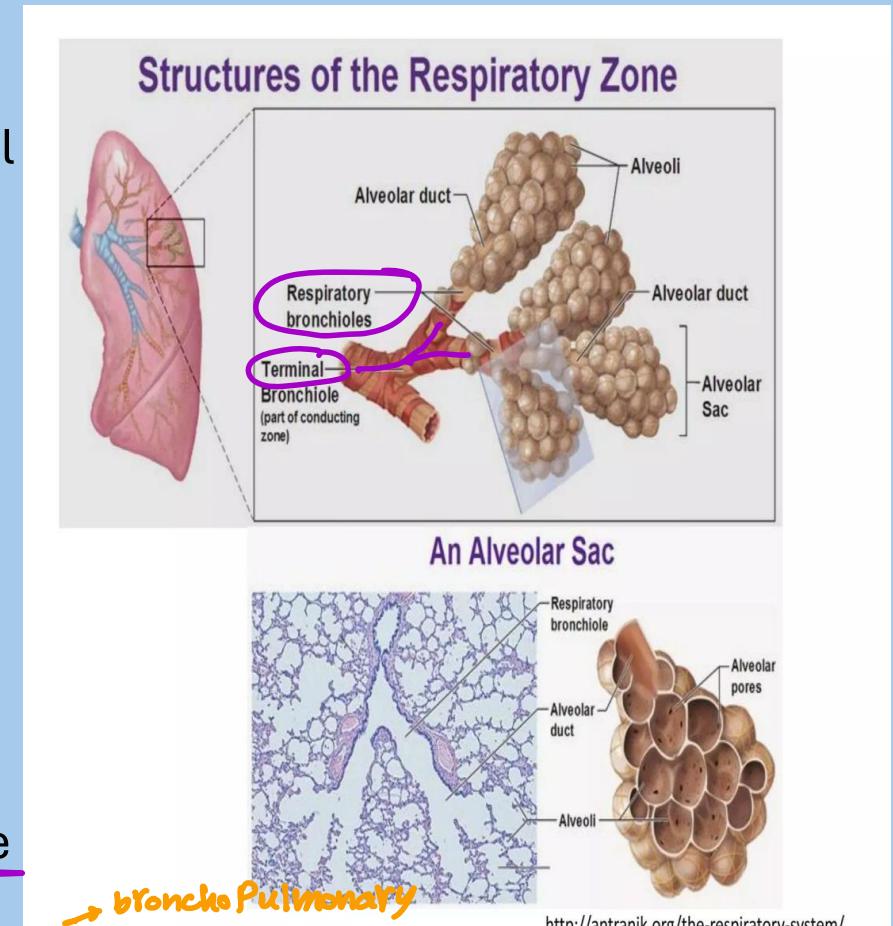
Each lobar bronchus then further divides into several tertiary segmental bronchi. Each segmental bronchus provides air to a **bronchopulmonary segment** – these are the functional units of the lungs.

The segmental bronchi give rise to many conducting bronchioles, which eventually lead into terminal bronchioles. Each terminal bronchiole gives off respiratory bronchioles, which feature thin walled outpocketings that extend from their lumens.

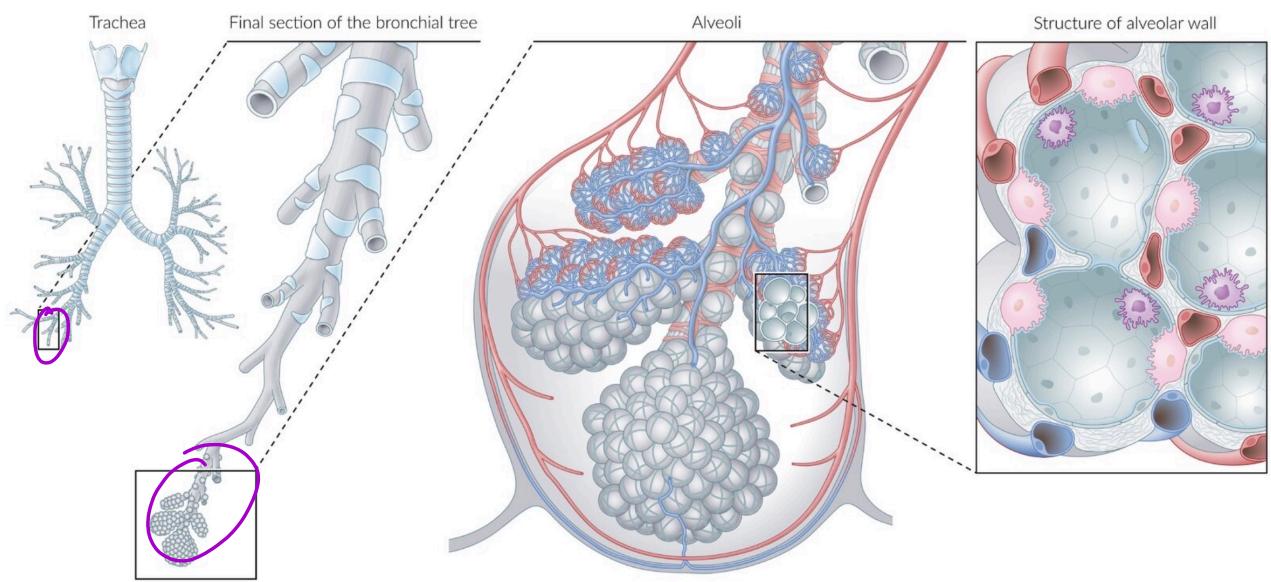
These are the alveoli – the site of gaseous exchange

trachea → primary bronchi → lobar bronchi → ^{lobe} tertiary segmental bronchi
→ **Conducting bronchioles** → terminal → **Respiratory** → alveoli

O_2 CO_2



		Height of epithelium	Cells of epithelium					Airway wall structures			
			Ciliated cells	Goblet cells	Club cells	Type I pneumocytes	Type II pneumocytes	Glands	Hyaline cartilage	Smooth muscle	Elastic fibers
	Trachea		High (Ciliated, Goblet)	Low (Goblet)	None	None	None				
Conducting zone	Bronchi		High (Ciliated, Goblet)	Low (Goblet)	None	None	None				
	Bronchioles		Medium (Ciliated, Goblet)	Low (Goblet)	None	None	None				
	Terminal bronchioles		Low (Ciliated, Goblet)	Low (Goblet)	None	None	None				
Respiratory zone	Respiratory bronchioles		Very Low (Ciliated, Goblet)	Low (Goblet)	None	None	None				
	Alveolar sacs		None (Type I, Type II)	None	None	None	None				

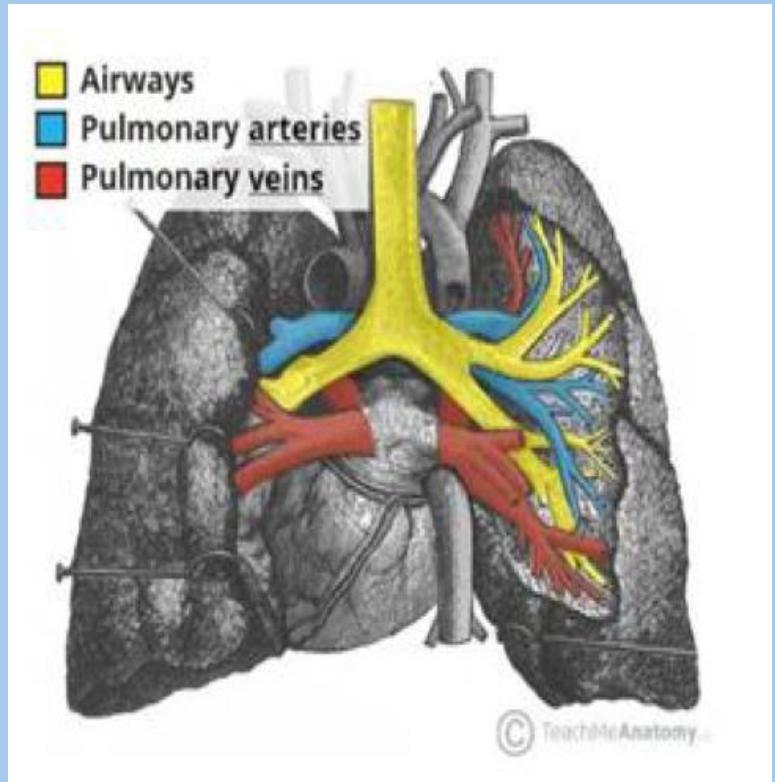


Vasculature

The lungs are supplied with deoxygenated blood by the paired pulmonary arteries. Once the blood has received oxygenation, it leaves the lungs via four pulmonary veins (two for each lung).

Nerve Supply

The nerves of the lungs are derived from the pulmonary plexuses. They feature sympathetic, parasympathetic and visceral afferent fibres.



Structure of the Pleurae

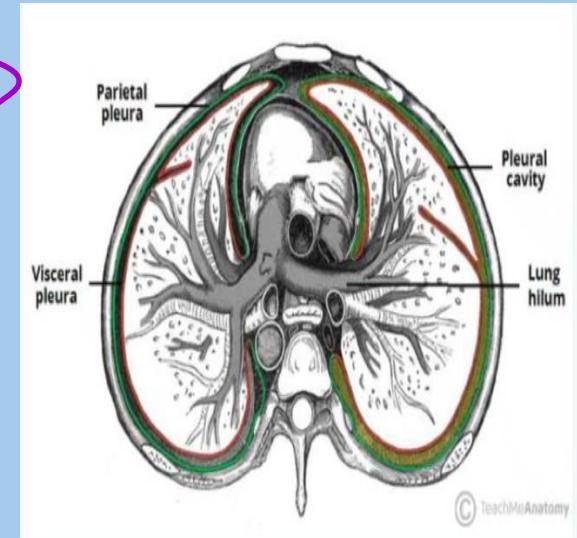
There are two pleurae in the body: one associated with each lung

They consist of a serous membrane

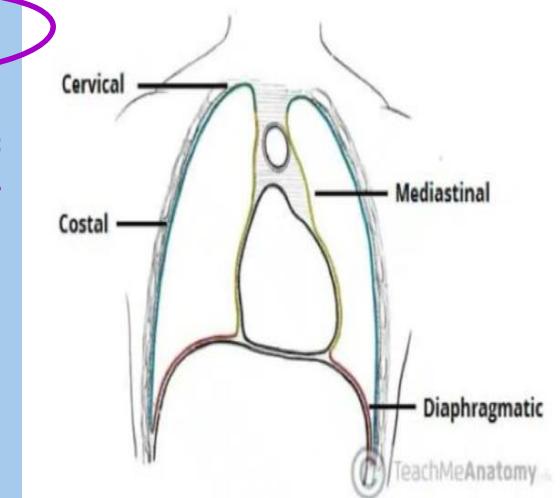
Each pleura can be divided into **two** parts:

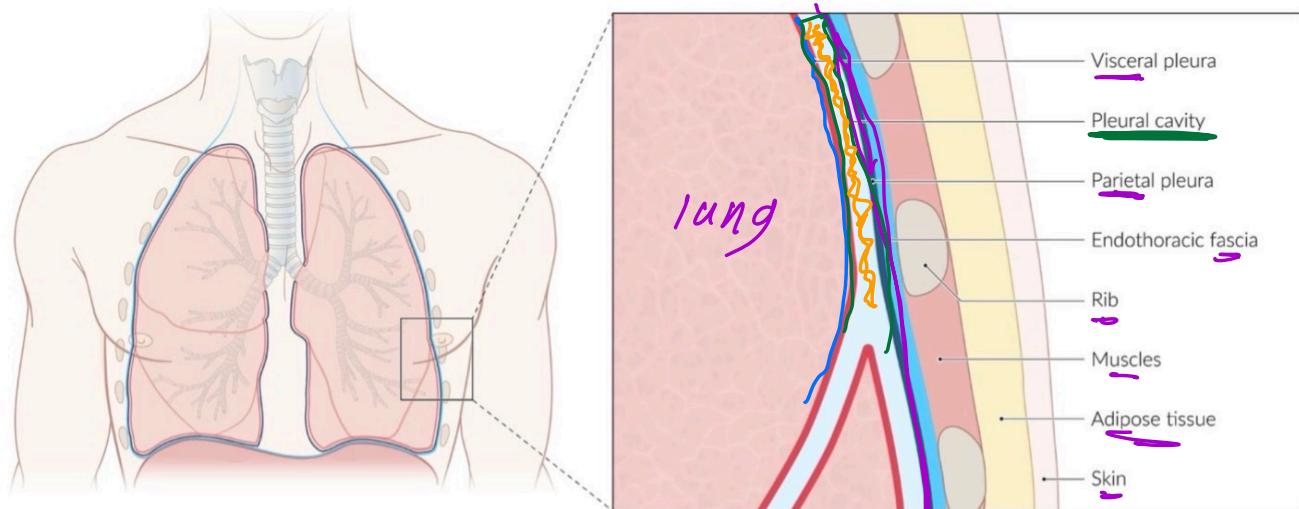
Visceral pleura – the inner layer; covers the lungs.

Parietal pleura – the outer layer; covers the internal surface of the thoracic cavity.



These two parts are continuous with each other at the hilum of each lung. There is a potential space between the viscera and parietal pleura, known as **the pleural cavity**; contains a thin film of serous fluid to prevent friction between the 2 layers.





Thank you