



**SNS COLLEGE OF ALLIED HEALTH SCIENCES**  
SNS Kalvi Nagar, Coimbatore - 35  
Affiliated to Dr MGR Medical University, Chennai



**DEPARTMENT : PHYSICIAN ASSISTANT**

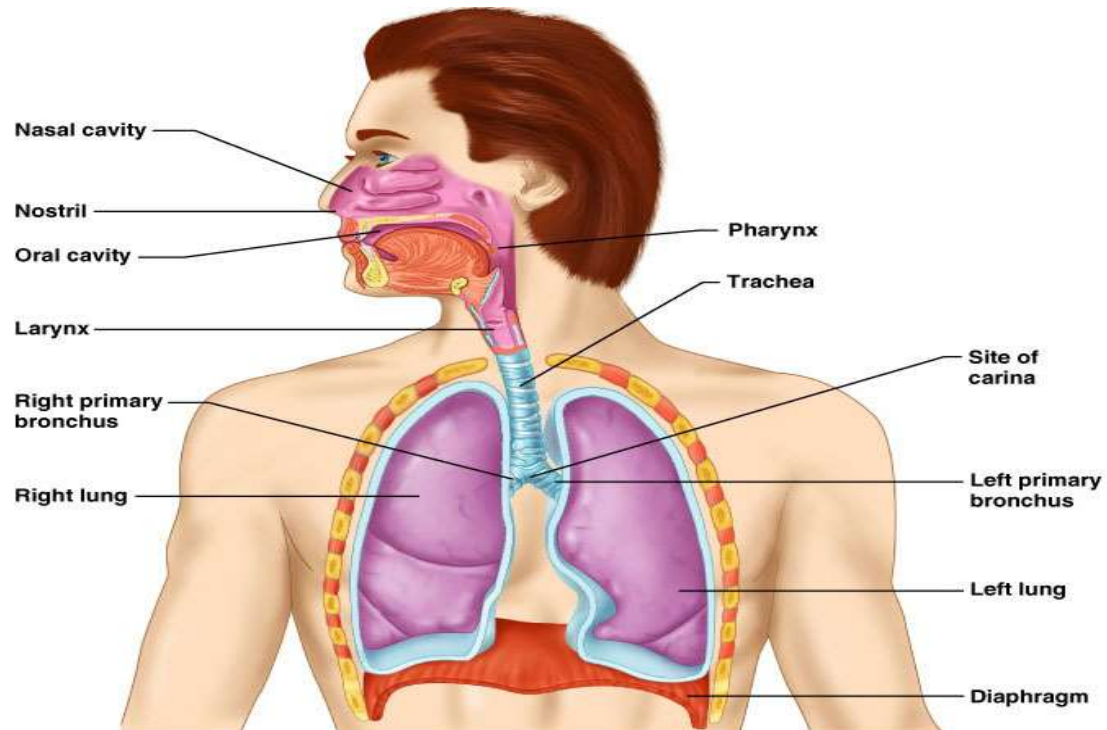
**COURSE NAME : ANATOMY**

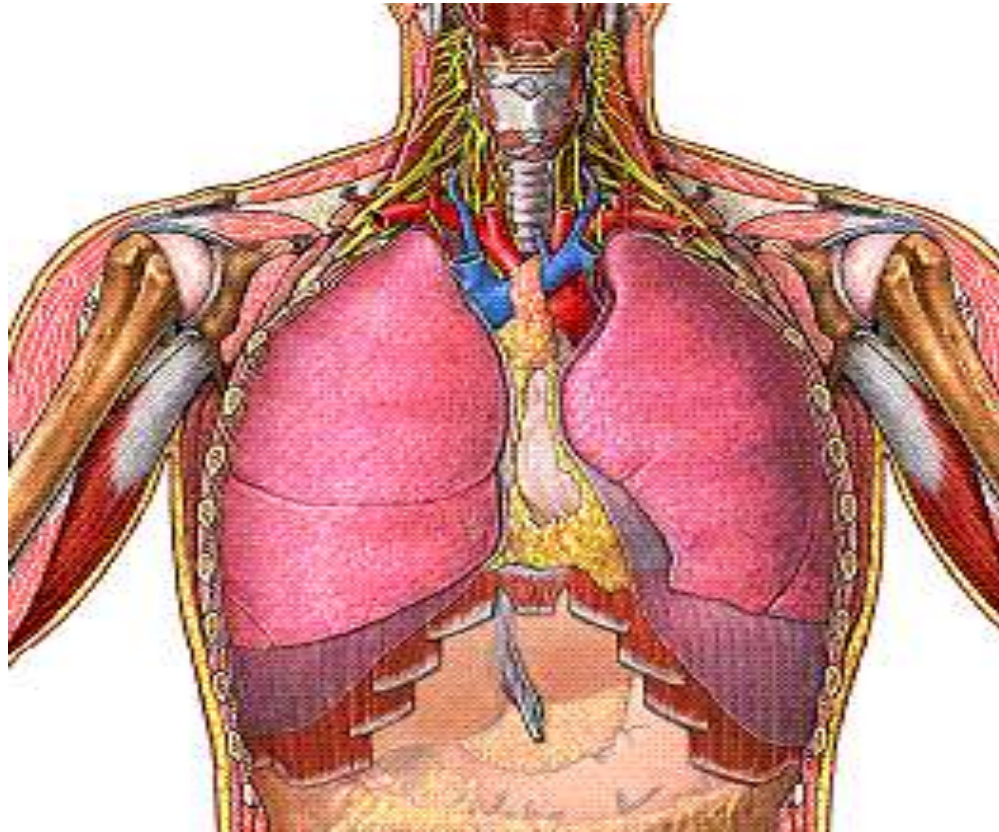
**UNIT : RESPIRATORY SYSTEM**

**TOPICS : NOSE, BRONCHI, LUNGS, DIAPHRAGM**



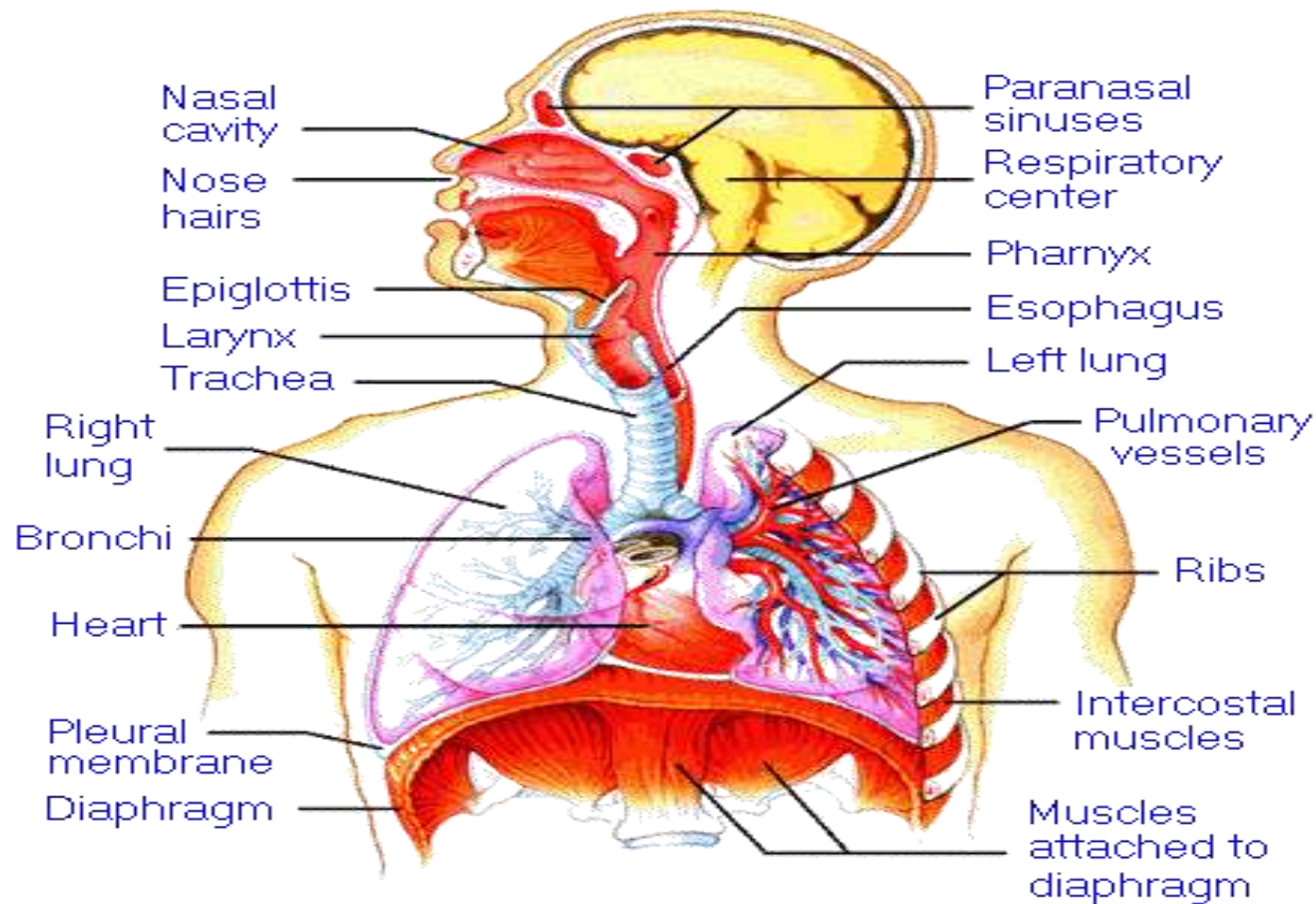
# RESPIRATORY SYSTEM







- It is the system, consisting of tubes and is responsible for the exchange of gases in Humans by filtering incoming air and transporting it into the microscopic alveoli where gases are exchanged
- Your respiratory system provides the energy needed by cells of the body to function according to their designated tasks.





The organs of the  
*“Respiratory Tract”*  
can be divided into two groups  
**“STRUCTURALLY”**

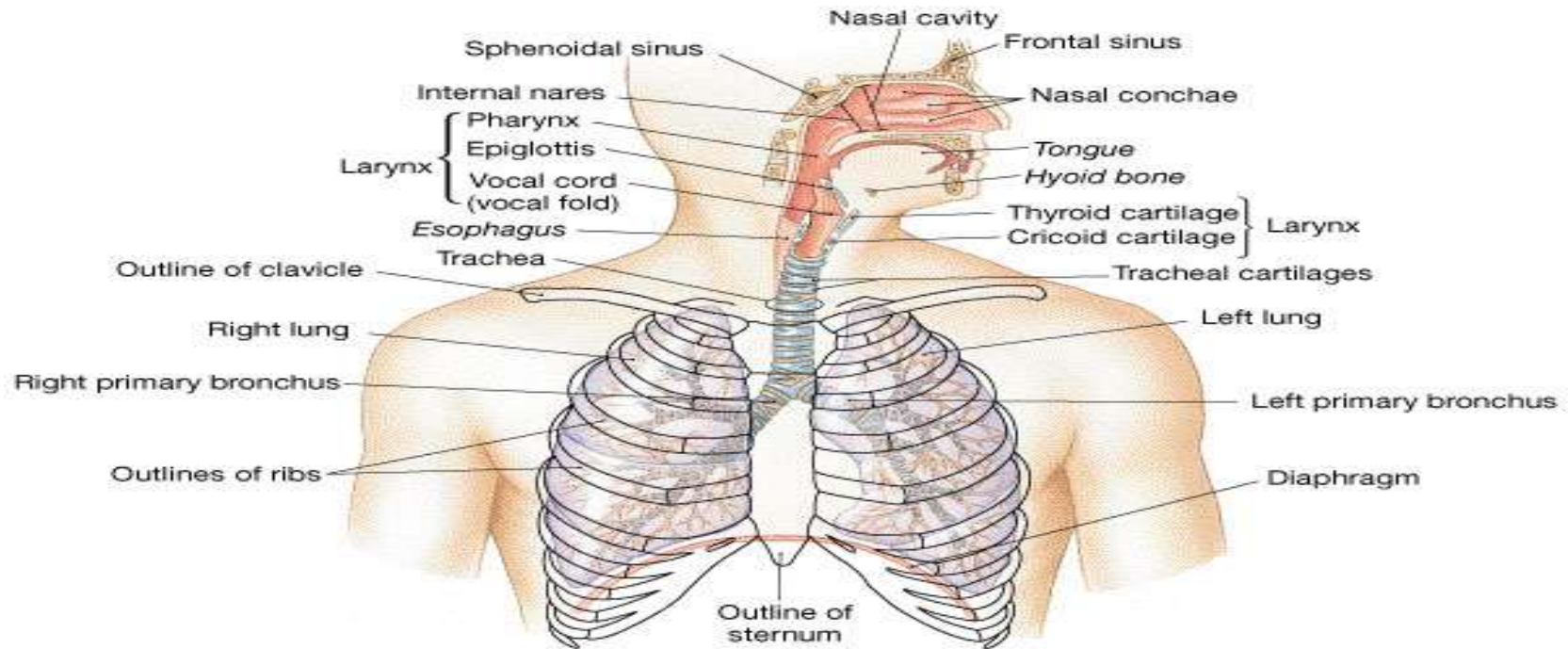


### The Upper Respiratory Tract

- \* Nose
- \* Nasal cavity
- \* Sinuses
- \* Pharynx

### The Lower Respiratory Tract

- \* Larynx
- \* Trachea
- \* Bronchial Tree
- \* Lungs





The organs of the  
*“Respiratory Tract”*  
can be divided into two groups  
**“FUNCTIONALLY”**



### The Conducting Portion

- system of interconnecting cavities and tubes that conduct air into the lungs

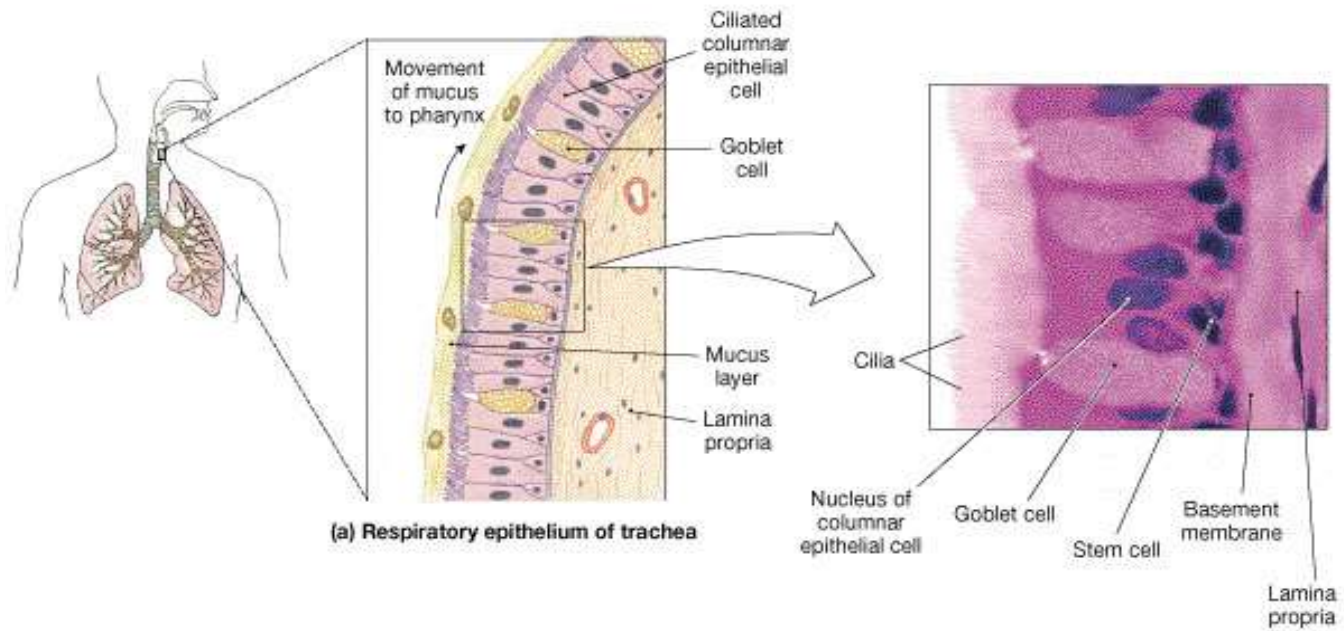
- \* Nose
- \* Pharynx
- \* Larynx
- \* Trachea
- \* Bronchi

### The Respiratory Portion

- system where the exchange of respiratory gases occurs

- \* Respiratory bronchioles
- \* Alveolar Ducts
- \* Alveoli







## **I. NOSE**

- A. Nasal Cavity
- B. Paranasal Sinuses

## **II. PHARYNX**

## **III. LARYNX**

- A. Epiglottis
- B. Vocal Cords



#### **IV. TRACHEA**

#### **v. BRONCHI**

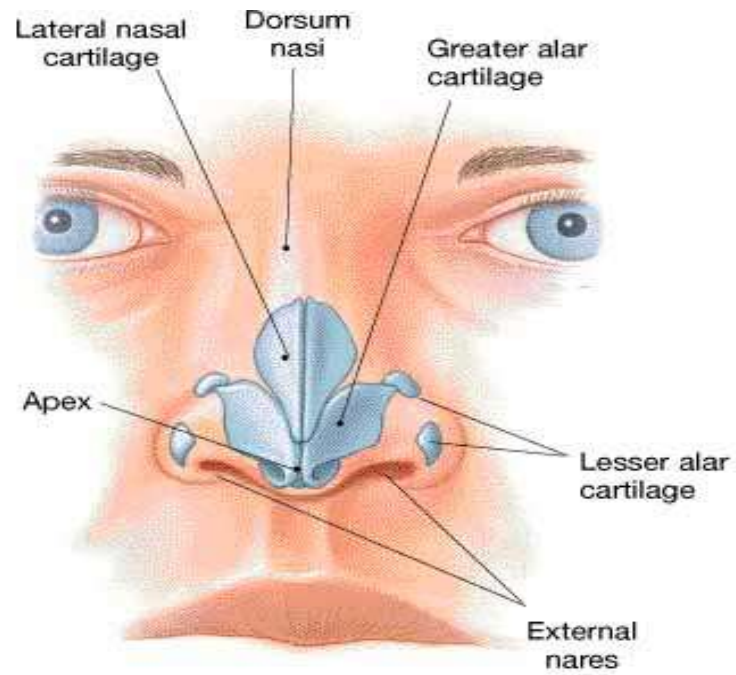
A. Bronchial Tree

#### **VI. LUNGS**

A. Lobes of the Lungs

B. Pleural Cavities

C. Alveoli



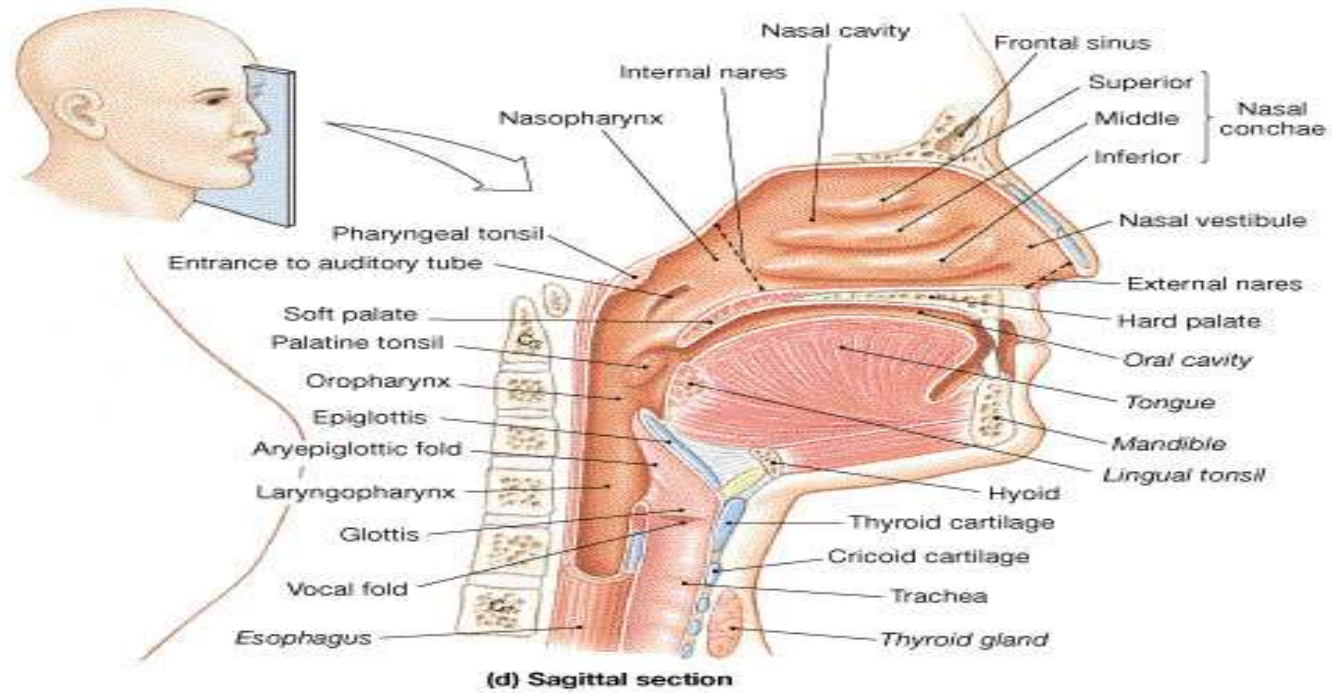
**(a) Anterior view**



# THE NOSE



- \* It provides an entrance for air in which air is filtered by coarse hairs inside the nostrils.
- \* It has 2 portions : the external and internal
- \* The external portion is supported by a framework of bone and cartilage covered with skin and lined with mucous membrane.
- \* The internal portion is a large cavity in the skull, merging with the external nose anteriorly and communicating with the throat posteriorly.

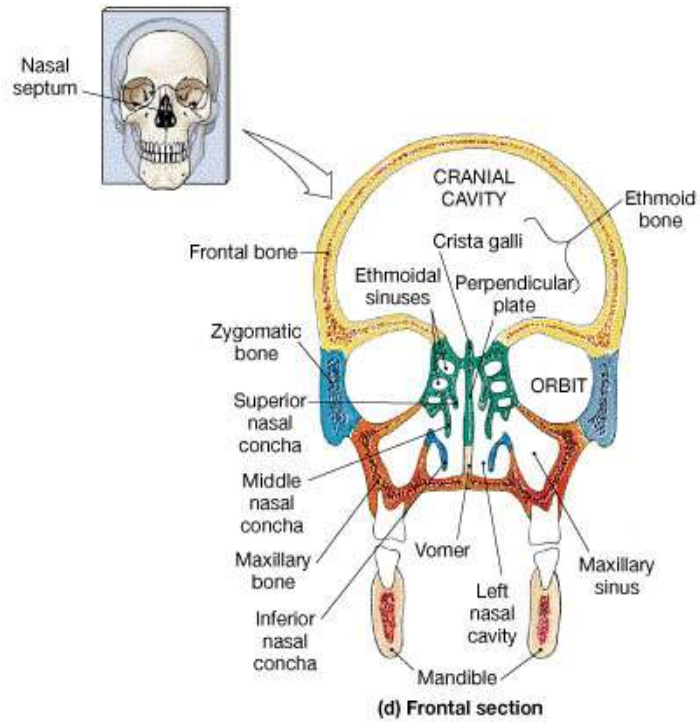




# The Nasal Cavity



- \* Interior area of the nose; lined with a sticky mucous membrane and contains tiny, surface hairs, cilia. divided medially by the nasal septum.
- \* Nasal conchae divide the cavity into passageways that are lined with mucous membrane, and help increase the surface area available to warm and filter incoming air.
- Particles trapped in the mucus are carried to the pharynx by ciliary action, swallowed, and carried to the stomach where gastric juice destroys any microorganisms in the mucus.







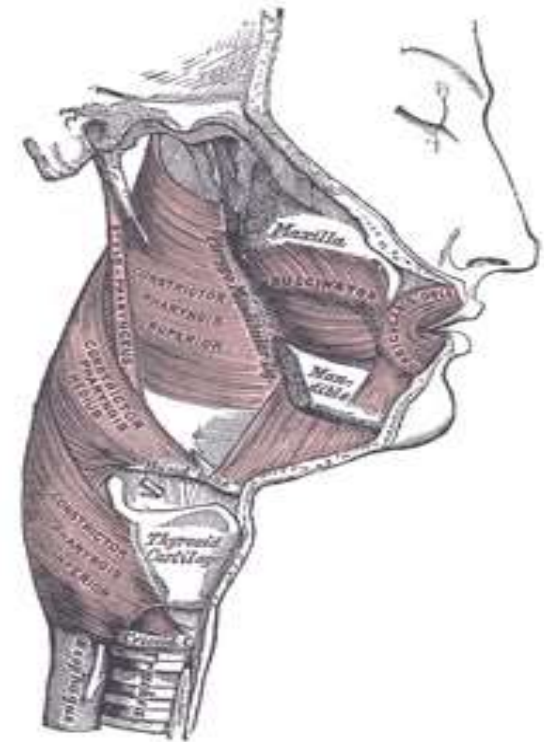
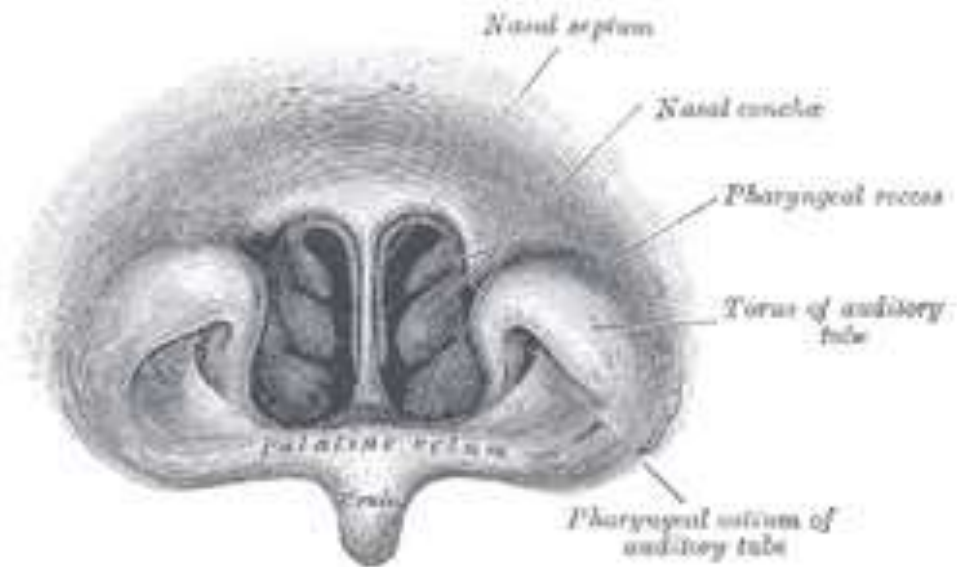
# Paranasal Sinuses



- \* Sinuses are air-filled spaces within the maxillary, frontal, ethmoid, and sphenoid bones of the skull.
- \* These spaces open to the nasal cavity and are lined with mucus membrane that is continuous with that lining the nasal cavity.
- \* The sinuses reduce the weight of the skull and serve as a resonant chamber to affect the quality of the voice.



# THE PHARYNX

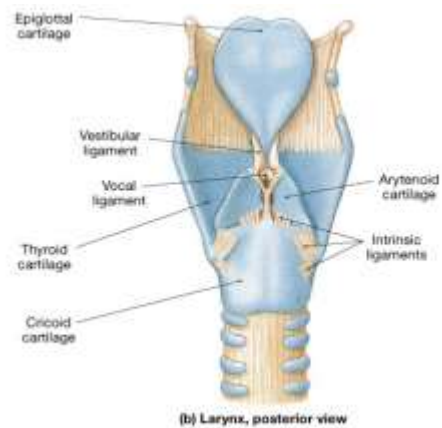
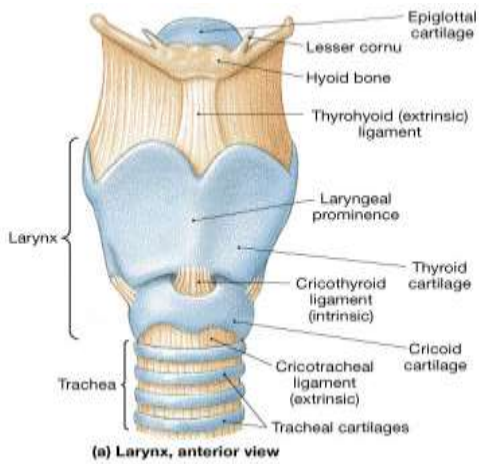




# THE PHARYNX



- \* The “throat” is a funnel shaped tube that lies posterior to the nasal cavity, oral cavity and larynx; and anteriorly to the cervical vertebra.
- \* It is composed of:
  - Nasopharynx – uppermost portion
  - Oropharynx – middle portion
  - Laryngopharynx – lowermost portion
- \* It is a common passageway for air and food and it provides a resonating chamber for speech sounds



Respiratory System/Anatomy/SNSCA  
 HS/Ms.Sineka M



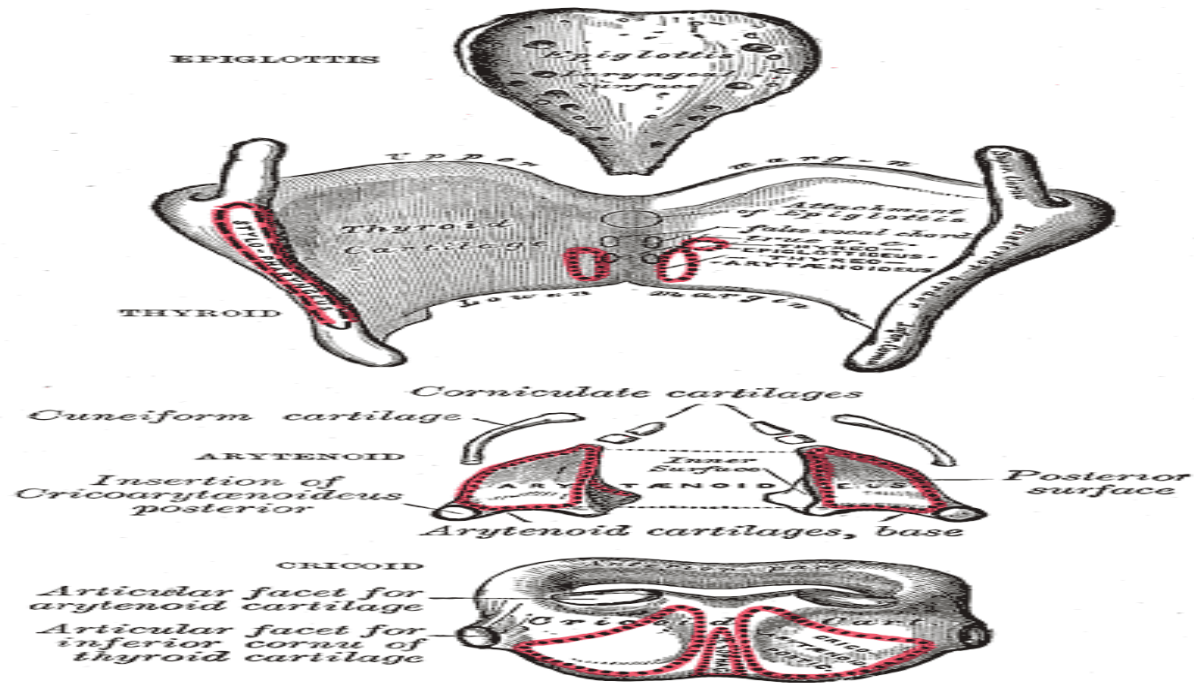
# THE LARYNX



- \* It is an enlargement in the airway superior to the trachea and inferior to the pharynx.
- \* It helps keep particles from entering the trachea and also houses the vocal cords.
- \* It is composed of a framework of muscles and cartilage bound by elastic tissue



# The Epiglottis

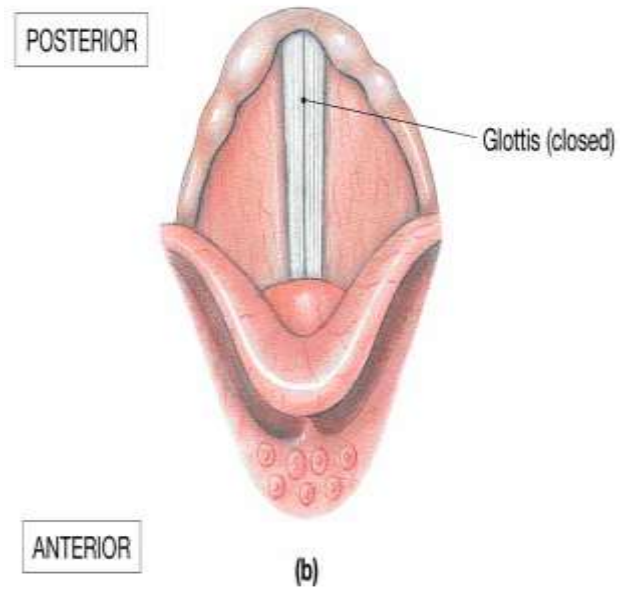




# THE EPIGLOTTIS



- \* It is a large leaf-shaped piece of cartilage.
- \* A flap of cartilage that prevents food from entering the trachea (or windpipe).
- \* During swallowing, there is elevation of the larynx







# THE VOCAL CORDS



\* Inside the larynx, 2 pairs of folds of muscle and connective tissues covered with mucous membrane make up the vocal cords.

a. The upper pair is the false vocal cords.

b. The lower pair is the true vocal cords.

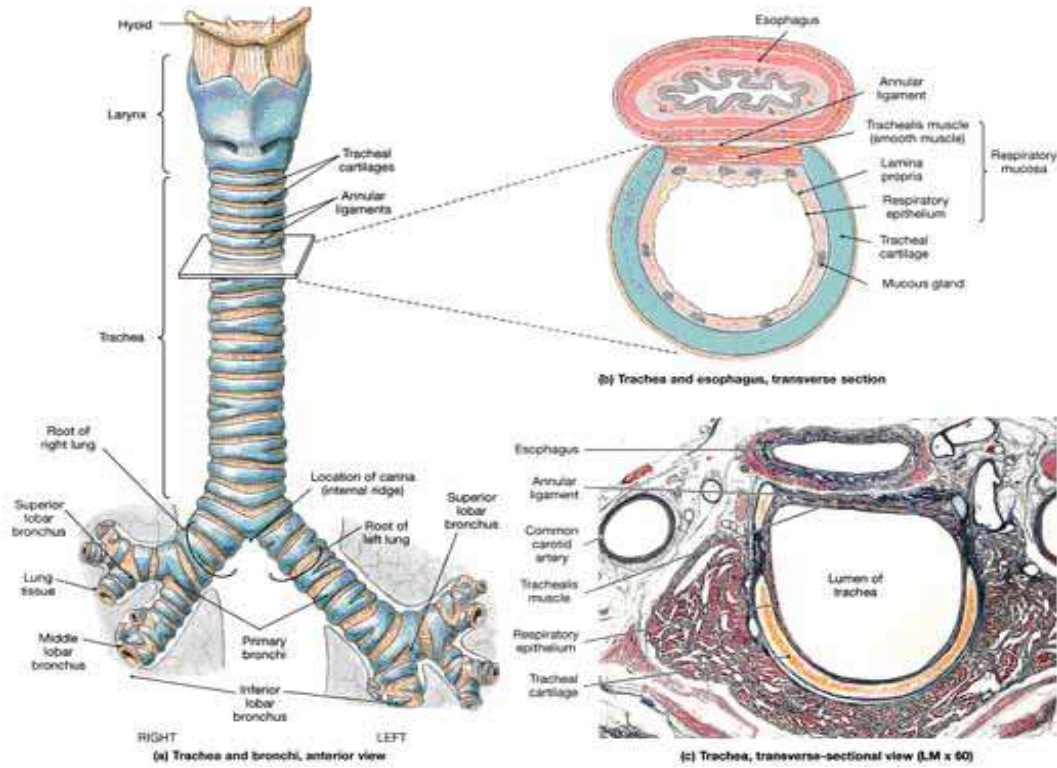
c. Changing tension on the vocal cords controls pitch, while increasing the loudness depends upon increasing the force of air vibrating the vocal cords.



## THE VOCAL CARDS



- \* During normal breathing, the vocal cords are relaxed and the glottis is a triangular slit.
- \* During swallowing, the false vocal cords and epiglottis close off the glottis.





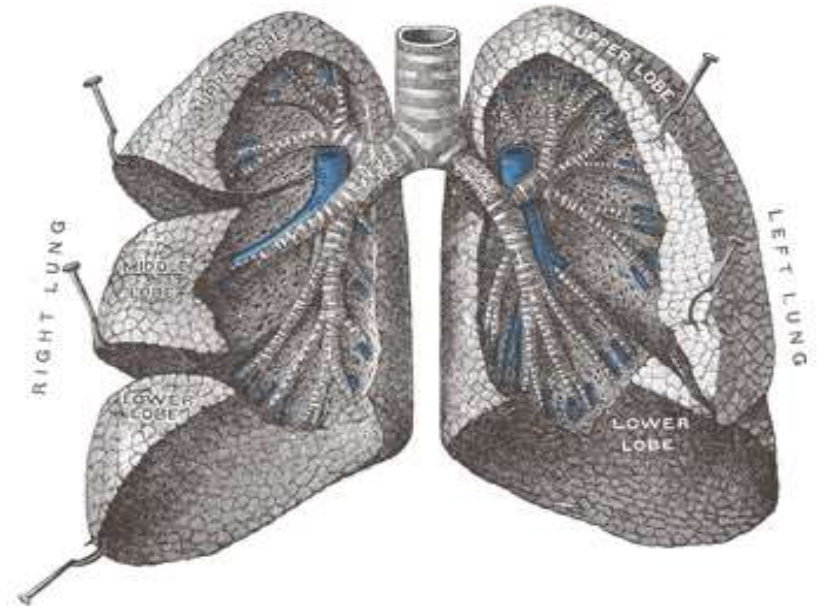
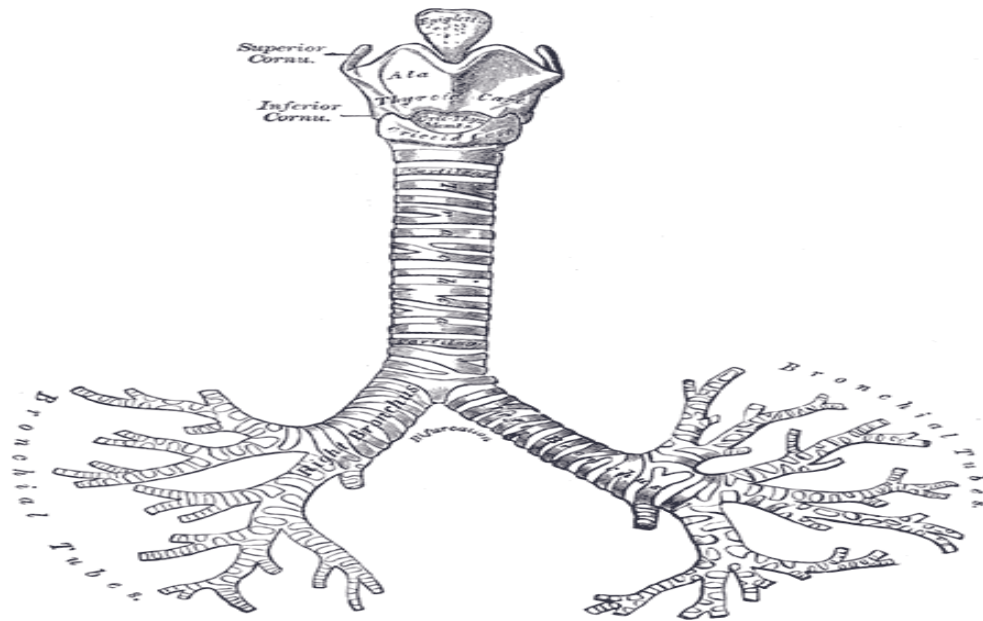
# THE TRACHEA



- \* It is a tubular passageway for air, located anterior to the esophagus
- \* It extends from the larynx to the 5<sup>th</sup> thoracic vertebra where it divides into the right and left bronchi.



# THE TRACHEA

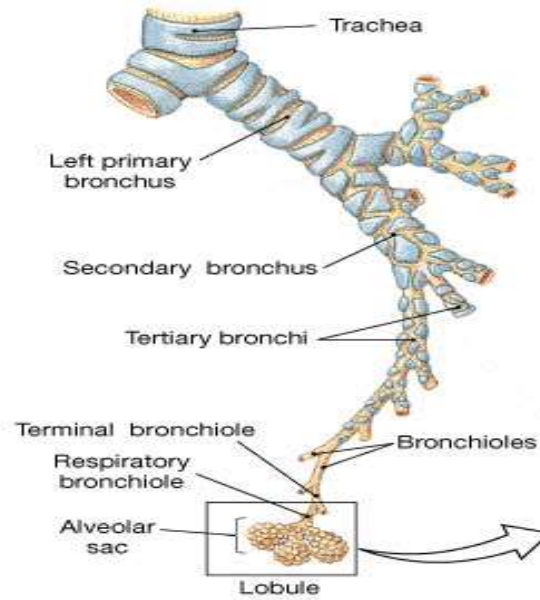




# THE TRACHEA



- \* The inner wall of the trachea is lined with ciliated mucous membrane with many goblet cells that serve to trap incoming particles.
- \* The tracheal wall is supported by 20 incomplete cartilaginous rings.



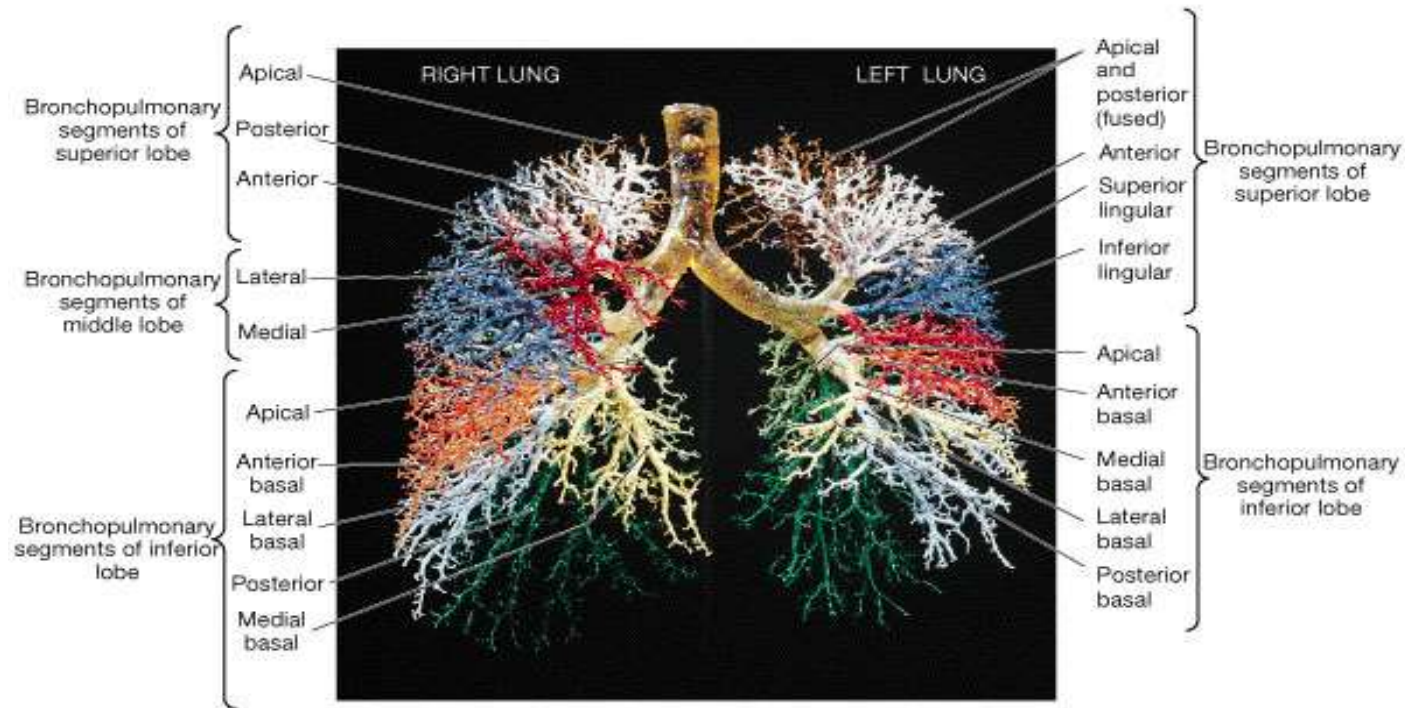


# BRONCHI



- \* The Bronchi are the two main air passages into the lungs.
  
- \* They are composed of the:
  - \*\* “Right Primary Bronchus”
    - leading to the right lung.
  
  - \*\* “Left Primary Bronchus”
    - leading to the left lung.





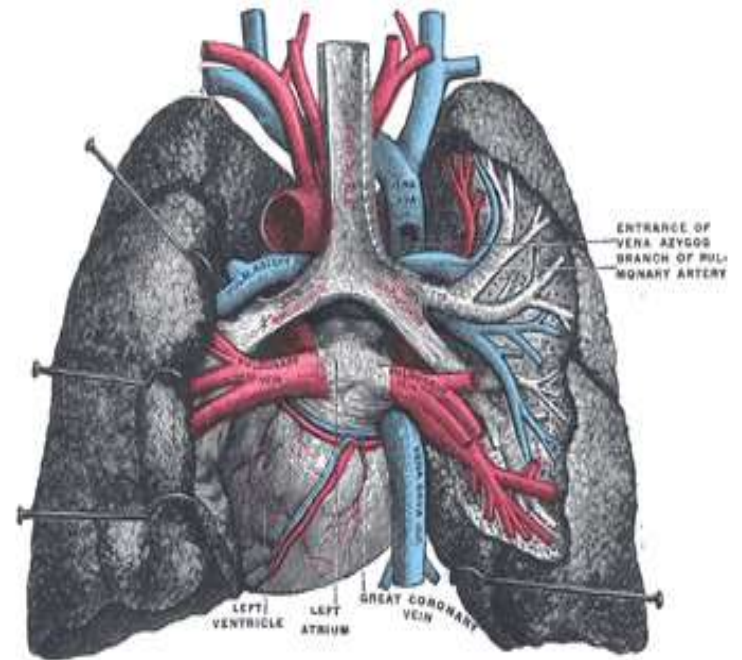
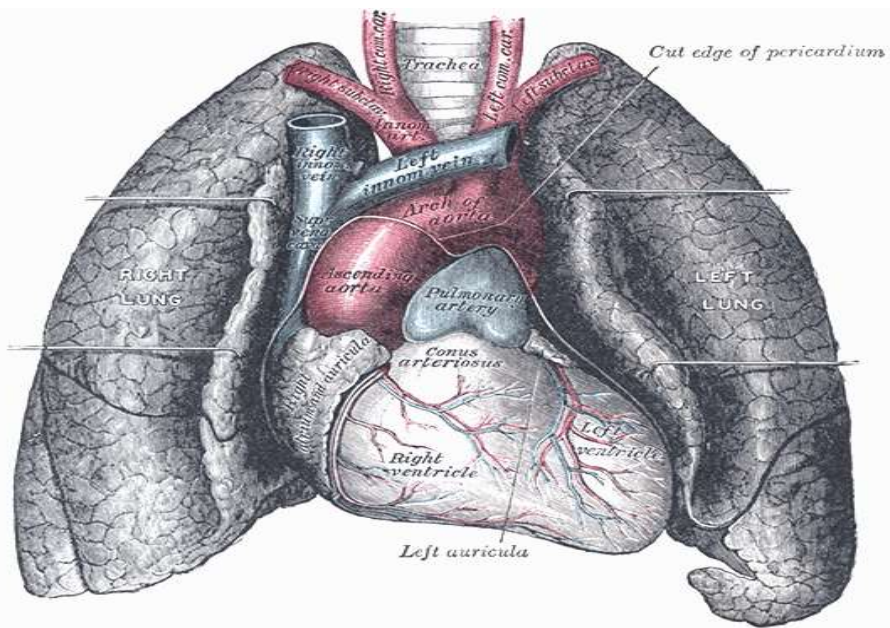
(d) The bronchial tree



# The Bronchial Tree



- \* The bronchial tree consists of branched tubes leading from the trachea to the alveoli.
- \* The bronchial tree begins with the two primary bronchi, each leading to a lung.
- \* The branches of the bronchial tree from the trachea are right and left primary bronchi; these further subdivide until bronchioles give rise to alveolar ducts which terminate in alveoli.
- \* It is through the thin epithelial cells of the alveoli that gas exchange between the blood and air occurs.

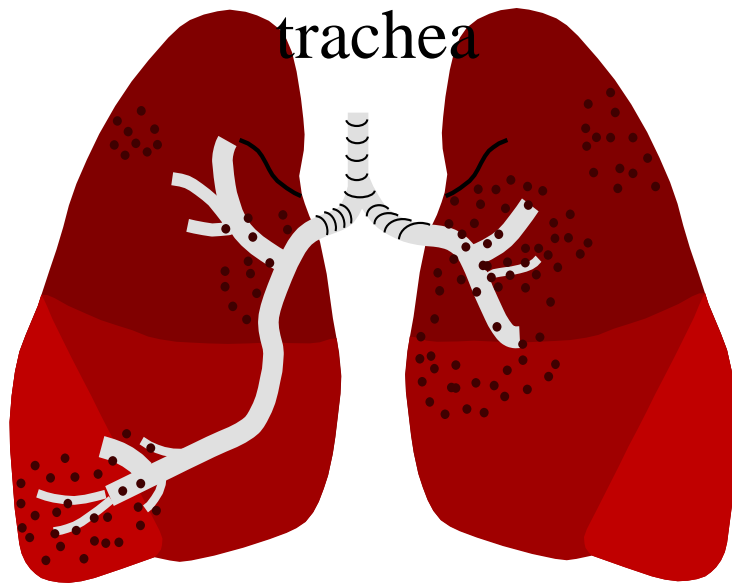




# THE LUNGS



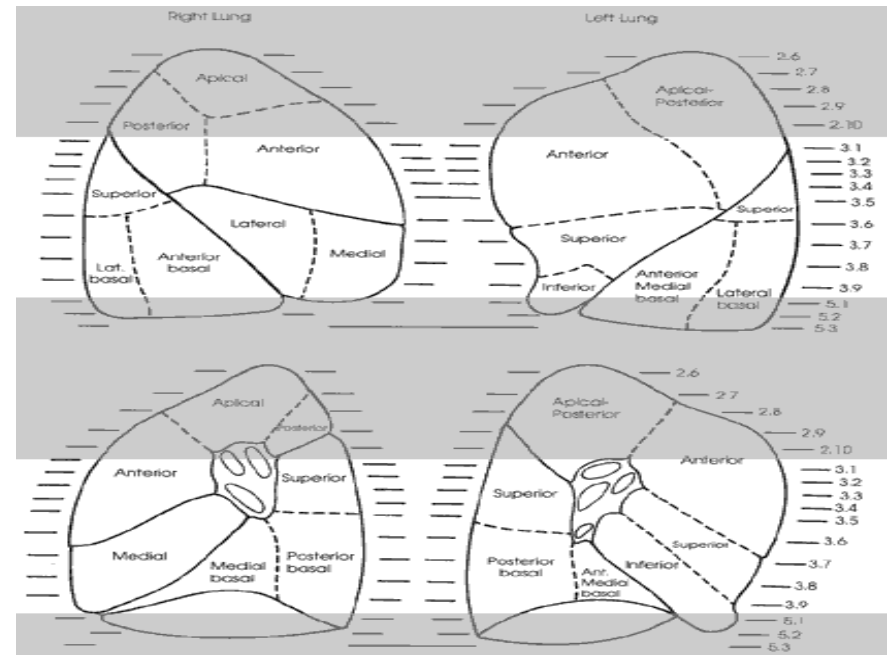
- The paired soft, spongy, cone-shaped lungs, separated medially by the mediastinum and are enclosed by the diaphragm and thoracic cage.
- 2 layers of serous membrane, collectively known as pleural membrane, enclose and protect each lung.
  - \*\* *Parietal Pleura*
    - outer layer attached to the thoracic cavity
  - \*\* *Visceral Pleura*
    - inner layer covering the lung itself



trachea

Right-3 lobes

Left-2 lobes

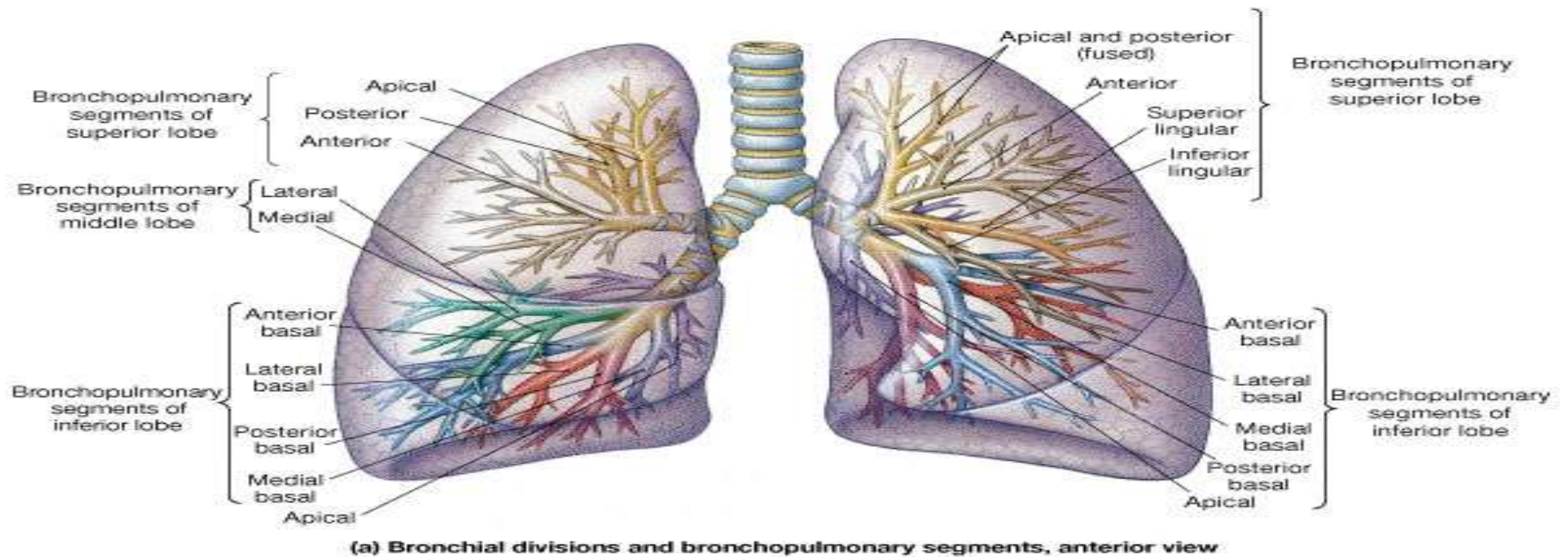




# THE LUNGS



- \* The two organs that extract oxygen from inhaled air and expel carbon dioxide in exhaled air.
- \* This is the main and primary organ of the Respiratory System.
- \* The bronchus and large blood vessels enter each lung.



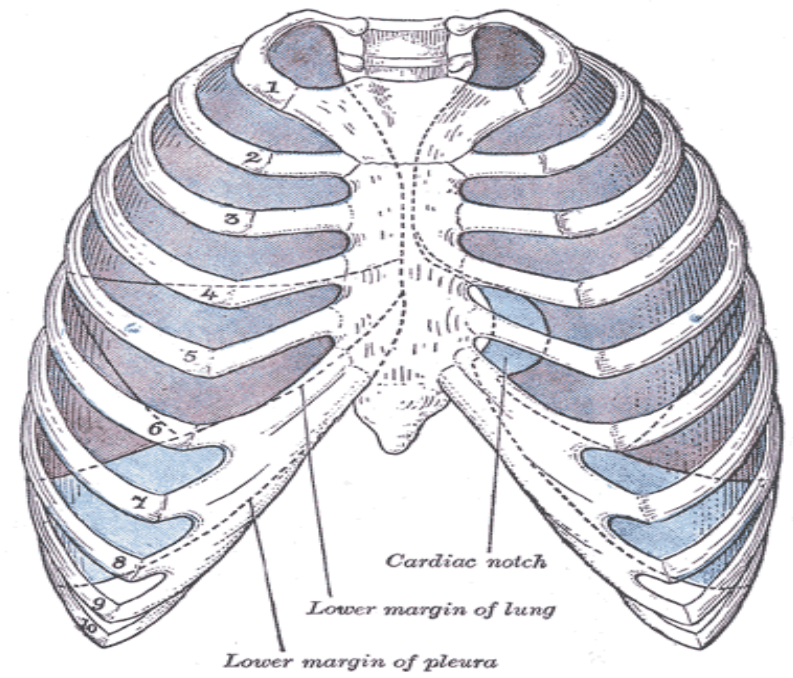
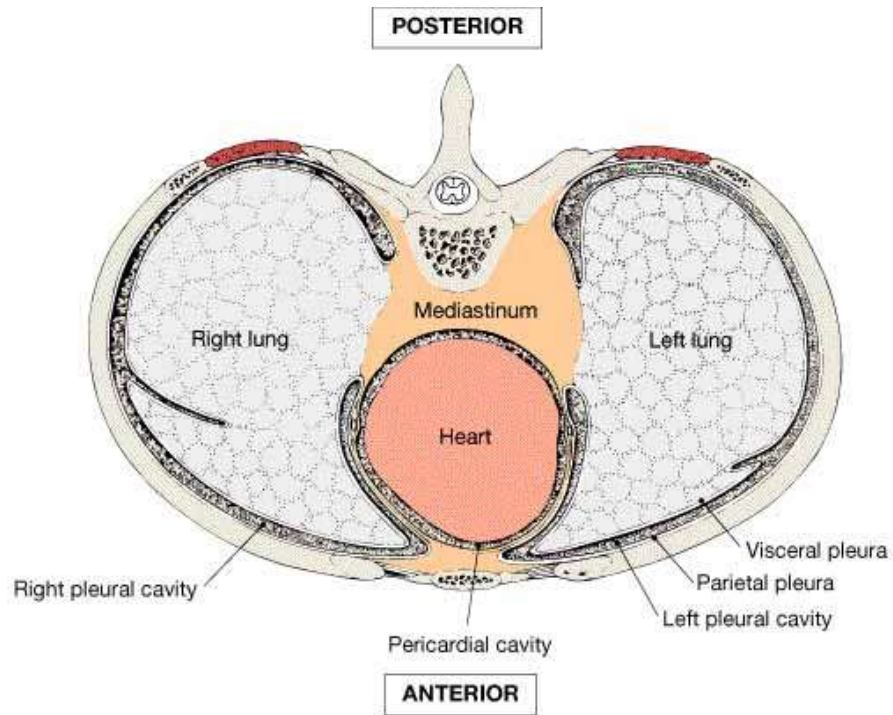


## Lobes of the Lungs



- \* The right lung has three lobes.
- \* The left lung has two lobes.
- \* Each lobe is composed of lobules that contain air passages, alveoli, nerves, blood vessels, lymphatic vessels, and connective tissues.







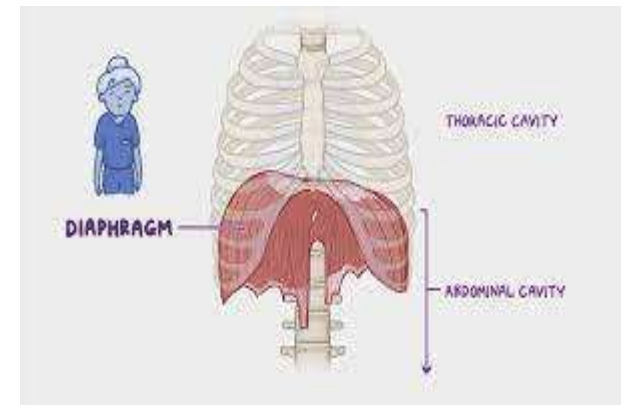
## DIAPHRAGM



- The diaphragm is an unpaired, dome shaped skeletal muscle that is located in the trunk. It separates the thoracic and abdominal cavities from each other by closing the inferior thoracic aperture.
- The diaphragm is the primary muscle that is active in inspiration. Contraction of the muscle facilitates expansion of the thoracic cavity. This increases volume of the the cavity, which in turn decreases the intrathoracic pressure allowing the lungs to expand and inspiration to occur.



- The diaphragm is much more than just a sheath separating your thoracic and abdominal cavities. This article will examine this intricate and crucial muscle in detail, looking at its anatomy, function and structures which pass through it.

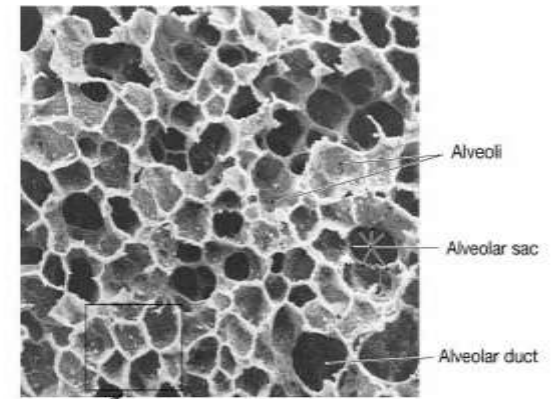
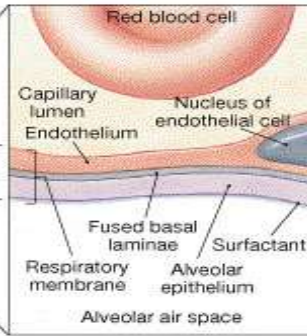
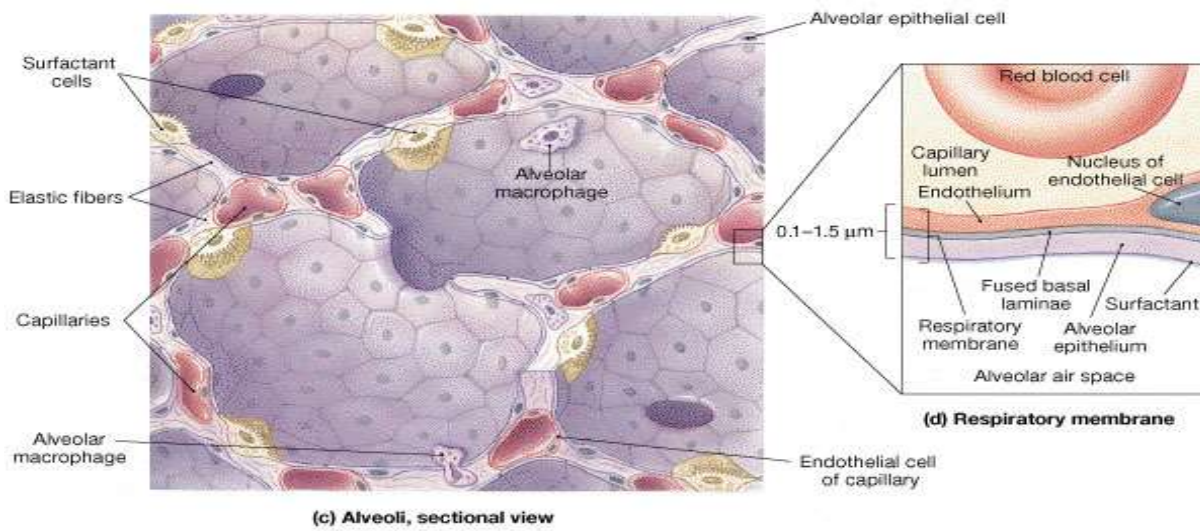




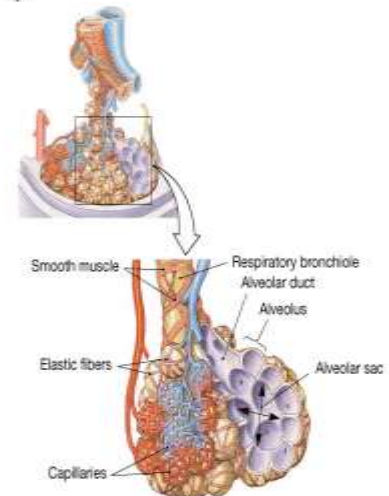
## The Pleural Cavities



- \* A layer of serous membrane, between the visceral pleura and the parietal pleura.
- \* It contains a lubricating fluid secreted by the membranes that prevents friction between the membranes and allows their easy movement on one another during breathing.



**(b) SEM of lung alveoli**



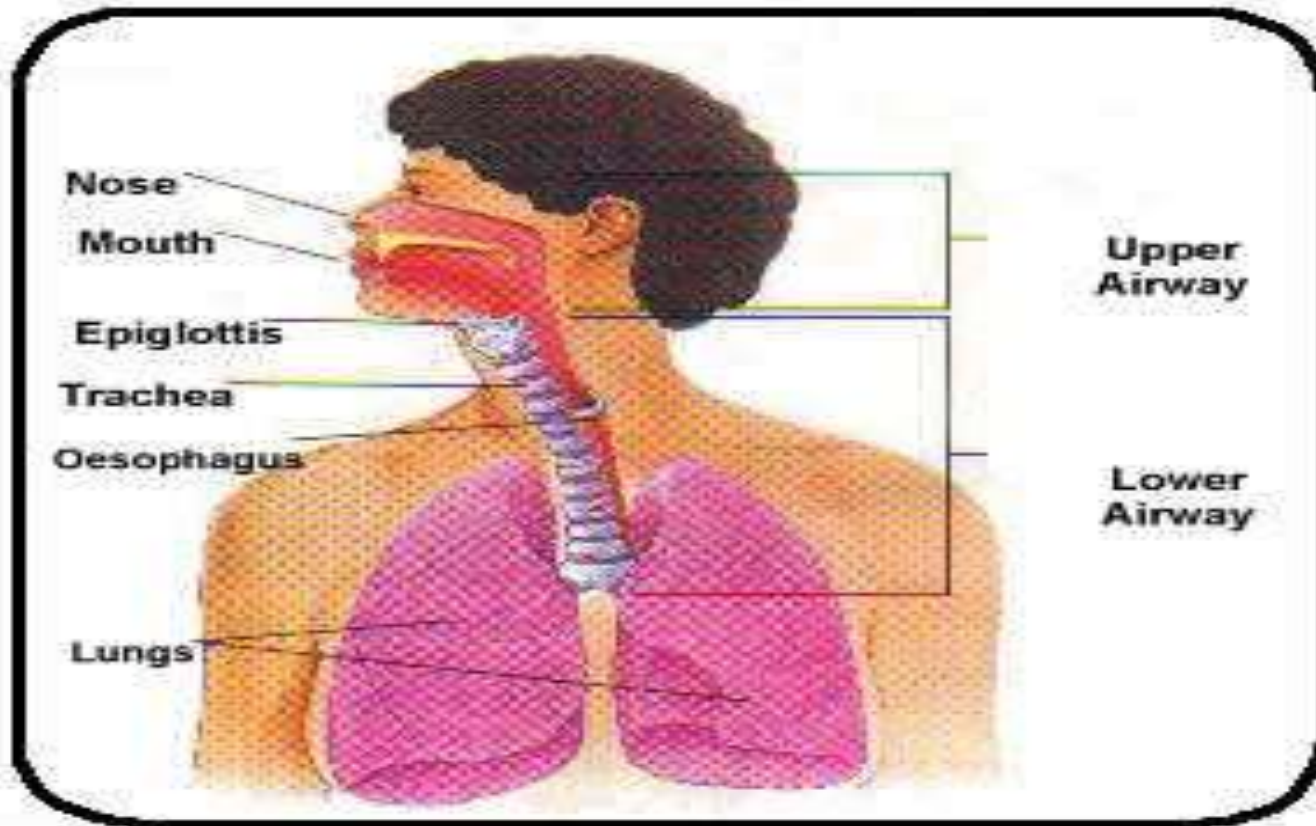
**(a) Alveolar organization**



# The Alveoli



- \* They are cup-shaped out pouching lined by epithelium and supported by a thin elastic basement membrane.
- With that you can imagine having bunch of grapes with each grape indicating and alveolus.
- \* Alveolar sacs are 2 or more alveoli that share a common opening.
- \* This is where the primary exchange of gases occur.





## ASSESSMENT



- What all are the structures in Respiratory system ?
- Difference between right and left lung?