

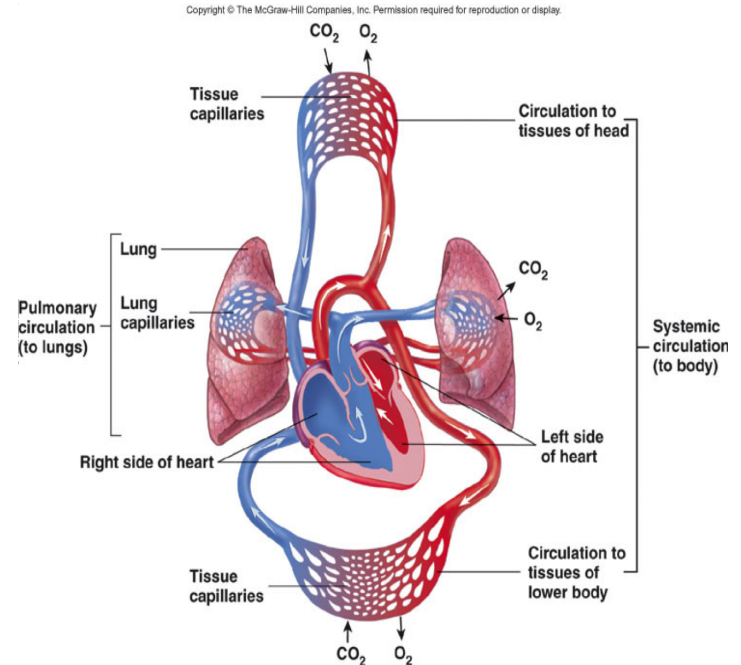
# Cardiovascular System



Part I - The Heart

# Cardiovascular Components

- Heart
- Arteries
- Veins
- Capillaries
- Blood



# Cardiovascular Circuits

There are two circuits in the Cardiovascular System of which blood flows through

- Pulmonary Circuit
  - blood flows to and from the lungs
- Systemic Circuit
  - blood flows to and from the rest of the body (everywhere except the lungs)

# The Heart

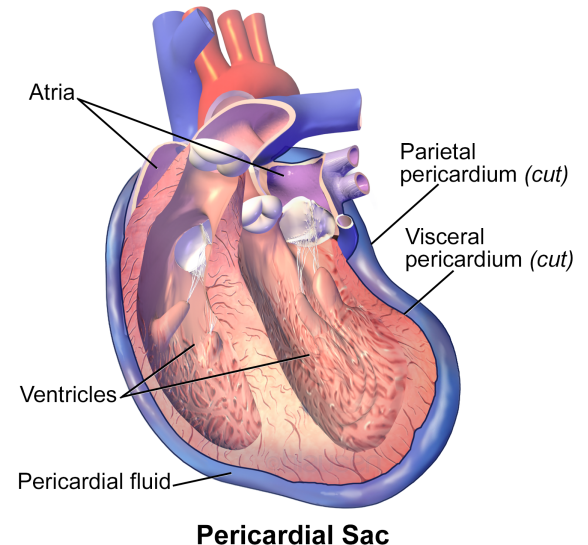
- Cardiac muscle
  - Intercalated discs - gap junctions that pass along action potentials from cardiac cell to cardiac cell
- Beats approximately 100,000 times a day
- Pumps 8,000 liters of blood
- About the size of a clenched fist
- Sits posteriorly to the sternum
- Sits to the left of the midline





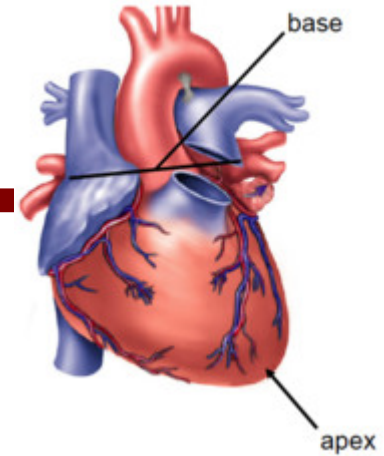
# The Heart's Surroundings

- Mediastinum - posterior & anterior
  - connective tissue region between pleural cavities
- Pericardial Sac - filled with pericardial fluid
  - Visceral Pericardium - closest to heart
  - Parietal Pericardium - outer lining



# Heart Structure

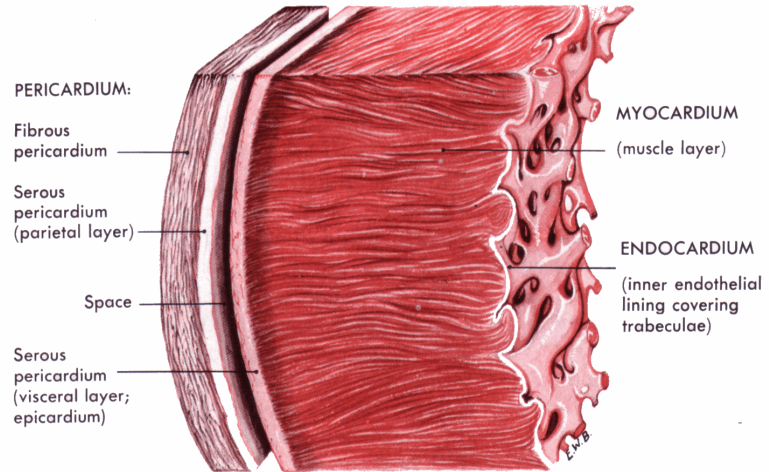
- Base - widest part of the heart (top)
- Apex - inferior point of the heart
- Auricle - deflated atrial flap
- Coronary Sulcus - deep groove separating atria & ventricles
- Interventricular Sulcus - groove separating the right & left ventricles
  - Anterior and posterior sulcus



# Heart Structure

There are three layers to the heart

- Epicardium
  - Outer most layer
  - Visceral Pericardium
- Myocardium
  - Muscular wall
- Endocardium
  - Inner squamous epithelial lining

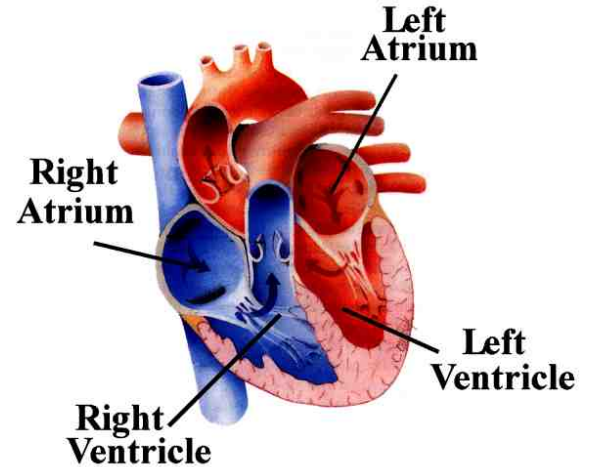


Section of the heart wall showing the components of the outer pericardium (heart sac), muscle layer (myocardium), and inner lining (endocardium).

# Heart Structure

There are four chambers in the heart

- Right Atrium
- Left Atrium
- Right Ventricle
- Left Ventricle
  - Septums separate left from right
    - Interatrial Septum & Interventricular Septum
  - Atrioventricular (AV) Valves separate atria from ventricles



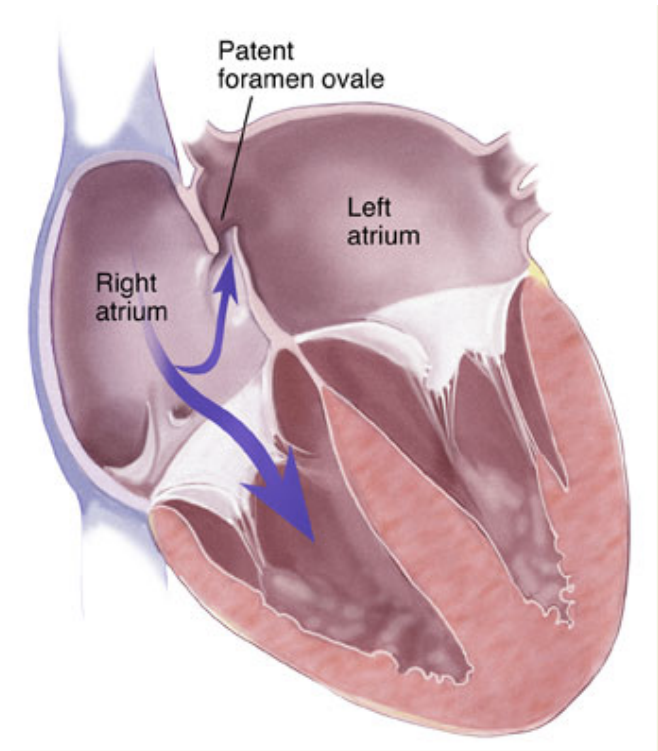
# Right Atrium

Pectinate Muscles

Vena Cava entrance

Foramen Ovale → Foramen  
Ovalis

Pumps blood into Right  
Ventricle



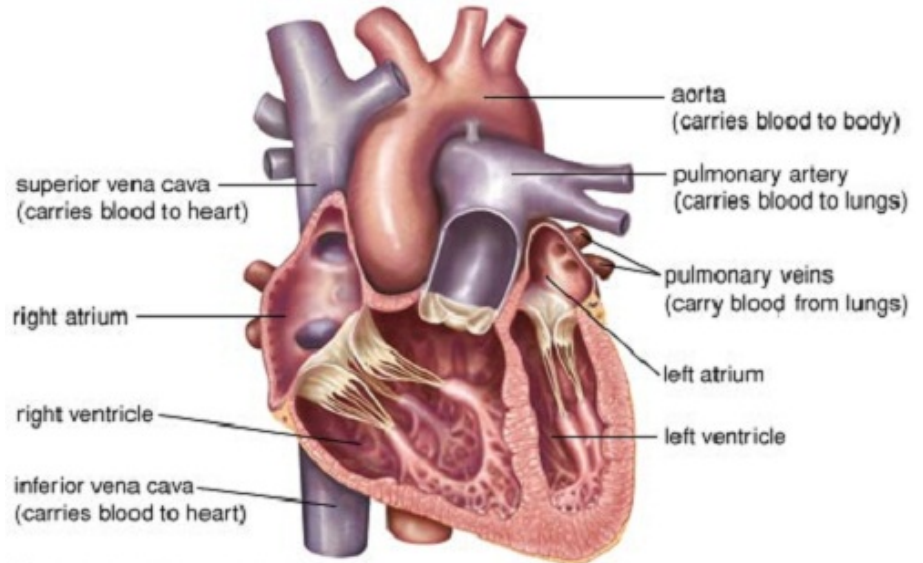
# Right Ventricle

Papillary Muscles

Tricuspid valve

Chordae Tendinae

Pumps blood into the pulmonary circuit through the pulmonary valve in the pulmonary trunk



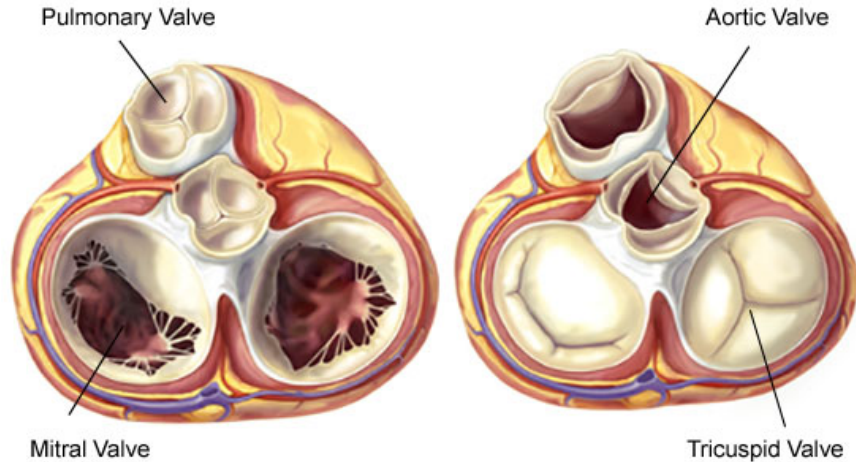
© 2006 Encyclopædia Britannica, Inc.

# Left Atrium

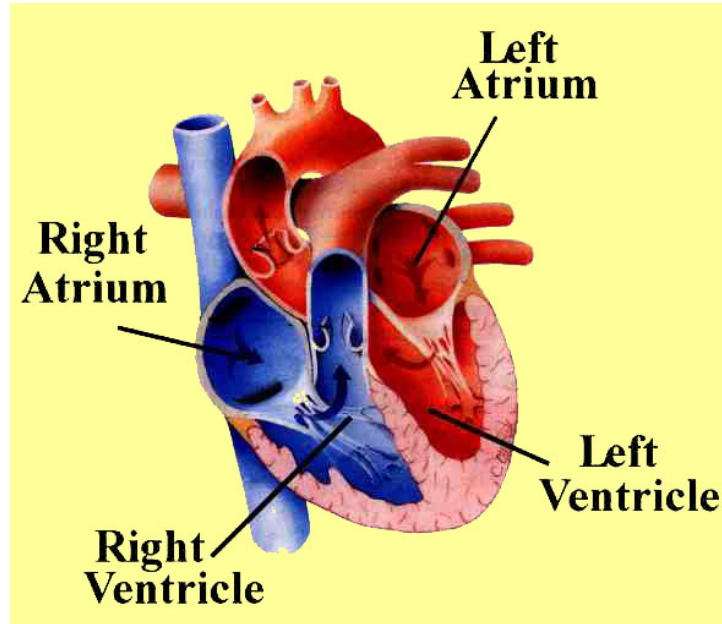
Pectinate Muscles

Bicuspid (mitral) valve

Pumps blood into the Left Ventricle



# Left Ventricle



Papillary Muscles

Chordae Tendinae

Pumps blood into the aorta through the Aortic Valve into the Aortic Arch

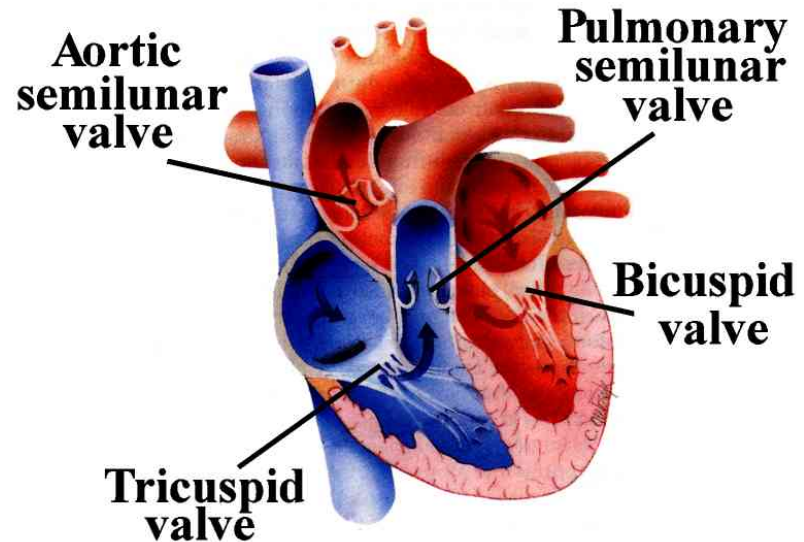


# Atrioventricular Valves

- Valves between atria & ventricles
- Prevent backflow of blood into the atria when the ventricles contract
  - Chordae Tendinae prevent the valve cusps from being pushed back into the atrium

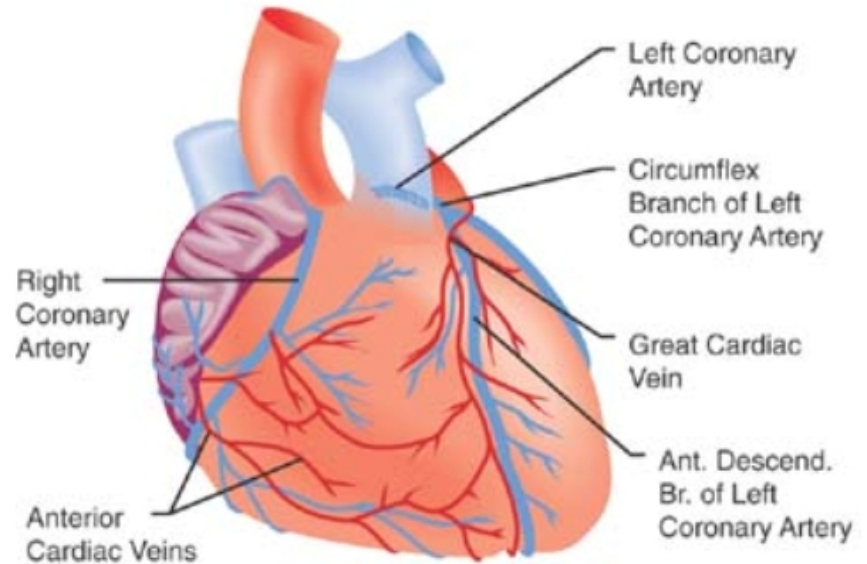
# Semilunar Valves

- Valves between ventricles and main blood vessel trunks
- No muscular brace (chordae tendinae & papillary muscles)
- The 3 cusps support each other



# Coronary Circulation

- Myocardium needs its own supply of blood
- Coronary Arteries
- Cardiac Veins

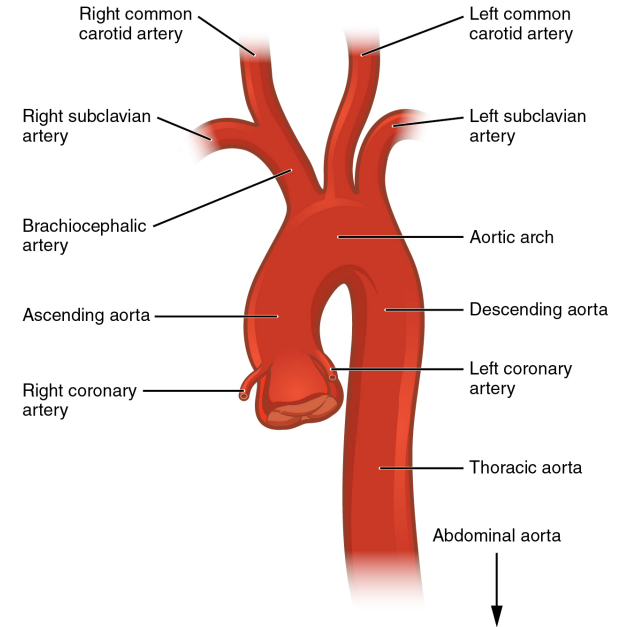


# Coronary Arteries

- Found at the base of the aorta
- Highest point of blood pressure in the systemic circuit
  - Right Coronary Artery
    - follows coronary sulcus
    - supplies RA, R & LV, & the nodes
    - branches into the posterior interventricular artery
  - Left Coronary Artery
    - supplies LA, LV, & interventricular septum
    - branches into the circumflex artery - follows coronary sulcus
    - branches into the anterior interventricular artery

# Aorta

- Largest artery
- Delivers blood to the systemic circuit
- Ascending Aorta
- Aortic Arch
  - 3 branches:
    - brachiocephalic trunk
    - left common carotid artery
    - left subclavian artery
- Descending aorta



# Cardiac Veins

- Great Cardiac Vein

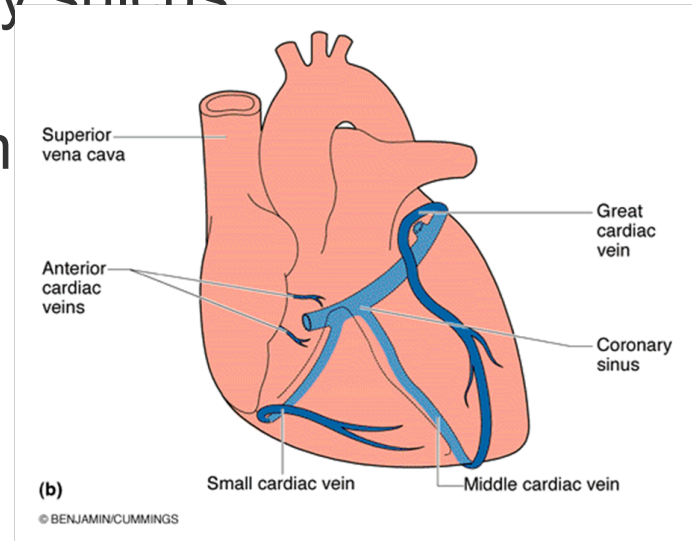
- starts at anterior interventricular sulcus the wraps around the left to the coronary sulcus
- leads to the Coronary Sinus
  - drains into the right atrium

- Posterior Cardiac Vein

- Anterior Cardiac Veins

- Small Cardiac Vein

- Middle Cardiac Vein



# Vena Cava

- Largest vein
- Returns blood from the systemic circuit
- Drains into the right atrium
  - Superior vena cava drains from veins superior to the heart
  - Inferior vena cava drains from veins inferior to the heart

