



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

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Department of Biomedical Engineering

Course Name: 19BMT201 Anatomy & Physiology

II Year : III Semester

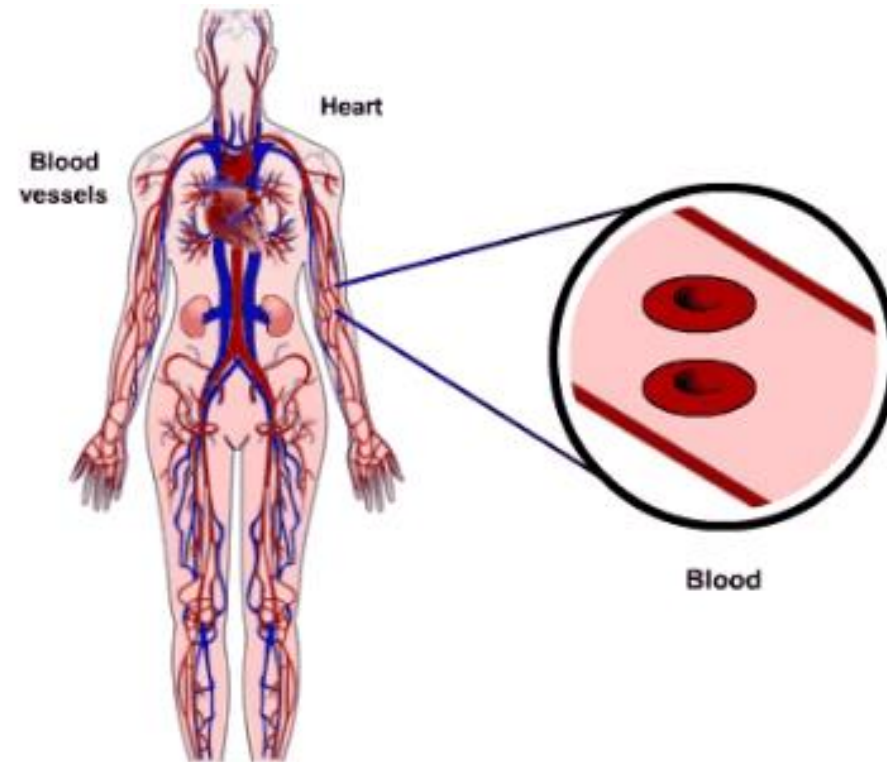
Unit III- Cardiovascular System

Topic : Cardiovascular System-Structure of Heart



Cardiovascular system

- The cardiovascular system is comprised of three components:
 - A pump (the heart)
 - A system of channels (blood vessels)
 - A fluid medium (blood)





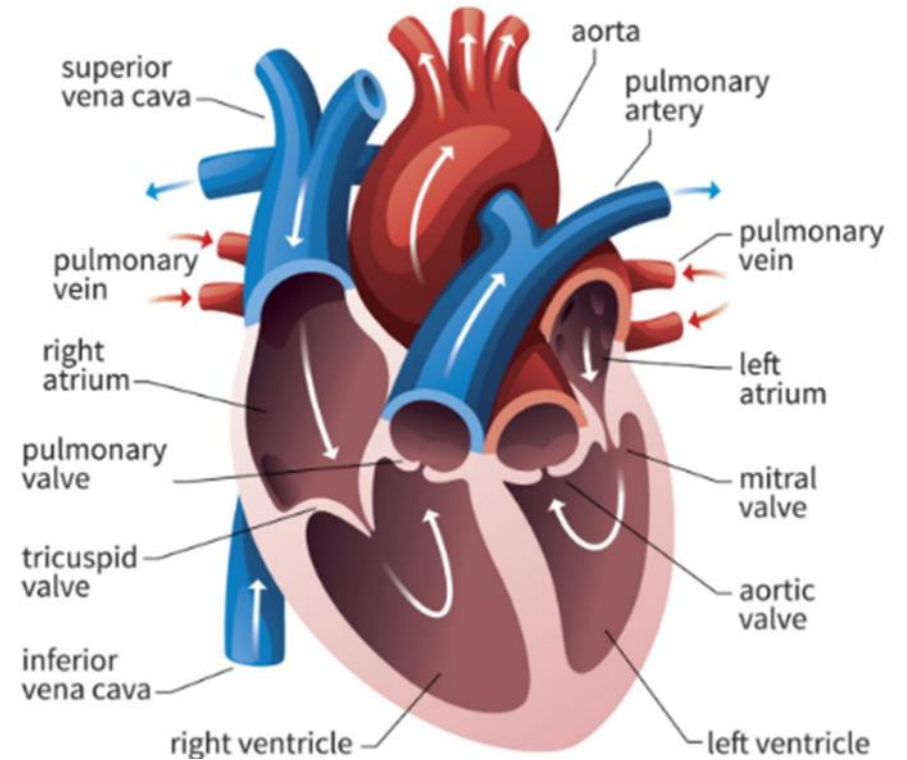
Function

- Delivers oxygen and nutrients to every cell in the body
- Transports hormones from endocrine glands to their target receptors
- Removes carbon dioxide and metabolic waste products from cells and tissues
- Maintains body temperature, fluid levels and appropriate internal pH levels
- Limits tissue damage and prevents infection from invading organisms.



Structure of Heart

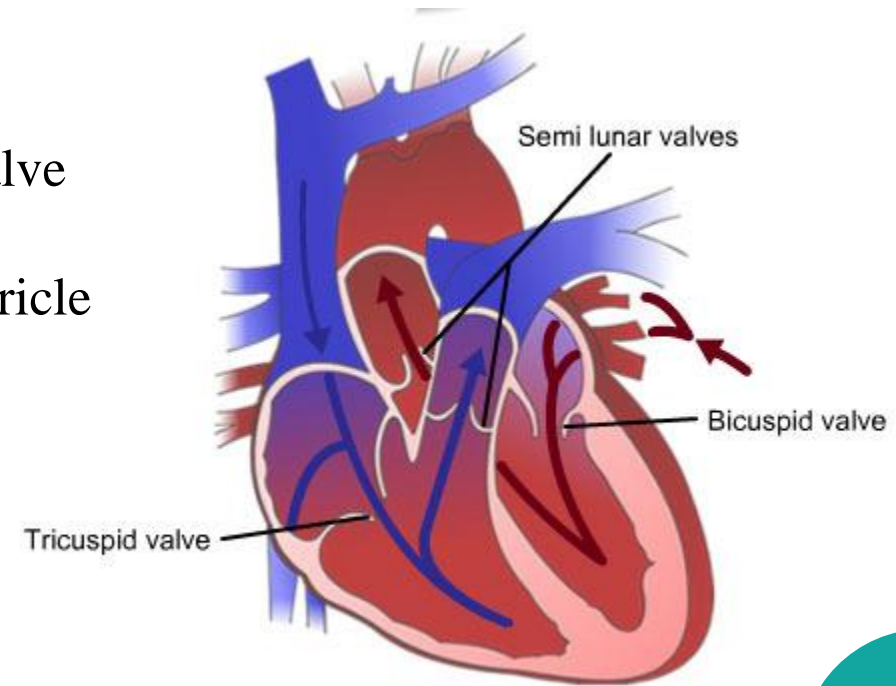
- the size of a closed fist,
- located inside the ribcage between the lungs (cardiac notch).
- It is divided into four chambers, each surrounded by muscle tissue (myocardium):
 - Right atrium
 - Left atrium
 - Right ventricle
 - Left ventricle





Valves of the heart

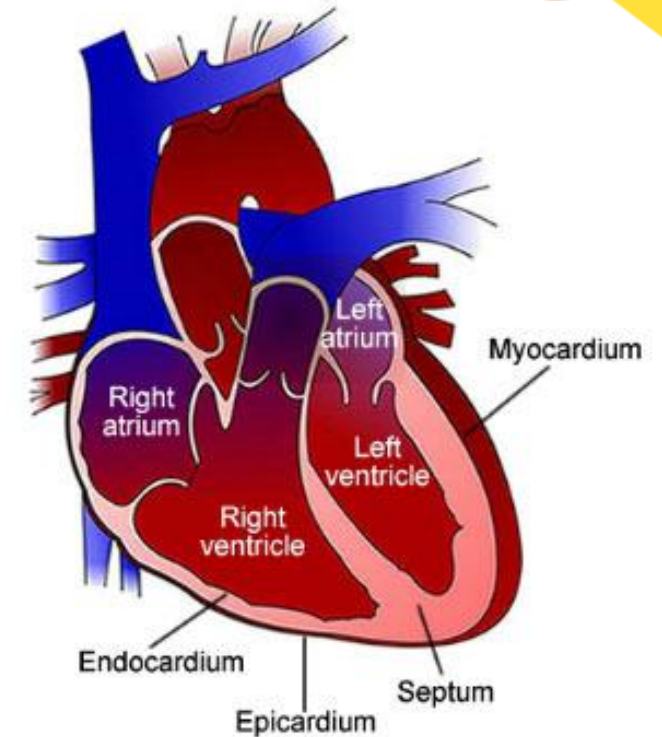
- Valves made of dense connective tissue are present between the atria and ventricles to prevent backflow into the atria.
- **AV valves**
 - The valve between the right atrium and ventricle is the tricuspid valve (it has three cusps).
 - The bicuspid, or mitral valve between the left atrium and left ventricle has two cusps.
- **Semi lunar valves** in the pulmonary artery and aorta also prevent back flow





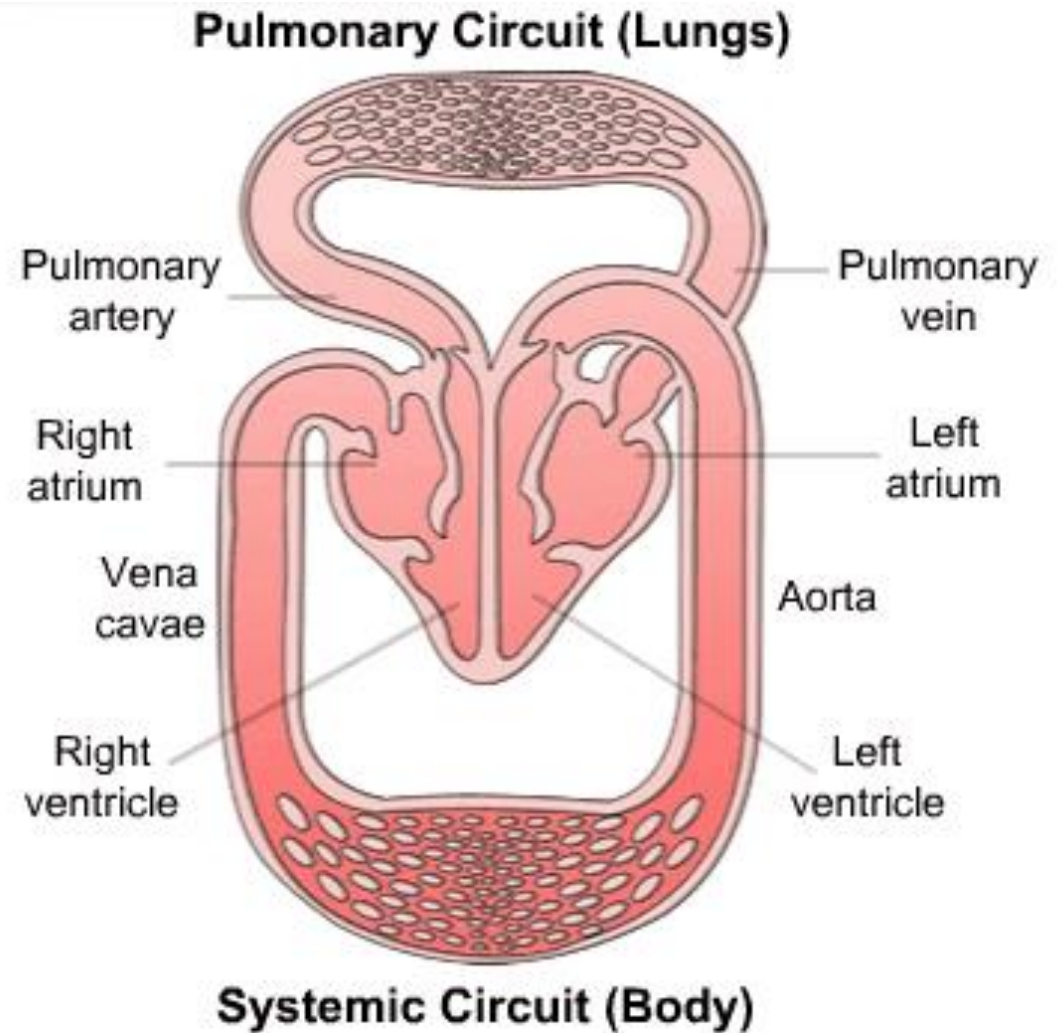
Connective tissues of the heart

- The heart is enclosed within a triple-layered sac called the pericardium.
- **Epicardium** (outer layer) – connective tissue on the outside of the heart wall
- **Myocardium** (middle layer) – cardiac muscle tissue which makes up most of the heart and enables its pumping action
- **Endocardium** (inner layer) – a thin membrane covering the heart valves and lining the inside of the heart. It is continuous with the endothelial lining of the large blood vessels and the rest of the cardiovascular system.



- Heart structure

- 4 chambers → 2 atria + 2 ventricles
- Impure blood → venacava →
→ right atrium → right ventricle
→ Pulmonary artery → lungs (purification)
→ pure blood → pulmonary vein →
→ Left atria → left ventricle → aorta →
→ All parts of the body



Coronary sinus

- The circuit of blood flow from the heart to the lungs and back is known as pulmonary circulation;
- blood flow from the left ventricle via the aorta to the body and back is known as systemic circulation.
- A third circulatory system serves the heart itself.
- The coronary sinus is a collection of veins meeting in the right atrium that collects blood from the myocardium. It delivers deoxygenated blood from the cardiac tissues into the right atrium.

