Anatomy of the Heart

Cardiac Muscles - A type of involuntary muscle found only in the heart, having the features of both skeletal and smooth muscles.

Atria - The two upper chambers of the heart that receives blood returning from the body/lungs.

Ventricles - The two lower chambers of the heart that pump blood out to the rest of the body

Right Atrium - Receives oxygen-deprived blood from the body from venae cavae (inferior & superior vena cava) and transports blood to the Right Ventricle via tricuspid valve

Left Atrium - Receives oxygen-rich blood from the lungs via left & right pulmonary veins transports blood into the Left Ventricle via bicuspid valve

Right Ventricle - Receives oxygen-deprived blood from the Right Atrium and pumps blood through the Pulmonary valve into the lungs for oxygenation

Left Ventricle - Receives oxygen-rich blood from the Left Atrium and pumps it through the aortic into the rest of the body

Heart Valves - Structures that ensures blood flows in one direction by opening and closing to prevent backflow

Chordae Tendineae - Strong fibers that connect AV valves to the papillary muscles in the Ventricles to prevent AV values from turning inside out

Pulmonary/Semilunar Valve - A triple-flap valve located between the Right Ventricle and the Pulmonary Artery, it prevents backflow of blood into the Right Ventricle after it is pumped to the lungs

Right AV or Tricuspid - A triple-flap valve located between the Right Atrium and Right Ventricle, preventing backflow of blood into the Right Atrium

Anatomy of the Heart (cont)

Left AV or Bicuspid/Mitral - A double-flap valve located between the Left Atrium and Left Ventricle that prevents backflow of blood into the Left Atrium

Aortic/Semilunar Valve - A triple-flap valve located between the Left Ventricle and the Aorta that prevents backflow of blood into the Left Ventricle

Superior Vena Cava - A large vein that returns oxygen-deficient blood from the upper body (head, upper limbs) to the heart

Inferior Vena Cava - A large vein that returns oxygen-deficient blood the lower body (abdomen, lower limbs) to the heart

Papillary Muscles - Muscles located in the heart that anchor Chordae Tendineae and contract to prevent inversion

Connective Tissue - A body tissue that supports/connects/separates different types of tissue/organs; separating the atria and the ventricles, supporting heart valves and muscle

Heart Walls - Made up of three layers that protect the heart

Endocardium - Made out of a thin layer of endothelial tissue (Inner Layer)

Myocardium - Made out of cardiac muscle, connected by intercalated disks that have desmosomes that hold the cells together and gap-junctions that allow electrical signals to flow smootly (Middle Layer)

Epicardium - A thin membrane that covers the heart and contains some pericardial fluid which reduces friction as the heart beats

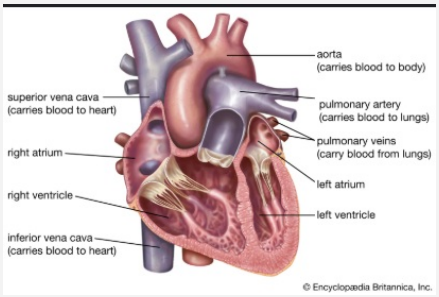
Cardiac Cycle and Blood Flow

Circularly System - Composed of the heart, blood, and blood vessels to transport oxygen, nutrients, waste, and hormones throughout the body, additionally acting as a temperature regulator

Pulmonary Circulation - Delivers oxygen-deprived blood the right side of the heart to the lungs which undergo oxygenation and is transported back to the heart as oxygen-rich blood

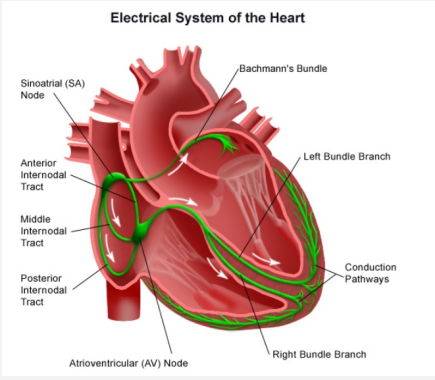
Systemic Circulation - Delivers oxygen-rich blood throughout the entire body via the aorta and blood vessels and returns oxygen-deprived blood to the heart using the superior and inferior vena cava.

Anatomy of the Heart



Reference: Britannica "Heart"

Electrical Activity of the Heart



Reference: Stanford Medicine Children's Health: Anatomy and Function of the Electrical System

Electrical Activity of the Heart

Autorhythmicity - The heart's ability to generate electrical impulses without external stimulation

Pacemaker Activity - Generation of electrical impulses by specialized cells

Nodes - Specialized regions where pacemaker cells are grouped together to manage the rate of heart contractions

Pacemaker Potential - A process that slowly triggers an action potential in pacemaker cells

Sinoatrial (SA) Node - A group of specialized pacemaker cells located in the Right Atrium of the heart, setting the rate and rhythm of the heartbeats (70 action potentials per minute)

Atrioventricular (AV) Node - A group of specialized cells located at the Right Atrium and follows the SA node (50 action potentials per minute

Bundle of His - A group of specialized cardiac pacemaker cells that branches and extends into the Right & Left Ventricles

Purkinje Fibers - Specialized fibers that conduct electrical impulses from Bundle of His and spread throughout the Myocardium (30 Action Potential per minute)

Interatrial Pathway - A pathway that transmits electrical impulses from the Right and Left Atrium

Internodal Pathway - A pathway that transmits electrical impulses from the sinoatrial node to the atrioventricular node

Current Flow Order through the Heart Wall: SA node, AV node, Bundle of His, Right & Left bundle branches, Purkinje fibers

Pacemaker Activity - This occurs because of the unique electrophysiological properties of a subset of specialized cardiac muscle cells that generate pacemaker activity.