

Module 15: Respiratory System — Study Questions

Respiratory System Overview

1. What are the primary functions of the respiratory system?
2. What is the difference between external respiration and internal respiration?
3. How do the respiratory and cardiovascular systems work together?
4. How does respiration help regulate blood pH?

Anatomy of the Respiratory System

1. What structures make up the upper respiratory tract?
2. What is the function of the nasal cavity in respiration?
3. What are the differences between the pharynx and the larynx?
4. What prevents food from entering the trachea during swallowing?
5. Describe the structure of the trachea. What keeps it open?
6. What happens to the airways as they branch into smaller bronchi and bronchioles?
7. What are alveoli, and why are they important for gas exchange?
8. What is surfactant, and why is it essential for lung function?
9. What would happen if the lungs could not produce surfactant?

Mechanics of Breathing

1. What muscles are involved in inspiration?
2. Describe what happens to the diaphragm and rib cage during inhalation.

3. Is normal exhalation active or passive? Explain.
4. How do pressure changes in the chest cavity cause air to move in and out of the lungs?
5. What is tidal volume?
6. What is vital capacity, and how does it differ from total lung capacity?
7. What is residual volume, and why is it important?

Gas Exchange

1. Where in the respiratory system does gas exchange occur?
2. What factors make alveoli efficient for gas exchange?
3. Describe the process of gas exchange between alveolar air and blood.
4. What determines the direction gases move during diffusion?
5. How does the partial pressure of oxygen in the alveoli compare to that in the pulmonary capillaries?

Gas Transport

1. How is most oxygen transported in the blood?
2. What is hemoglobin, and how does it carry oxygen?
3. What is the oxygen-hemoglobin dissociation curve?
4. How is carbon dioxide transported in the blood? Name three ways.
5. What is the most common form in which CO₂ is transported?
6. How does the release of CO₂ in the lungs relate to the release of oxygen to tissues?

Control of Breathing

1. Where in the brain are the respiratory centers located?
2. What is the primary chemical stimulus for breathing?
3. How do chemoreceptors influence the rate and depth of breathing?
4. Why does holding your breath eventually become uncomfortable?
5. How does breathing change during exercise, and why?

Respiratory Health

1. What is asthma, and how does it affect breathing?
2. What is chronic obstructive pulmonary disease (COPD)?
3. How does smoking affect the respiratory system?
4. Why is pneumonia particularly dangerous for gas exchange?