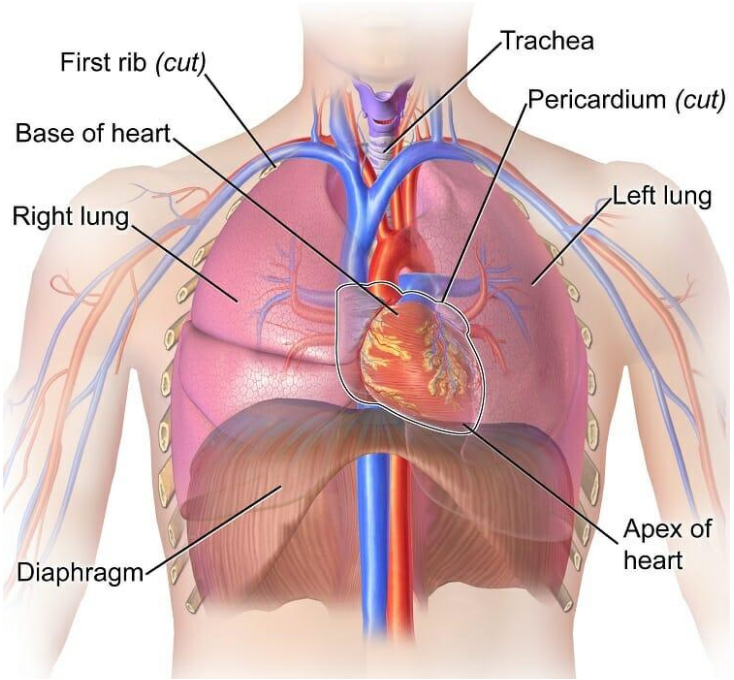
Respiratory System

Learning Objectives

1. Understand the importance of the Respiratory System
2. Understand the functions of the Respiratory System
3. Understand the circulatory pathways

The Function of System

The respiratory system is responsible for gas exchange between the body and the external environment. The respiratory system helps bring oxygen into the cells of the body and helps eliminate waste gases like carbon dioxide when you exhale. The respiratory system connects to and interacts with every other part of your body.



Structures of the Respiratory System

Pharynx (throat) - Tube connecting the nose/mouth to the esophagus

Larynx (voice box) - Tube forming a passage between the pharynx and trachea

Trachea - Tube connecting the larynx to the bronchi of the lungs

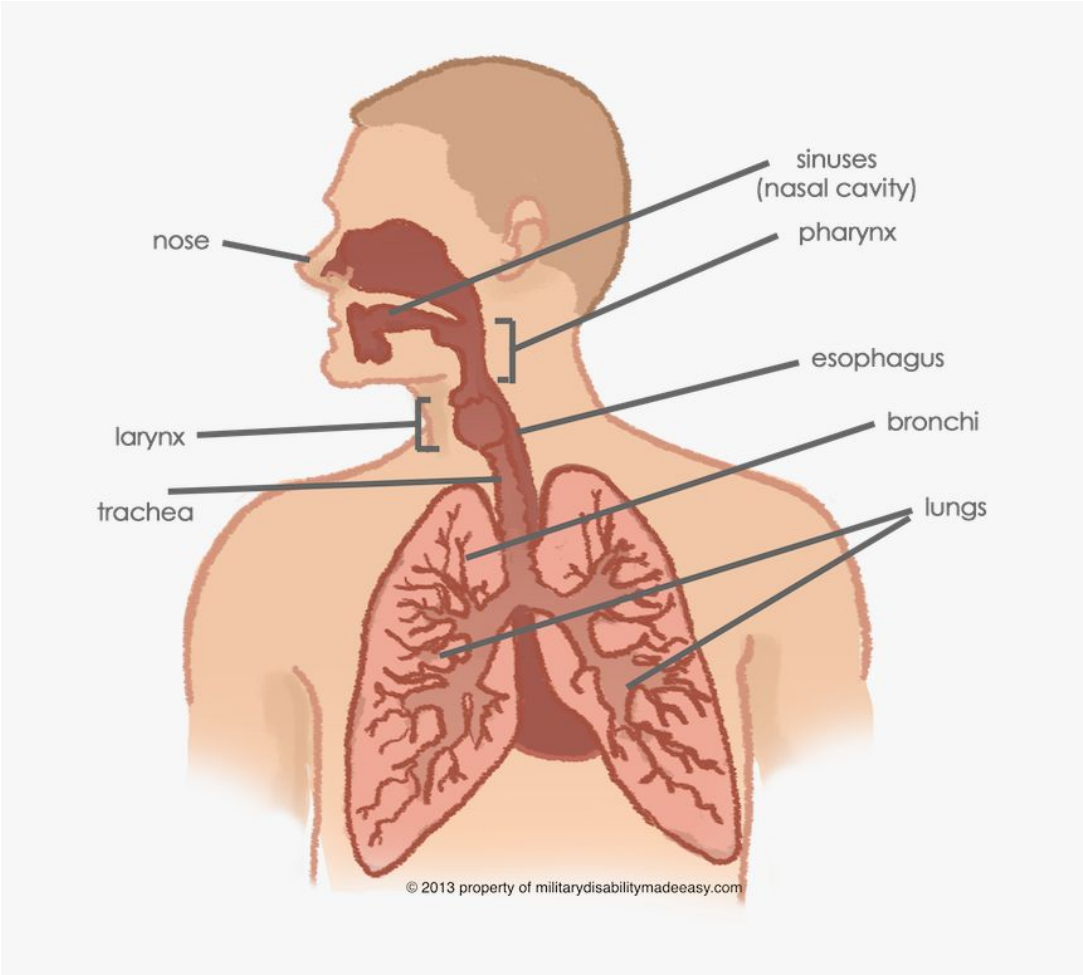
Bronchi - Branches of tissue stemming from the trachea (a left one and a right one)

Bronchioles - Tiny tubes branch off from the bronchi, extending throughout all of your lungs

Alveoli - Structures of the lung where gas exchange occurs (super small + super thin membrane)

Diaphragm - Thoracic muscle that lays beneath the lungs and aids in inhalation/exhalation

Lungs - Organs in the chest that supplies the body with oxygen, and removes carbon dioxide from the body


sinuses
(nasal cavity)
nose
pharynx
esophagus
larynx
bronchi
trachea
lungs
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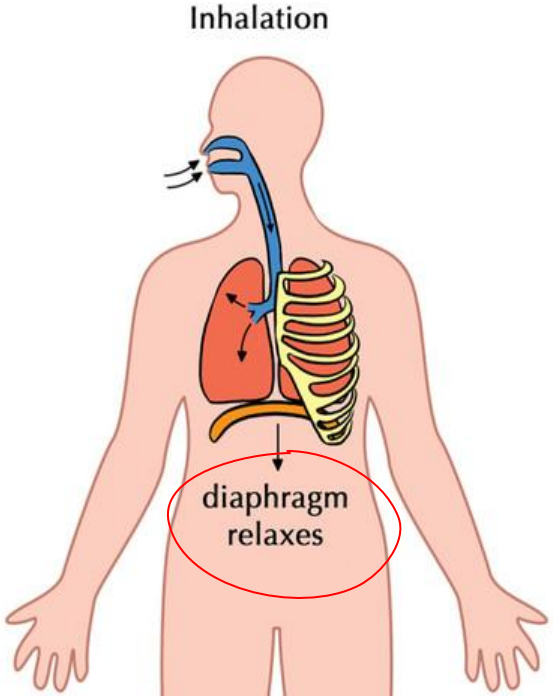
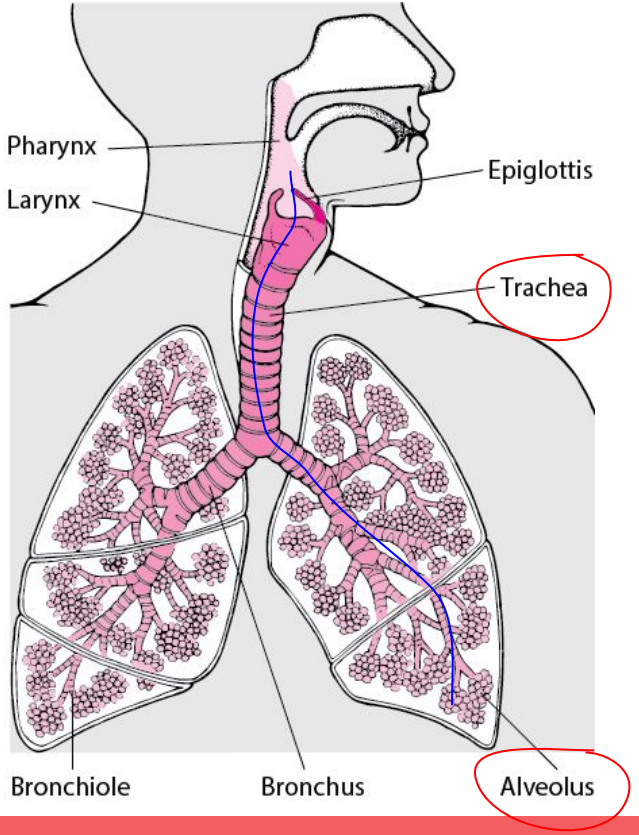
What happens when you breathe?

Pulmonary ventilation is commonly referred to as breathing. It is the process of air flowing into the lungs during inspiration (inhalation) and out of the lungs during expiration (exhalation). Air flows because of pressure differences between the atmosphere and the gases inside the lungs. When you breathe your diaphragm moves downward and your lungs expand pulling air in through your nose and/or mouth.



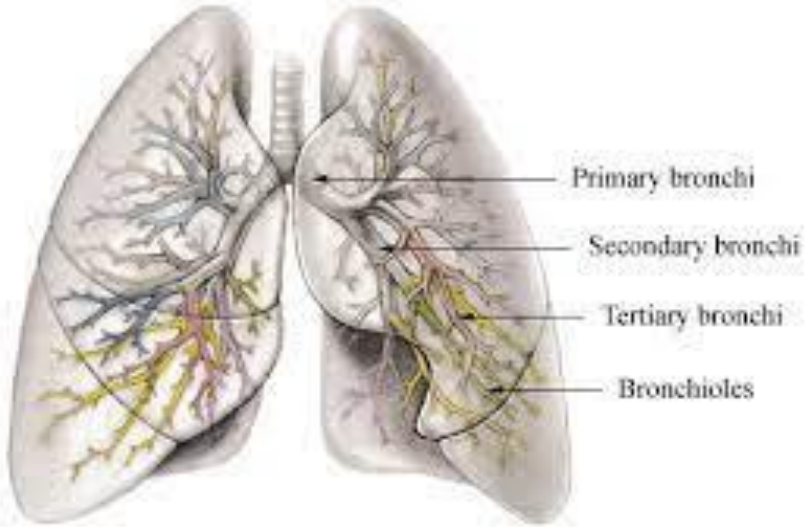
What happens when you breathe? (cont.)

Air moves from your oral cavity to your pharynx (back of throat) to your larynx (voice box). That air then moves down your trachea, through your bronchi and into the bronchioles, where it reaches your alveoli.



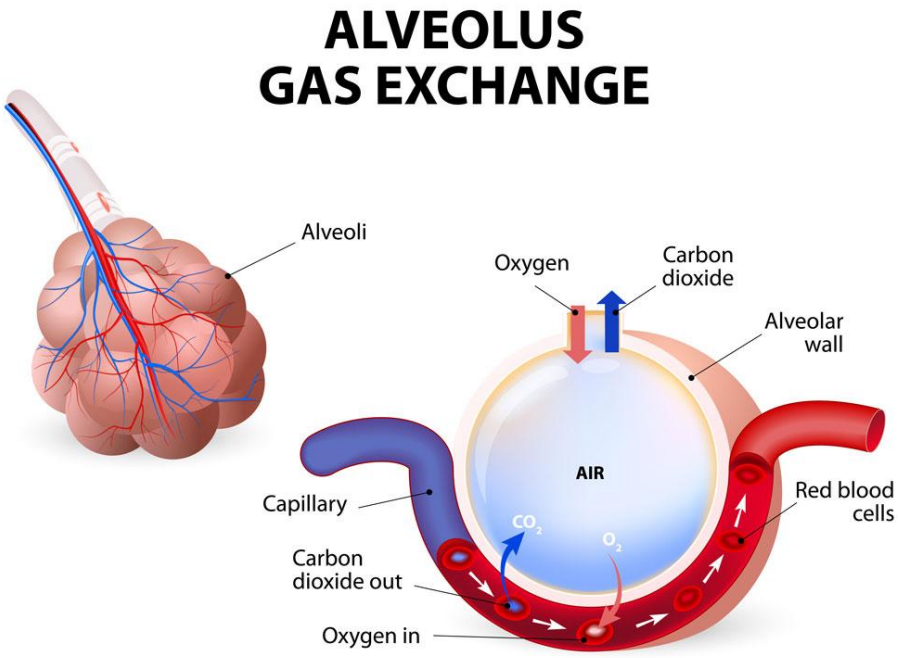
Bronchus and Bronchioles

Your bronchi carry air to and from your lungs. The bronchi also help moisturize the air you breathe and screen out foreign particles. By having the trachea go to the bronchus and then the bronchioles which keep expanding throughout the lungs, the surface area inside the lungs increases. By having a larger the surface area, the lungs are able to absorb more oxygen.



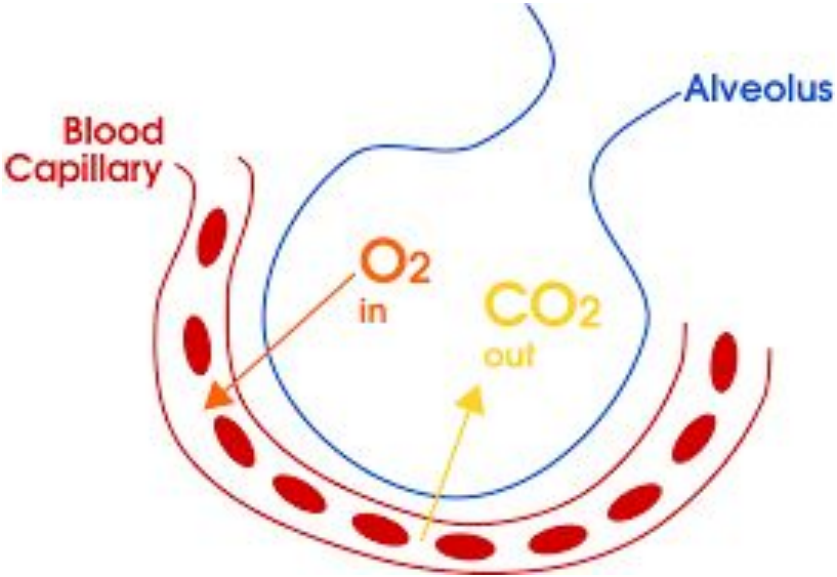
Alveoli

Alveoli are tiny air sacs at the end of the bronchioles. The alveoli are where the lungs and the blood exchange oxygen and carbon dioxide during the process of inspiration and expiration. Oxygen breathed in from the air passes through the alveoli and into the blood and travels to the tissues throughout the body. Carbon dioxide travels in the blood from the body's tissues and passes through the alveoli to be breathed out.



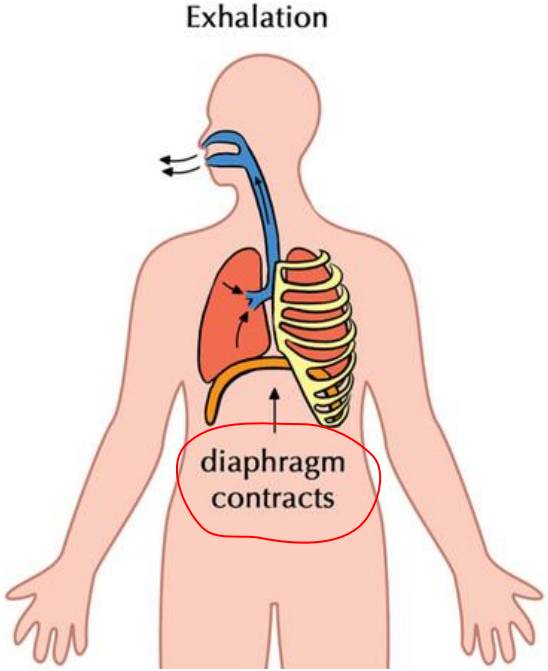
What happens when you breathe? (gas exchange)

Oxygen passes from the alveoli to the hemoglobin in the surrounding capillaries, while carbon dioxide (waste) passes from the capillaries into the alveoli, the capillaries and alveoli share a membrane. This gas exchange creates oxygen-rich blood, which is then carried to the pulmonary vein, where it travels to the left side of the heart and is then pumped throughout the rest of the body, while tissues are able to expel carbon dioxide to be carried via the bloodstream back to the lungs to be exhaled.



What happens when you breathe? (cont.)

The carbon dioxide is exhaled when your diaphragm relaxes and moves upward into the chest cavity, forcing the air out of your lungs.

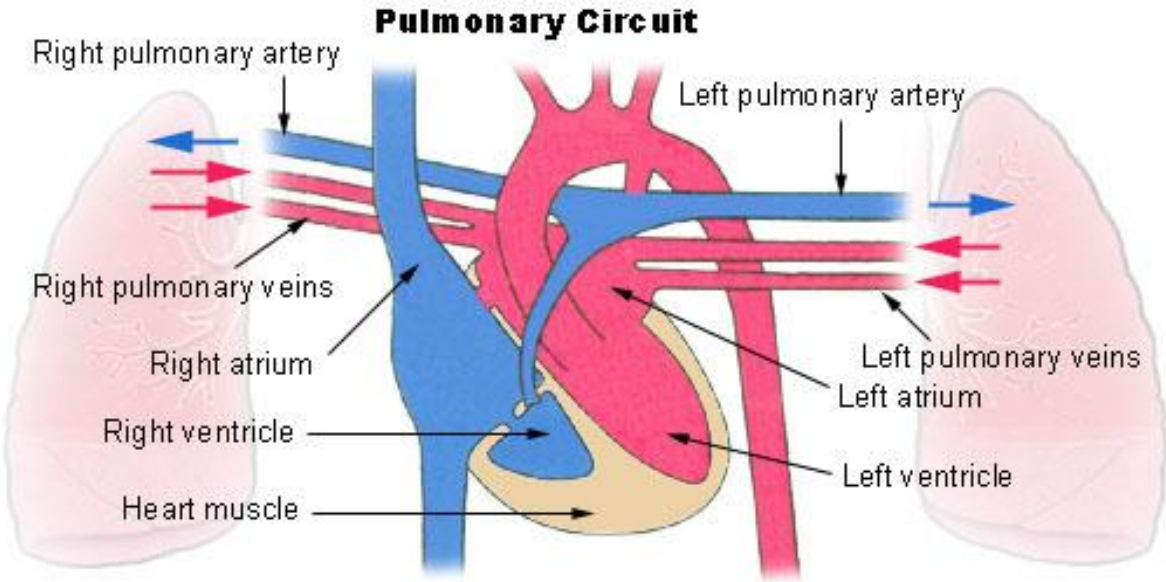


Refresher on **Circulatory Pathways**

(Cardiovascular and Respiratory are super interconnected! Where is that air going?)

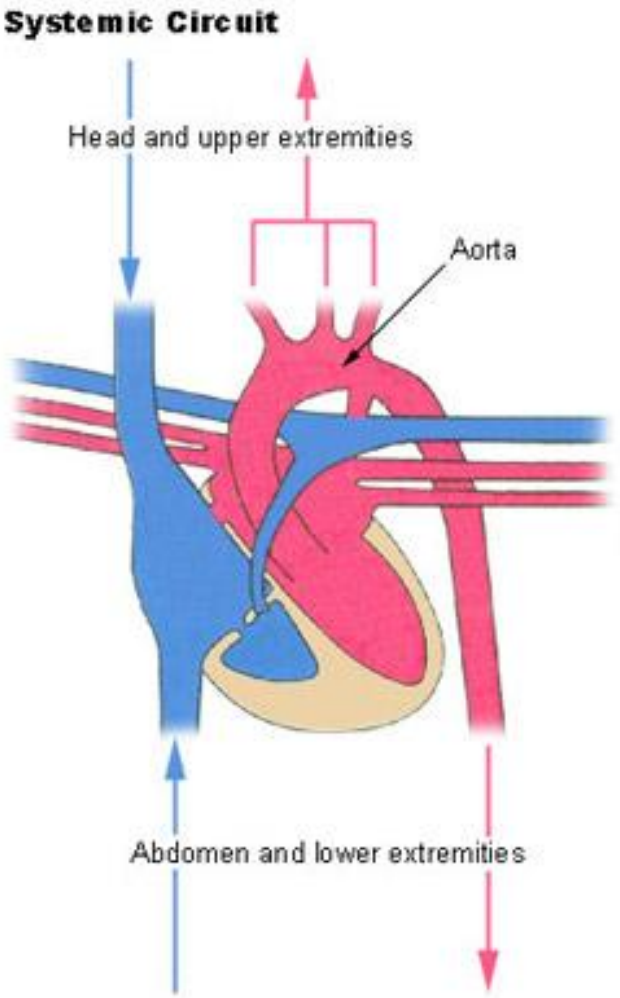
Pulmonary Circuit

Pulmonary circulation transports oxygen-poor blood from the right ventricle to the lungs, where blood picks up a new blood supply. Then it returns the oxygen-rich blood to the left atrium.



Systemic Circuit

The systemic circulation provides the functional blood supply to all body tissue. It carries oxygen and nutrients to the cells and picks up carbon dioxide and waste products. Systemic circulation carries oxygenated blood from the left ventricle, through the arteries, to the capillaries in the tissues of the body. From the tissue capillaries, the deoxygenated blood returns through a system of veins to the right atrium of the heart.



Homework

Watch video https://www.youtube.com/watch?v=MrDbiKQOtIU

Review Notes and take quiz