



CIRCULATION

With each heartbeat, blood is sent throughout our bodies, carrying **oxygen and nutrients** to every cell. Every day, the approximately 10 pints (**5 liters**) of blood in your body travel many times through about 60,000 miles (**96,560 kilometers**) of blood vessels that branch and cross, linking the cells of our organs and body parts

The circulatory system is composed of the heart and blood vessels, including arteries, veins, and capillaries.

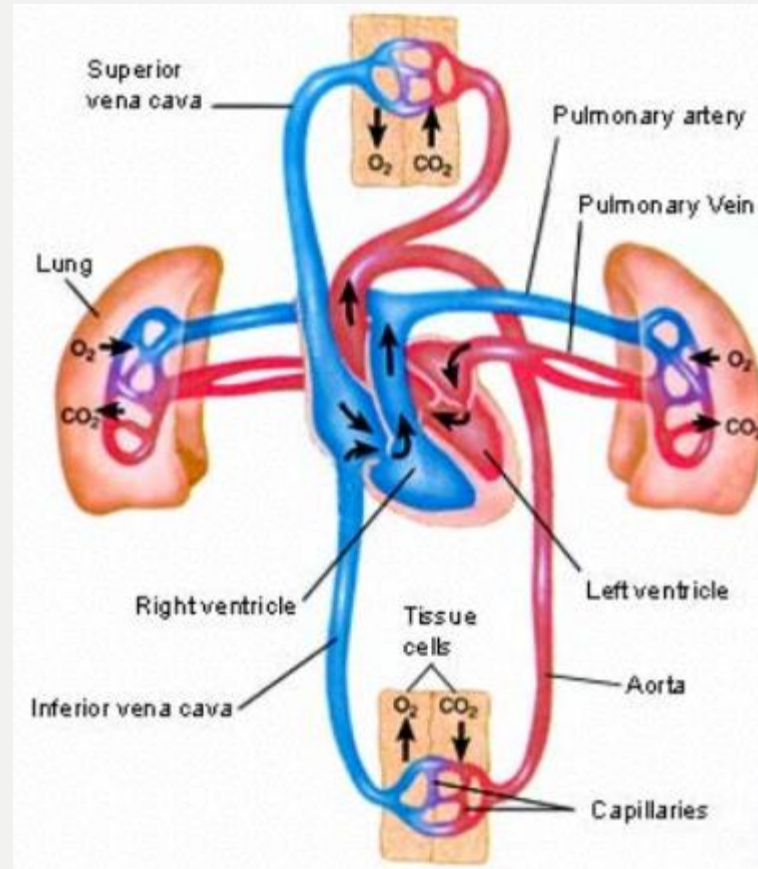
Our bodies actually have **two** circulatory systems...

- The pulmonary circulation is a short loop from the heart to the lungs and back again
- The systemic circulation (the system we usually think of as our circulatory system) sends blood from the heart to all the other parts of our bodies and back again.

Within the heart there are two systems...

1. PULMONARY SYSTEM = vessels that carry blood to and from the LUNGS

2. SYSTEMIC SYSTEM = vessels that carry blood to and from BODY cells



THE HEART

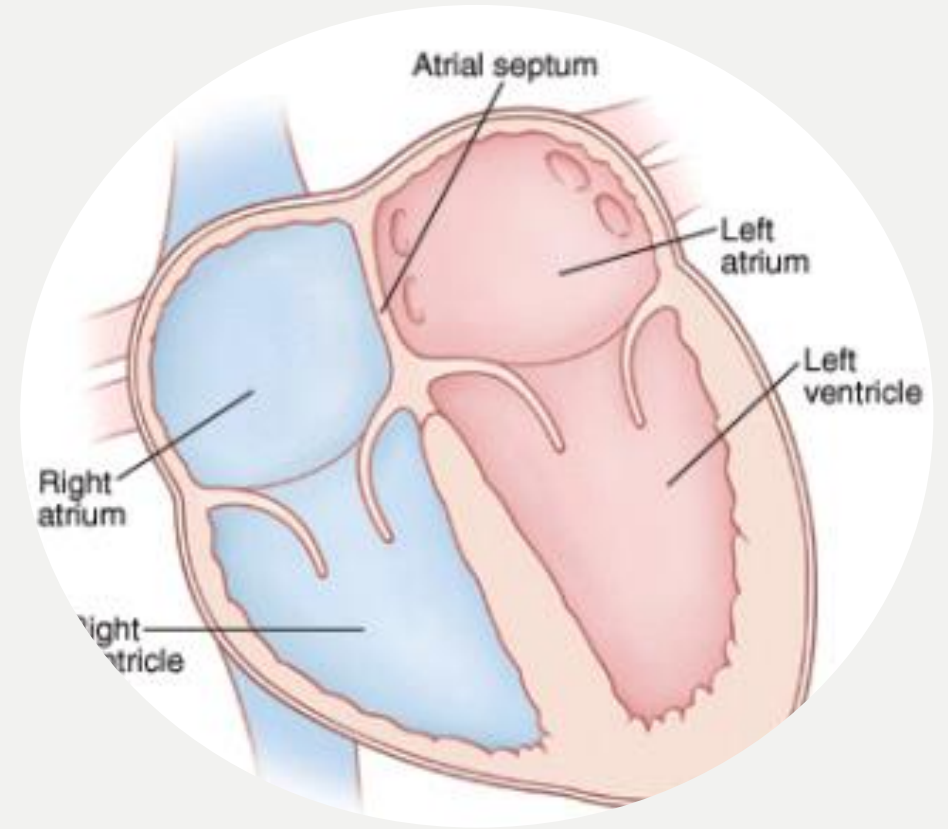




The heart is the key organ in the circulatory system. As a hollow, muscular pump, its main function is to **propel blood** throughout the body. It usually beats from 60 to 100 times per minute, but can go much faster when necessary.

It beats about 100,000 times a day, more than 30 million times per year, and about 2.5 billion times in a 70-year lifetime!

- System of parallel pumps (right and left side)
- Separated by SEPTUM (wall of muscle)

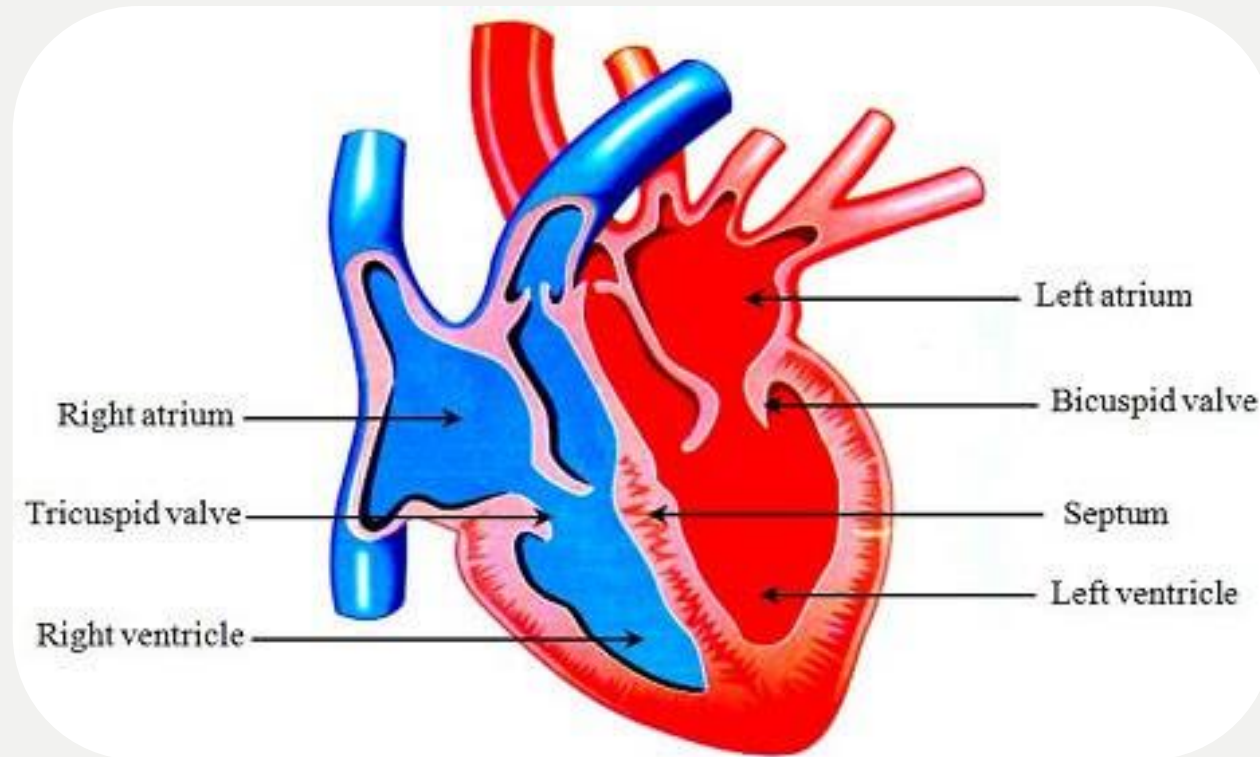


RIGHT SIDE

- Receives deoxygenated blood from the body cells

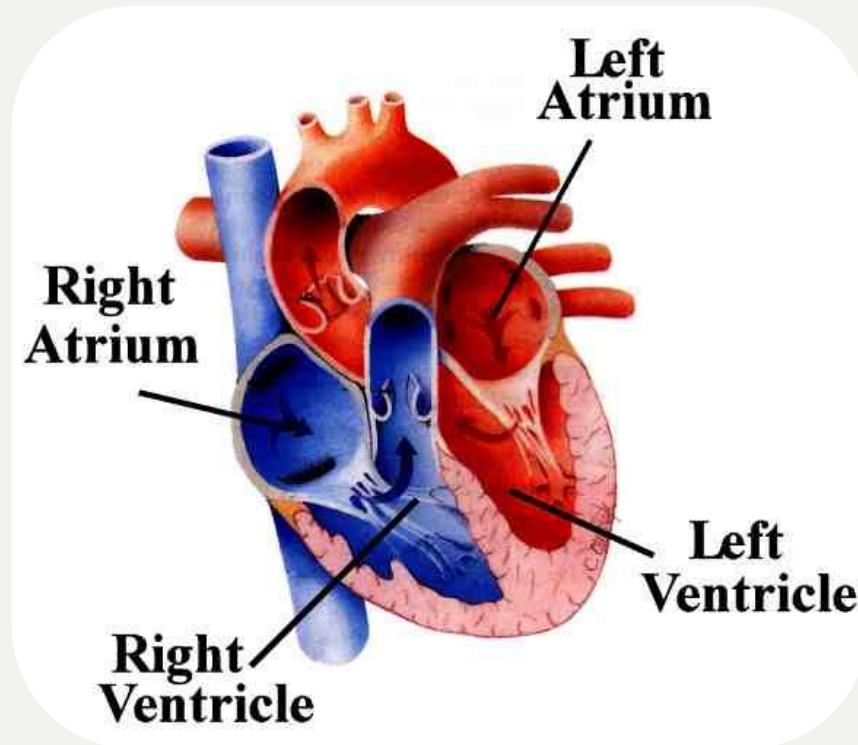
LEFT SIDE

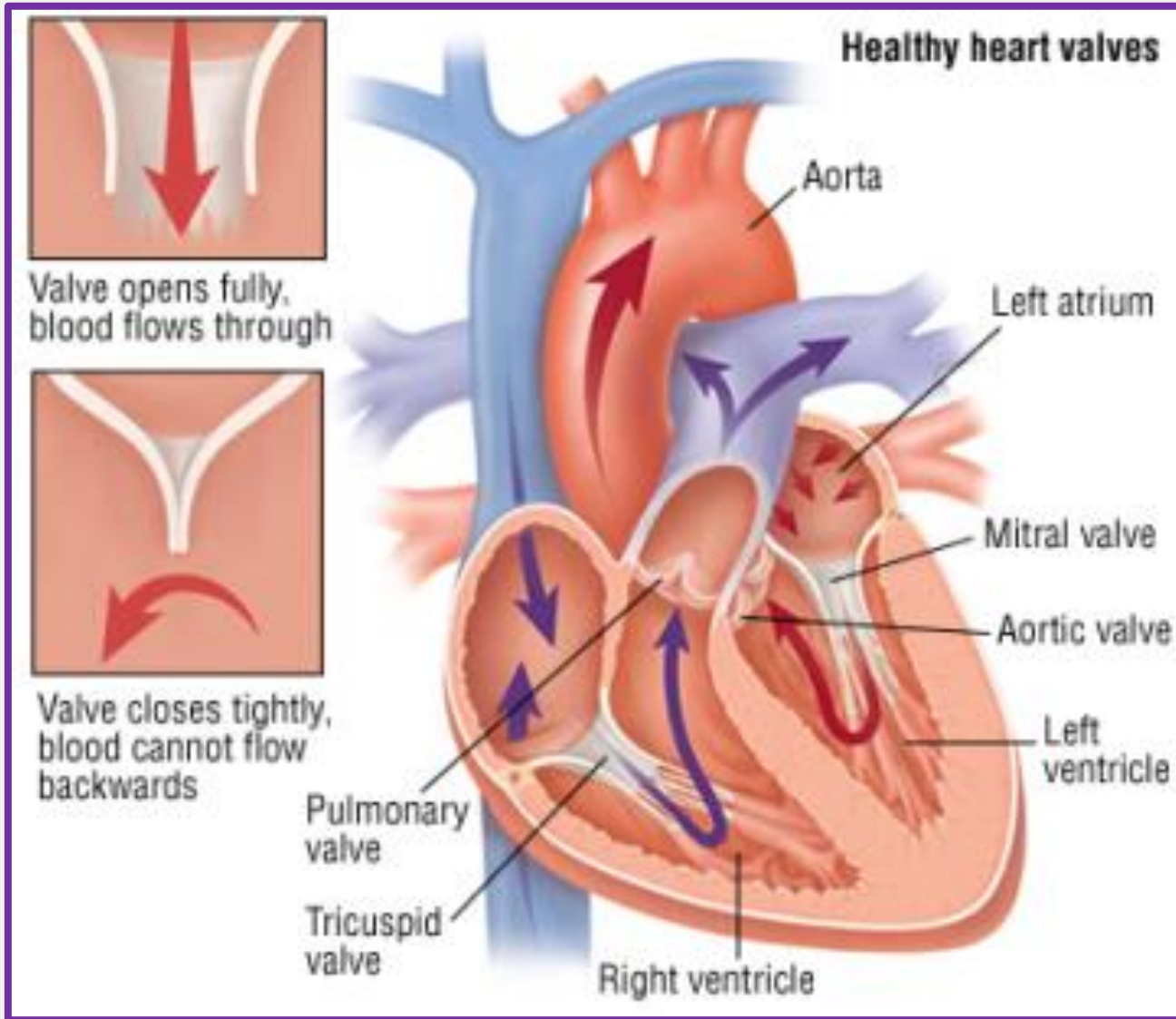
- Receives oxygenated blood from the lungs



Each side has 2 chambers:

1. **ATRIUM** = thin walled, receive blood from veins
2. **VENTRICLE** = thicker walls, pump blood out of heart into arteries



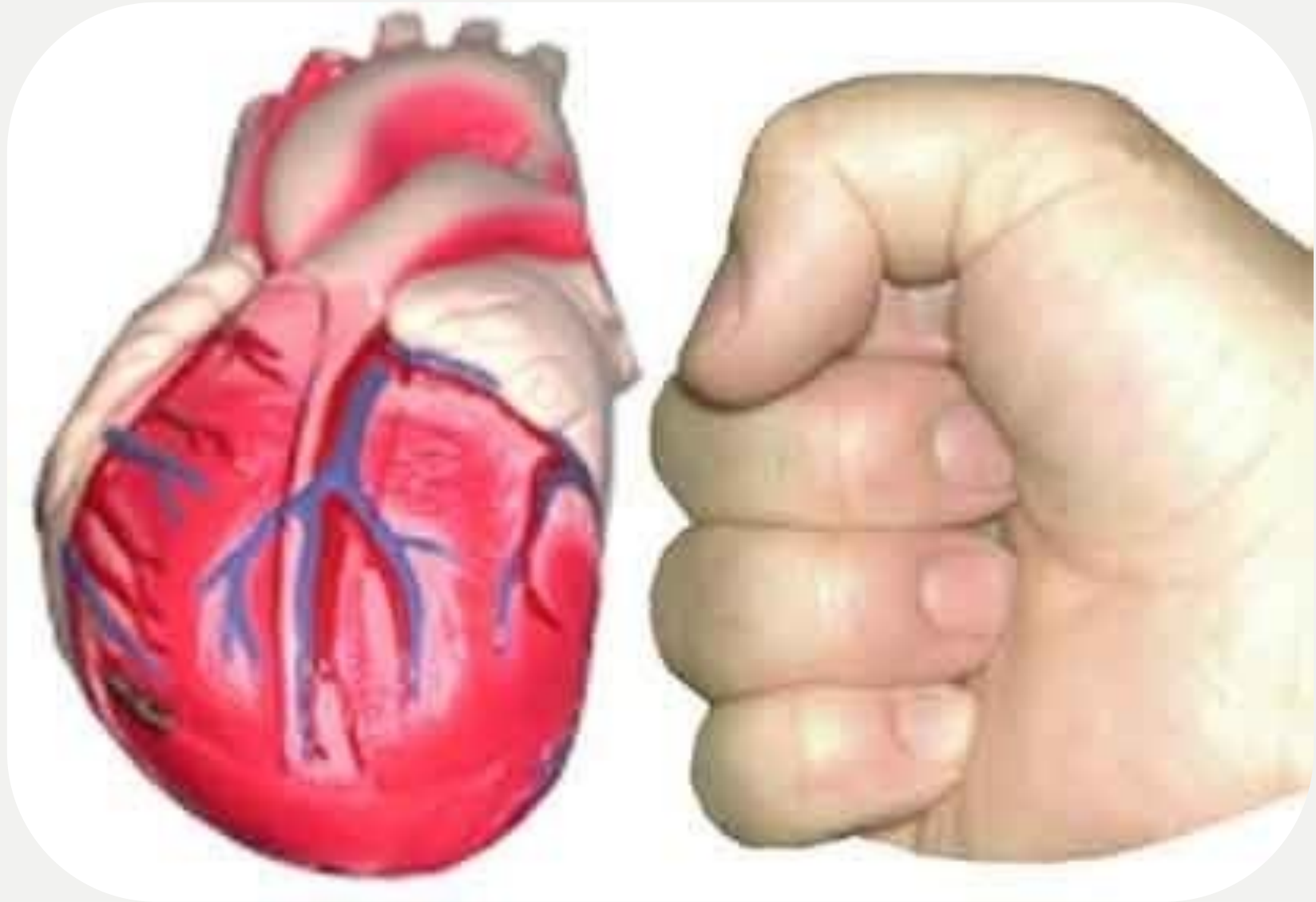


The heart also contains several **VALVES** which prevent the backward flow of blood

DID YOU KNOW?



- It takes 10 seconds for a person to become unconscious if blood stops flowing into the brain
- There are more heart attacks on a Monday than on any other day
 - Make a fist. That's how big your heart is!

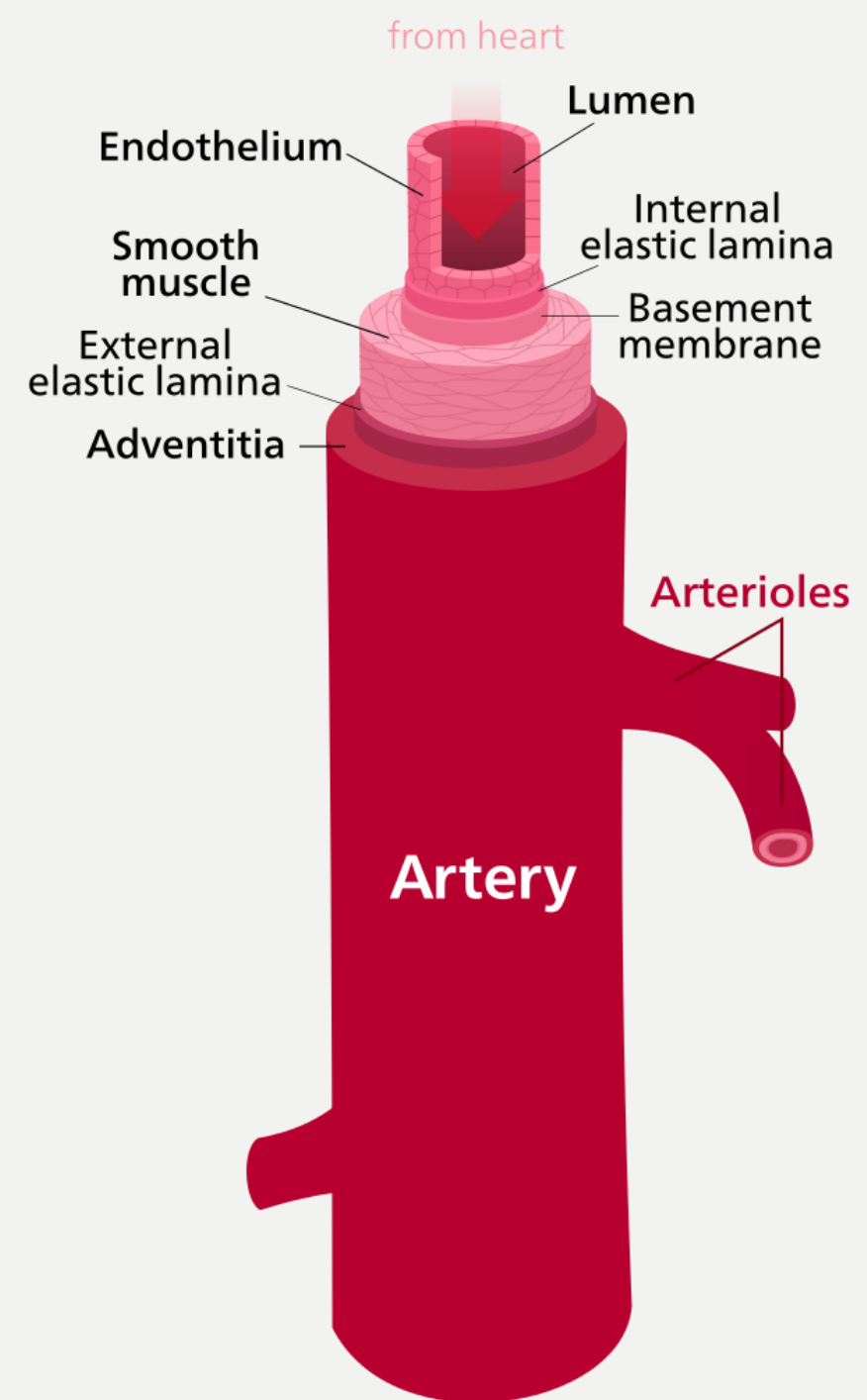


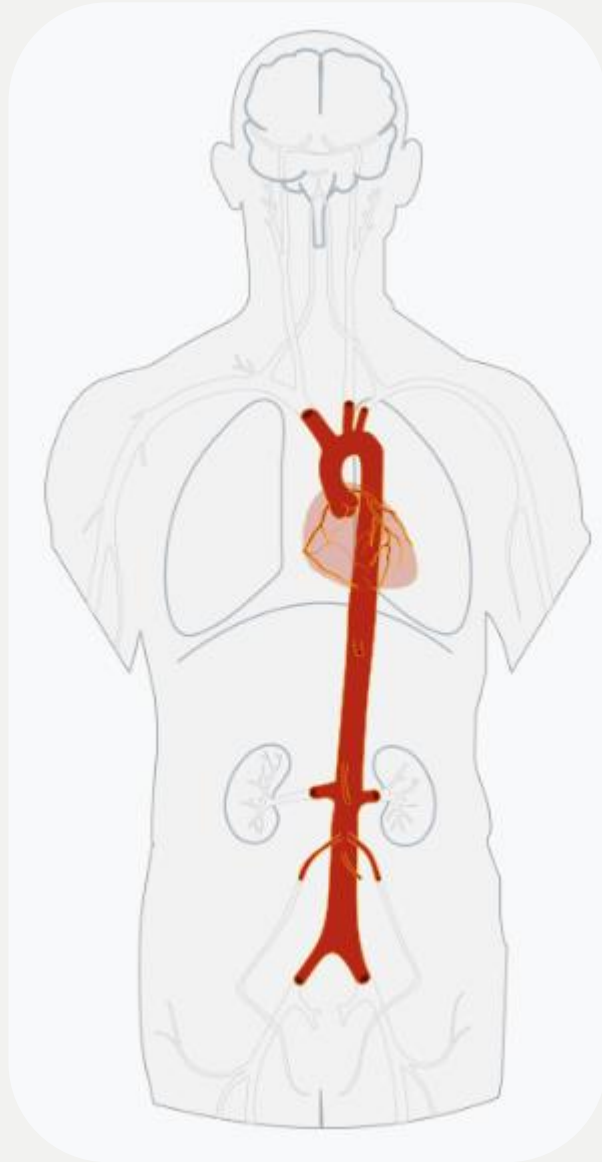
BLOOD VESSELS



ARTERIES

- Carry blood from heart to organs
 - Branch into smaller arterioles



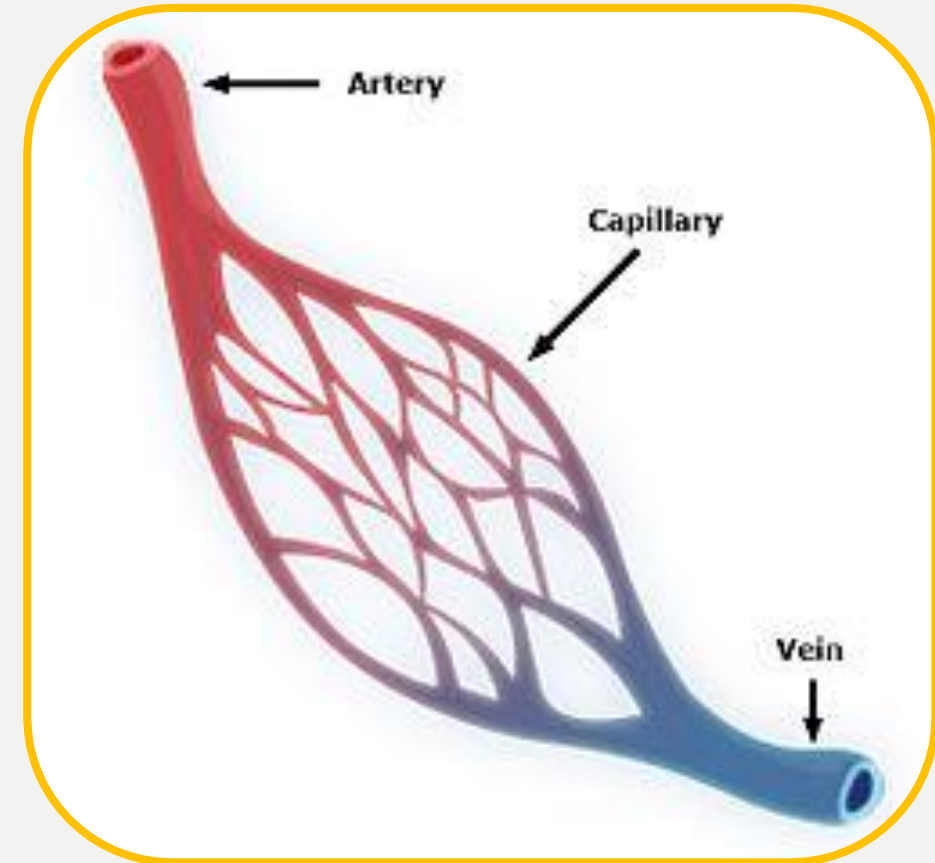


THE AORTA is the **main artery** in the human body, originating from the left ventricle of the heart and extending down to the abdomen, where it splits into two smaller arteries.

The aorta distributes oxygenated blood to the entire body through systemic circulation.

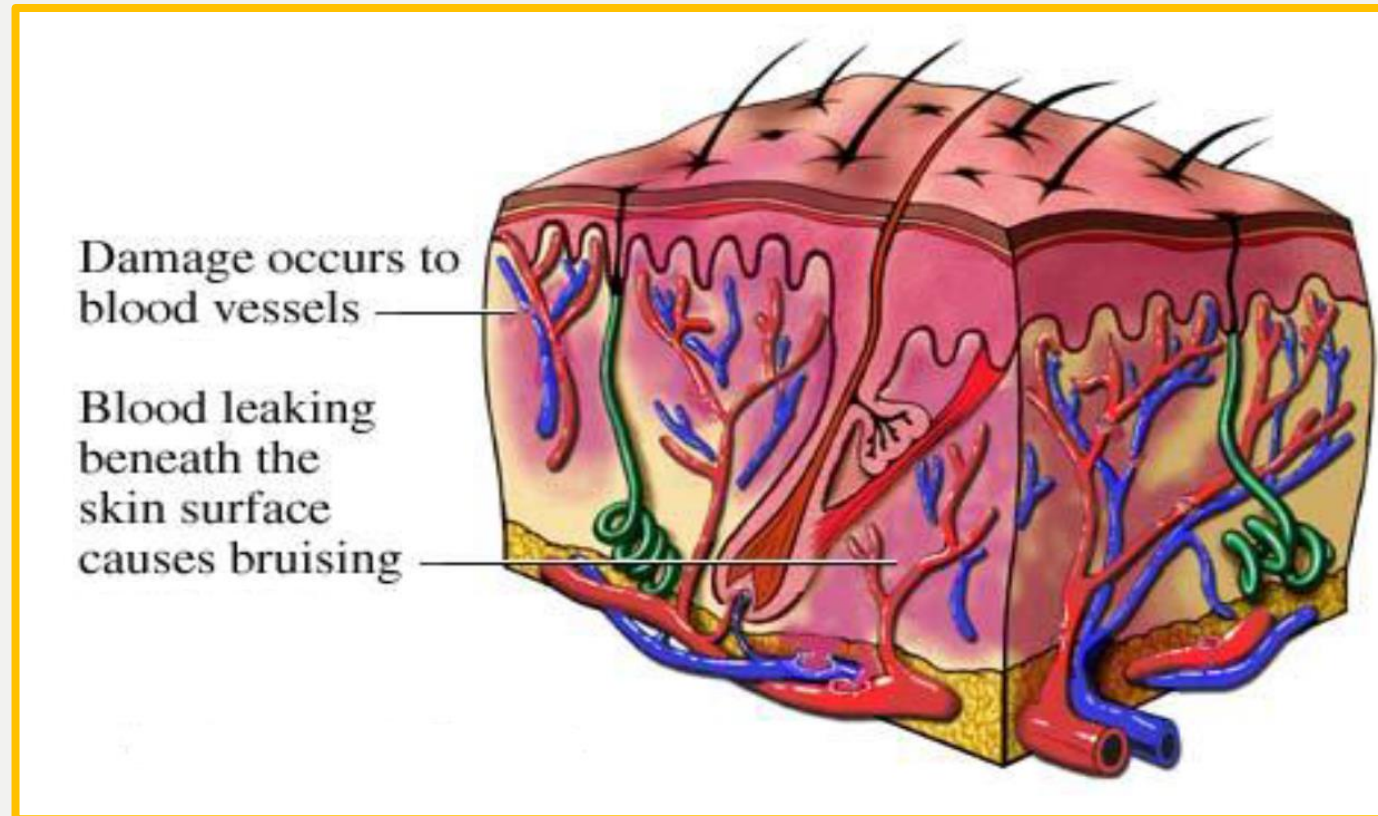
CAPILLARIES

- Microscopic
- Have thin, porous walls that only allow one RBC to travel through at a time
 - Form a network (CAPILLARY BED) which is ideal for diffusion
- Gas exchange



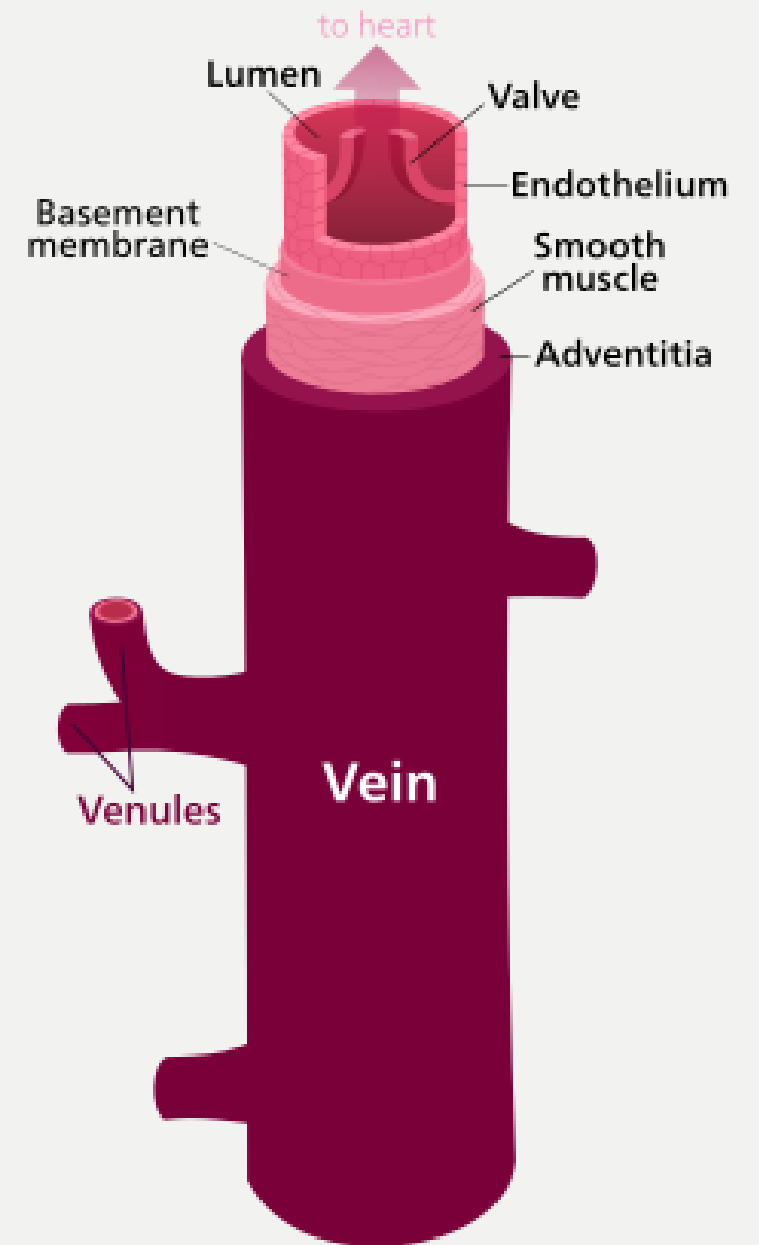
BRUISE

When the thin layer around capillaries are ruptured, the blood rushes into the spaces between cells



VEINS

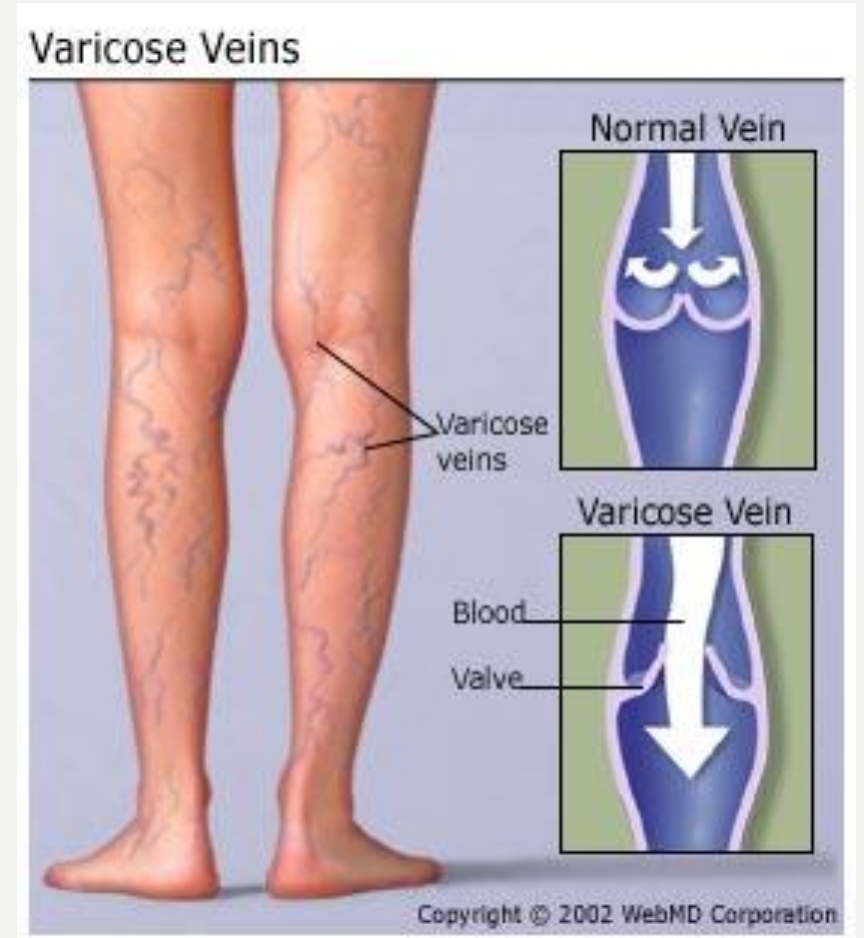
- Bring blood back to the heart
 - Have valves
- Convergence of venules



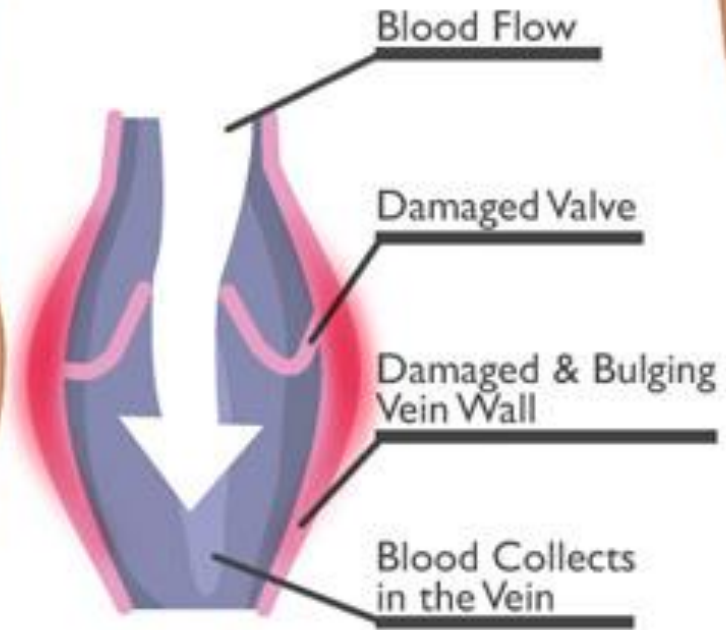
VARICOSE VEINS

Surface veins become large and bulge due to large volumes of blood.

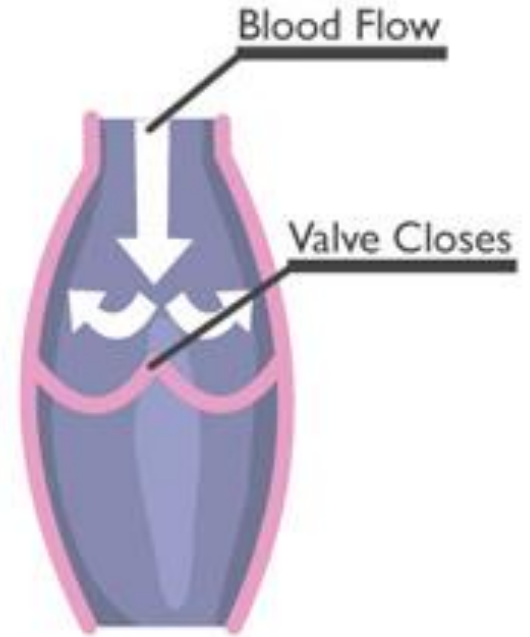
Causes: prolonged standing, restricted movement, hereditary



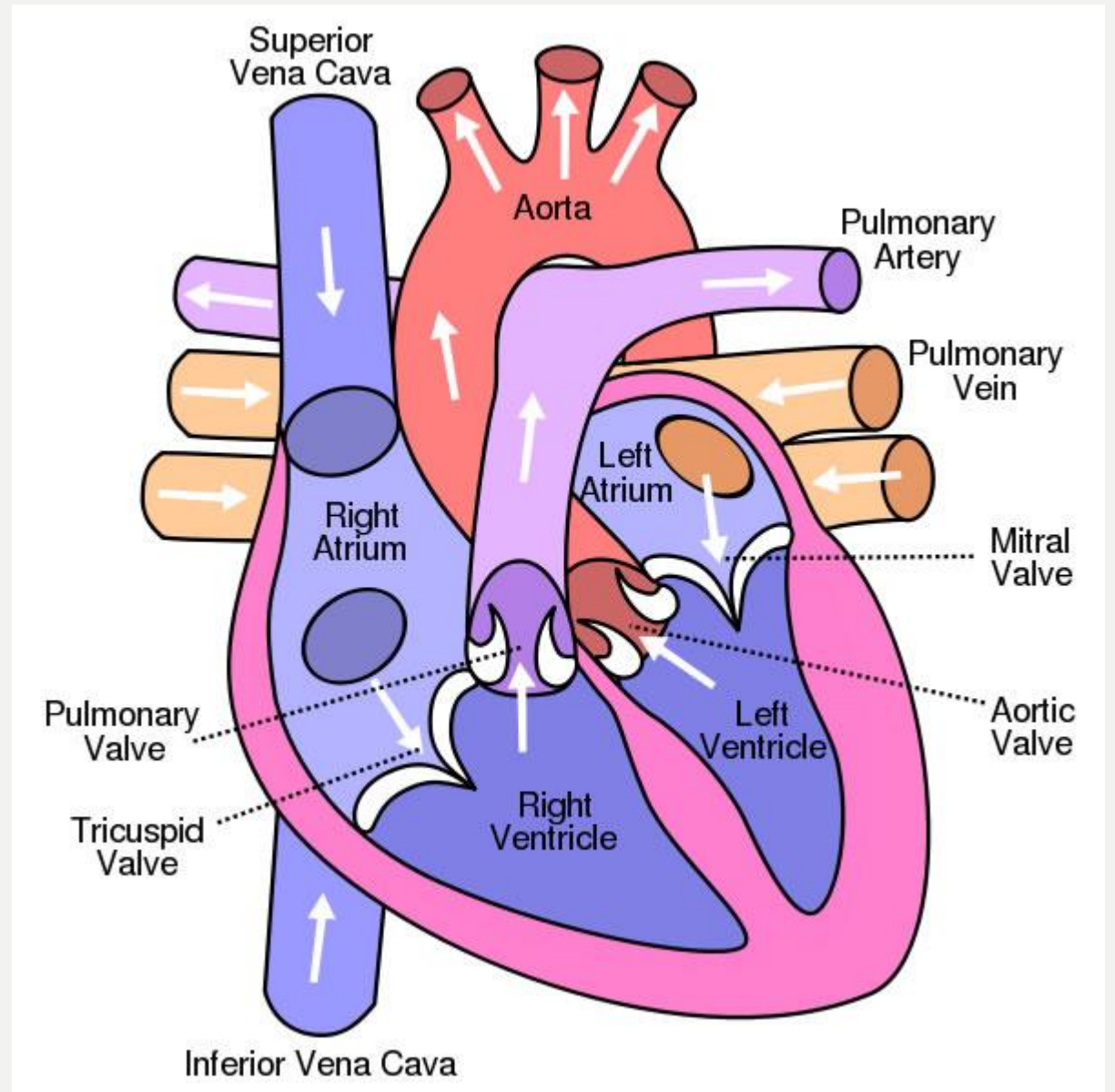
VARICOSE VEINS



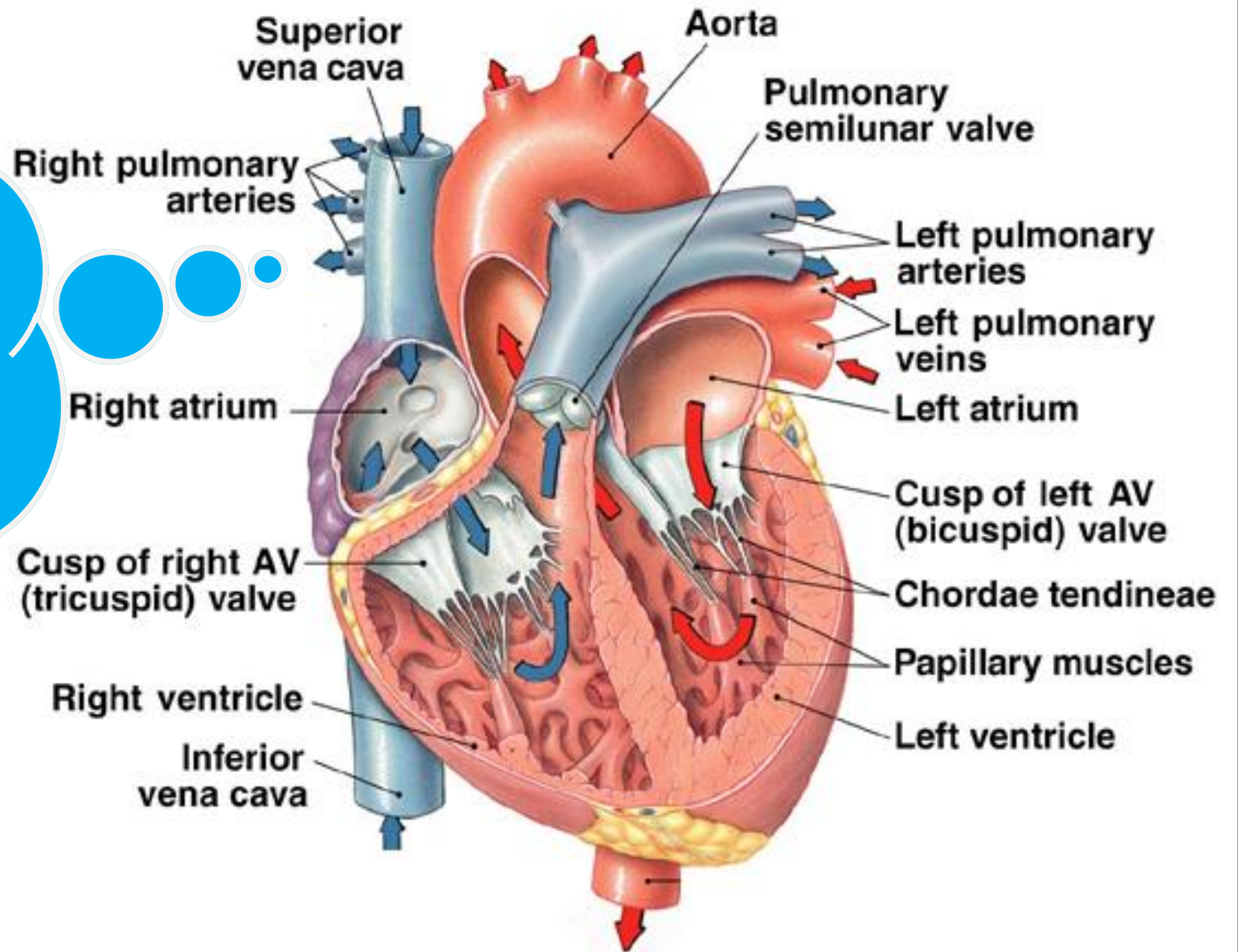
HEALTHY VEINS



PARTS OF THE HEART

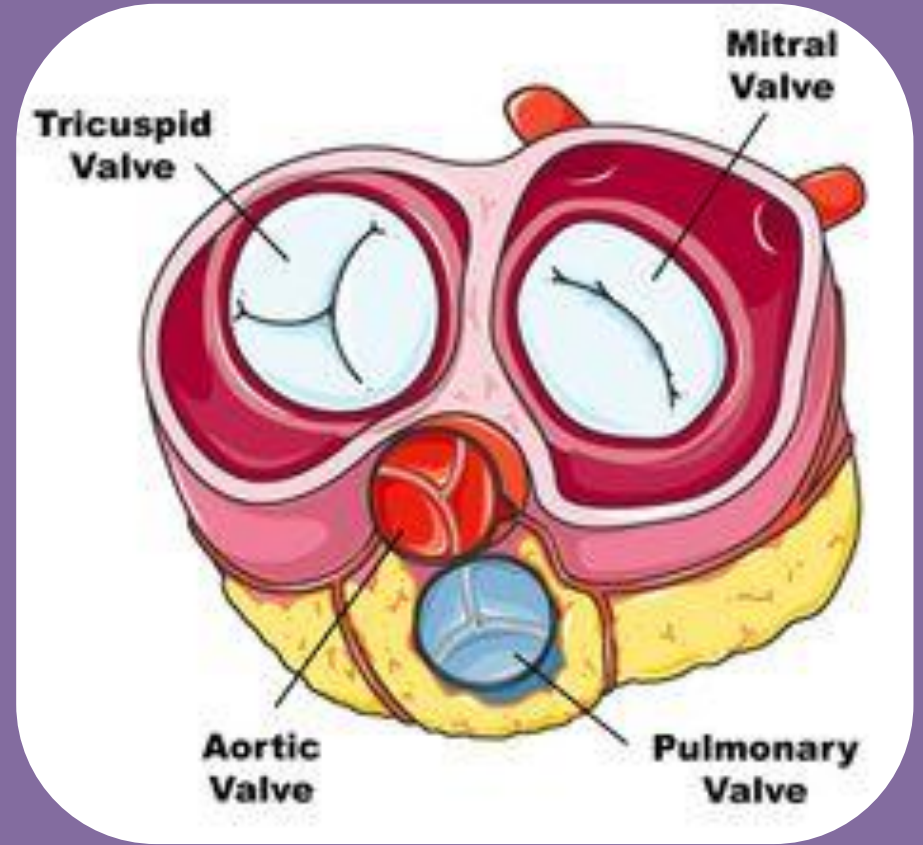
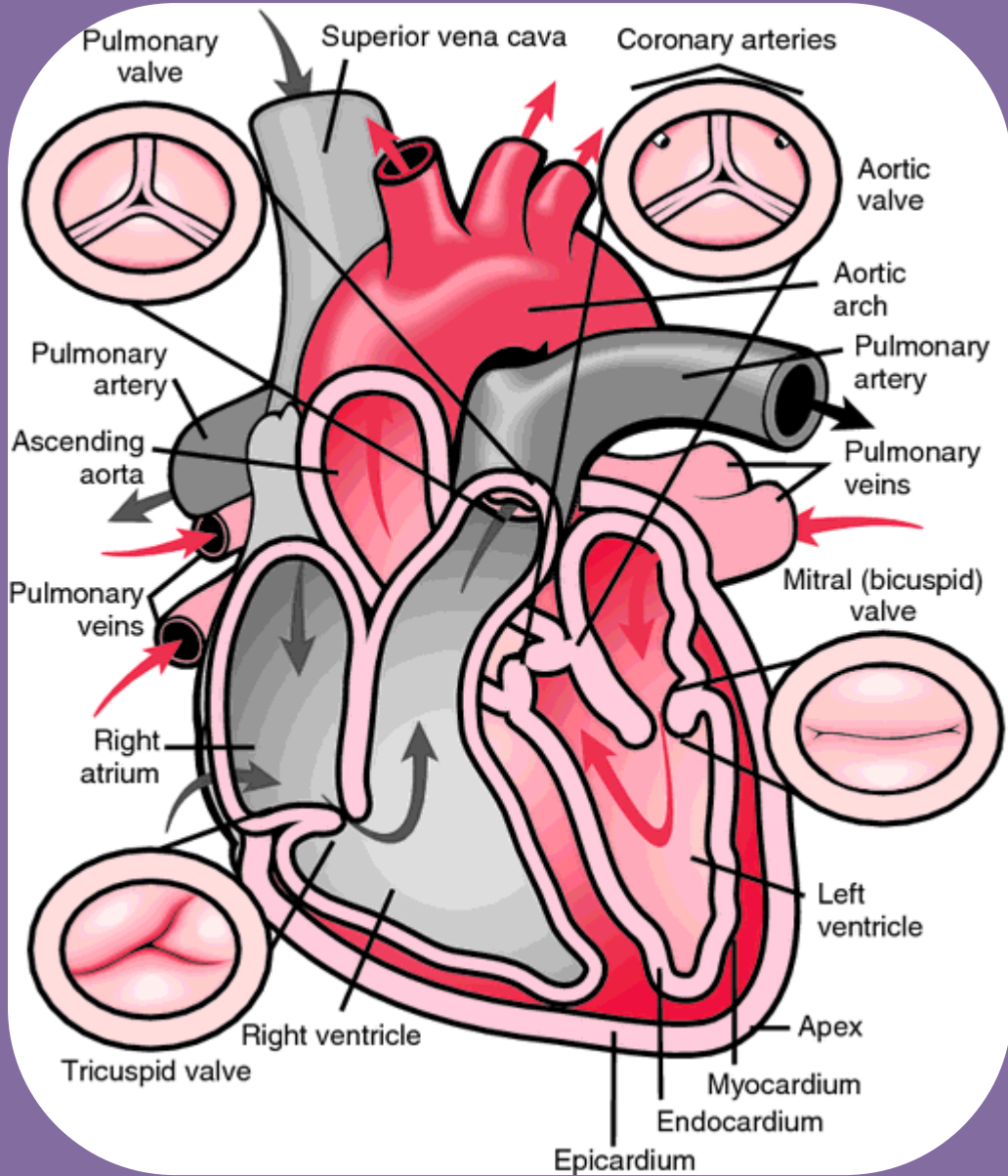


PULMONARY
means “*relating to the lungs*”.



TRICUSPID

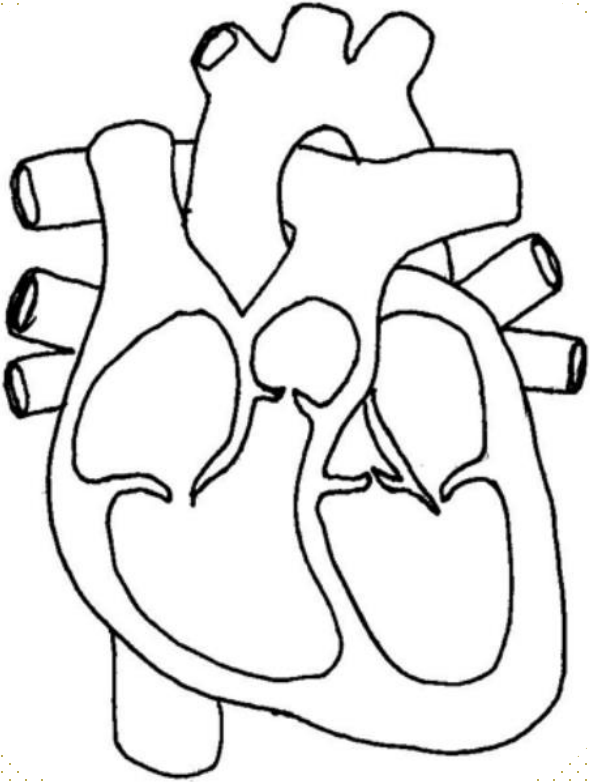
means "*has three cusps*"!



RIGHT SIDE OF HEART

Use a **blue marker** to show the blood flow through the right side of the heart

Superior and inferior vena cava → right atrium → right atrioventricular (tricuspid) valve → right ventricle → pulmonary valve → pulmonary arteries



LEFT SIDE OF HEART

Use a **red marker** to show the blood flow through the left side of the heart

Pulmonary veins → left atrium → left atrioventricular (bicuspid or mitral) valve → left ventricle → aortic valve → aorta