UNIT 5
CHAPTER 7

The Respiratory System

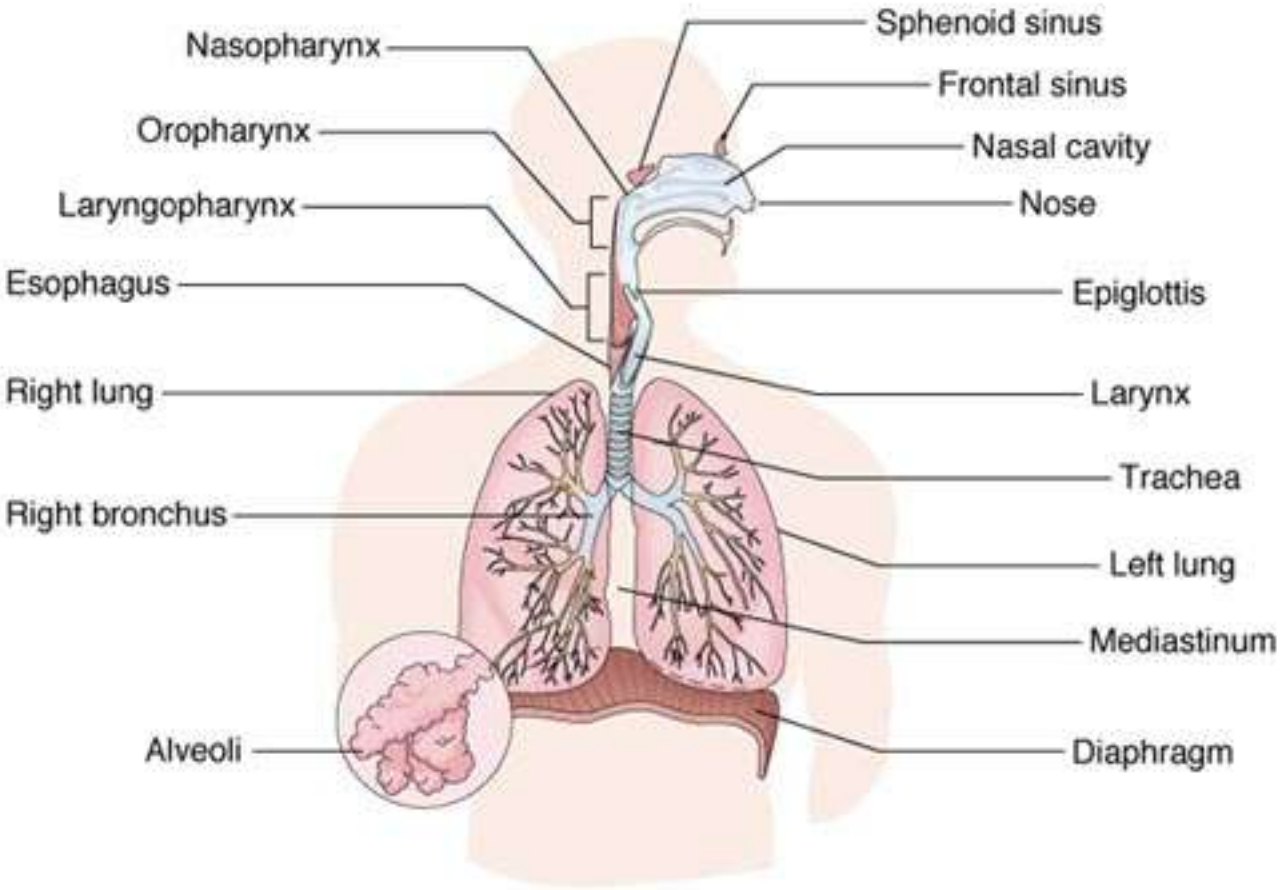
OBJECTIVES

- To identify and describe the major structures and functions of the respiratory system
- To recognize, define, spell, and pronounce terms related to the pathology and treatment of disorders of the respiratory system

FUNCTIONS OF THE RESPRIATORY SYSTEM

- To bring in oxygen to be transported by the bloodstream and used by the cells of the body.
- To expel waste products from the lungs.
- The produce speech by passing air through the larynx (voicebox).

THE MAJOR STRUCTURES OF THE RESPIRATORY SYSTEM

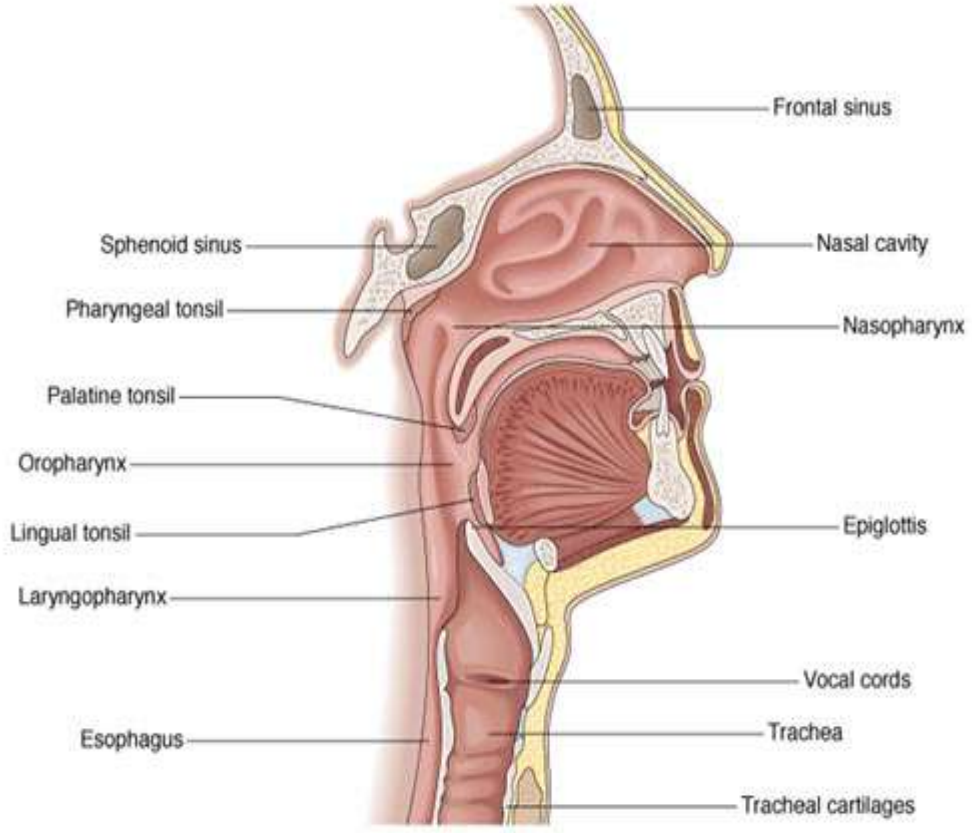


Respiratory System

THE UPPER RESPIRATORY TRACT

Consists of:

- Nose
- Mouth
- Pharynx
- Epiglottis
- Larynx
- Trachea



3 SECTIONS OF THE PHARYNX

- **Describe the 3 sections of the pharynx (throat)**
  - **Nasopharynx:** posterior to the nasal cavity
  - **Oropharynx:** visible when looking into the mouth (shared by the respiratory and digestive systems)
  - **Laryngopharynx:** continues downward to the openings of the esophagus and trachea.

LARYNX

- The *voice box*.
- Triangular chamber between pharynx and trachea.

- During breathing: vocal cords are held open allowing air to pass.

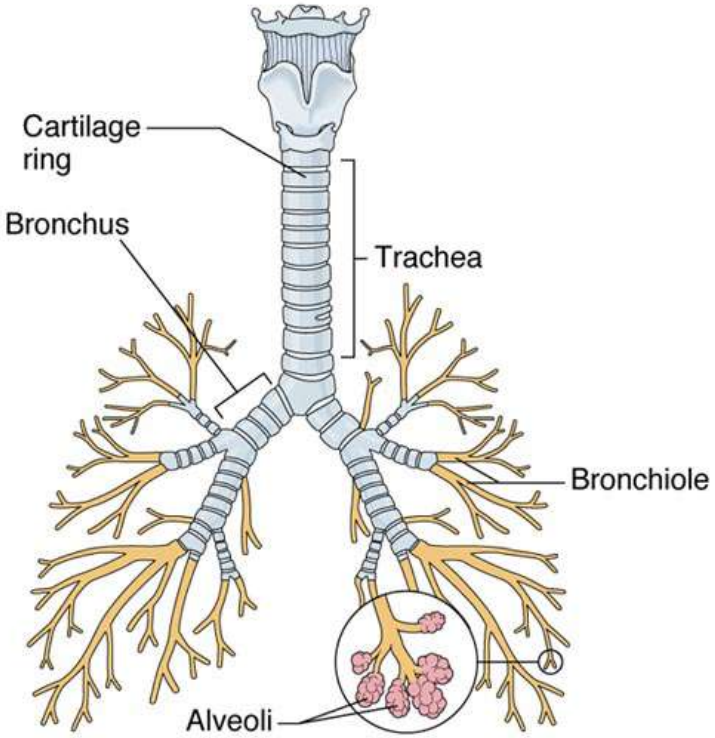
- During speech: they are together, sound produced as air is expelled from lungs causing cords to vibrate against each other.

EPIGLOTTIS

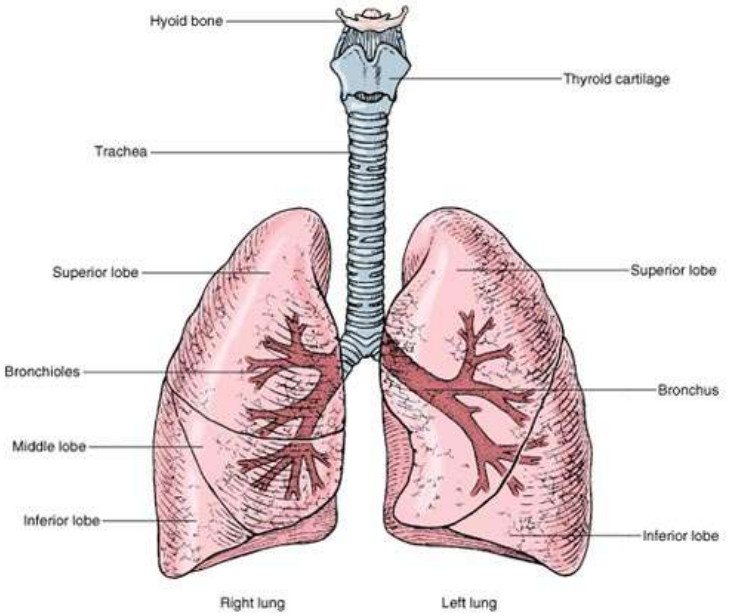
What is the epiglottis?:

-lid-like structure located at the base of the tongue, swings downward and closes off the laryngopharynx during swallowing, so food and liquids do not enter the trachea.

THE LOWER RESPIRATORY SYSTEM CONSISTS OF:



The Bronchial Tree



The Lungs

- How many lungs are in the normal human body?
  - 2 lungs, right and left. The right has 3 lobes and the left has 2. The left lung is smaller to allow for space for the heart.

- What is the mediastinum: also known as the interpleural space?
  - It is the space between the lungs that contains connective tissue and organs (including the heart)

- What is the pleura?
  - The multi-layered membrane that surrounds the lungs

BRONCHIAL TREES

What are the bronchial trees, where do they go, and how do they divide?

The trachea divides into two branches called the bronchi. One branch goes to each lung. Each bronchus divides into increasingly smaller bronchi. Bronchioles are the smallest branches of bronchi. At the end of the bronchioles, you find the alveoli.

What is the function and location of the alveoli?

*Air sacs that are very small grapelike clusters found at the end of each bronchiole. During respiration the gas exchange between the alveolar air and the pulmonary capillary blood occurs in the alveoli.

- **What is the diaphragm, where is it located?**
  - The diaphragm is the muscle that separates the thoracic cavity from the abdomen. Contraction and relaxation of this muscle allows breathing to happen.

- **What is the phrenic nerve?**
  - The nerve that stimulates the diaphragm and causes it to contract.

- **What is breathing?**
  - The act of bringing air into and out of the lungs
- **What is inhalation?**
  - The act of taking in air as the diaphragm contracts and pulls downward. This causes a vacuum and draws air into the lungs
- **What is exhalation?**
  - The act of breathing out. When the diaphragm relaxes it moves upward and forces air out.
- **What is cyanosis?**
  - Bluish discoloration of the skin caused by a lack of adequate oxygen
- **What is respiratory rate?**
  - RR is counted as the number of respirations (one inhalation and one exhalation) per minute. Normal range for adults is 15 to 20 rpm

EXCHANGE OF GASES

- **Describe external respiration:**

  exchange of gases at the level of the alveoli (lungs) and pulmonary capillaries. The heart sends low-oxygen blood to the lungs to drop off carbon dioxide and pick up oxygen. The now high-oxygen blood returns to the heart to be pumped to the body's cells.

- **Describe internal respiration:**

  exchange of gases between the capillaries and the body cells. The heart sends the high-oxygen blood through the arterial system to the body's cells. After the gas exchange occurs at the cellular level, the now low-oxygen blood returns to the heart via the venous system…..and the cycle continues.

RESPIRATORY DISEASES/DISORDERS

- **What is COPD?**
  - Chronic obstructive pulmonary disease characterized by damage to the bronchi which makes it difficult to breathe.
- **What is Chronic Bronchitis?**
  - Inflamed and thickened airways with an increase in the size and number of mucous producing cells.
- **What is Emphysema?**
  - **The progressive loss of lung function characterized by a decreased number of alveoli and enlargement and destruction of remaining alveoli.**
- **What is asthma?**
  - **Chronic allergic disorder with severe breathing difficulty from airway inflammation and bronchospasm.**

What is tuberculosis?

- Infectious disease caused by bacteria that generally affects the lungs.

What is pneumonia?

- A serious infection or inflammation of the lungs in which the air sacs fill with pus and other liquid.

What is cystic fibrosis?

- Genetic disorder in which the lungs are clogged with large quantities of abnormally thick mucus.

- Using your word parts and the text. differentiate among the breathing terms below:

  - Apnea
  - Eupnea
  - Hyperpnea
  - Hypopnea
  - Dyspnea
  - Cheyne-stokes breathing
  - Hyperventilation