

HUMAN ANATOMY AND PHYSIOLOGY-1(BP101T)

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UNIT: 5 CARDIOVASCULAR SYSTEM

CLASS: 1

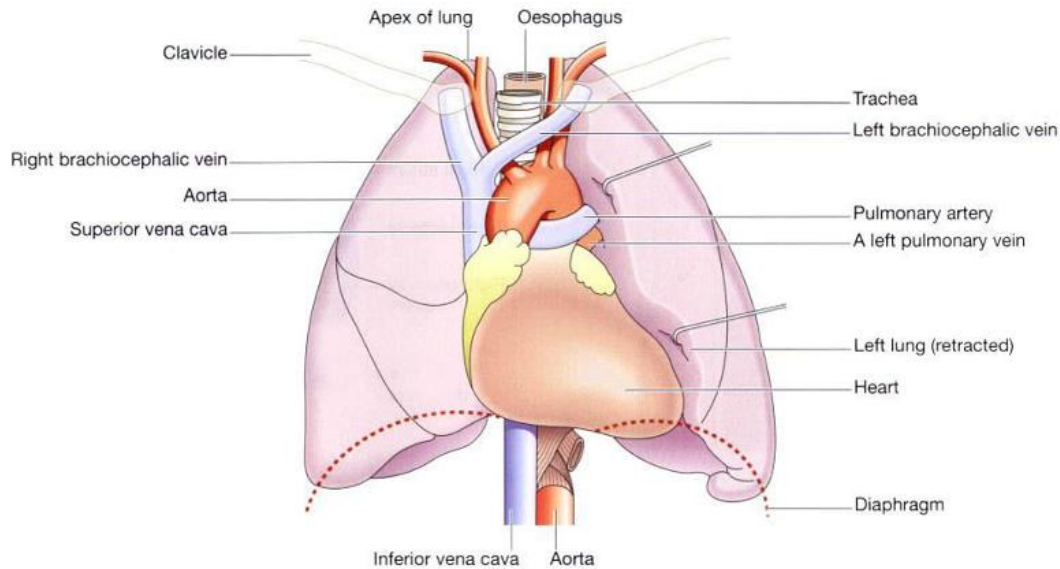
TOPIC: ANATOMY OF HEART

CARDIO VASCULAR SYSTEM is the system of Heart and blood vessels that circulates blood throughout the body. The blood circulating the body transports nutrients and oxygen to the tissues and removes the CO₂ & waste products from the tissues.

HEART is the central pump and series of blood vessels are the distributing and collecting tubes.

STRUCTURE & FUNCTION OF HEART: Heart is a roughly cone shaped hollow muscular organ. Its length is 10 cm and size of the owner's fist. It weighs about 225 gms in women and heavier in men about 310 gms.

POSITION OF HEART Heart lies in “Thoracic Cavity” It is obliquely a little more to the left than the right.



ORGANS ASSOCIATED WITH HEART:

Inferiorly – Diaphragm

Superiorly- Great blood vessels is Aorta superior Vena Cava, Pulmonary Artery and Pulmonary Vein.

Posterior - Oesophagus, Trachea, left and right Branches, descending aorta, Inferior Vena Cava and Thoracic Vertebra.

Laterally - Lungs - The left lung overlaps the left side of the heart.

Anteriorly - The Sternum, ribs and Inter costal muscles.

LAYERS OF HEART:

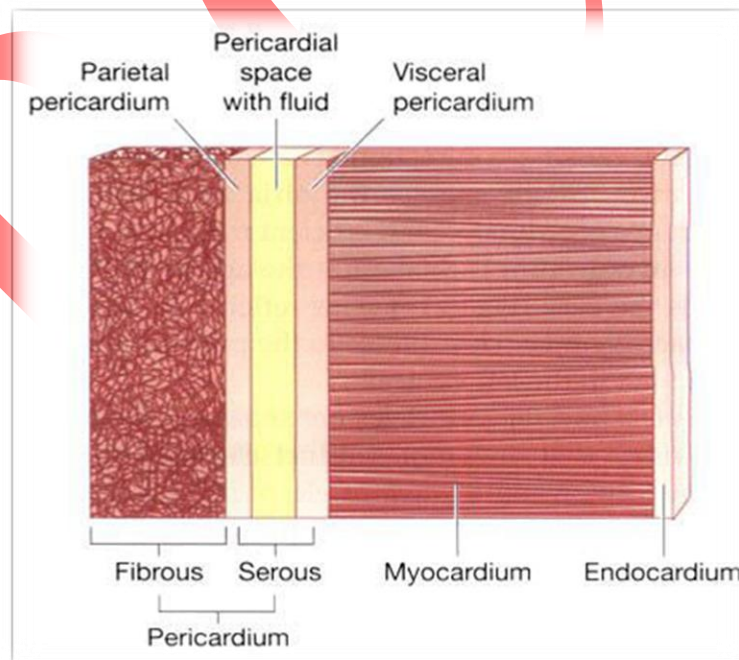
Heart is composed of three layers of tissue:-

They are: 1) Pericardium 2) Myocardium 3) Endocardium

1) PERICARDIUM: The pericardium is outer most layer of Heart. The Pericardium is made up of two sacs. The outer sacs consist of Fibrous tissue and inner double layer of Serous membrane.

a) FIBROUS LAYER: The outer Fibrous Sac is continuous with tunica adventitia of the great blood vessels above and diaphragm below. It is in elastic and Fibrous nature. It prevents over distension of the Heart.

b) SEROUS LAYER: The outer layer of serous membrane is made up of Mesothelium contain small amount of Connective tissue. It contains two-layer, outer layer is Parietal pericardium lines the Fibrous Sac. The inner layer, the Visceral pericardium and Epicardium. The Serous Membrane consists of Flattend Epithelial Cells. It secretes Serous Fluid in the space between the Visceral and Parietal layers, which allows smooth movement between the Parietal layer and Visceral Pericardium.



2) MYOCARDIUM:- The Myocardium is composed of specialized Cardiac Muscle found only in the Heart. It is Involuntary in nature. Each Fibre has a

nucleus and one or more branches. Microscopically these joints on Intercalated discs can be seen as thicker, darker lines than the ordinary cross strips. This layer is appear like a sheet of muscle and have end to end continuity of fibres. When an impulse is initiated it spreads from one cell to other cell via branches and intercalated disc, over the whole sheet of muscle causing contraction. It is thickest at the left vertical region which has the greatest work load.

3) ENDOCARDIUM:- This lines the Chamber and Valves of the heart. It is thin, smooth, glistening membrane that permits smooth flow of blood inside the heart. It consists of flattened epithelial cells and it is continuous with the endothelium lining of blood vessels.

The heart is divided into a right and left side by the Septum. The partition consisting of Myocardium covered by Endocardium. Each side is divided by an Atrio Tricular Valve into an upper chamber called Atrium and lower chamber called Ventricle.

There are two Atrioventricular Valves are present they are:-

1. Right Atrioventricular Valve.
2. Left Atrioventricular Valve.

1) RIGHT ATRIO VENTRICULAR VALVE- is having double Folds in nature with little Fibro tissue. These are Tricuspid Valves i.e. having three Flaps on Cusps.

2) LEFT ATRIO VENTRICULAR VALVE- is having double folds in nature with little Fibro tissue. These are bicuspid Valves i.e. having two Flaps on Cusps also called Mitral Valve.

- Due to these Valves the Flow of blood will be in Unidirectional Flow on one way.
- The blood enters the heart via the atrio and then Ventricles.

- The Valves between the Atria and Ventricles open and close passively according to changes in pressure in chamber.
- These are open when the pressure in the Atria is greater than in the Ventricles. Ventricular contraction (Ventricular Systals), the pressure in the Ventricles rises more than the Atria.
- Then the Valves are closed to prevent the backward flow of blood.
- The Valves are prevented from opening upwards into the Atria by tendinous cords called Chordiae tendineae.

These are extended from the interior surface of the cusps to little projection of Myocardium into Ventricles covered with endothelium called Papillary Muscle

