



SNS COLLEGE OF NURSING

SARAVANAMPATTI, COIMBATORE-35

DEPARTMENT OF NURSING

COURSE NAME : BSC (NURSING) I YEAR

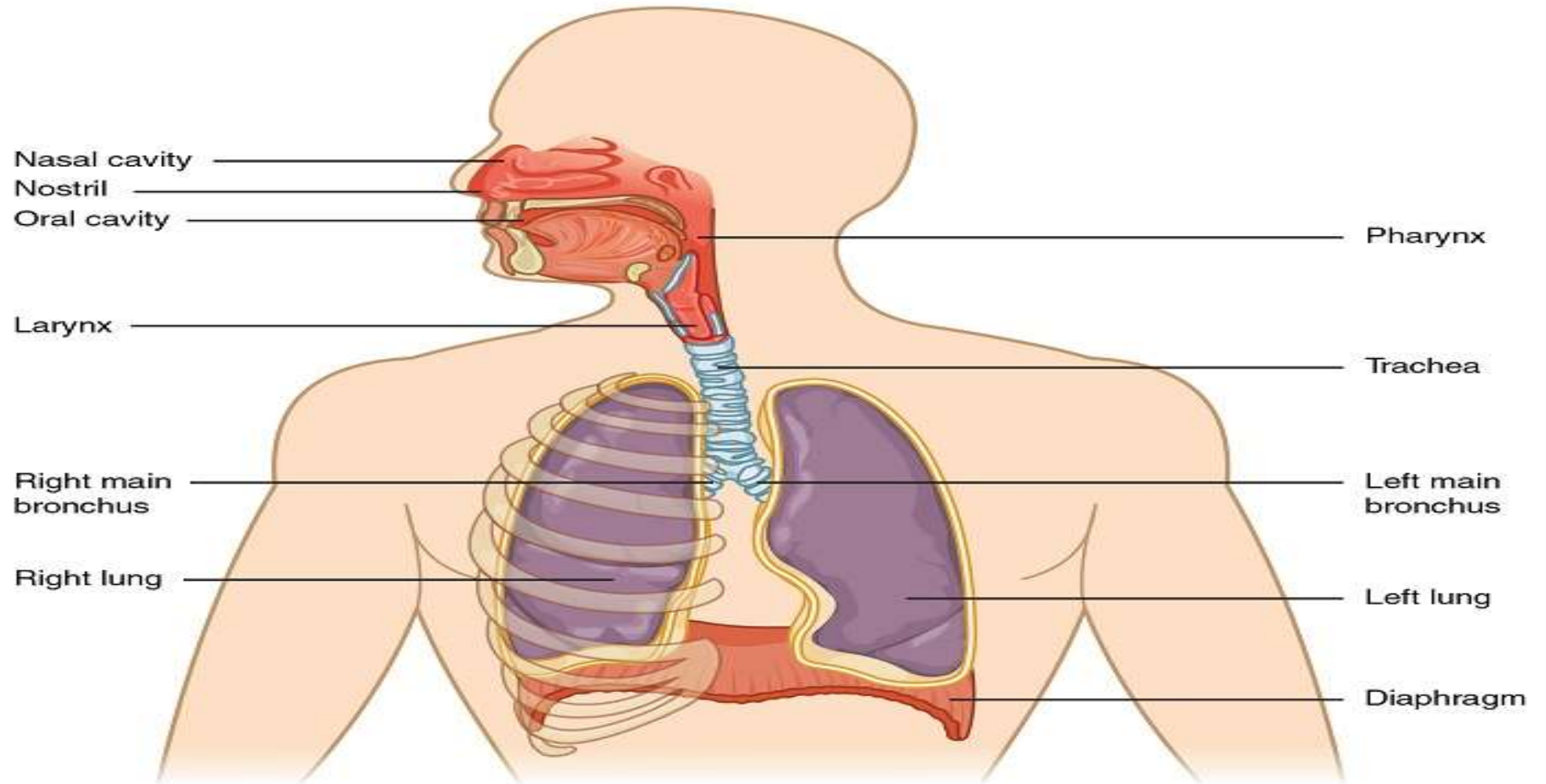
SUBJECT : ANATOMY AND PHYSIOLOGY

UNIT II: RESPIRATORY ANATOMY

RESPIRATORY ANATOMY

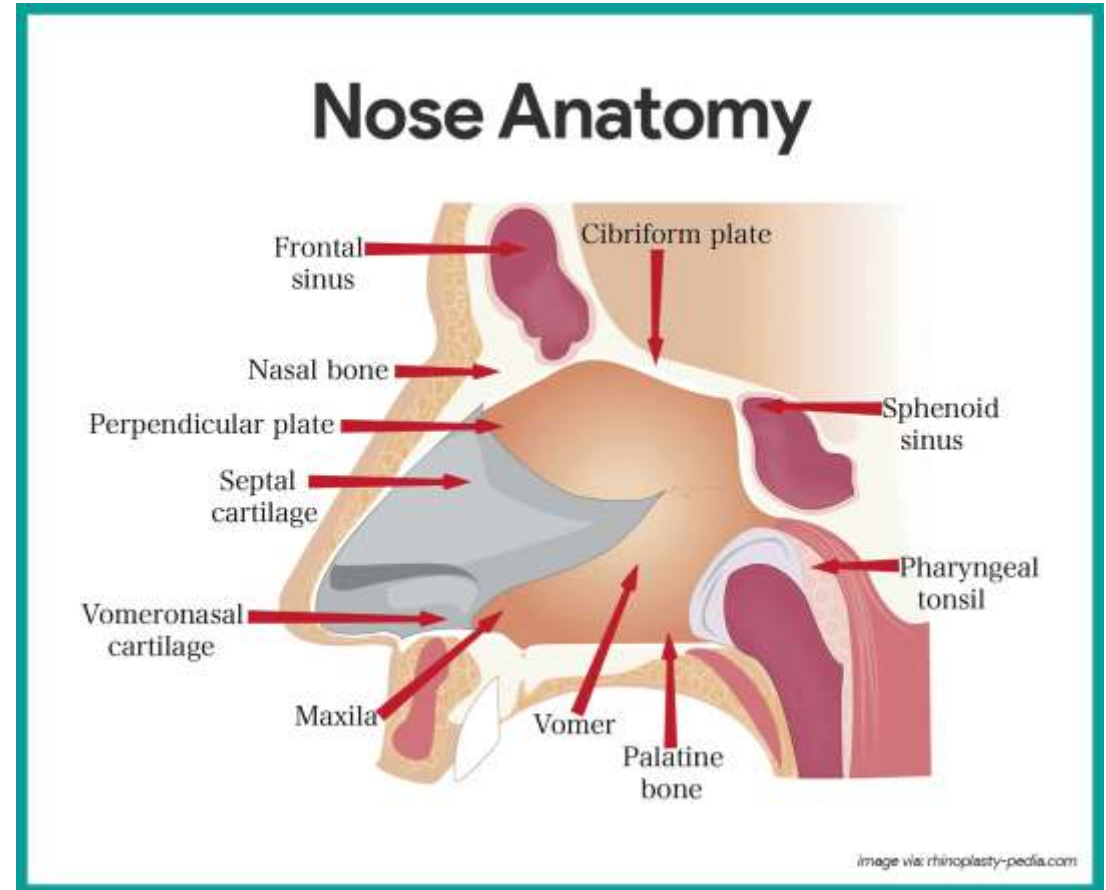
- The respiratory system is **the network of organs and tissues that help to breathe.**
- It includes airways, lungs and blood vessels and the muscles .
- These parts work together to move oxygen throughout the body and clean out waste gases like carbon dioxide.

RESPIRATORY SYSTEM



NOSE

- **Nostrils** - During breathing, air enters the nose by passing through the **nostrils, or nares**.
- **Nasal cavity** - The interior of the nose consists of the nasal cavity, divided by a **midline nasal septum**.





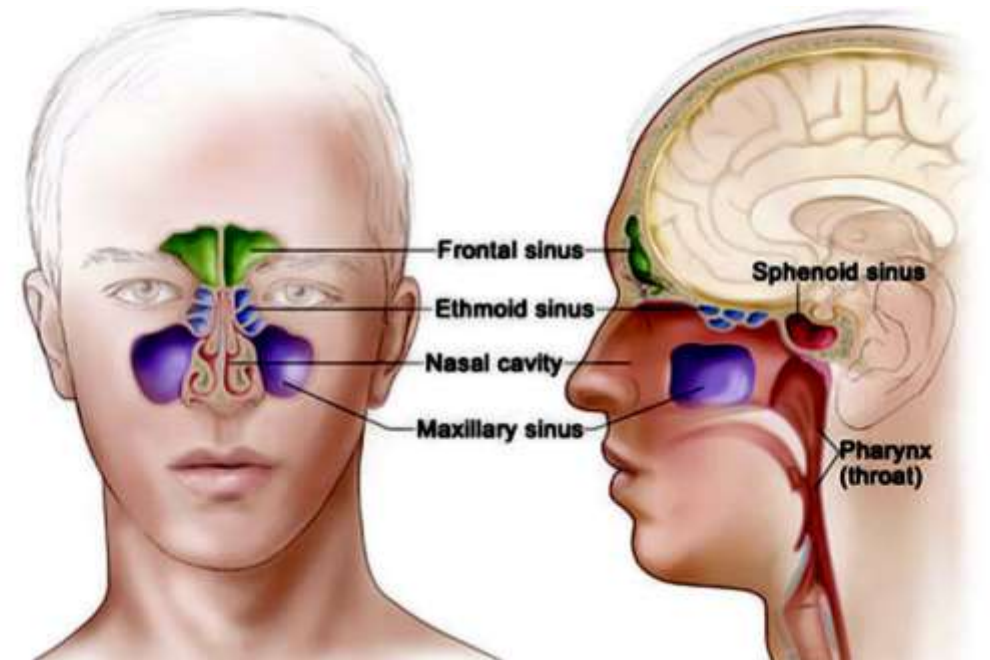
NOSE



- **Olfactory receptors** - The olfactory receptors for the **sense of smell** are located in the mucosa in the slit like superior part of the nasal cavity, just beneath the ethmoid bone.
- **Respiratory mucosa** - The rest of the mucosal lining, the nasal cavity called the respiratory mucosa, rests on a rich network of thin-walled veins that warms the air as it flows past.
- **Mucus**- The sticky mucus produced by the mucosa's glands moistens the air and traps incoming bacteria and other foreign debris, and **lysozyme enzymes** in the mucus destroy bacteria chemically.

- **Ciliated cells.** The ciliated cells of the nasal mucosa create a gentle current that moves the sheet of contaminated mucus posteriorly toward the throat.
- **Conchae.** The Lateral walls of the nasal cavity are uneven owing to three mucosa-covered projections, or lobes called conchae
- **Palate.** The nasal cavity is separated from the oral cavity below by a partition, the palate;
 - anteriorly, where the palate is supported by bone, is the **hard palate**;
 - the unsupported posterior part is the **soft palate**.

- **Paranasal sinuses.**
- The nasal cavity is surrounded by a ring of paranasal sinuses located in the
 - frontal,
 - sphenoid,
 - ethmoid, and
 - maxillary bones
- These sinuses lighten the skull, and they act as a resonance chamber for speech.



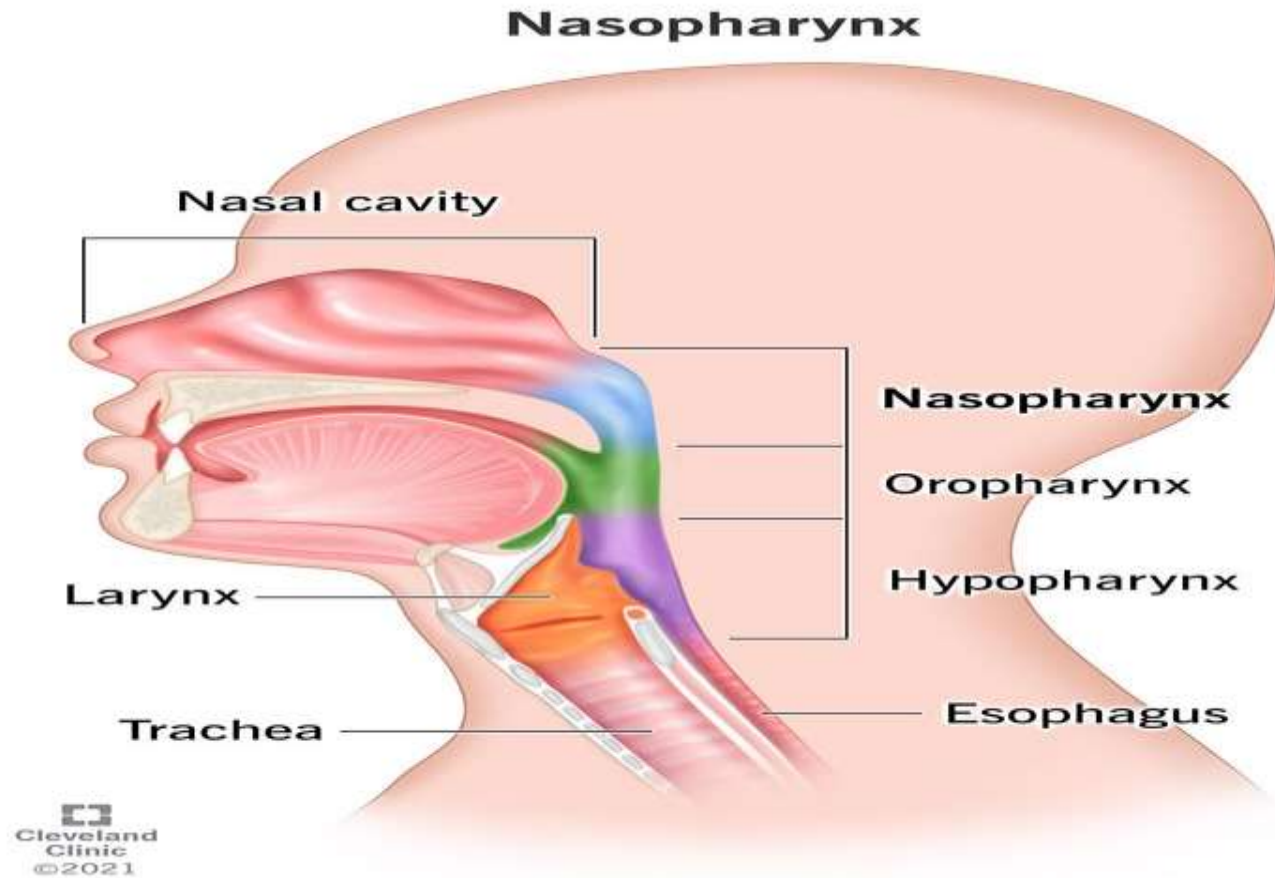


PHARYNX



- **Size.** The pharynx is a muscular passageway about **13 cm (5 inches)** long that vaguely resembles a short length of red garden hose.
- **Portions of the pharynx.** Air enters the superior portion, the **nasopharynx**, from the nasal cavity and then descends through the **oropharynx** and **laryngopharynx** to enter the larynx below

PHARYNX



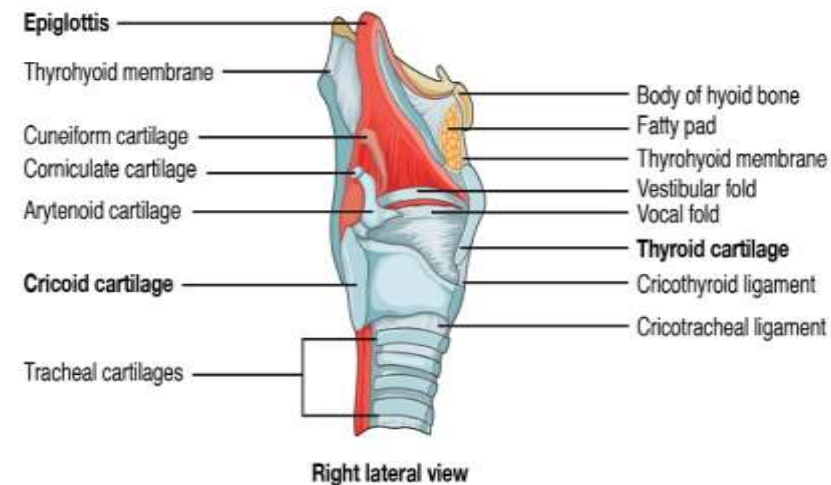
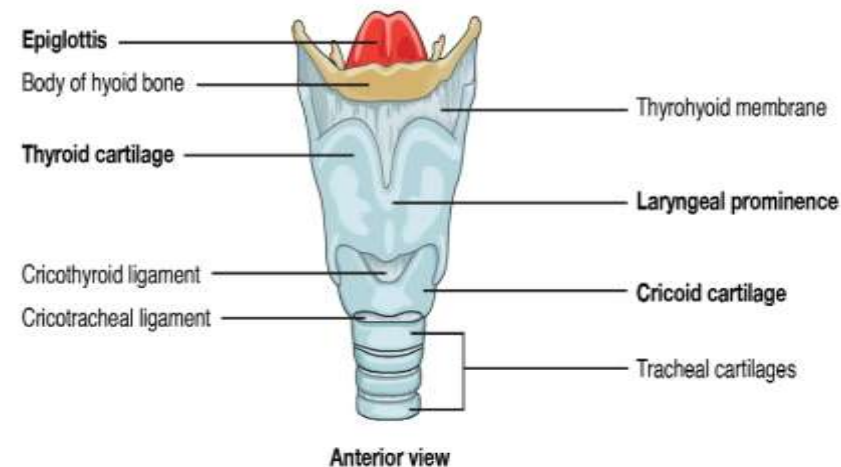


PHARYNX



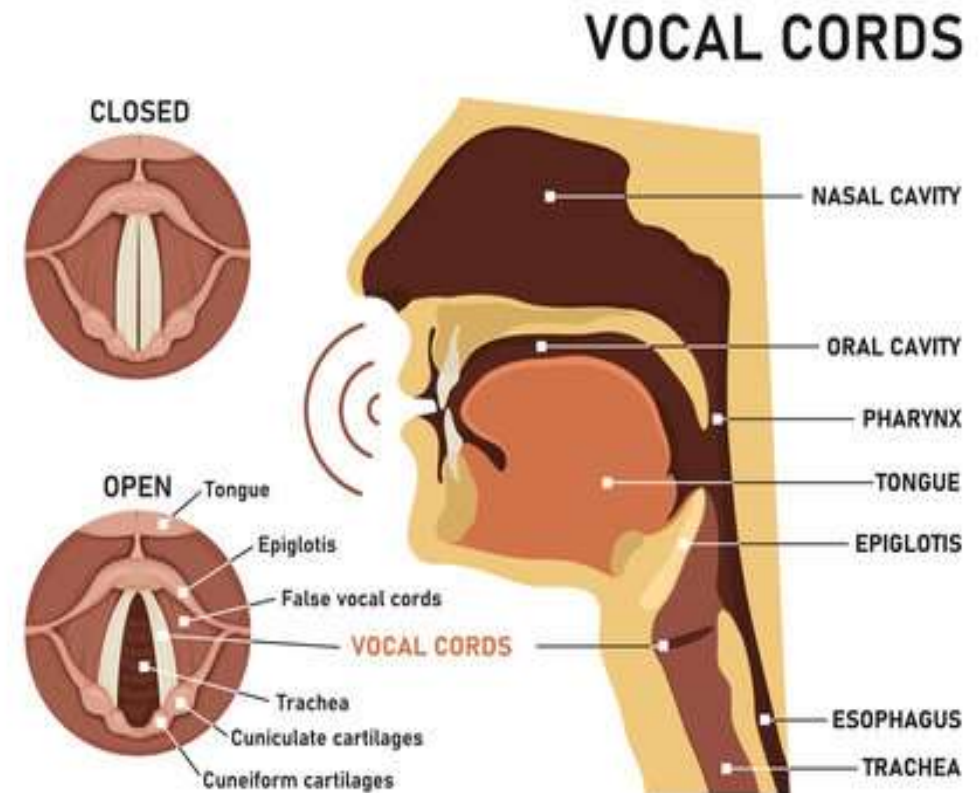
- **Pharyngotympanic tube.** The pharyngotympanic tubes, which drain the middle ear open into the nasopharynx.
- **Pharyngeal tonsil.** The pharyngeal tonsil, often called **adenoid** is located high in the nasopharynx.
- **Palatine tonsils.** The palatine tonsils are in the oropharynx at the end of the soft palate.
- **Lingual tonsils** The lingual tonsils lie at the base of the tongue

- **The larynx or voice box** routes air and food into the proper channels and plays a role in speech.
- **Structure.** Located inferior to the pharynx, it is formed by eight rigid hyaline cartilages and a spoon-shaped flap of elastic cartilage, the **epiglottis**.



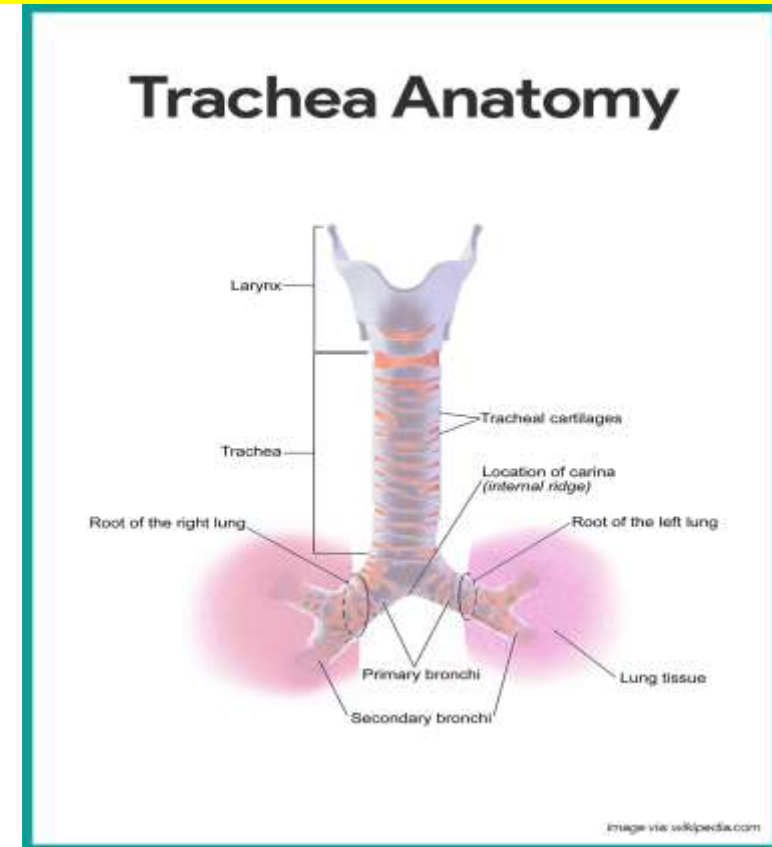
LARYNX

- **Thyroid cartilage.**
- The largest of the hyaline cartilages is the shield-shaped thyroid cartilage, which protrudes anteriorly and is commonly called **Adam's apple.**



TRACHEA

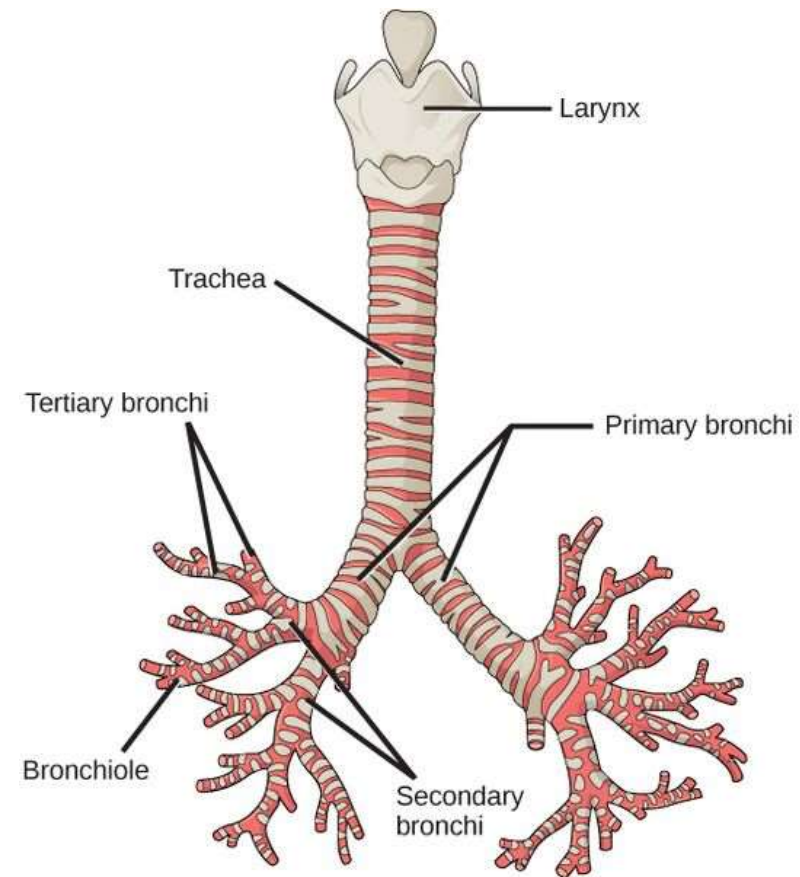
- **Length.** Air entering the trachea or **windpipe** from the larynx travels down its length (10 to 12 cm or about 4 inches) to the level of the **fifth thoracic vertebra**, which is approximately midchest



- **Structure.**
- The trachea is fairly rigid because its walls are reinforced with **C-shaped rings** of hyaline cartilage;
- The open parts of the rings abut the esophagus
- It allow to expand anteriorly when we swallow a large piece of food,
- **Cilia.**
- The trachea is lined with ciliated mucosa
- They propel mucus, loaded with dust particles and other debris away from the lungs to the throat, where it can be swallowed or spat out.

BRONCHI AND BRONCHIOLES

- **Structure.** The right and left main (primary) bronchi are formed by the division of the trachea.
- **Location.** Each main bronchus runs obliquely before it plunges into the medial depression of the lung on its own side.





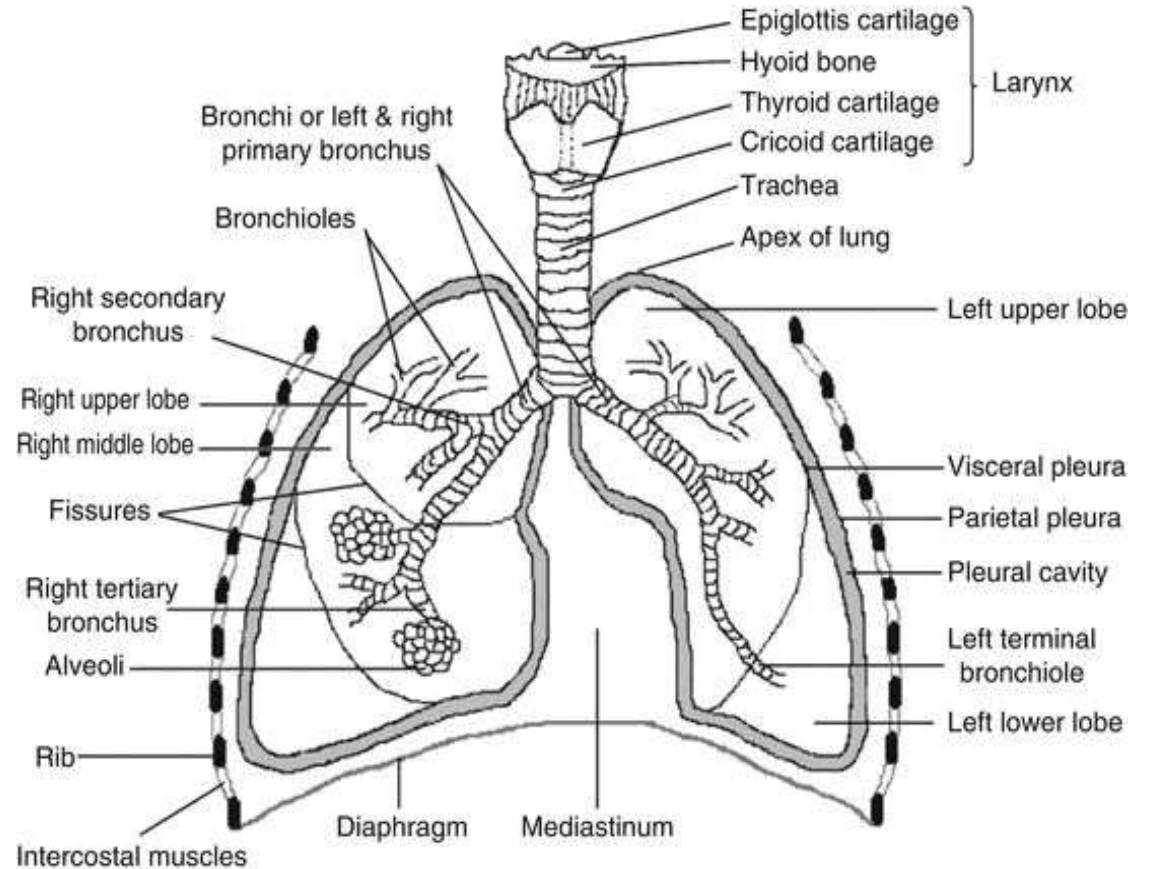
BRONCHI AND BRONCHIOLES



- **Size.** The right main bronchus is wider, shorter, and straighter than the left.
- **Carina**
- A ridge at the base of the trachea (windpipe) that **separates the openings of the right and left main bronchi**

LUNGS

- **Location.**
- The lungs occupy the entire thoracic cavity except for the most central area, the **mediastinum**, which houses the heart, the great blood vessels, bronchi, esophagus, and other organs.





LUNGS



- **Apex.** The narrow, superior portion of each lung, the apex, is just deep to the clavicle.
- **Base.** The broad lung area resting on the diaphragm is the base.
- **Division.** Each lung is divided into lobes by fissures;
 - the left lung has two lobes,
 - the right lung has three.



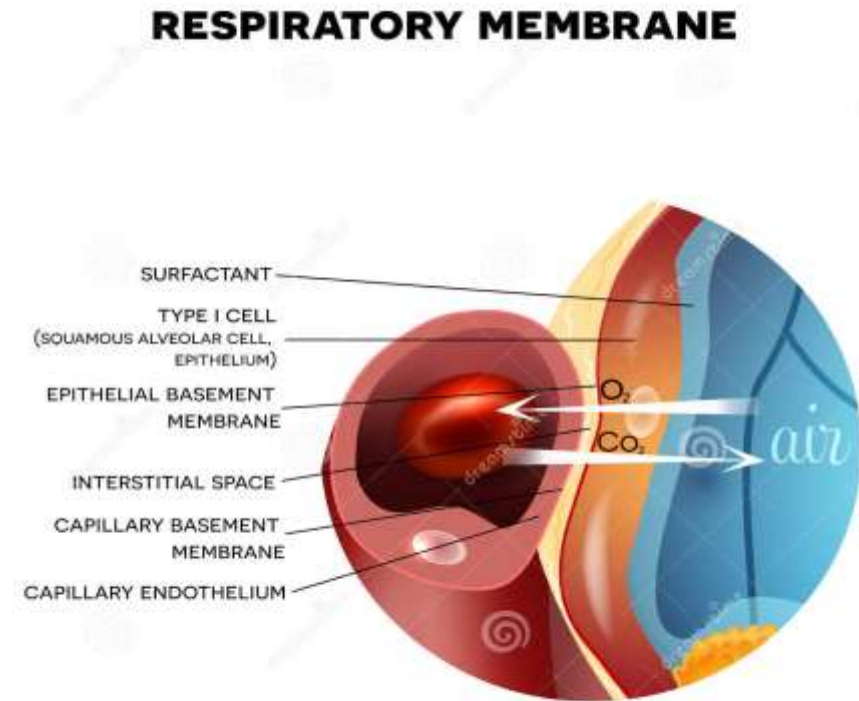
LUNGS



- **Bronchioles.** The smallest of the conducting passageways are the bronchioles.
- **Alveoli.** The terminal bronchioles lead to the respiratory zone structures, even smaller conduits that eventually terminate in alveoli, or air sacs.
- **Respiratory zone.** The respiratory zone, which includes the respiratory bronchioles, alveolar ducts, alveolar sacs, and alveoli, is the only site of gas exchange.

RESPIRATORY MEMBRANE

- **Wall structure.** single, thin layer of squamous epithelial cells.
- **Alveolar pores.** connecting neighboring air sacs and provide alternative routes for air to reach alveoli.
- **Respiratory membrane.**
 - the alveolar and capillary walls,
 - their fused basement membranes,
 - occasional elastic fibers construct the respiratory membrane (air-blood barrier)





RESPIRATORY MEMBRANE



- **Alveolar macrophages.**

Efficient alveolar macrophages sometimes called “**dust cells**”, wander in and out of the alveoli picking up bacteria, carbon particles, and other debris.

- **Cuboidal cells.**

- scattered amid the epithelial cells that form most of the alveolar walls are chunky cuboidal cells,
- Produce a lipid (fat) molecule called **surfactant**, which coats the gas-exposed alveolar surfaces and is very important in lung function



CONCLUSION



- RESPIRATORY SYSEM is an essential system and complicated system composed of organs from nose till lungs.
- Understanding the physical structure of these organs are mandatory for providing care to the patients .
- These various organs are interrelated with the structural formation and their action is also interrelated



REFERENCE

- ❑ [Ashalatha](#) Textbook Of Anatomy and Physiology For Nurses With Free Practice Workbook Jaypee Brothers Medical Publishers fourth edition
- ❑ Nachiket Dr Shankar Textbook and Workbook of Applied Anatomy and Applied Physiology for Nurses 2nd Edition



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