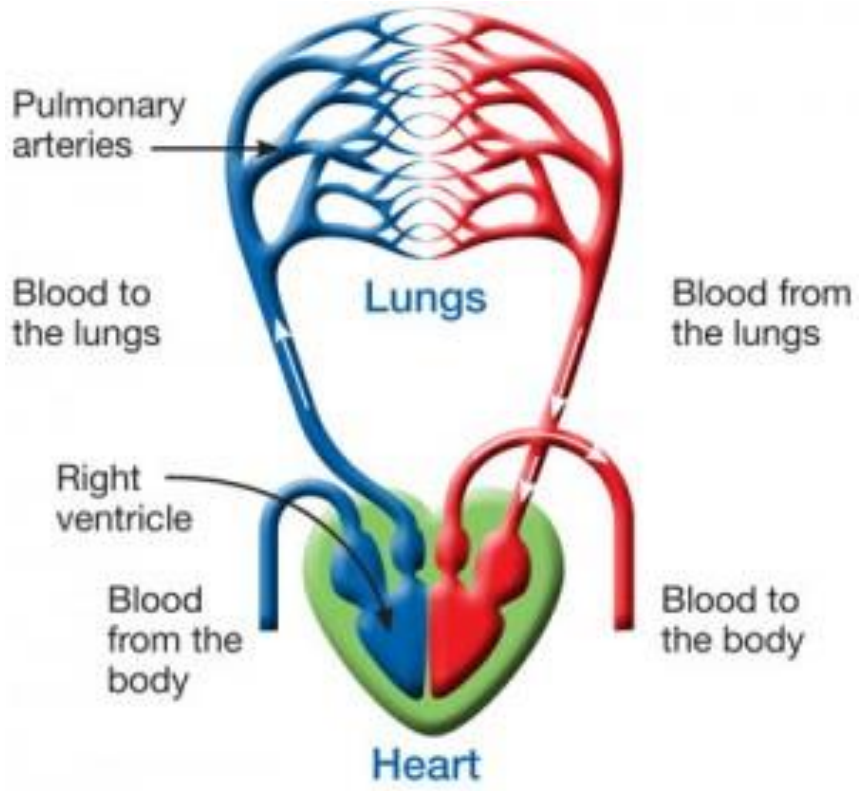
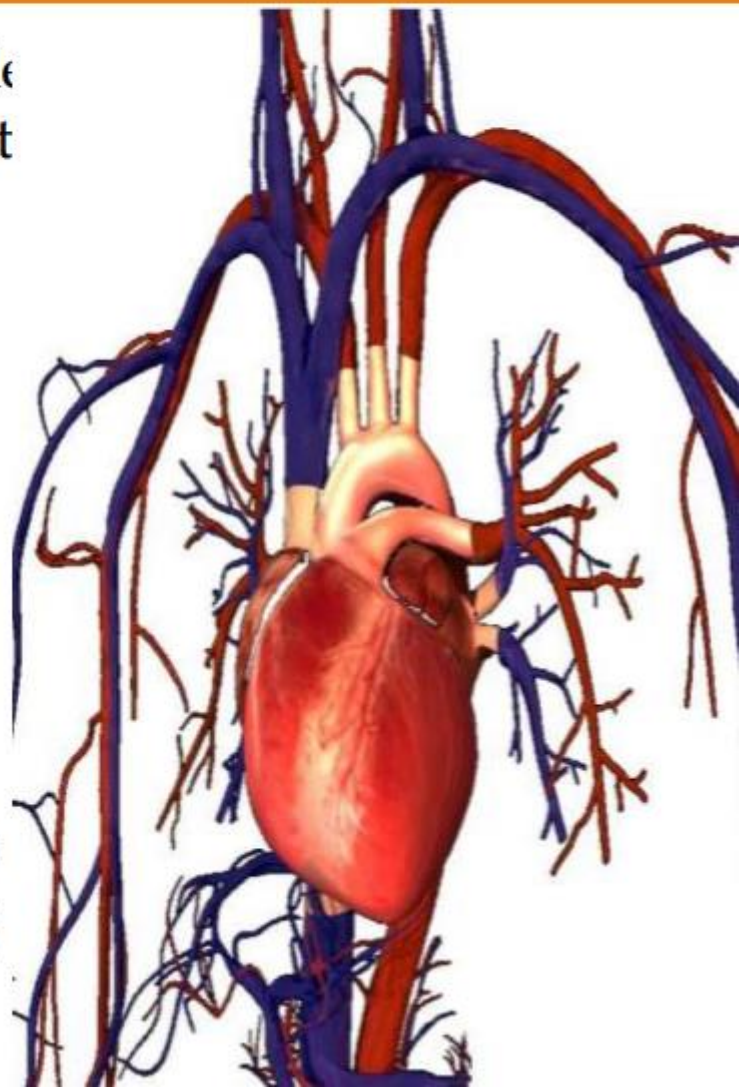
Human Circulatory System



Circulatory System

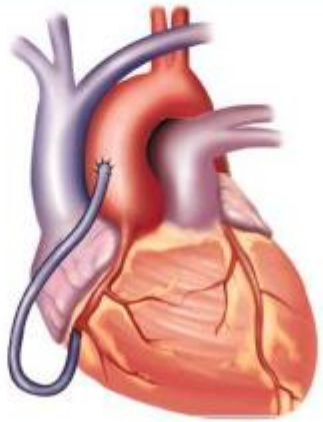
- The **Circulatory System** is responsible for transporting materials throughout the entire body.
- It **transports** nutrients, water, and oxygen to your billions of body cells and carries away wastes such as carbon dioxide that body cells produce.
- It is an amazing highway that travels through your entire body connecting all your body cells.



Circulatory System

Components

- Heart
- Blood
- Vessels
  - Arteries
  - Veins
  - Capillaries



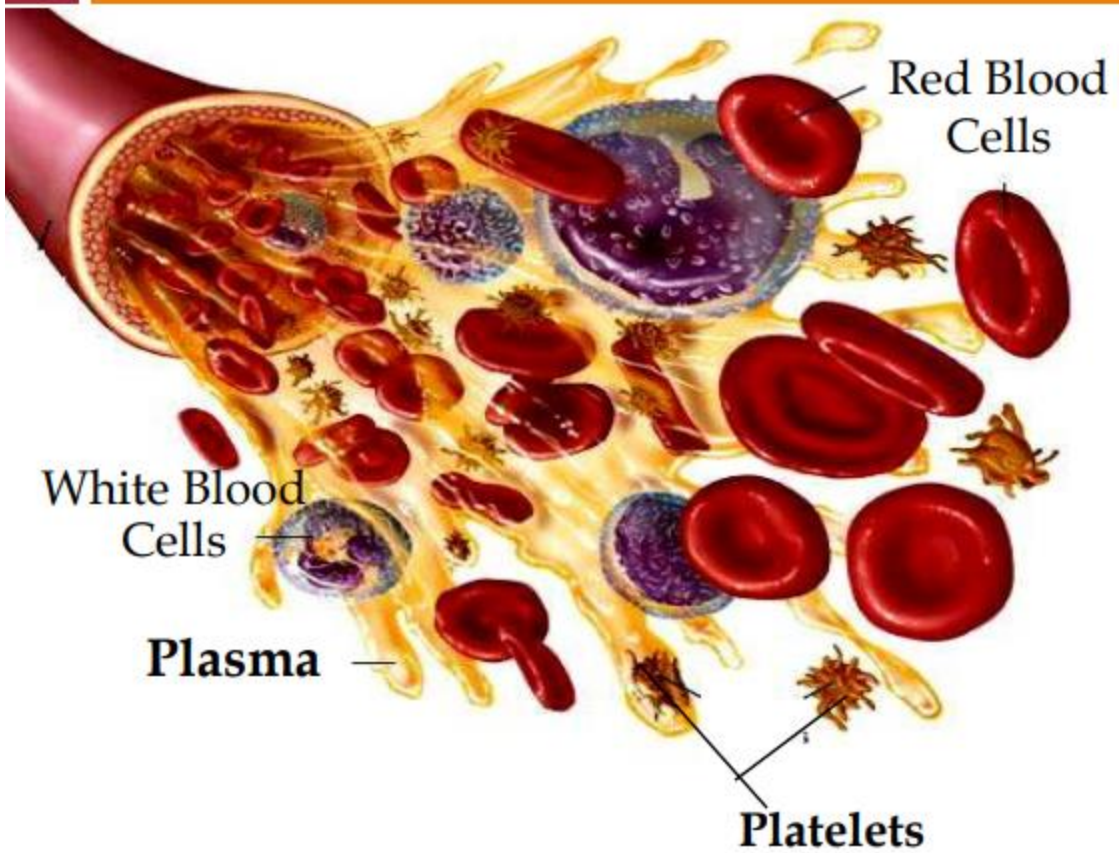
Heart

Blood

Veins

Arteries

Blood



Blood has 3 main Functions

- Transport
- Protection
- Temperature Regulation

- The circulatory system carries two types of blood

Oxygen-rich blood

- Blood travelling to the body cells
- High oxygen content
- Low carbon dioxide content

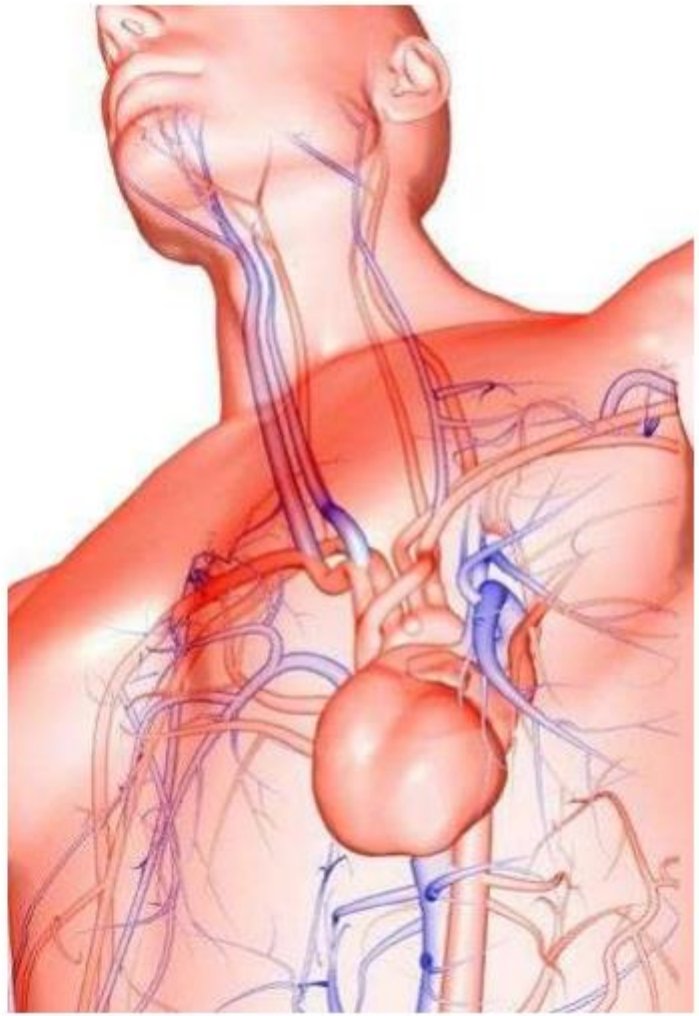
Oxygen-poor blood

- Blood travelling away from the body cells
- Low oxygen content
- High carbon dioxide content

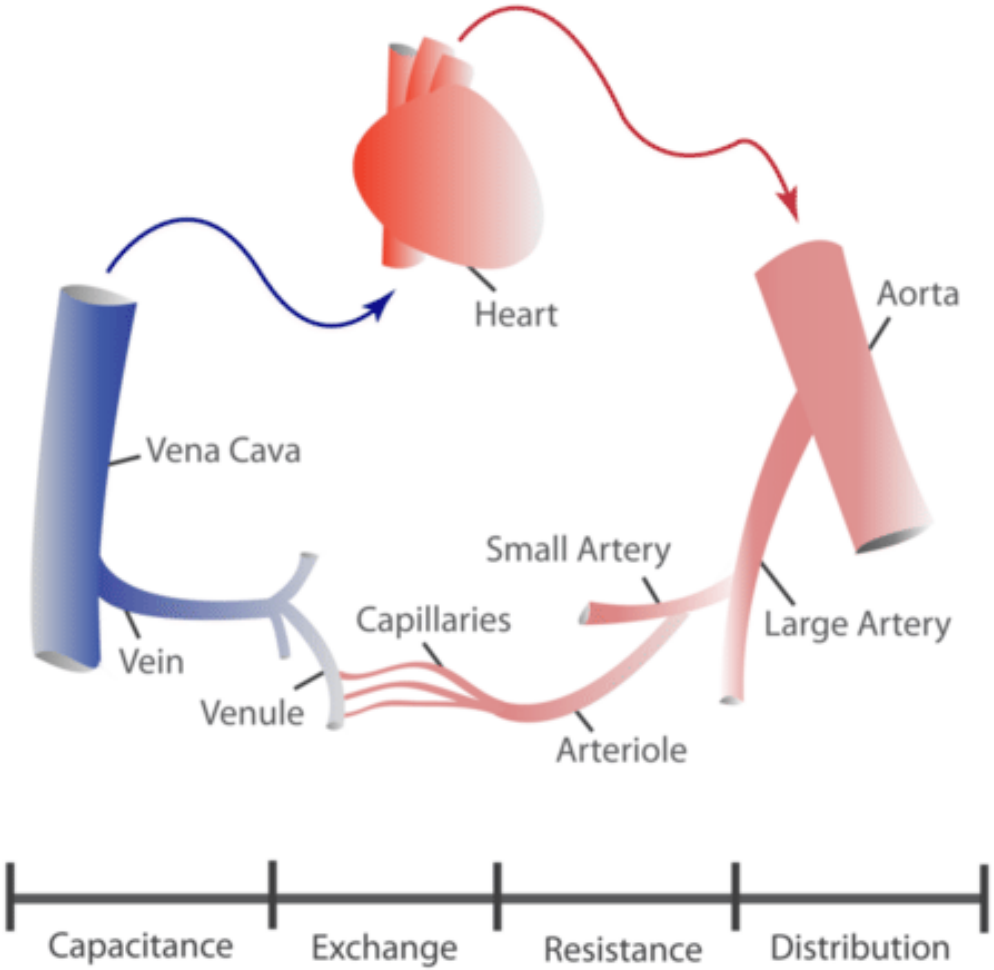
- Arrangement of the circulatory system means that these two types of blood do not mix.

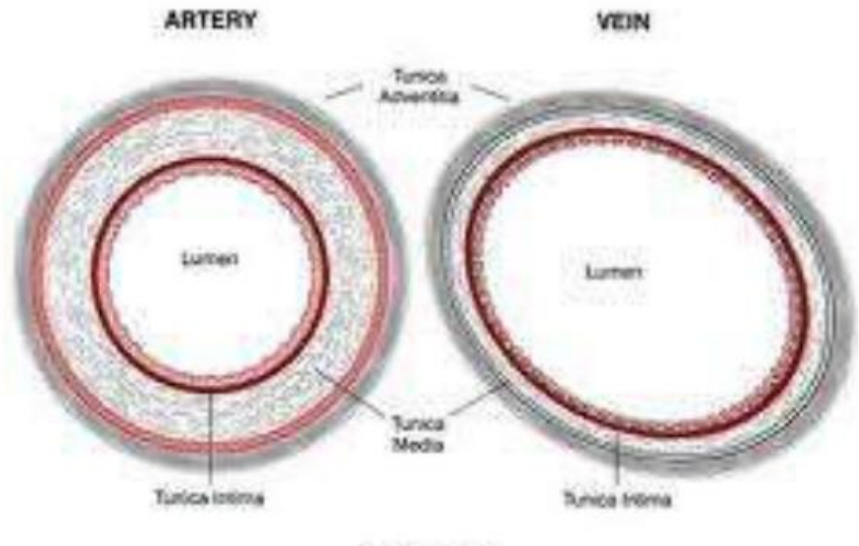
Blood Vessels

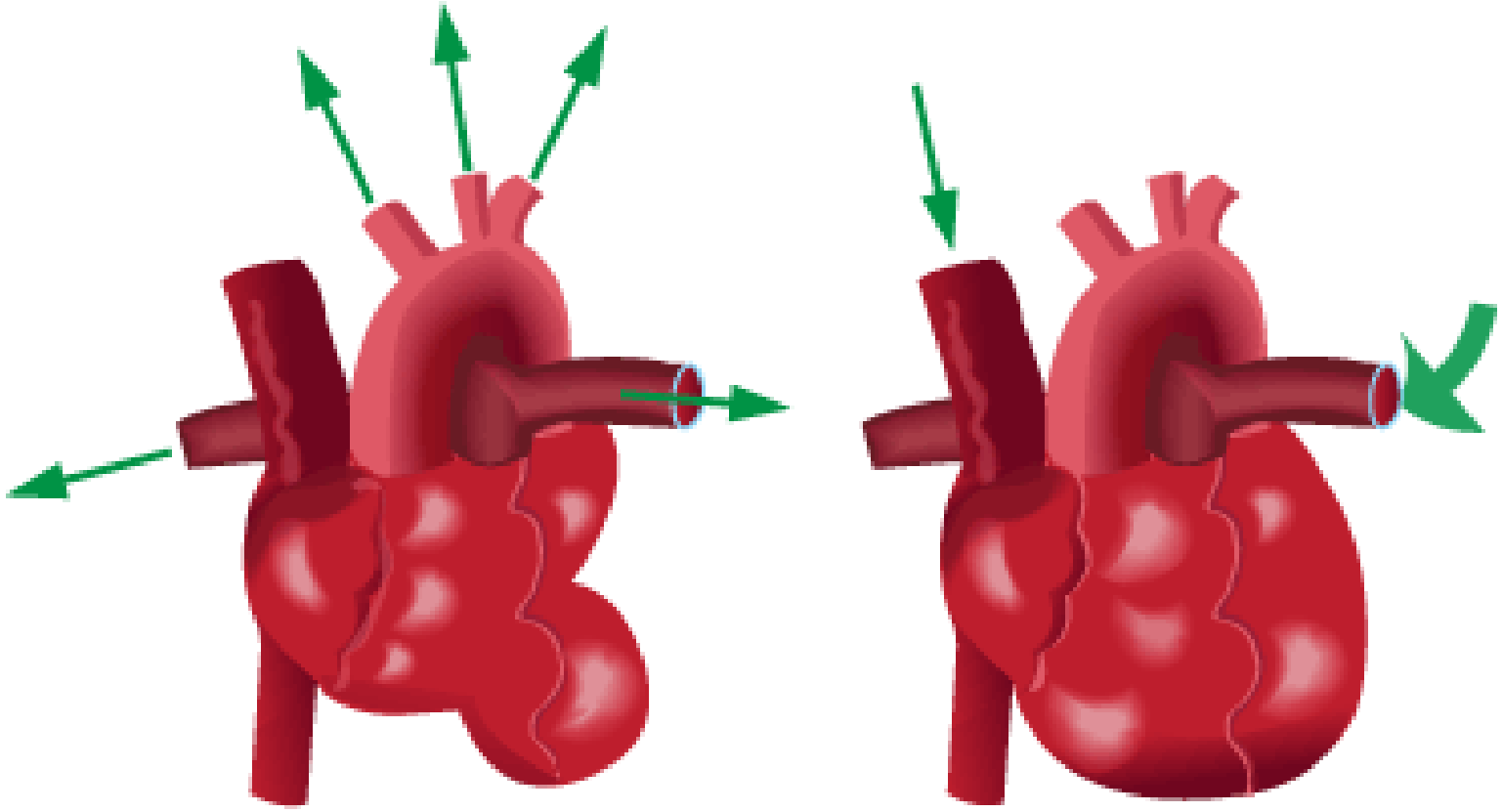
- As blood moves through the circulatory system it moves through 3 types of blood vessels:
  - **Arteries:** Carry blood away from the heart .
  - **Capillaries:** Link arterioles to veins.
  - **Veins:** Carry blood towards the heart



BLOOD VESSELS

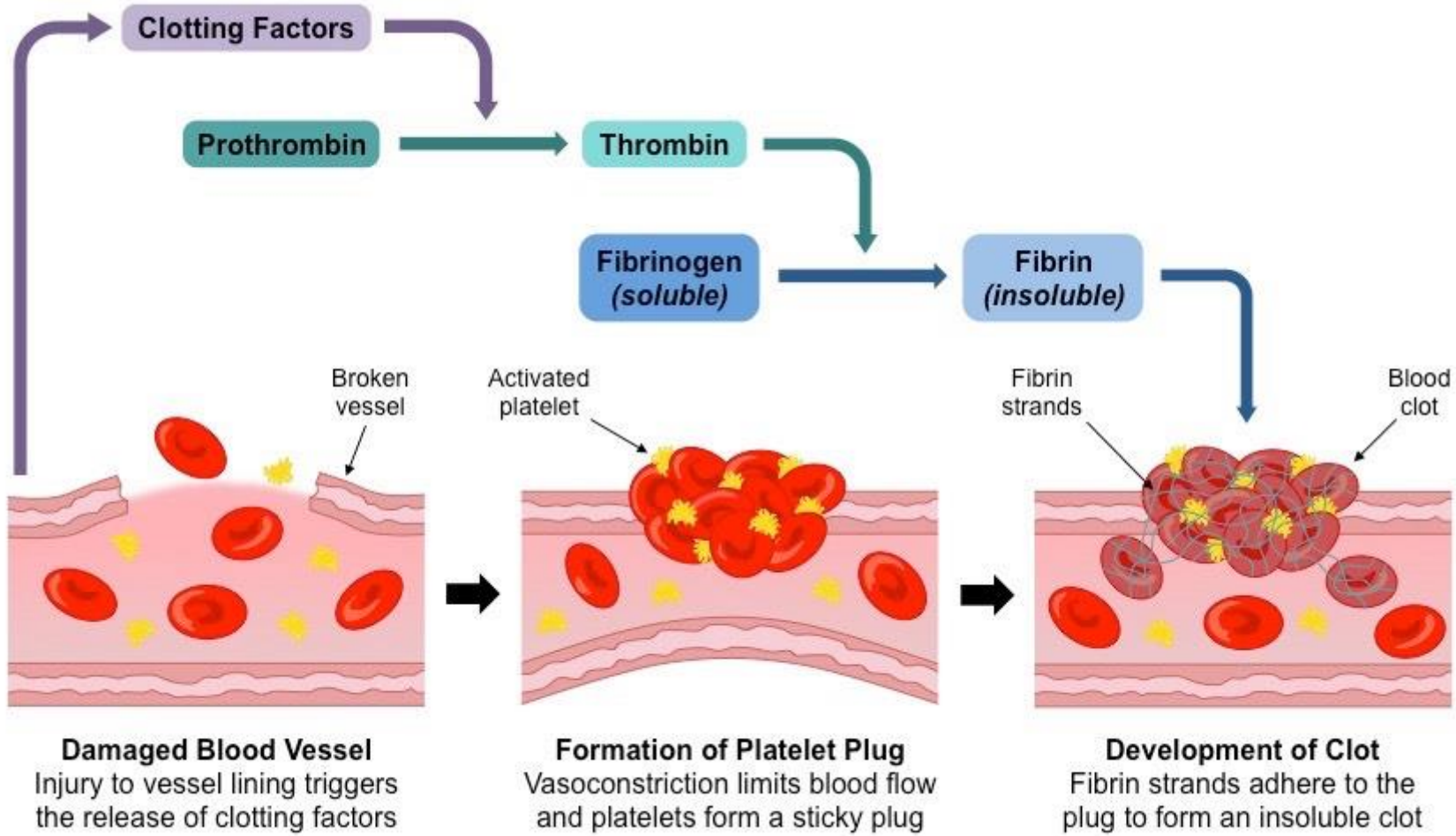


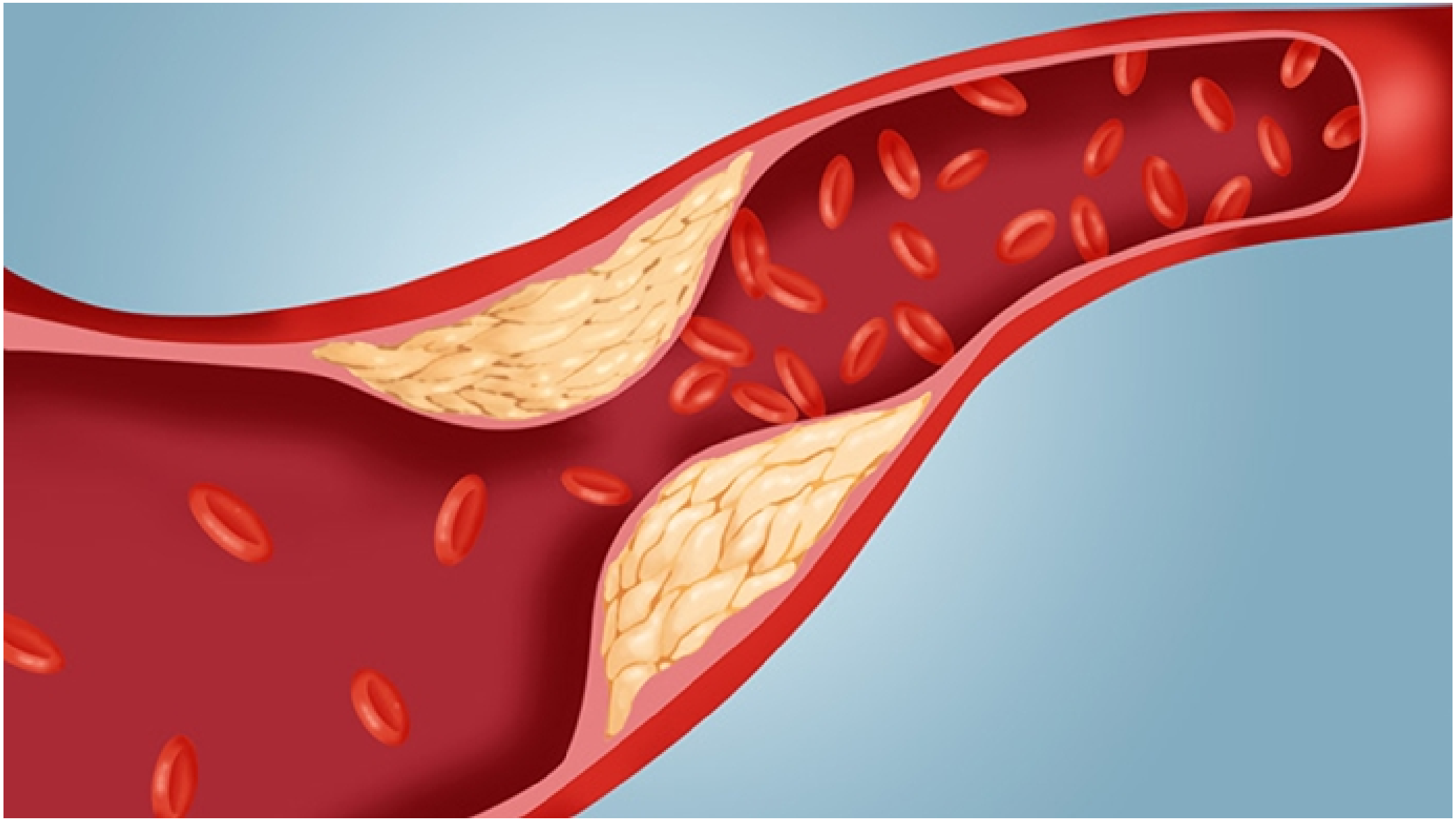




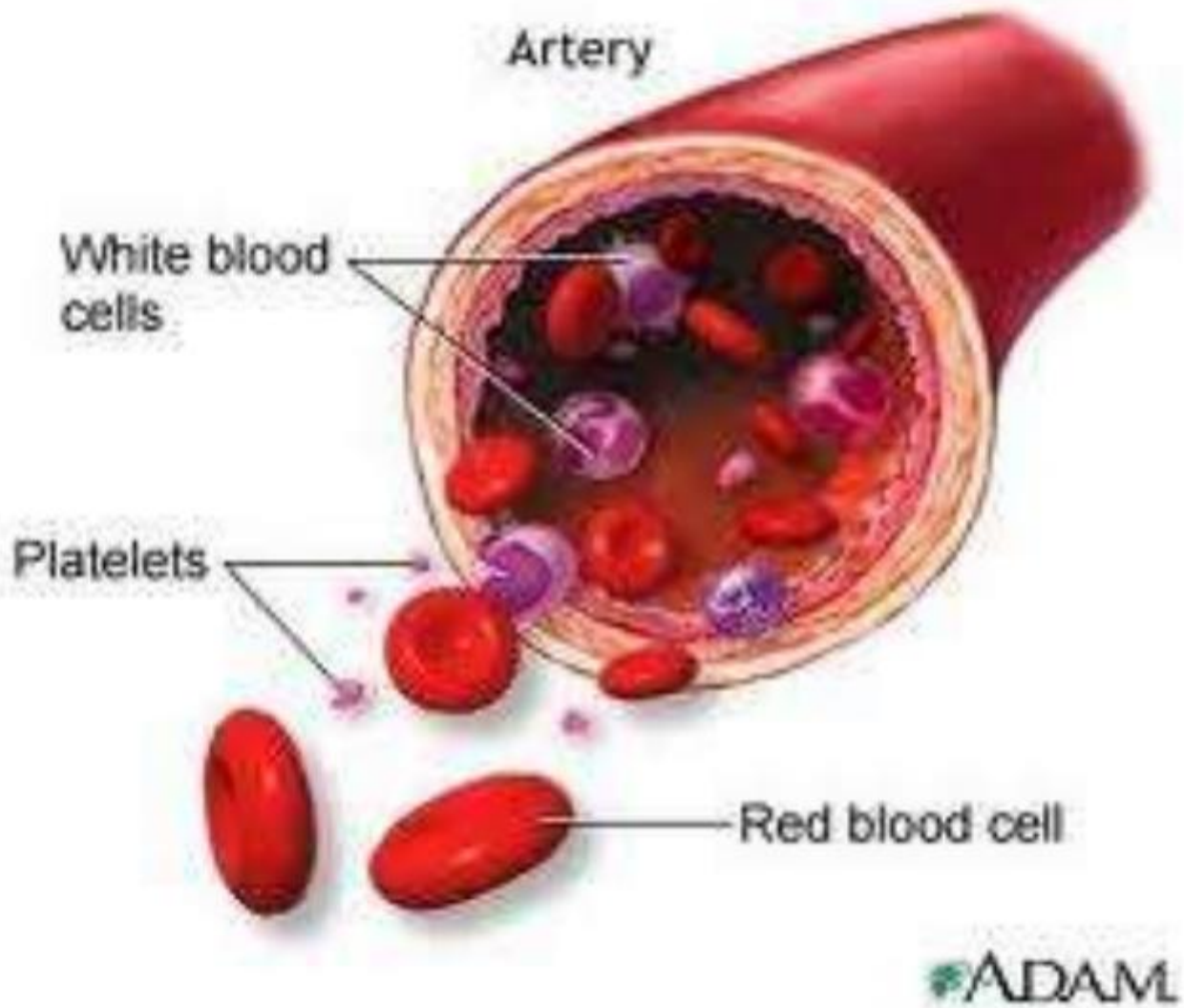
SYSTOLIC
In the systolic phase the heart contracts, blood pressure rises and blood moves out along the vessels

DIASTOLIC
In the diastolic phase the heart relaxes, blood pressure falls and the blood fills the heart

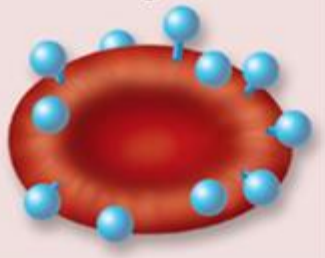
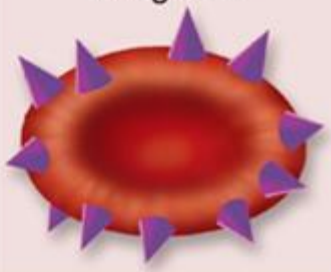
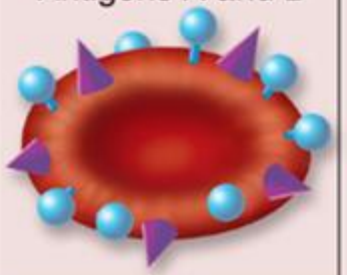

Clotting Factors
Prothrombin
Thrombin
Fibrinogen
(soluble)
Fibrin
(insoluble)
Broken
vessel
Activated
platelet
Fibrin
strands
Blood
clot
Damaged Blood Vessel
Injury to vessel lining triggers
the release of clotting factors
Formation of Platelet Plug
Vasoconstriction limits blood flow
and platelets form a sticky plug
Development of Clot
Fibrin strands adhere to the
plug to form an insoluble clot

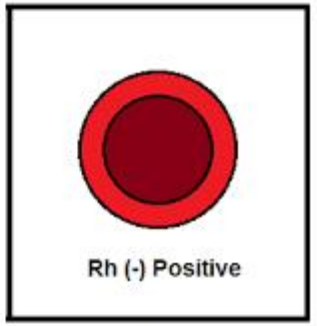


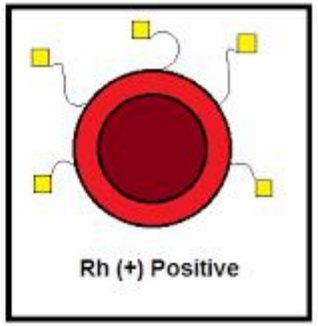
COMPOSITION OF BLOOD



ABO Blood Types

	Antigen A	Antigen B	Antigens A and B	Neither antigen A nor B
Erythrocytes				
Plasma	Anti-B antibodies 	Anti-A antibodies 	Neither anti-A nor anti-B antibodies	Both anti-A and anti-B antibodies 
Blood type	**Type A** Erythrocytes with type A surface antigens and plasma with anti-B antibodies	**Type B** Erythrocytes with type B surface antigens and plasma with anti-A antibodies	**Type AB** Erythrocytes with both type A and type B surface antigens, and plasma with neither anti-A nor anti-B antibodies	**Type O** Erythrocytes with neither type A nor type B surface antigens, but plasma with both anti-A and anti-B antibodies



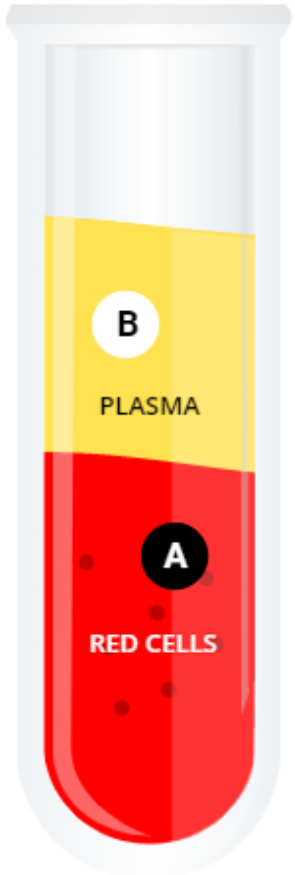


Group A

Group B

Group AB

Group O

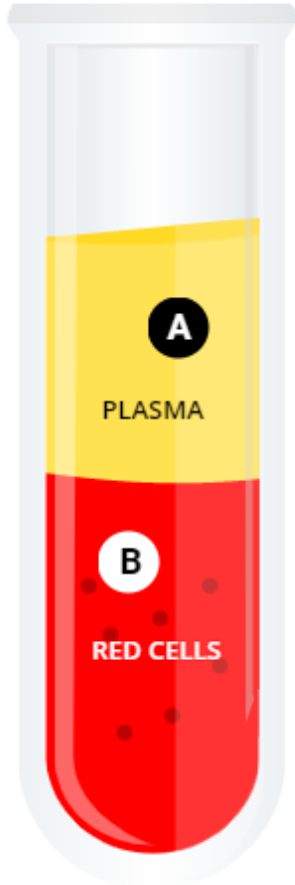


Group A

Group B

Group AB

Group O



Group A

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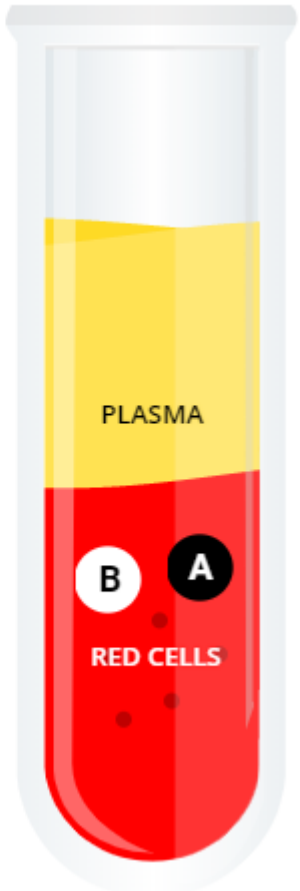

Group A

Group B

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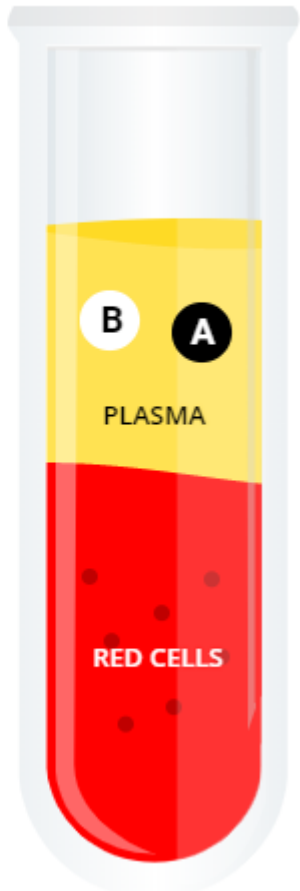
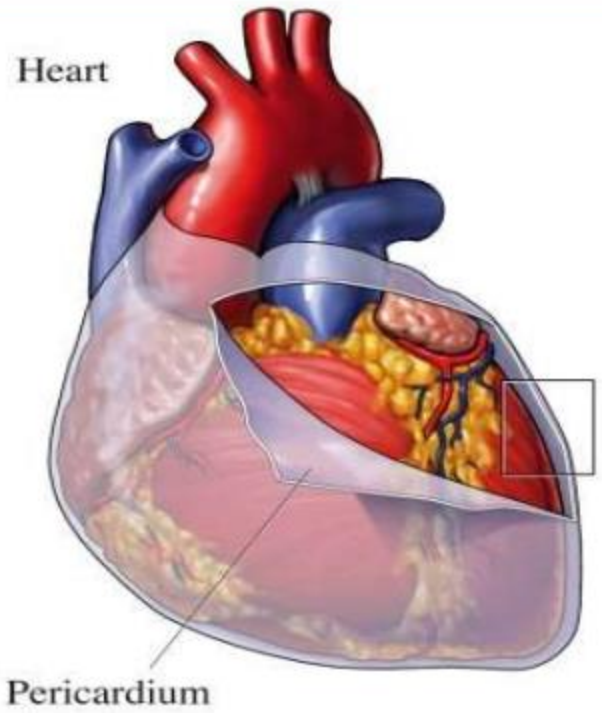
Group O



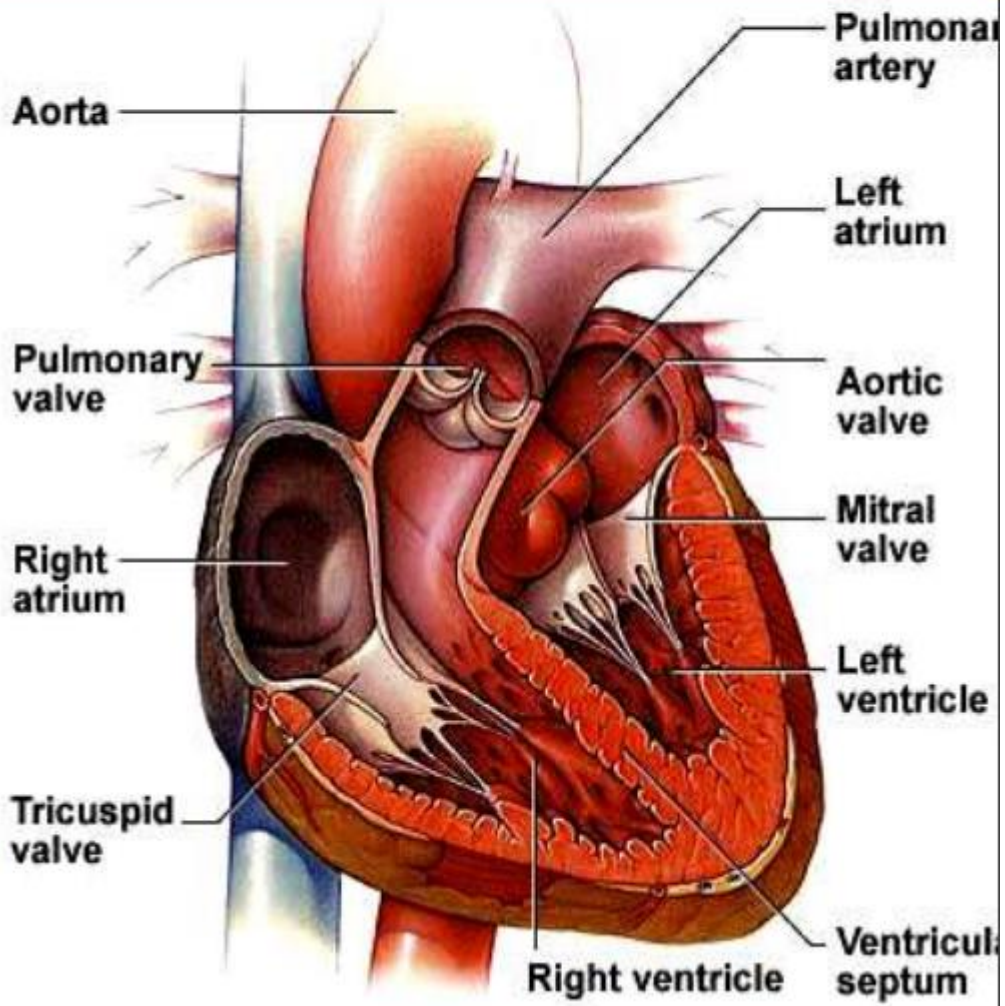
The Heart: Structures

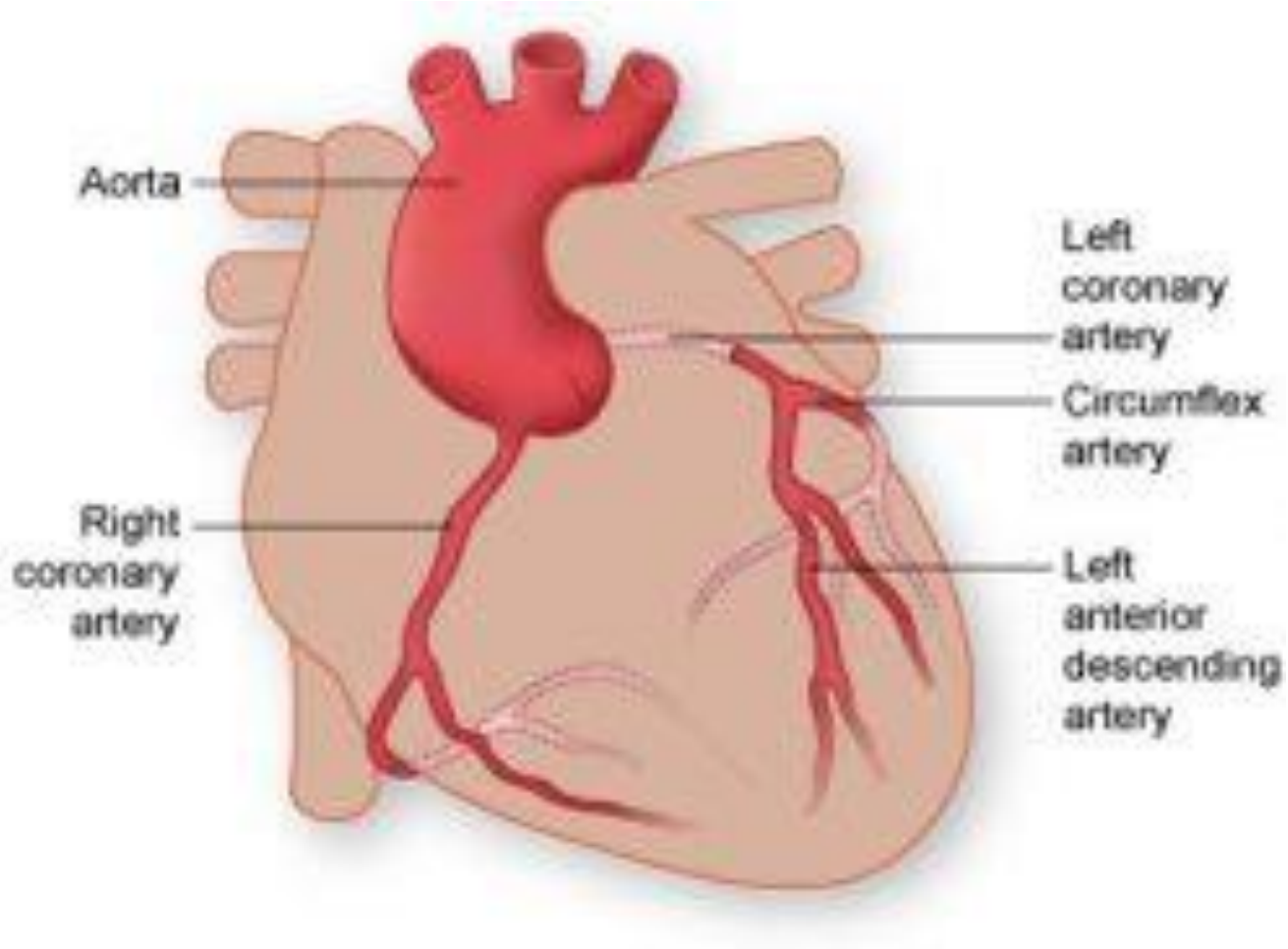
- Pericardium
  - Protective sac of connective tissue
  - Surrounds the heart
  - Filled with fluid



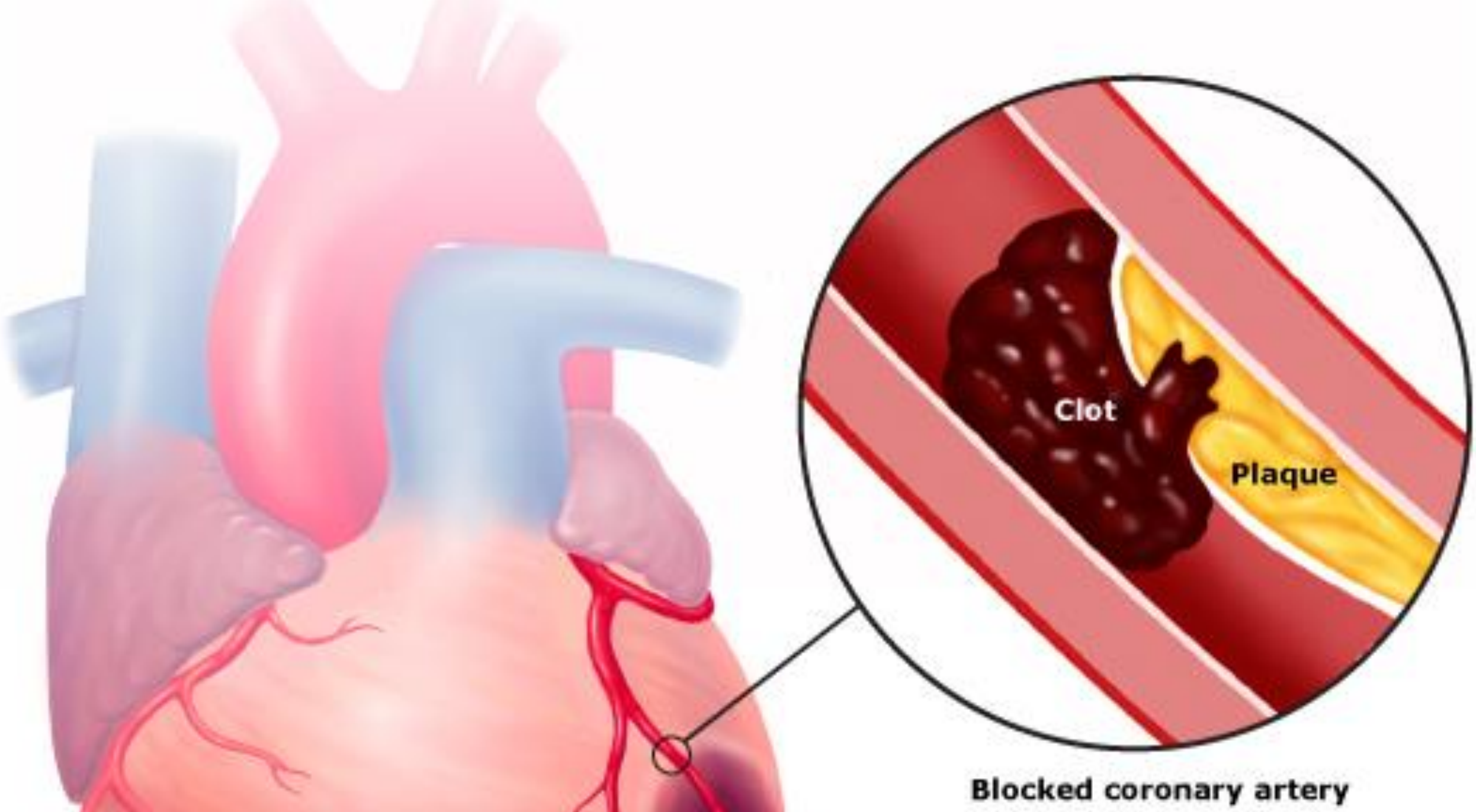
The Heart: Structures

- Heart walls:
  - Epicardium
    - Outermost layer
    - Fat to cushion heart
  - Myocardium
    - Middle layer
    - Primarily cardiac muscle
  - Endocardium
    - Innermost layer
    - Thin and smooth
    - Stretches as the heart pur

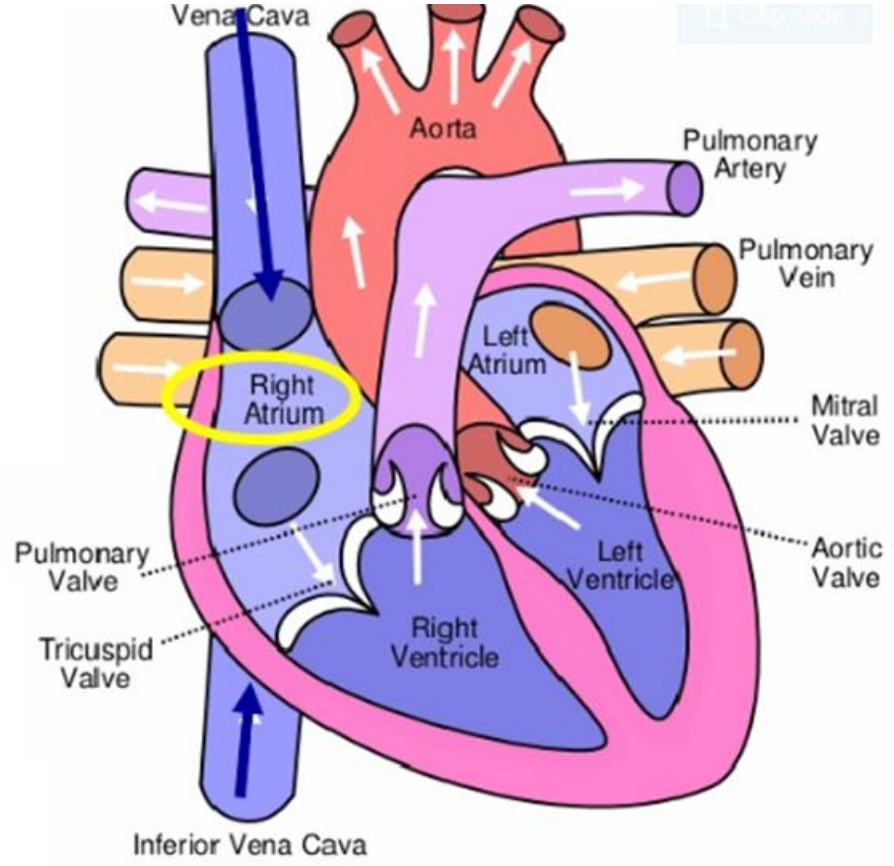


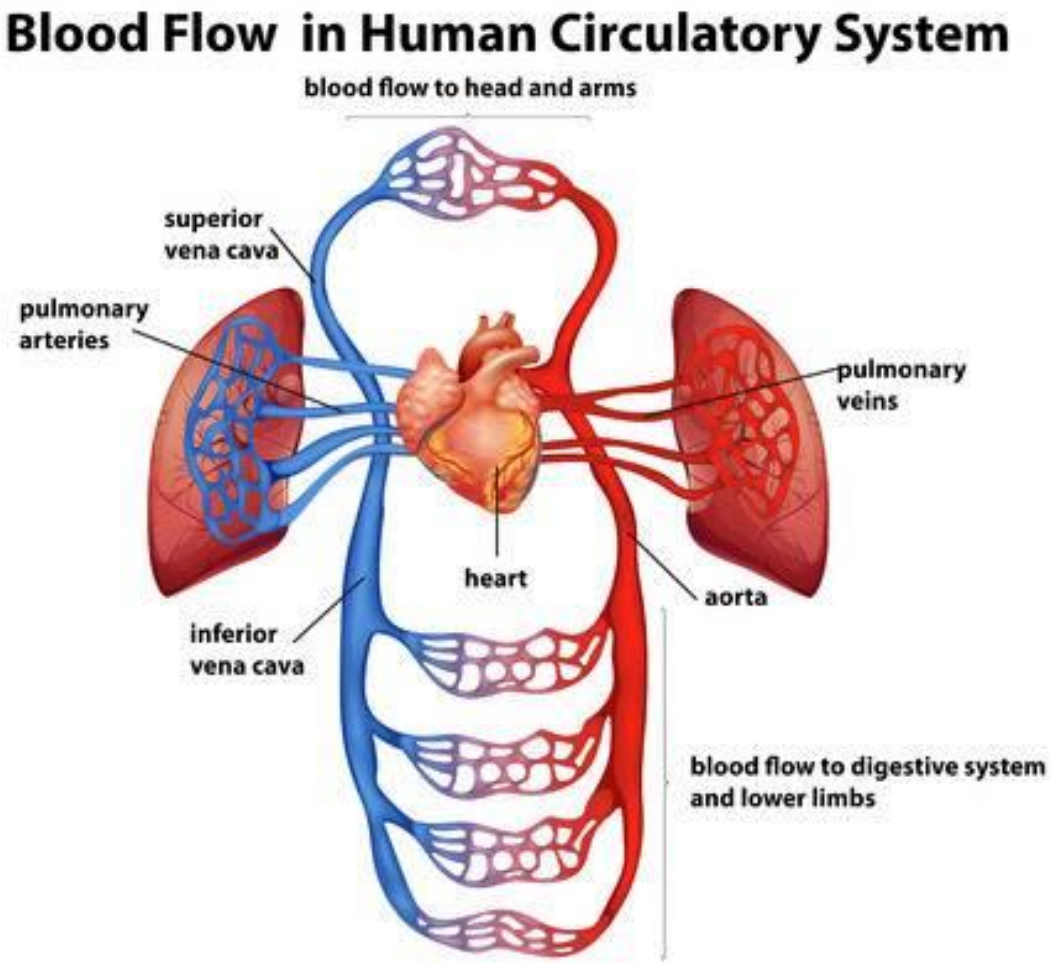


Coronary Arteries

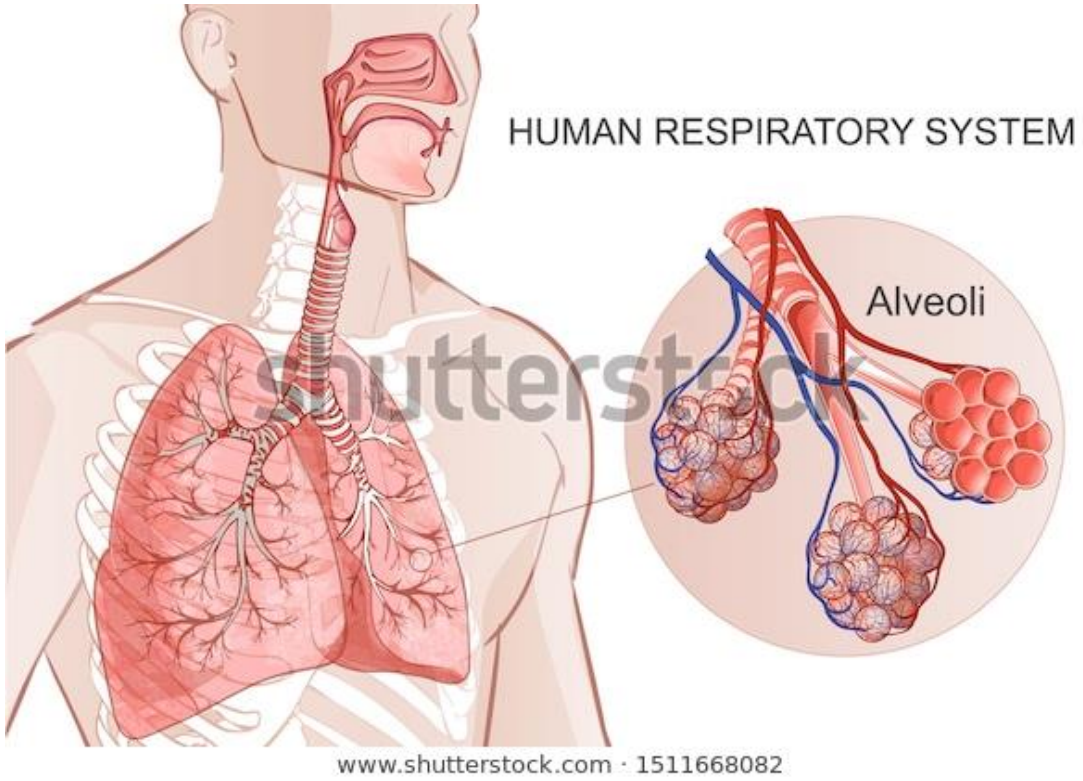


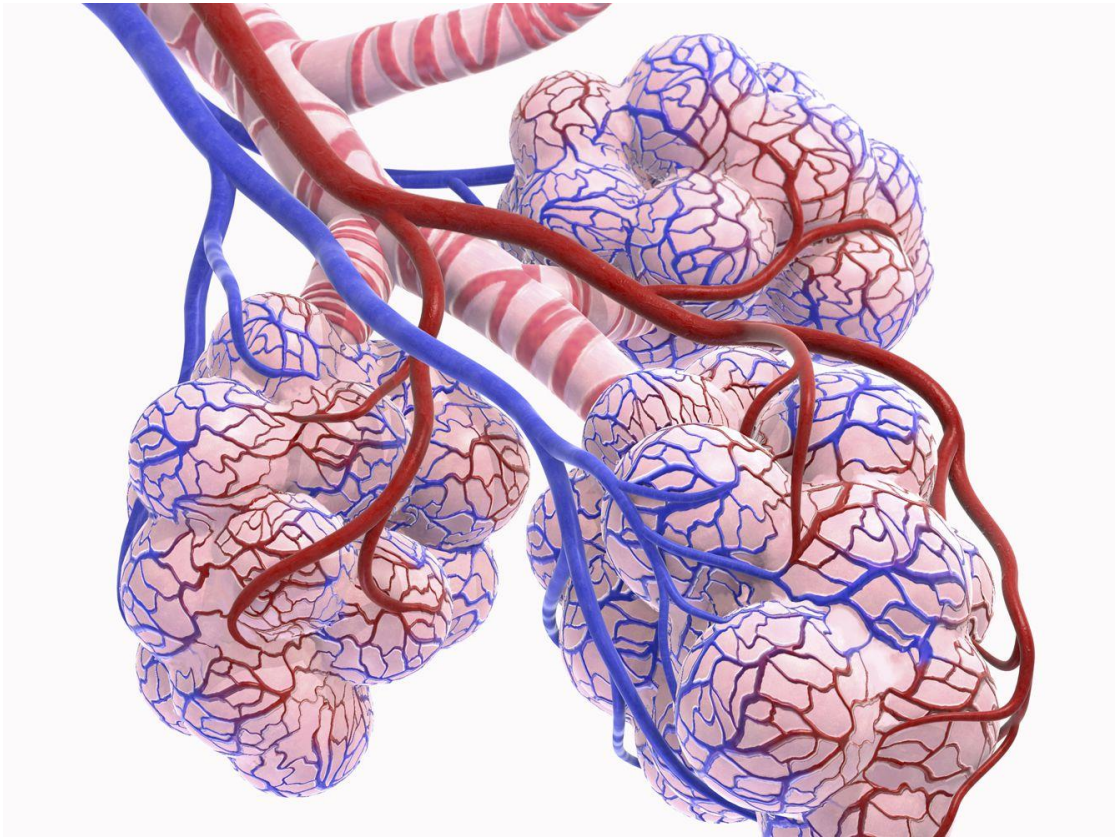
Blocked coronary artery


Vena Cava
Aorta
Pulmonary Artery
Pulmonary Vein
Left Atrium
Right Atrium
Mitral Valve
Aortic Valve
Pulmonary Valve
Left Ventricle
Tricuspid Valve
Right Ventricle
Inferior Vena Cava


Blood Flow in Human Circulatory System
blood flow to head and arms
superior vena cava
pulmonary arteries
pulmonary veins
heart
aorta
inferior vena cava
blood flow to digestive system and lower limbs

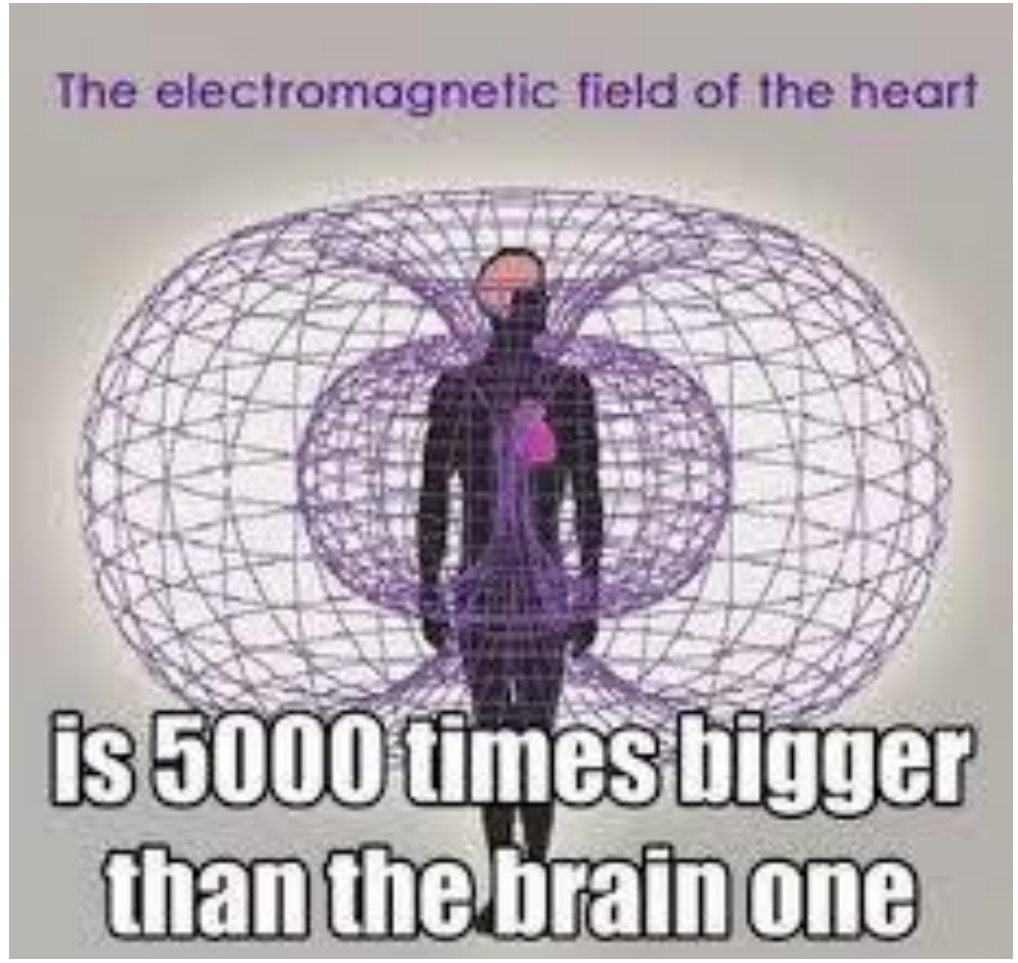
Alveoli – Gas Exchange





Memorize By Heart

Memorize Anything


The electromagnetic field of the heart
is 5000 times bigger
than the brain one