

❖ The Cardiovascular System

- The function of the cardiovascular system is to deliver oxygen and nutrients and to remove carbon dioxide and other waste products
- Transport of substances such as:
 - o Oxygen and nutrients to cells
 - o Wastes from cells to liver and kidneys
 - o Hormones, immune cells, clotting proteins to specific target cells
- A closed system of the heart and blood vessels
 - o The heart pumps blood
 - o Blood vessels allow blood to circulate to all parts of the body
- Blood is used for delivery

❖ Overview of the Cardiovascular System

- The Heart
 - o Located in the thoracic cavity
 - o Diaphragm separates abdominal cavity from thoracic cavity
 - o Size of fist
 - o Weighs approximately 250-350 grams
 - o Valves present for unidirectional blood flow
 - o Four chambers: 2 atria and 2 ventricles
- Blood Vessels
- Blood

❖ The Heart

- Location is in the thorax between the lungs in the inferior mediastinum
- Orientation

- o Pointed apex directed toward left tip
- o Base points toward right shoulder

❖ Properties of Cardiac Muscle

- Intercalated
 - o Gap junctions: so heart contracts as a unit
 - o Desmosomes: resist stress
- Aerobic muscle
- No cell division after infancy—growth by hypertrophy
- 99% contractile cells
- 1% autorhythmic cells

❖ The Heart's Covering The Pericardium

- Pericardium is a double-walled membranous sac surrounding heart
 - o Fibrous pericardium is loose and superficial
 - o Serous pericardium is deep to the fibrous pericardium and composed of two layers
 - Visceral pericardium: next to heart; also known as the epicardium
 - Parietal pericardium: outside layer that lines the inner surface of the fibrous pericardium
 - o Serous fluid fills the space between the layers of pericardium
 - o Lubricates heart decreasing friction
 - o Pericarditis=inflammation of pericardium

❖ Walls of the Heart

- Three layers
 - o Epicardium
 - Outside layer
 - Visceral pericardium

- Connective tissue layer
 - o Myocardium
 - Middle layer
 - Mostly cardiac muscle
 - o Endocardium
 - Inner layer
 - Endothelium
- Walls of ventricles thicker than walls of atria
- Wall of left ventricle thicker than wall of right ventricle
- ❖ The Heart: 4 Chambers
 - Right and left side act as separate pumps
 - Septa: separate chambers
 - Interventricular septum
 - o Separates the two ventricles
 - Interatrial septum
 - o Separates the two atria
 - Four chambers
 - o Atria are receiving chambers
 - Right atrium
 - Left atrium
 - o Ventricles are discharging chambers
 - Right ventricle
 - Left ventricle
- ❖ The Heart: Valves