

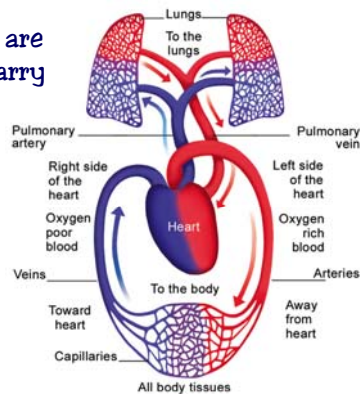
## Blood Vessels

Contractions of the heart generate blood pressure and heart valves prevent back flow of blood in the circulatory system.

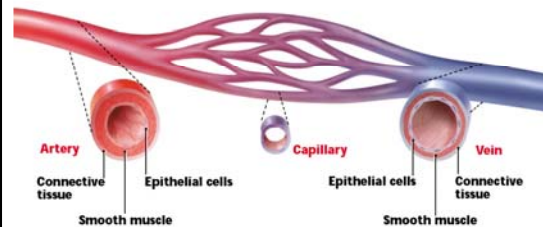
Did you know that your blood circulates through about 90,000 kilometers of blood vessels in your body?

A kilometer is 1,000 meters or 0.621 miles!

Blood vessels are organs that carry the blood throughout your body.



There are three types of blood vessels: arteries, capillaries, and veins.



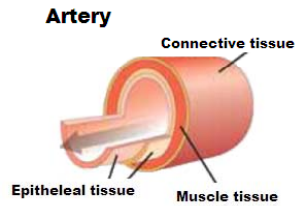
Each heart beat pushes about 90 milliliters of oxygenated blood from the heart into the *aorta*, the body's largest blood vessel.

- From there, the blood flows to smaller arteries and then capillaries.
- Eventually, it transfers its oxygen to body cells and returns back to the heart through the veins.

Arteries are blood vessels that carry blood from the heart.

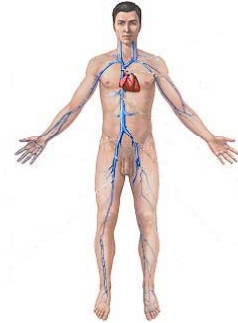
- With the exception of the pulmonary artery, they carry oxygen-rich blood.
- Each time the heart contracts, blood is pumped out at high pressure.

Arteries are made of three layers of tissues that help them withstand that pressure.



Veins are blood vessels that carry blood toward the heart.

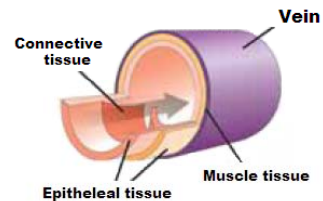
- With the exception of the pulmonary veins, they carry oxygen-poor blood.



Veins are aided in pushing blood back toward the heart by the skeletal muscles as they contract and squeeze nearby veins.



Like arteries, veins have three tissue layers.



But veins have thinner walls because they do not receive blood directly from the heart.

- The largest veins have one-way valves to keep blood flowing toward the heart.

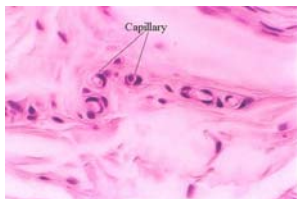
Capillaries are the smallest blood vessels where the exchange of materials with cells takes place.

- They form a net-like structure throughout your tissues.



Capillary walls are only one cell thick and may be so narrow that blood cells must pass through in single file.

- Oxygen and other materials diffuse through capillary walls into the tissues and then into cells.



Contractions of the heart generate blood pressure.

- The rhythmic change in blood pressure is called a pulse.
- Blood pressure keeps the blood flowing in the right direction.
- Valves prevent backflow of blood.

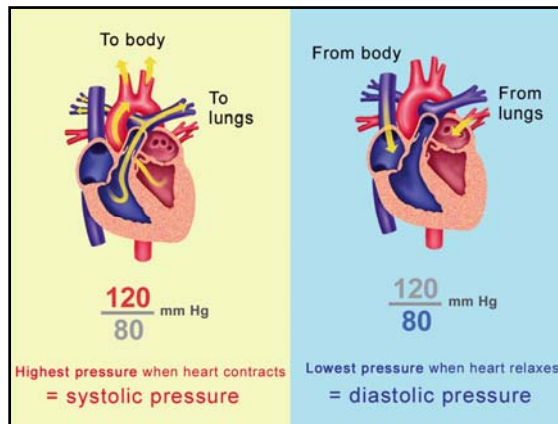
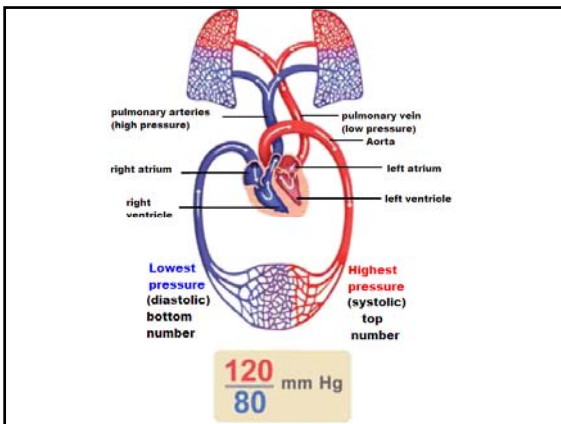


Blood pressure is a measure of the force of blood pushing against the walls of the arteries.

- It is measured in millimeters of mercury (mm Hg).
- A pressure of 100 mm Hg means the pressure is great enough to push a narrow column of mercury 100 mm high.

Normal blood pressure is 120/80 mm Hg.

- The top number is called the systolic pressure; the lower number is called diastolic pressure.
- Systolic pressure is the maximum force exerted against artery walls each time the heart contracts.
- Diastolic pressure is the force exerted on the arteries when the heart relaxes.



A *sphygmo'ma'nom'e'ter* is used to measure blood pressure.

- The cuff is pumped up with air to restrict blood flow in the arm.
- As the pressure in the cuff is released, blood starts flowing again.
- You can hear the flow in a stethoscope.



The number at which blood starts flowing is the measure of the systolic pressure.

- Pressure in the cuff continues to release.
- The point at which no sound is heard indicates the pressure in the system when the heart is relaxed— the diastolic reading

Blood pressure increases with age.

- The blood vessels of an infant are very elastic.
- As the elasticity of a person's blood vessels decreases, their blood pressure increases; this is what typically happens with age.

