

Unit 3 – TRANSPORTATION SYSTEMS

Respiratory System - Lecture Notes

DESCRIBE THE BASIC FUNCTIONS OF THE RESPIRATORY SYSTEM

- A. Warm, moisten, and filter incoming air.
 - The mouth, nose, and nasal cavity warms, moistens, and filters the air as it enters the body.
- B. Provides resonating chambers used in speech and sound production.
 - The larynx generates sound.
 - The nose provides a resonating chamber for speech sounds.
- C. Carbon dioxide gas exchange
 - The alveoli serve as a site of gas exchange (oxygen and carbon dioxide) between the air and the blood.

IDENTIFY BASIC STRUCTURES OF THE RESPIRATORY SYSTEM

- A. Nose
 - 1. Structures include a bony framework, cartilage, skin, and mucous membrane lining which contains small hairs known as cilia.
 - 2. Nostrils or nares provide the openings into the nose.
 - 3. Septum is a piece of cartilage that separates the nostrils into right and left sides.
 - 4. The functions of the nose is to warm, moisten, and filter incoming air, smell, and provide resonating chambers used in speech and sound production.
- B. Nasal Cavity
 - 1. Large, air-filled space above and behind the nose in the middle of the face.
 - 2. Where the air is warmed, filtered, and humidified.
 - 3. Nerve endings that provide the sense of smell are located in the upper part of the nasal cavity.
- C. Pharynx
 - 1. A funnel-shaped tube about 13 cm (5 inches) long.
 - 2. Located behind the mouth and nasal cavity, and above the larynx.
 - 3. The walls are composed of skeletal muscle and lined with mucous membrane.
 - 4. Divided into three sections: nasopharynx, oropharynx, and the laryngopharynx.
 - 5. Serves as a passageway for air and food.
 - 6. Provides a resonating chamber for speech sounds and assists in the formation of words.

D. Epiglottis

1. The epiglottis is below the pharynx, attached to the entrance of the larynx.
2. A large leaf-shaped piece of cartilage that covers the larynx during swallowing to prevent food from entering the larynx and trachea.
3. The epiglottis is the opening through the larynx (voice box) for the passage of air.

E. Larynx (voice box)

1. Located below the pharynx.
1. Contains the vocal cords.
2. A short passageway that connects the pharynx and the trachea.
3. Contains the epiglottis.

F. Trachea (windpipe)

1. Tubular passageway for air about 12 cm (4.5 inches) in length and 2.5 cm (1 inch) in diameter (close to the size of a hot dog).
2. Located anterior to the esophagus.
3. Extends from the larynx to the center of the chest where the bronchi branch off from it.
4. Supported by cartilage rings to prevent collapse.
5. Passageway for air.

G. Bronchi

1. The two large sets of branches that come off the trachea and enter the lungs. There are right and left bronchi.
2. The right primary bronchus is more vertical, wider, and shorter than the left which means inhaled objects are more likely to lodge in the right bronchus.
3. Passageway for air.

H. Bronchioles

1. The bronchi continue to divide to form smaller tubes called bronchioles.
2. Passageway for air.

I. Alveoli

1. At the end of the bronchioles are the small air sacs or alveoli which are one-cell thick and surrounded by many blood capillaries.
2. Serve as a site of gas exchange (oxygen and carbon dioxide) between the air and the blood.

J. Lungs

1. The organs where exchange of atmospheric oxygen and waste carbon dioxide take place.

DESCRIBE THE DISEASES AND DISORDERS ASSOCIATED WITH THE RESPIRATORY SYSTEM

A. Common Cold (Coryza)

The common cold is caused by one of many viruses. Signs and symptoms include fatigue, sneezing, coughing, congestion, body aches and pains, and nasal secretions. Treatment includes medication to reduce the discomfort of signs and symptoms.

B. Pneumonia

Pneumonia is an inflammatory illness of the lung. It is described as lung inflammation and abnormal alveolar filling. Pneumonia can result from a variety of causes, including infection with bacteria, viruses, fungi, or parasites, and chemical or physical injury to the lungs. Symptoms include cough, chest pain, fever, and difficulty breathing. Treatment depends on the cause of pneumonia, but is typically treated by antibiotics.

C. Lung Cancer

Lung Cancer is a disease of uncontrolled cell growth in tissues of the lung. This growth may lead to an invasion of adjacent tissues and infiltration beyond the lungs. The vast majority of primary lung cancers are carcinomas of the lung. The most common symptoms are shortness of breath, coughing (including coughing up blood), and weight loss. The most common cause of lung cancer is long term exposure to tobacco smoke. Possible treatments include surgery, chemotherapy, and radiotherapy.

D. Asthma

Asthma is a reversible obstructive airway disease characterized by periods of coughing, difficulty breathing, or wheezing. Asthma is caused by spasms of the smooth muscles that line the wall of the smaller bronchi and bronchioles. Treatment includes antibiotics, SVN (small volume nebulizer), or use of an inhaler.

E. Bronchitis

Bronchitis is an inflammation of the bronchi, primarily caused by genetic factors, air pollution, carbon monoxide, respiratory infection, and deficient antibody levels. Signs and symptoms include a productive cough, low grade fever, soreness, and constriction behind the sternum. Treatment may include antibiotics and removal of known irritant.

F. Tuberculosis

Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*. It is an infectious, communicable disease that destroys the lung tissue and pleura replacing it with a fibrous connective tissue. Inhaled respiratory droplets spread disease. Signs and symptoms include fatigue, night sweats, lesions on the body, aches in muscles and joints, and loss of appetite. Treatment consists of rest, medications and relief from emotional stress.

G. Influenza

Influenza (also known as the flu) is a contagious respiratory illness caused by flu viruses. It can cause mild to severe illness, and at times can lead to death. The flu is different from a cold. The flu usually comes on suddenly and may include the following symptoms: fever (usually high), headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, muscle aches, nausea, vomiting, and diarrhea. Treatment includes rest, drinking plenty of fluids, and taking medications to relieve the symptoms of flu.

H. Emphysema

Emphysema is a progressive disease that can result in disability, and in severe cases, heart or respiratory failure and death. The alveoli become stretched out and are not able to push the carbon dioxide and other pollutants out of the lungs. Can be caused by smoking, frequent, untreated respiratory infections, asthma, or abnormal stress on the lungs. Symptoms are: anxiety, shortness of breath, difficulty breathing, cough, cyanosis, unequal chest expansion, rapid heartbeat, and elevated body temperature. Treatment includes: adequate rest, a balanced diet, not smoking, keeping the lungs clean, medications, oxygen, and the possibility of a lung transplant.