

Circulatory & Gas Exchange

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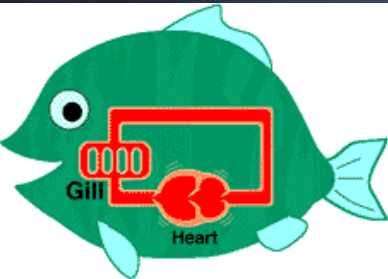
Major Parts of the Circulatory System

- Heart: consistently pumps blood through the body
- Arteries: carry blood rich oxygen away from the heart to other parts of the body
- Blood: carrier for nearly everything in the body. Transports nutrients, oxygen, antibodies, and other things to keep us healthy
- Pulmonary System: carries oxygen deprived blood away from the heart and to the lungs then back to the heart
- Capillaries: tiny, thin blood vessels, connect arteries to veins, oxygen and waste pass through the walls of the capillaries
- Veins: carry blood to the heart

The Circulatory System pumps blood throughout the body and is always flowing, never stopping. By keeping the blood flow through every part of the body it helps maintain homeostasis

Closed System vs. Open System

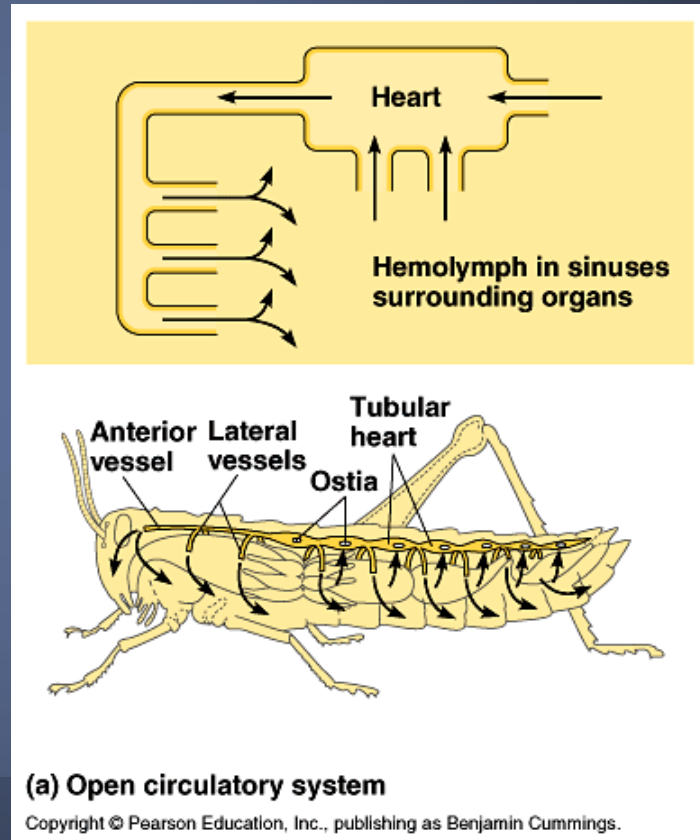
- A closed system is a system like the fish's system that is closed and consists of a pump, the heart, that pumps the blood through a series of tubes, veins and capillaries, to give the oxygen rich blood to all of the muscles.
- An open system consists of a fluid called hemolymph that bathes the organs and supplies them with oxygen. Which leads us to a wonderful quote by Mr. Noah Martin.



“No wonder when you step on grasshoppers they explode” -Noah Martin

Open Loop Circulatory System

- The open system is like a fish tank when it circulates the fluid.
- The heart is a series of long tubes which pump the hemolymph in and push it out.
- This system can be seen in arthropods, mollusks, and even crustaceans.

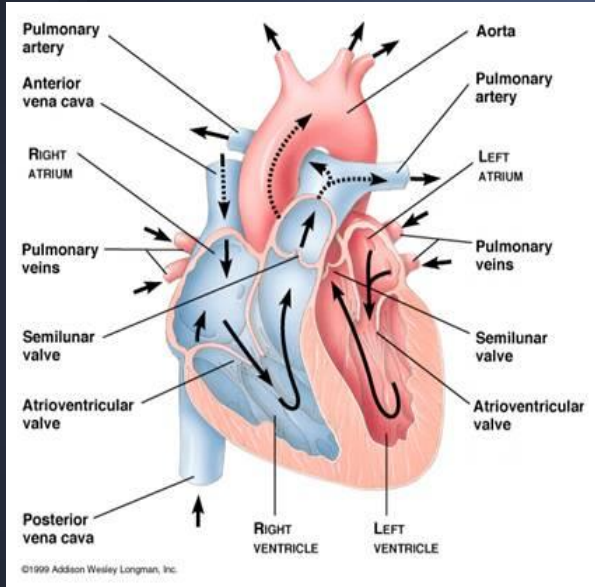


Double Circulation in Mammalia

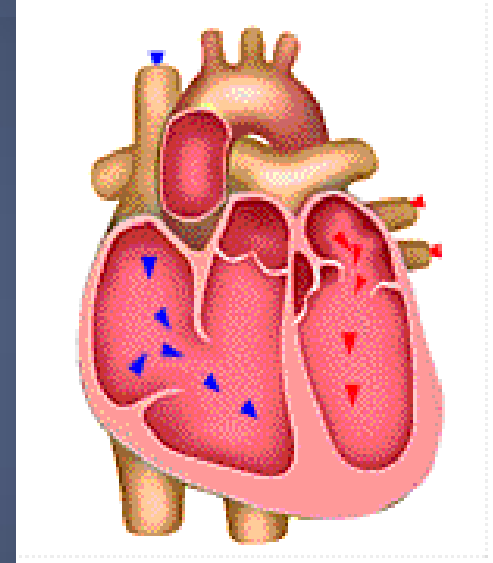
There are two different circuits in a double circulatory system

- Pulmonary Circulation
 - Deoxygenated blood is pumped from the right ventricle to the lungs. Oxygenated blood then returns to the heart through the left atrium.
- Systemic Circulation
 - Oxygenated blood is pumped out of the heart and around the body to tissue and organs through the left ventricle. Once delivering the oxygen the deoxygenated blood cells return to the heart through the right atrium to enter the pulmonary circuit, thus a neverending cycle.

Beating and Labelled Heart



- the right side of the heart receives oxygen deprived blood from your veins and sends it to your lungs
- The left side of your heart receives oxygen rich blood and transports it through the rest of your body
- The right atrium receives oxygen poor blood and pumps it to the right ventricle through the tricuspid valve
- the right ventricle pumps the oxygen deprived blood through the pulmonary valve to the lungs
- the left atrium receives oxygen rich blood from the lungs and pumps it to the left ventricle through the mitral valve
- the left ventricle pumps oxygen rich blood through the aortic valve to the rest of the body



pH levels in Blood

- pH levels are important due to denaturization in proteins, such as enzymes.
- pH levels can't go under 6.8 or over 7.8 pH
- If under 6.8 you will die due to the acidity
- If above 7.8 you will die due to your blood being too basic.
- Kidneys play a role in the balance of acids and bases in the body.

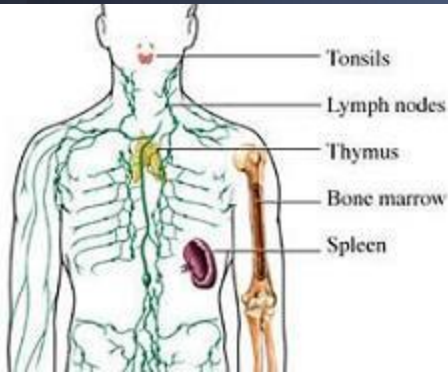
Who relies on the Circulatory System

- The muscular system relies on the circulatory system because the circulatory system sends oxygen and nutrients to the muscles through vessels
- the respiratory system relies on the circulatory system because the blood vessels can spread oxygen throughout the body
- The endocrine system releases hormones for growth and are released into the bloodstream to the appropriate part of the body
- The water that is used in the urinary system to filter the fluids in our body is carried by the bloodstream

Lymphatic System

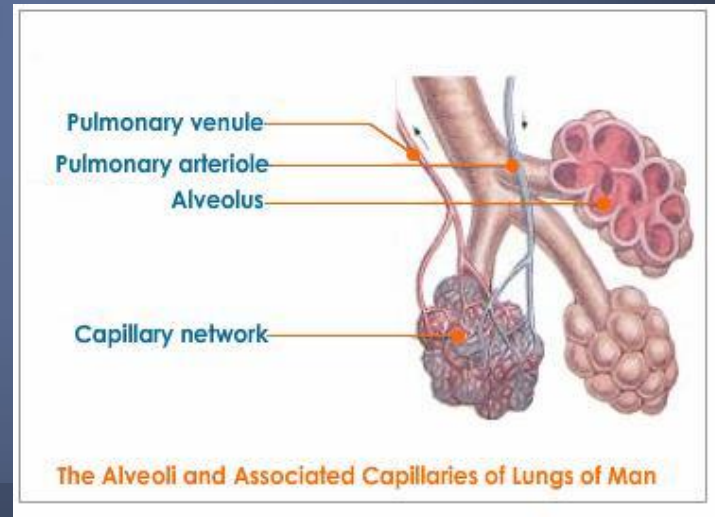
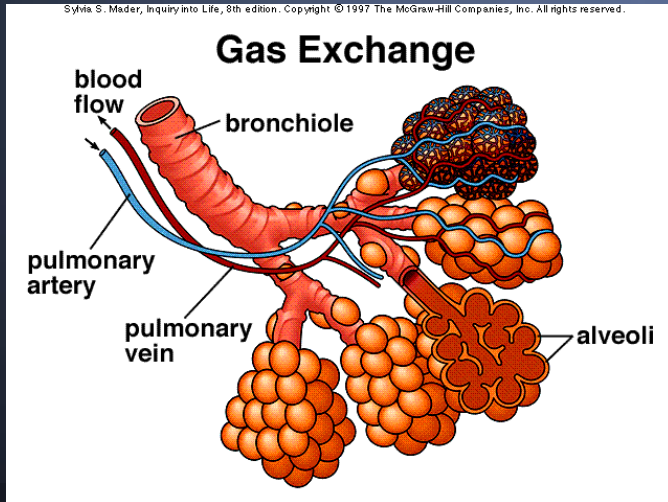
Essentially acts as the circulatory system's maid.

<https://www.youtube.com/watch?v=EEP0PYEWcwU>



Gas Exchange

Process in which blood is delivered to the lungs to exchange carbon dioxide and oxygen

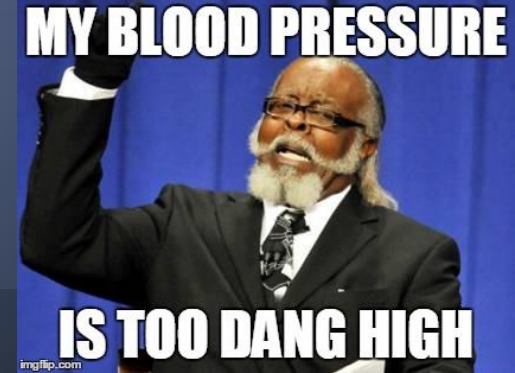
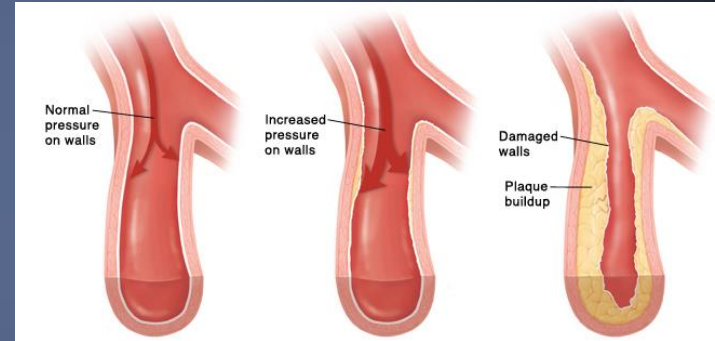
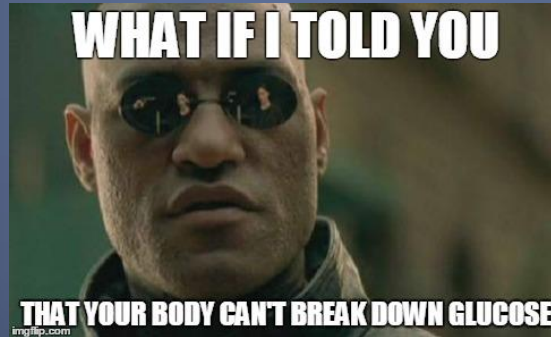


Adaptation for Gas Exchange

- Large surface area allows gas exchange to occur at a rapid pace
- The wall between the arteries and alveoli is extremely thin allowing gases to easily diffuse
- Rapid refreshing of oxygen in lungs allows alveoli to contain more oxygen than that in blood making diffusion easier

What can go Wrong

Bronchitis occurs when the mucus membrane in the [lungs](#)' bronchial passages becomes inflamed.



Cause of Bronchitis

<https://www.youtube.com/watch?v=bFEoM00pc7k>

Citation

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