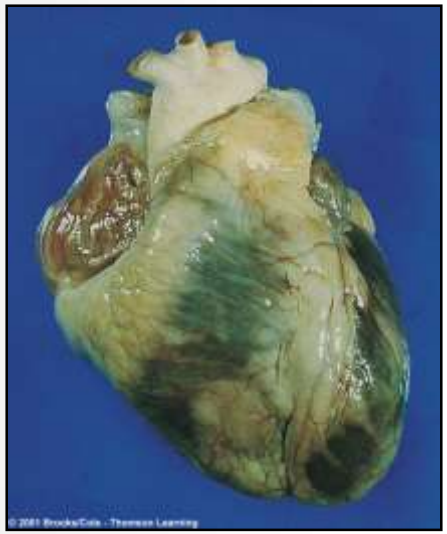
Cardiovascular System



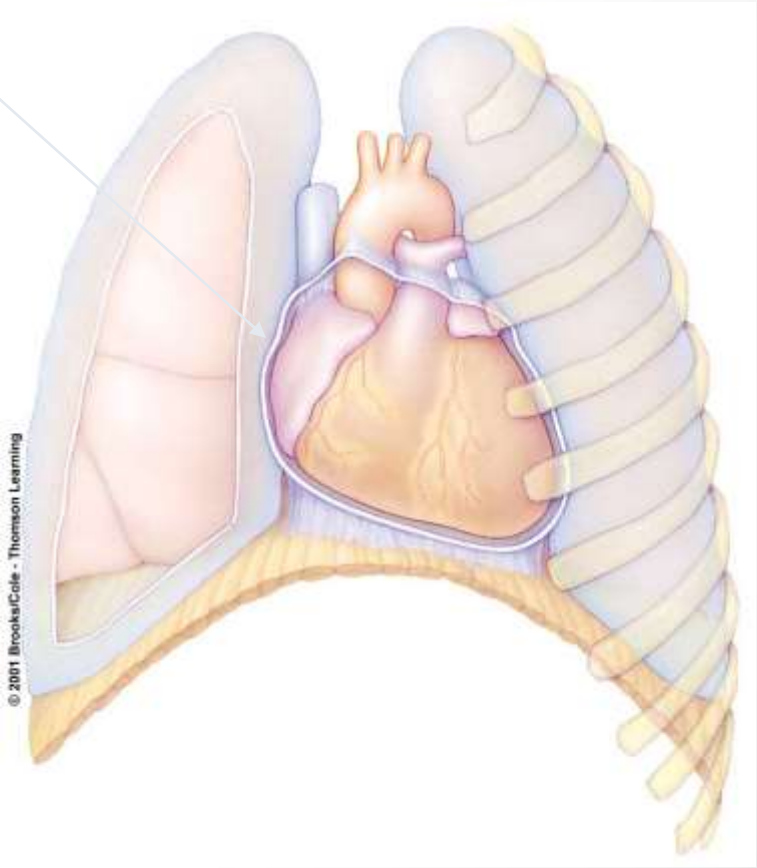
Eq: Why is having a 4 chambered heart so important?

General Description:

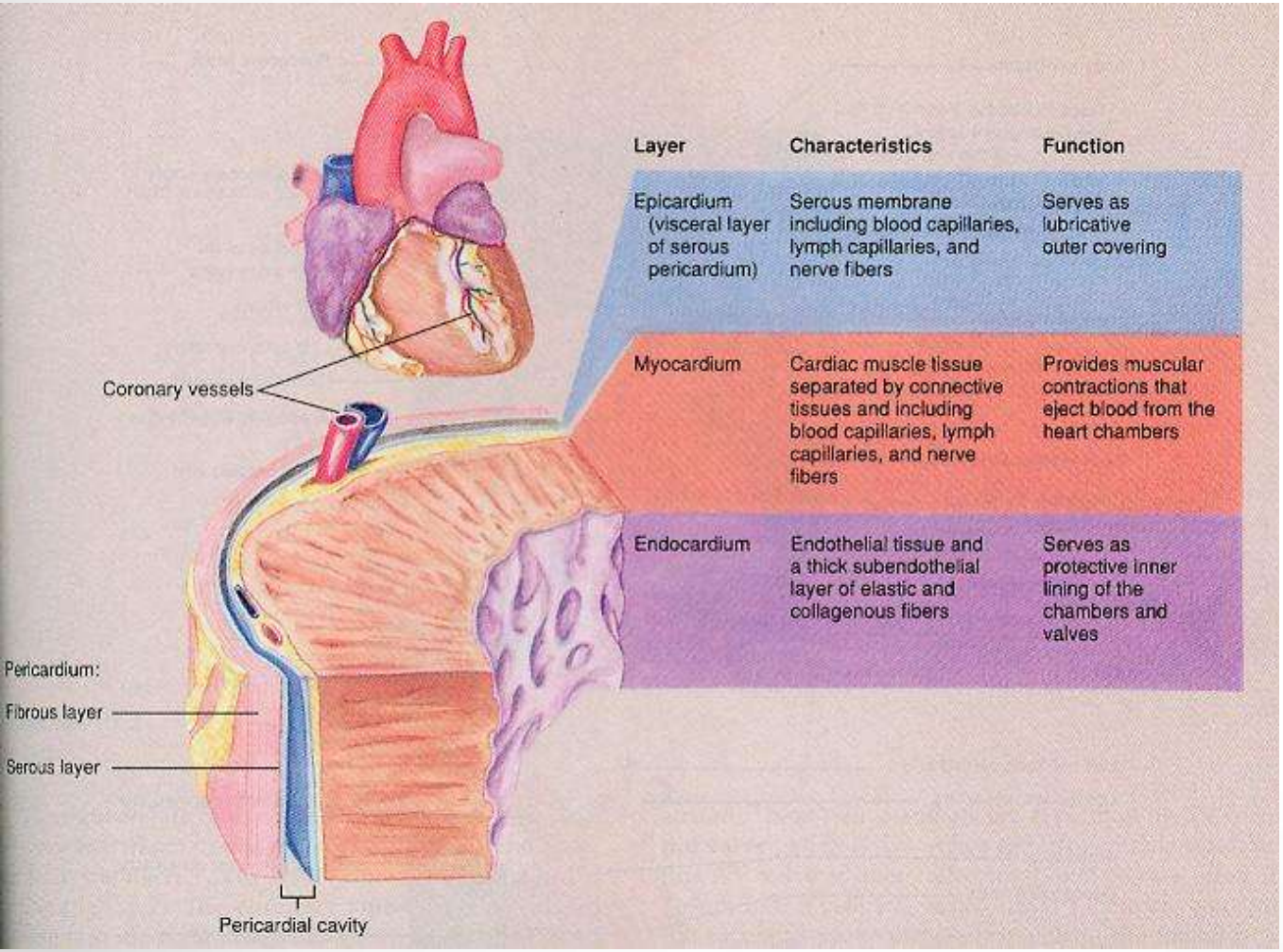
- 4 Chambers
- About the size of a fist
- Triangular in shape with apex pointed down (distal end)
- The base of the heart is the superior portion
- The great vessels attach to the base

Pericardium

- The heart is surrounded by a loose-fitting sac called the **pericardium**
- The heart beats 42,000,000 times/year and pumps 700,000 gallons of blood



Heart Wall – 3 Layers



Layer	Characteristics	Function
Epicardium (visceral layer of serous pericardium)	Serous membrane including blood capillaries, lymph capillaries, and nerve fibers	Serves as lubricative outer covering
Myocardium	Cardiac muscle tissue separated by connective tissues and including blood capillaries, lymph capillaries, and nerve fibers	Provides muscular contractions that eject blood from the heart chambers
Endocardium	Endothelial tissue and a thick subendothelial layer of elastic and collagenous fibers	Serves as protective inner lining of the chambers and valves

Epicardium – the heart's surface

Myocardium – middle layer, all muscle

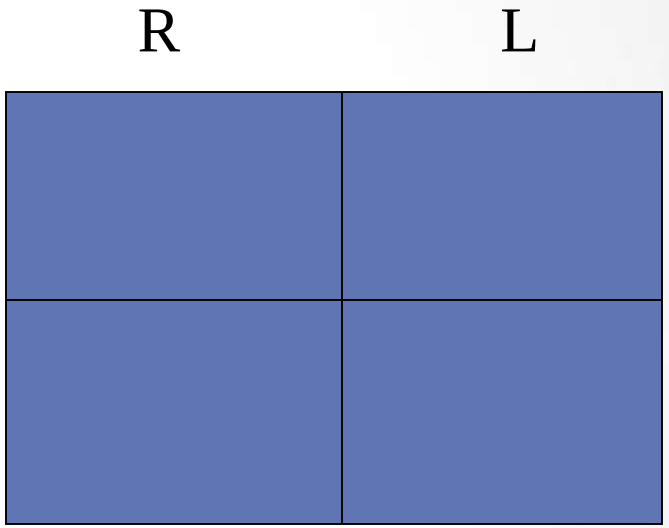
Endocardium – the inner layer

Heart Chambers

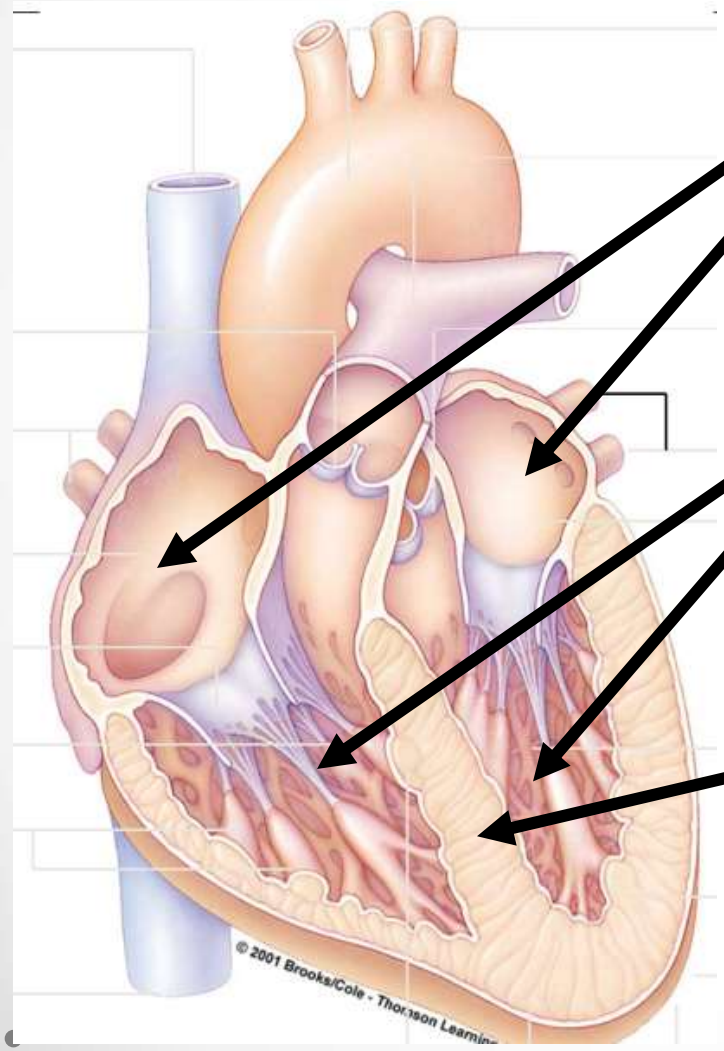
- …is a double pump
  - Atria (L/R)
  - Ventricles (L/R)
- A double circuit – (two circulatory systems in one)

  (1) Pulmonary (lungs only)

  (2) Systemic (rest of the body)



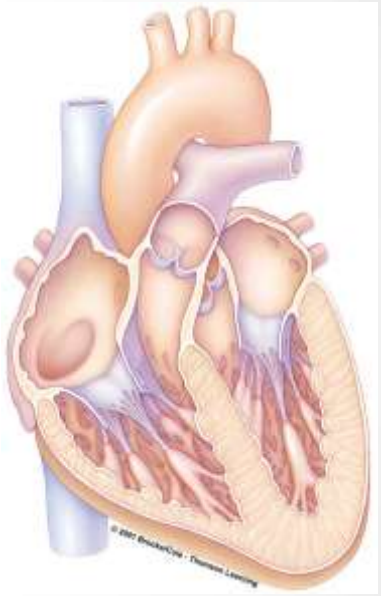
Heart Chambers

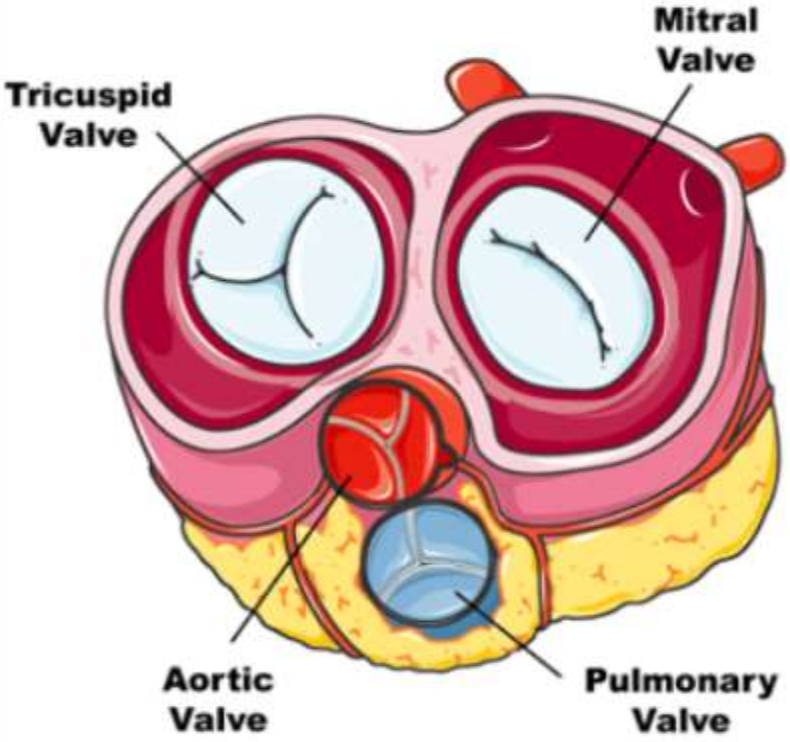


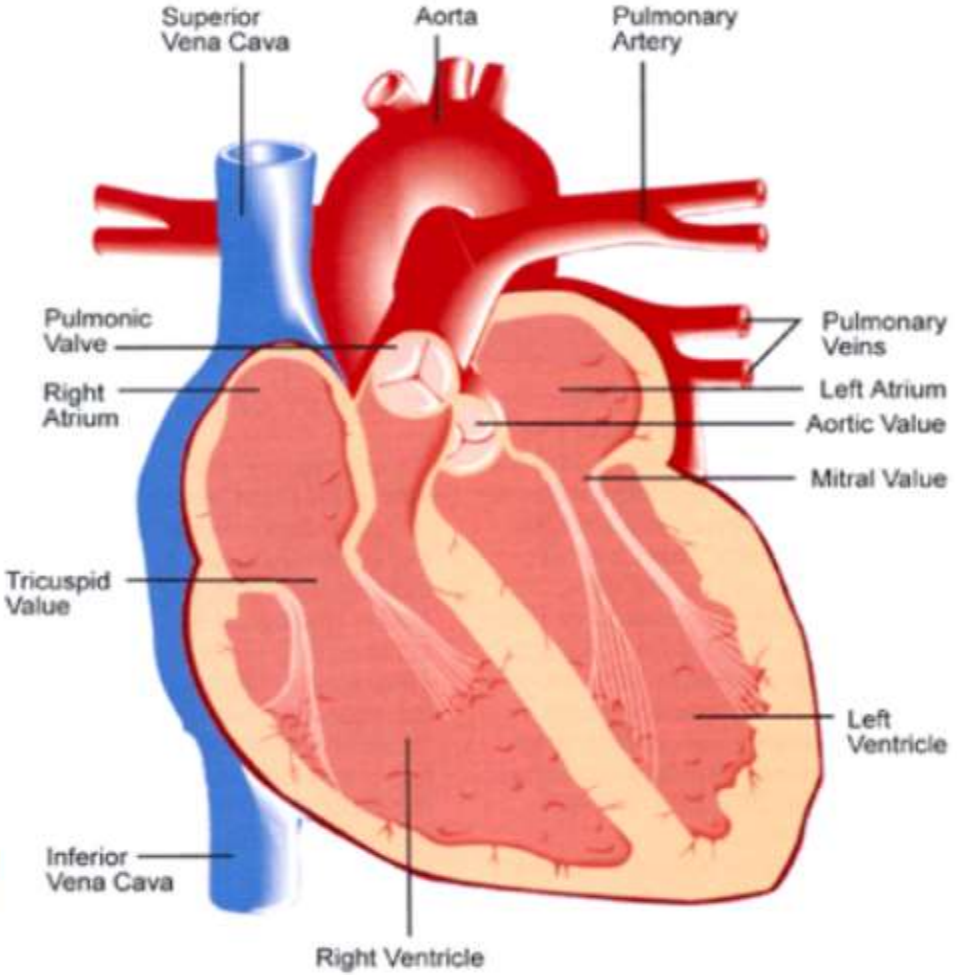
- 2 Atria: thin upper chambers
  - receive blood from lungs via veins
- 2 Ventricles: Thick and powerful
  - blood from atria and pump blood out of heart through arteries
- Septum: Separates the right & left sides of the heart

Heart Structures

- Valves: allow one-way flow of blood (4 total)
  - 2 Atrioventricular valves (AV)
    (1) L AV or bicuspid or mitral valve between L atrium & ventricle
    (2) R AV or tricuspid valve between r atrium & ventricle
  - 2 Semilunar valves
    (1) Aortic Semilunar; between L ventricle and the aorta
    (2) Pulmonary Semilunar; between R ventricle and the pulmonary artery



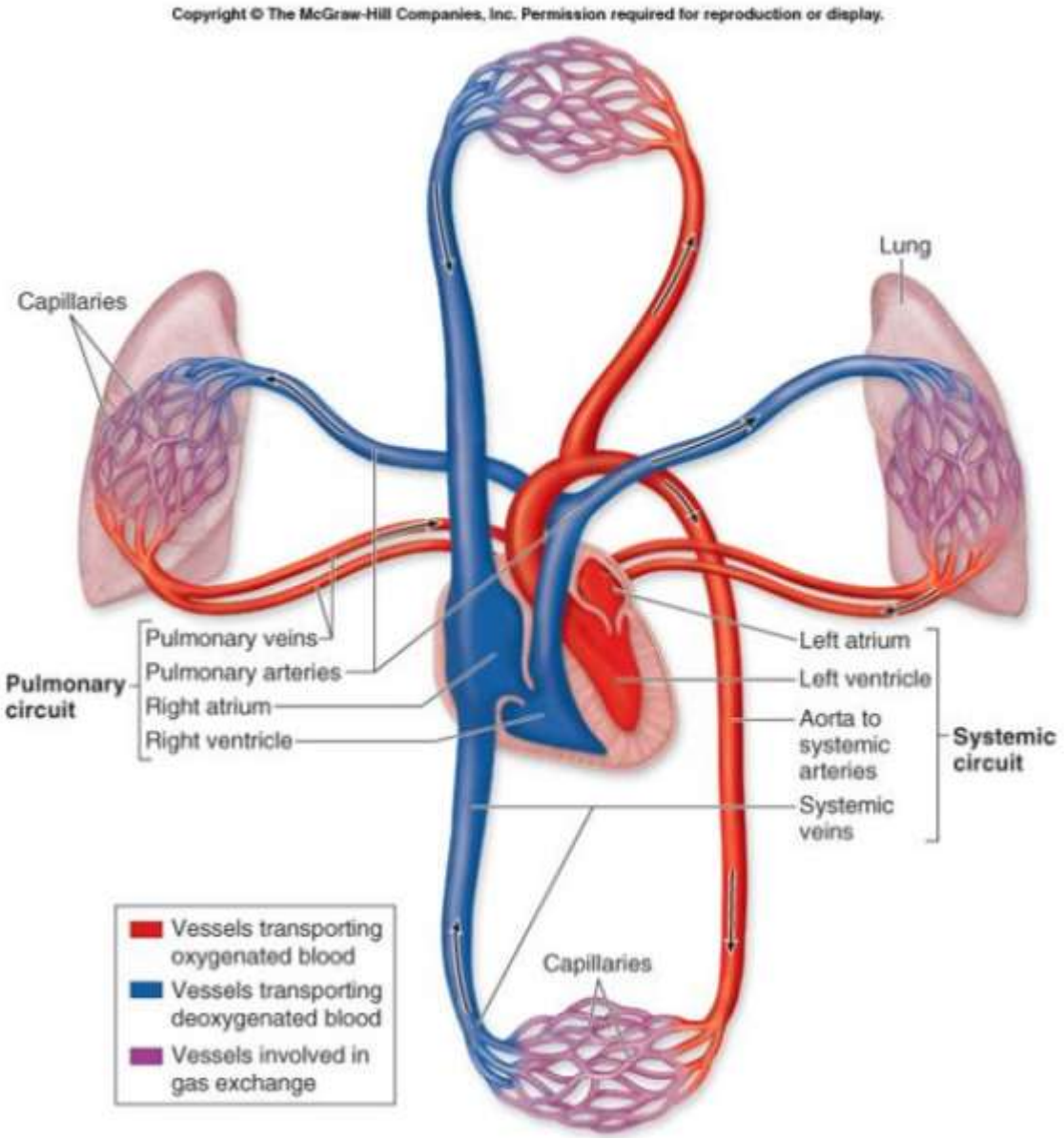




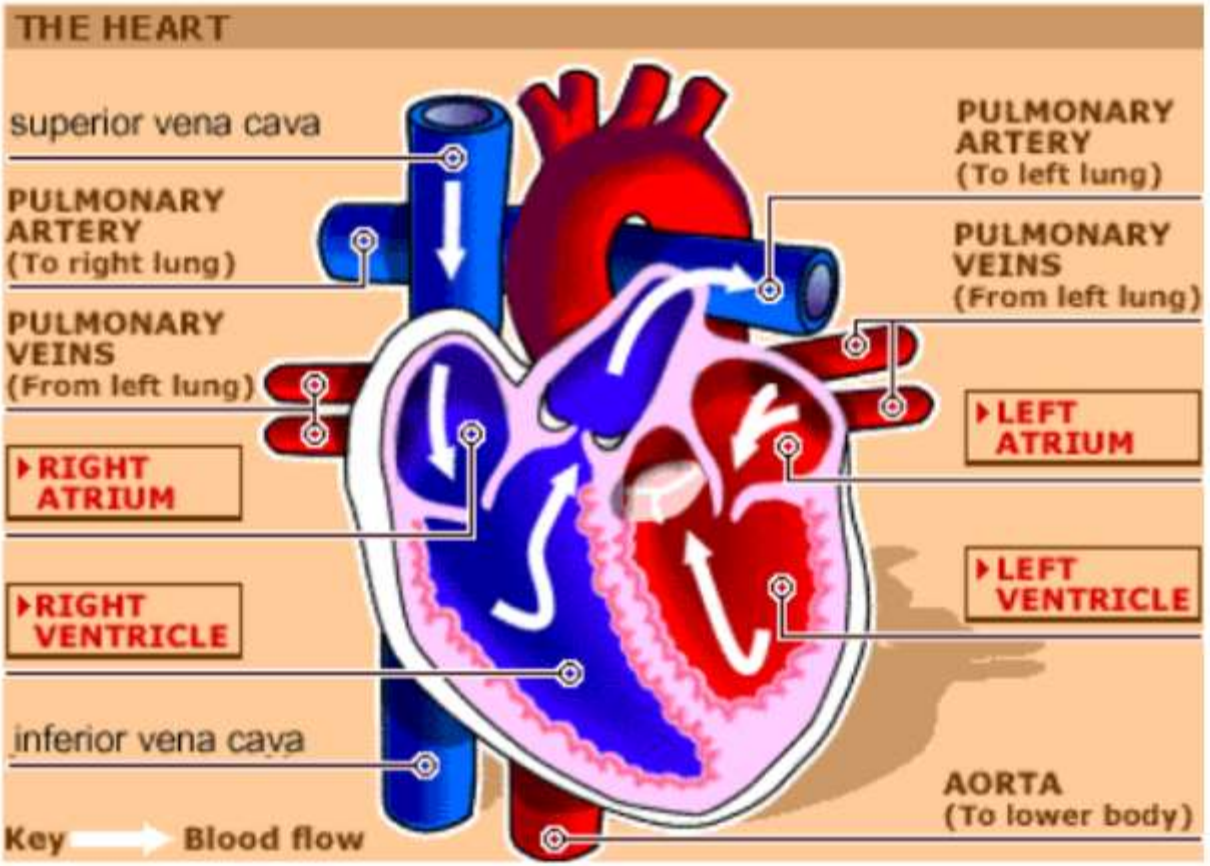
Mitral = bicuspid (left side)
Tricuspid (right side)

Systemic Circulation – delivers blood to all body cells and carries away waste

Pulmonary Circulation – eliminates carbon dioxide and oxygenates blood (lung pathway)



Path of Blood Flow



Blood Flow

Superior Vena Cava

→ Right Atrium

→ past tricuspid valve to Right Ventricle

→ past the semilunar valve to the pulmonary arteries

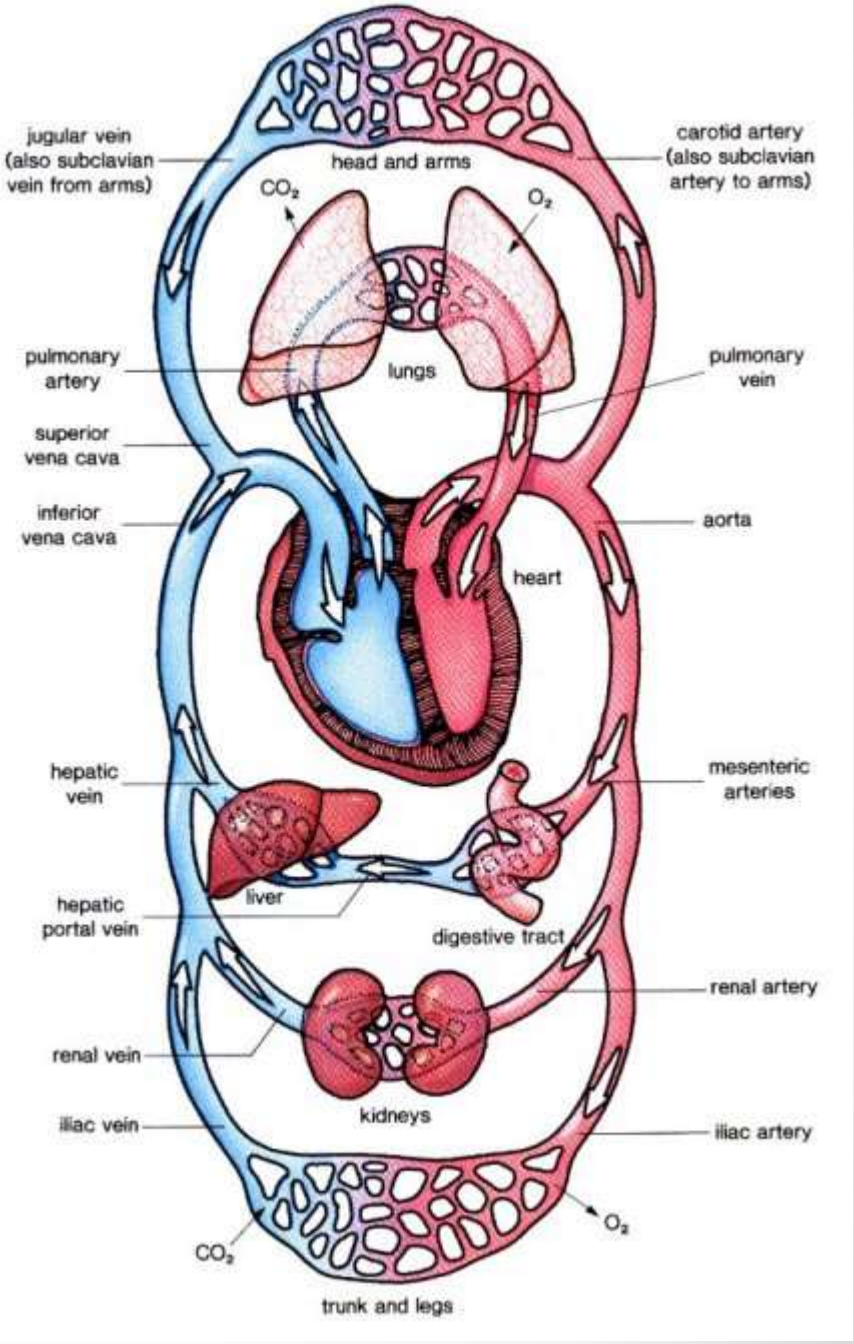
→ Lungs

→ Left Atrium

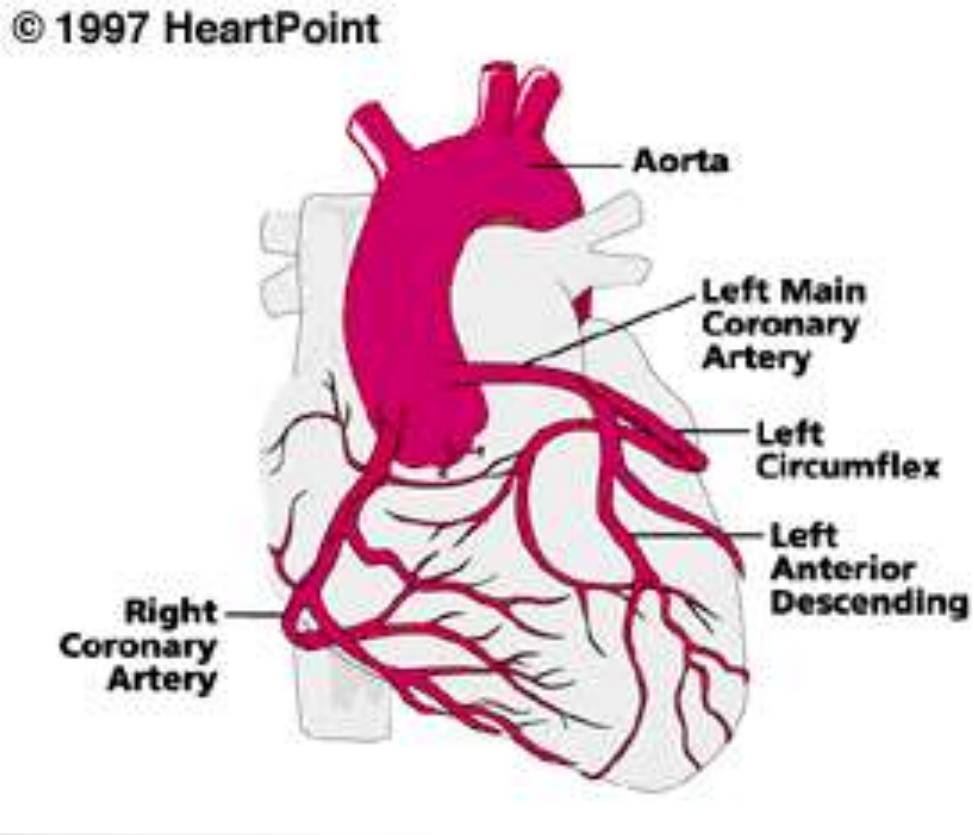
→ past bicuspid valve to Left Ventricle

→ past aortic semilunar valve to the Aorta

→ to the body



Coronary Circulation



- The heart gets its blood via the coronary circulation
- The blood leaves the heart via the coronary sinus