جامعة المعقل الأهلية
Almaaqal University

General Anatomy

Heart

Dr. Jassim H. Salim

Consultant Surgeon

Goals

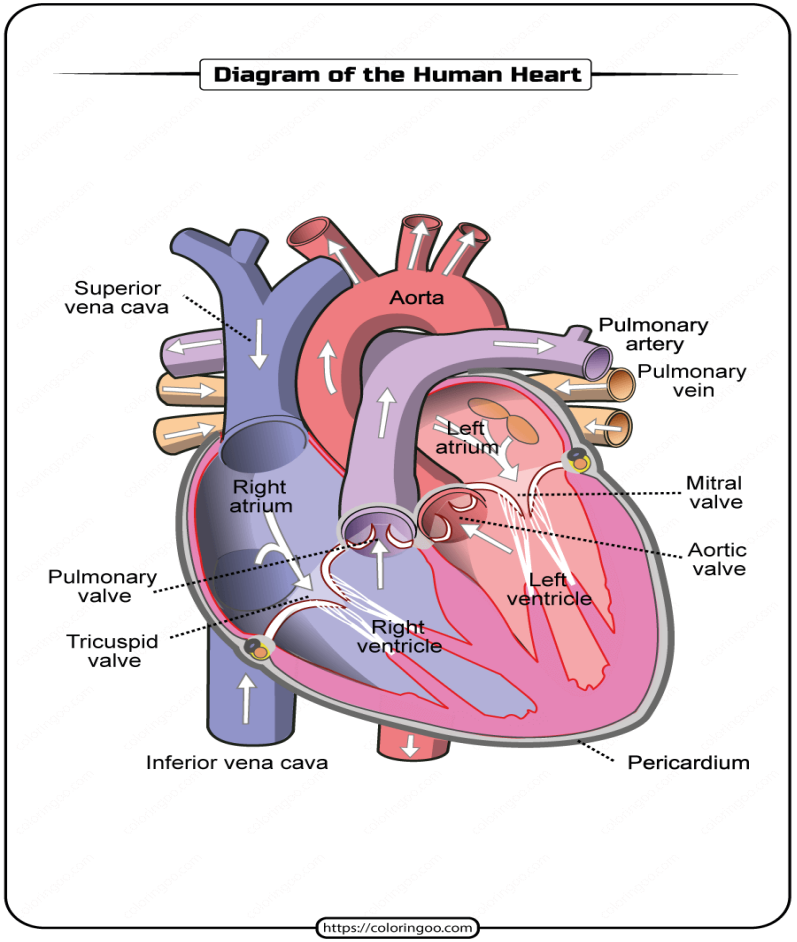
- Knowing the different parts of the heart.
- Knowing various functions of it and clinical applications.

Objectives

- Introduction.
- Definition.
- Function of the heart.
- Component of the heart.
- Chambers of the heart.
- Valves of the heart.
- Heart sounds.
- Blood flow in the heart.
- Blood supply of the heart.
- Myocardial infarction.
- Electricity of the heart.
- Electrocardiography E C G. practical photos.

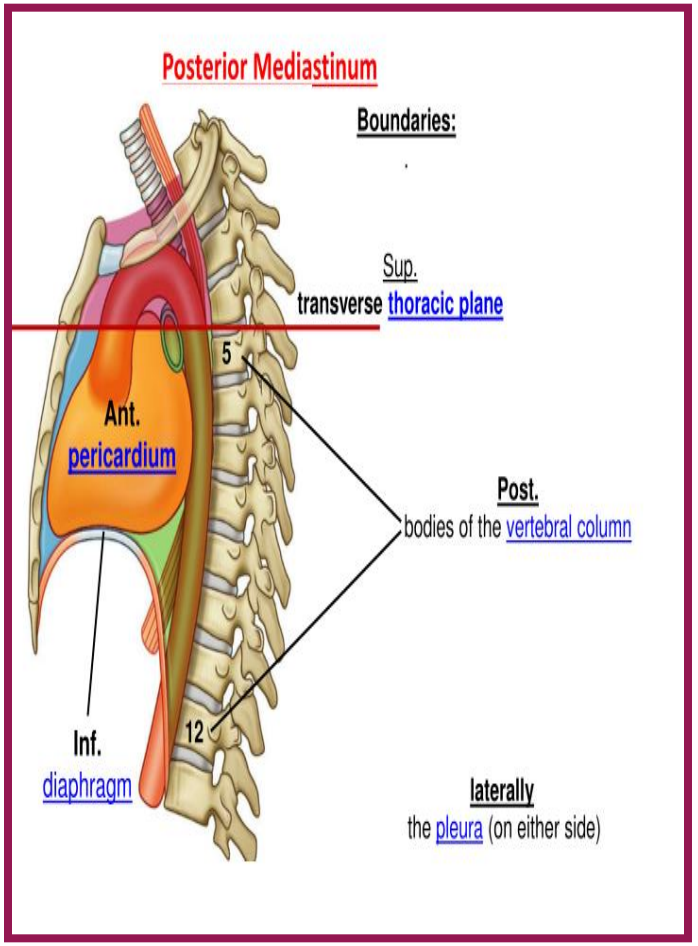
Introduction

The heart is the organ which pump blood and nutrient to different parts of the body through the great vessels, it has two atria and two ventricles. It lies in the thorax.



Definition

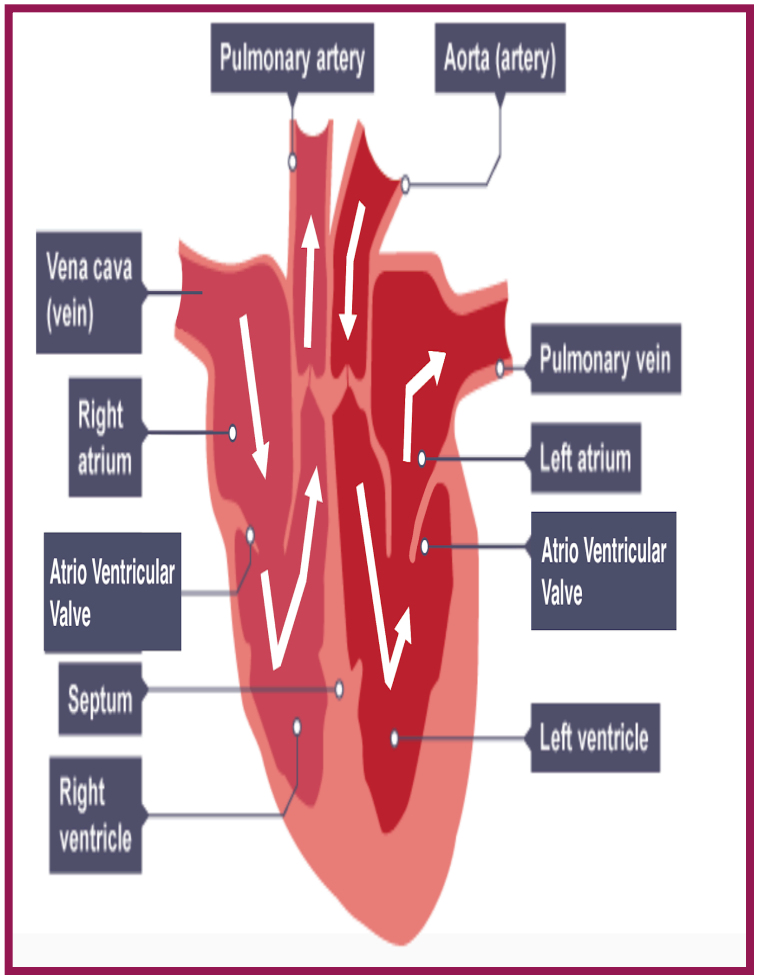
a hollow muscular organ which push blood to different parts of the body. It receive blood from the superior and inferior vena cava and push it to other part of the body through the aorta. It lies in the chest behind the breast bone and in front trachea, esophagus and aorta. It is above the diaphragm.



Function

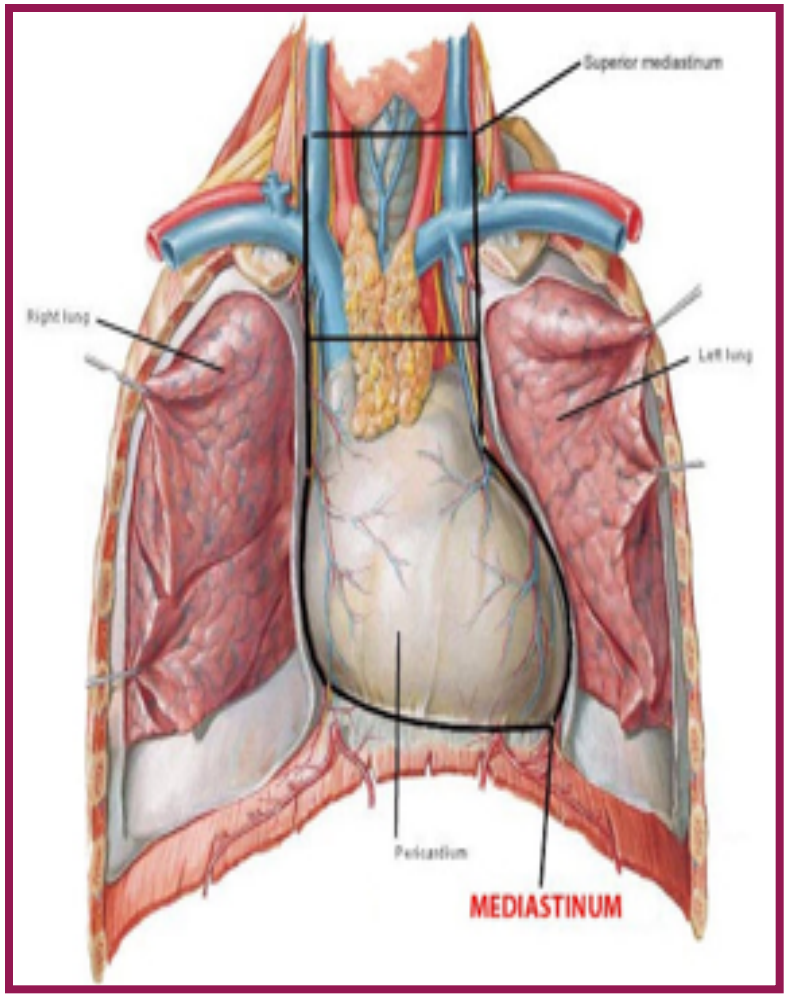
The four main functions of the heart are:

1. It distribute oxygenated blood to other part of the body.
2. It sends hormones and nutrients to different parts of the body.
3. It get deoxygenated blood from the rest of the body and send it to the lung for oxygenation
4. It Maintains **blood pressure.**



Location of heart

Heart is located in a space in the centre of the chest cavity called mediastinum in particular the Middle mediastinum. It is the space between the 2 lungs and the heart is wedged between them.



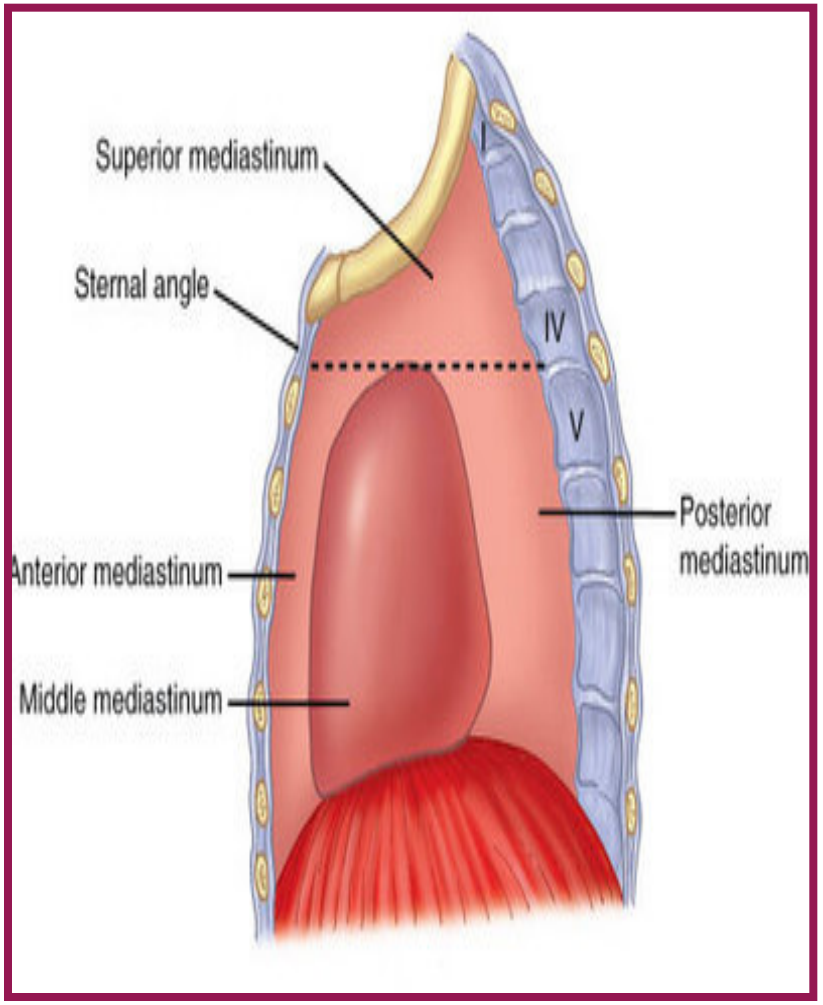
The mediastinum

The mediastinum is divided into

- Superior mediastinum
- Inferior mediastinum.

Inferior mediastinum is further divided into

- Anterior mediastinum
- Middle mediastinum
- Posterior mediastinum



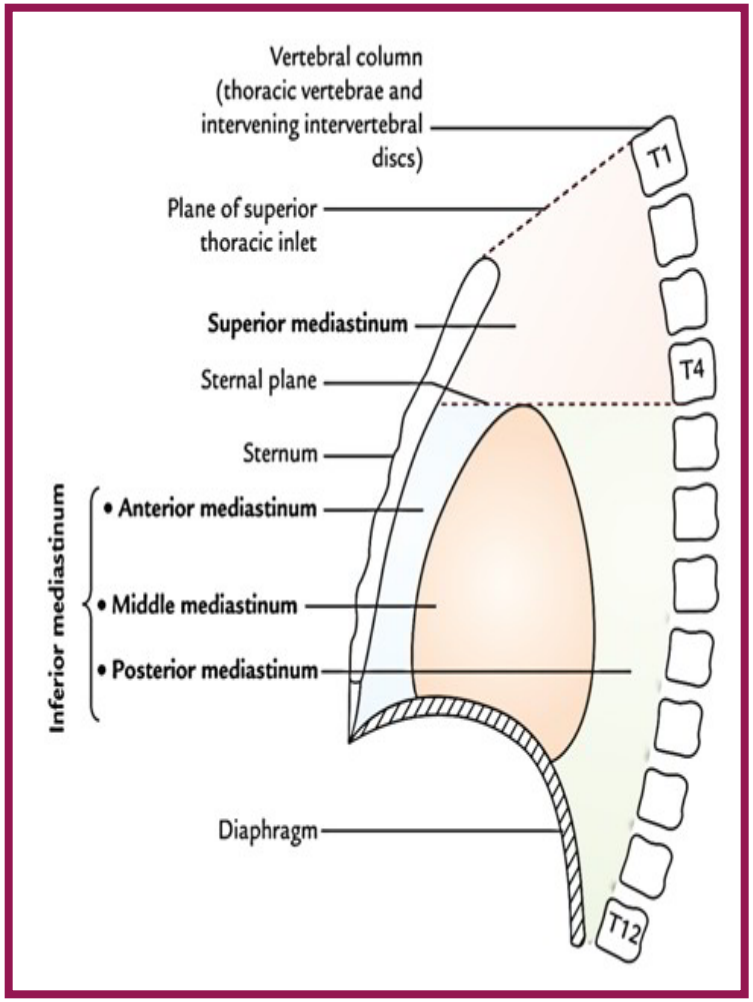
Boundaries of the Mediastinum

In the front – sternum

At the back – vertebral column

Above – Thoracic outlet – the opening of the chest cavity at the top

Below – Diaphragm – the muscular layer separating the chest from the abdomen



Boundaries of the Middle Mediastinum

Boundaries of Middle Mediastinum:

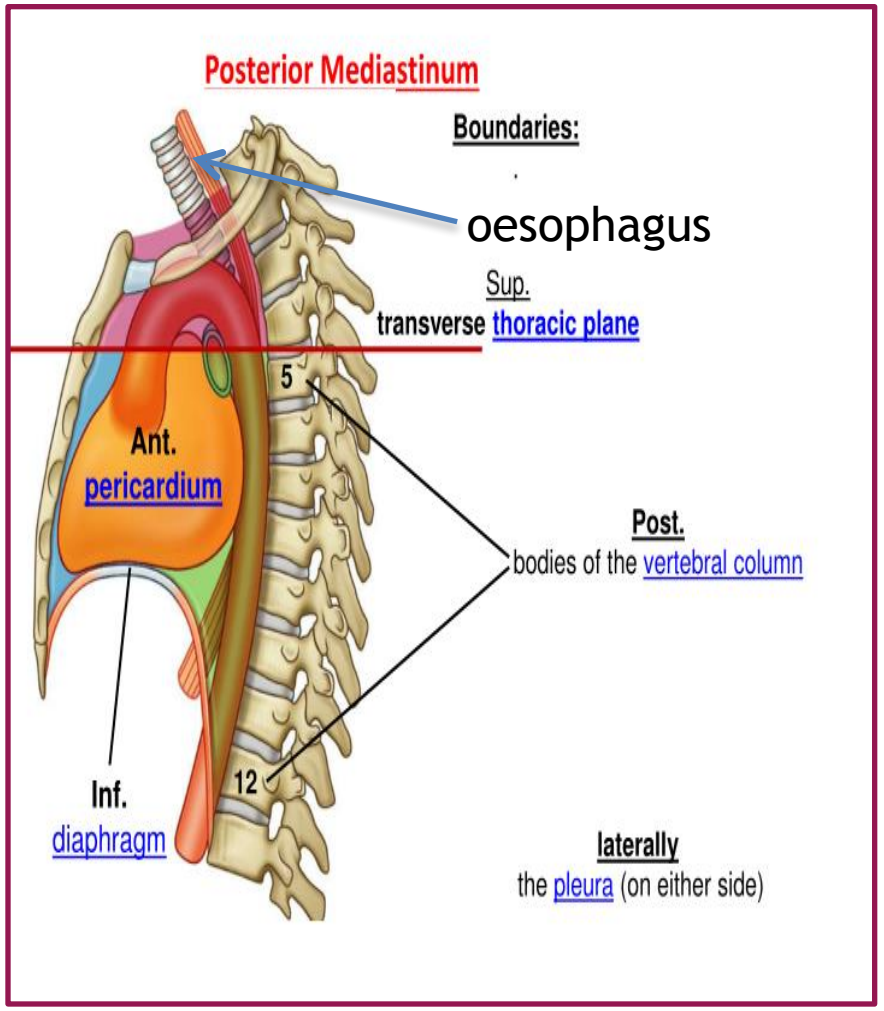
In the front – Inner surface of the sternum

At the back – esophagus which is the muscular tube that carries the food to the stomach

On both sides –the pleura – layer of tissue lining the lungs

Above – Superior mediastinum

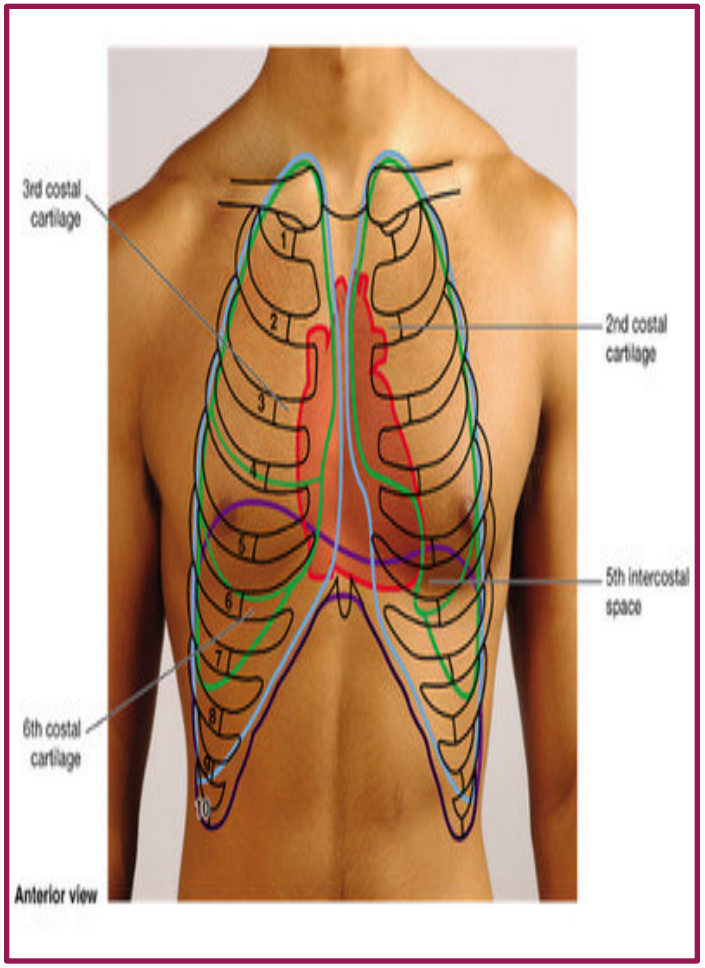
Below – diaphragm



Location of heart in relation to other organs

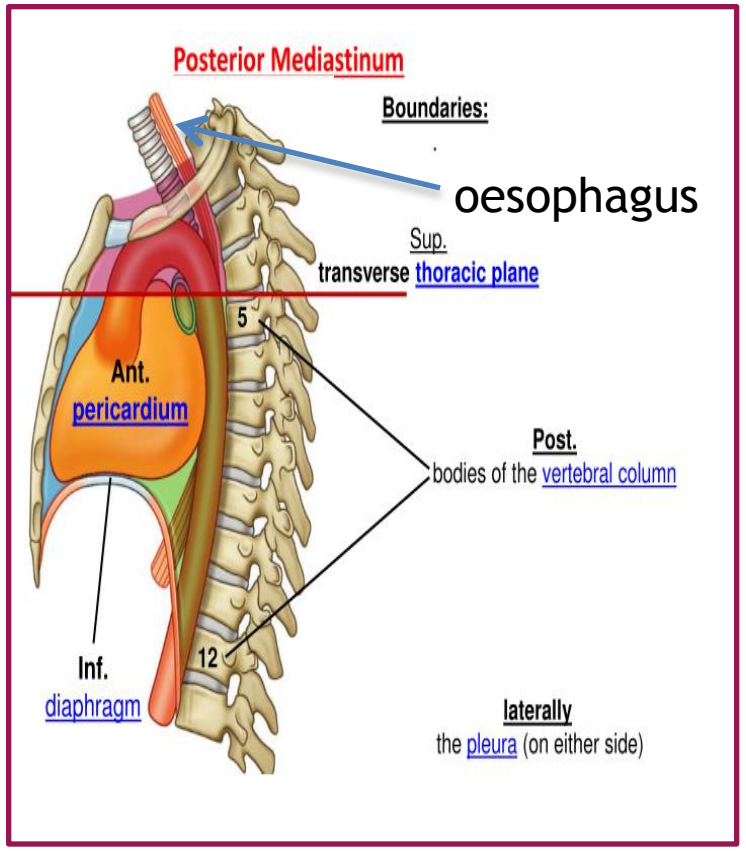
Anterior relations of heart from front to back

- Skin
- Connective tissues
- Anterior chest muscles
- The ribs 2 to 7 on left side
- Sternum
- Structures of anterior mediastinum



Posterior relation of the heart

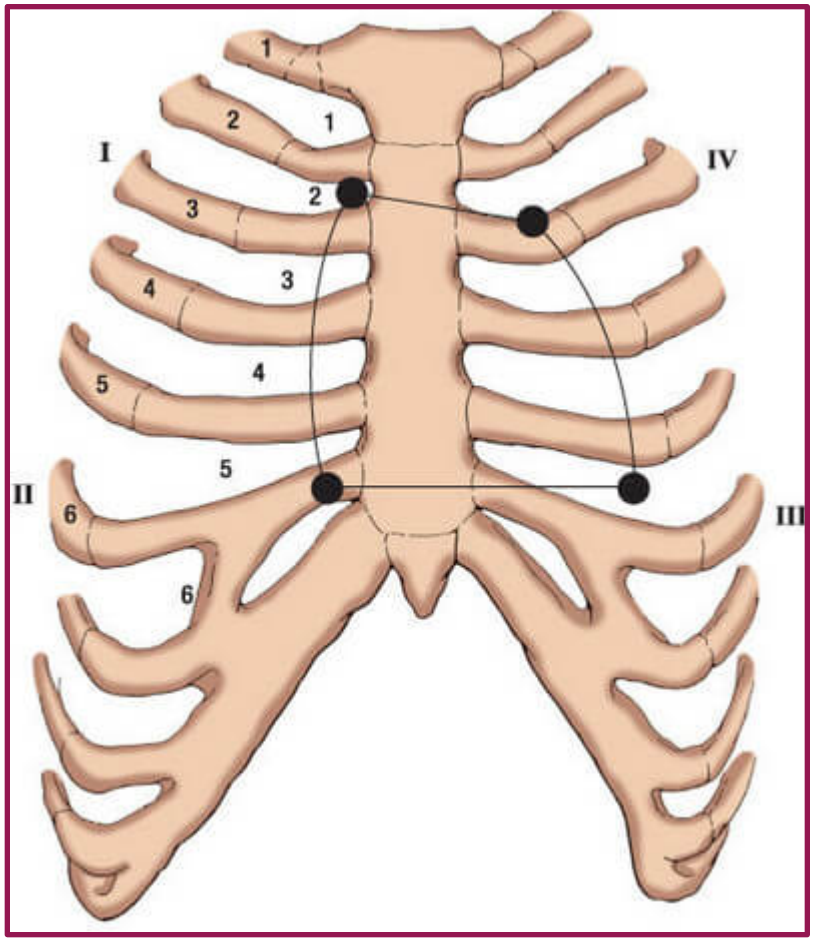
- Esophagus
- Thoracic duct
- Descending aorta
- Azygos vein
- Other structures of posterior mediastinum
- On either side, heart is wedged between the lungs and the structures that are present in the medial side of the lungs.



Surface Anatomy of heart

The border of the heart that lies inside can be traced on the front of chest wall by marking the following points:

1. Mark a point 1cm from the right sterna line along the Upper border of 3 rd right costal cartilage.
2. Mark another point at 2.5 cm from the left lateral sterna line along the lower border of the second left costal cartilage Joining points 1 and 2 forms superior border of heart.

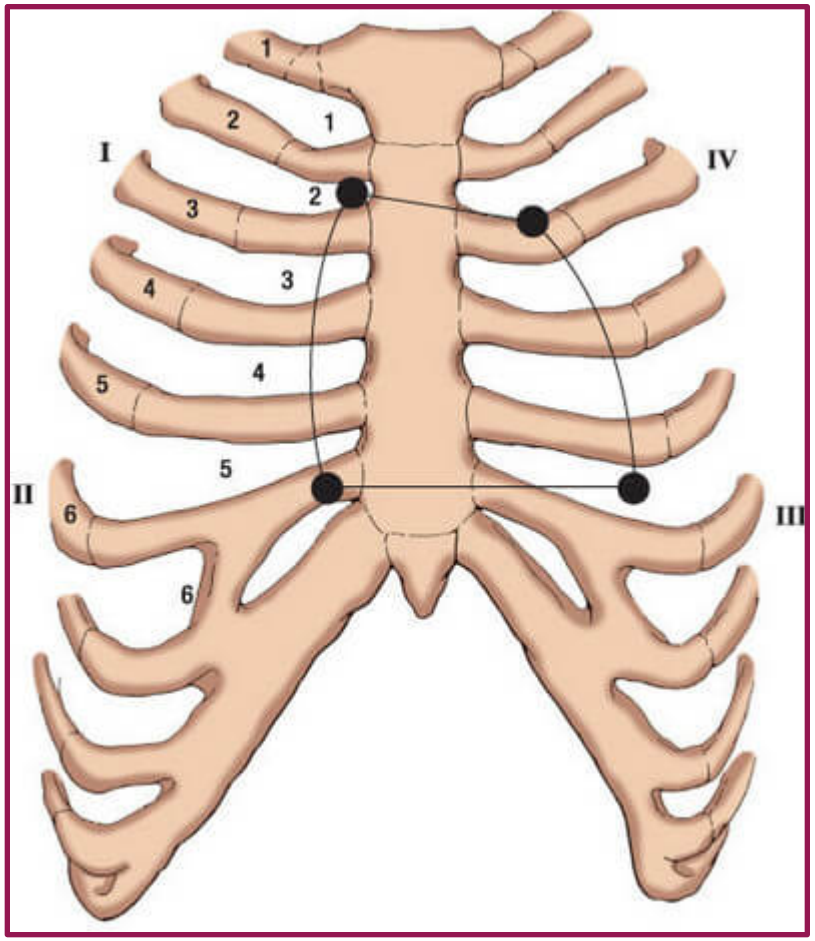


Surface Anatomy of heart

3. A point 2 cm to the right of the sternum along the space between 6th and 7th rib on the right side where the cartilage joins the sternum.

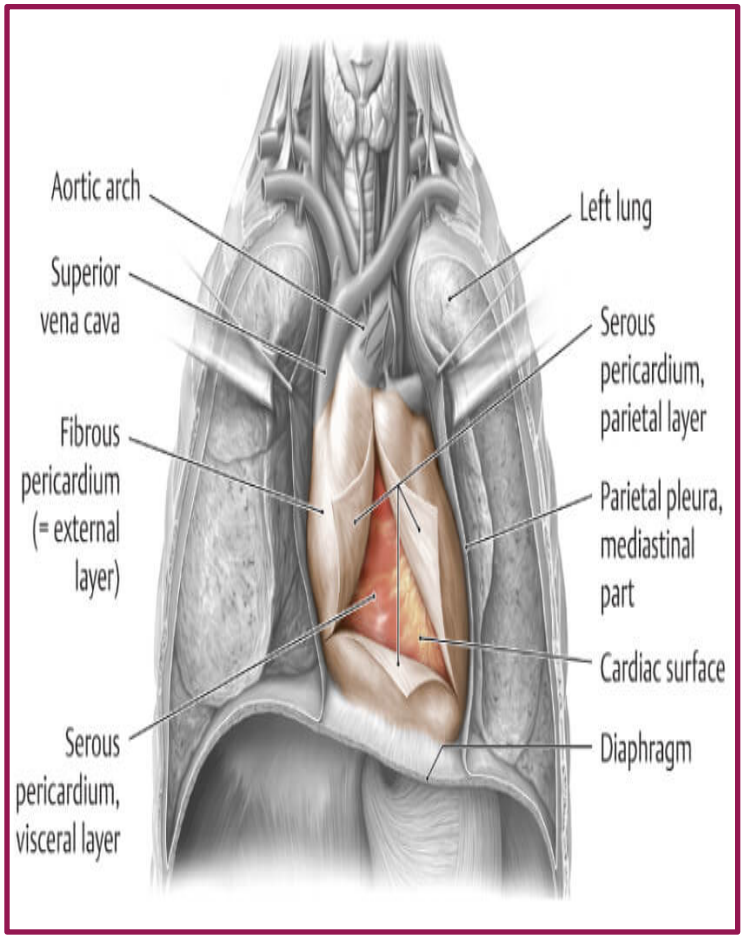
4. Mark a point 9 cm to the left of midsternal line. This point lies corresponding to the apex of heart inside Joining points 3 and 4 forms the inferior border of heart

Thus right border is formed by joining 1 and 3 and left border of heart is formed by joining 2 and 4



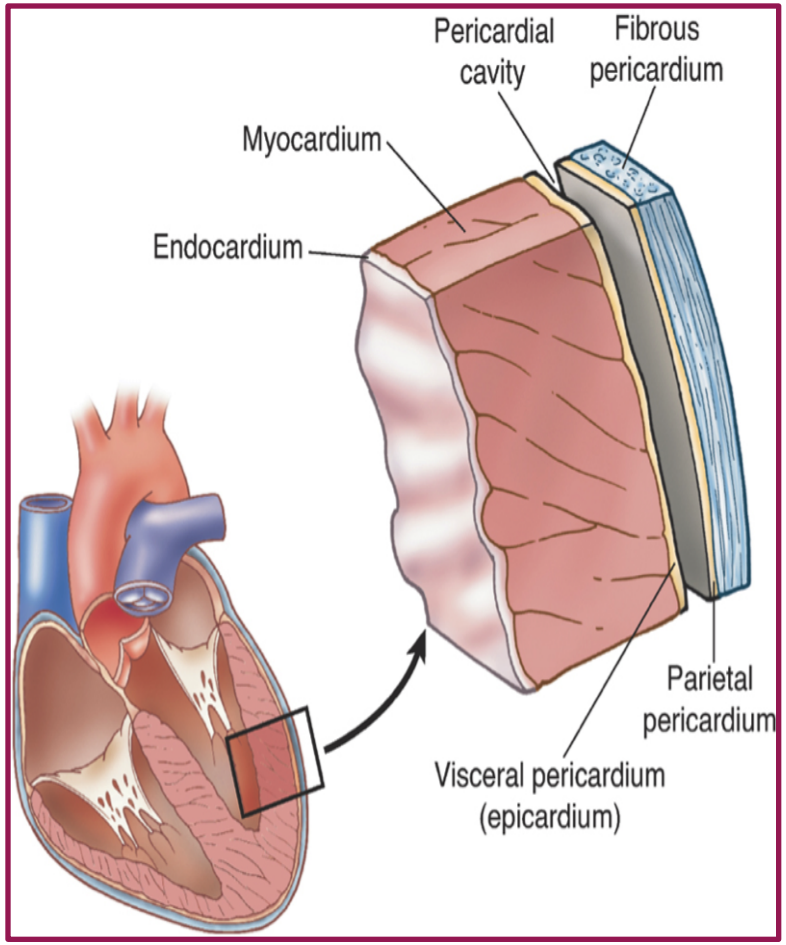
Pericardium

The pericardium consists of 2 layers with a lubricating fluid in between called the pericardial fluid. The outer layer is called as fibrous pericardium. It has strong attachment with the diaphragm below and it merges with the walls of great blood vessels like aorta and pulmonary arteries that arise from the heart and pulmonary veins, superior and inferior vena cava



Layers of heart

The wall of the heart is made up of three layers: layer forms the heart muscles

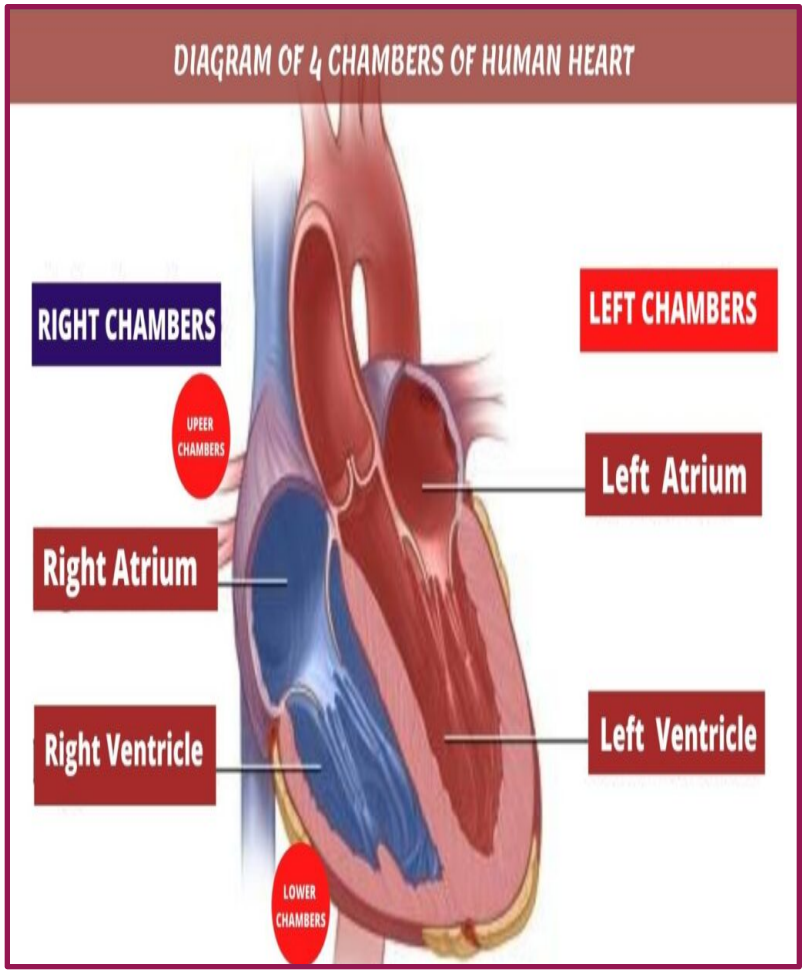


- **Epicardium-** This is a protective layer made of connective tissues.
- **Myocardium-** This layer forms the heart muscles.
- **Endocardium-** This is the innermost layer and protects the valves and the heart.

Heart chambers

Two atria which have thin walls they pass blood to the ventricles

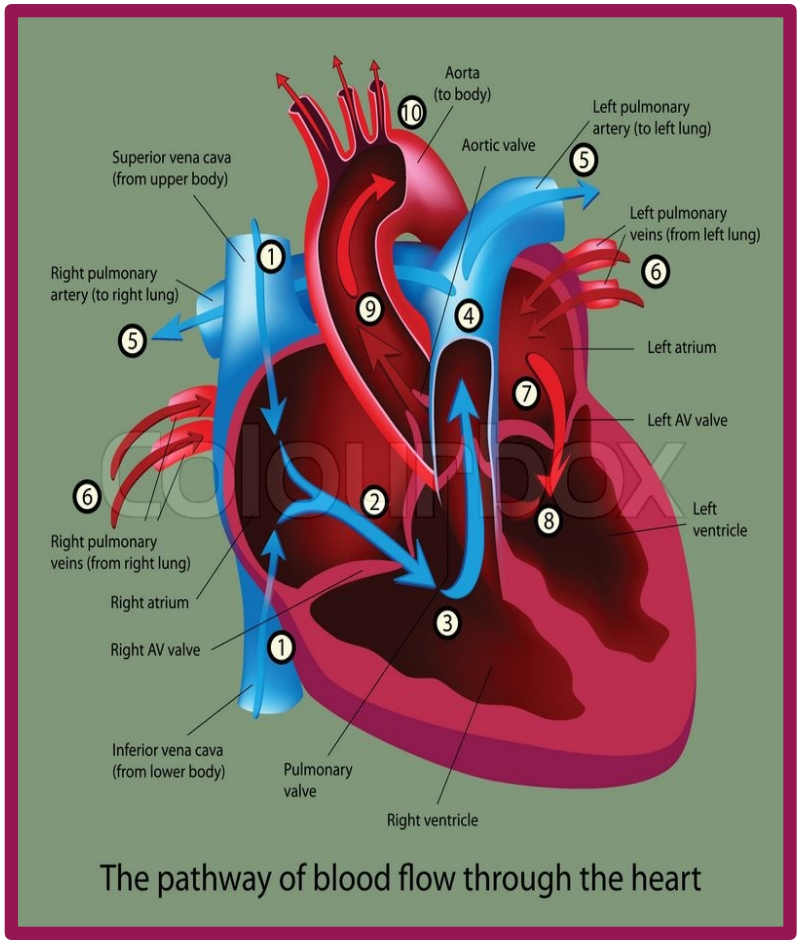
Tow ventricles which have thicker walls. The left ventricle wall thicker than the right, they push blood to the pulmonary trunk and the aorta respectively.



Blood flow in the heart

Blood coming from the inferior and superior vena cava to the right atrium. Then from right atrium to the right ventricle , from which deoxygenated blood goes to the lung.

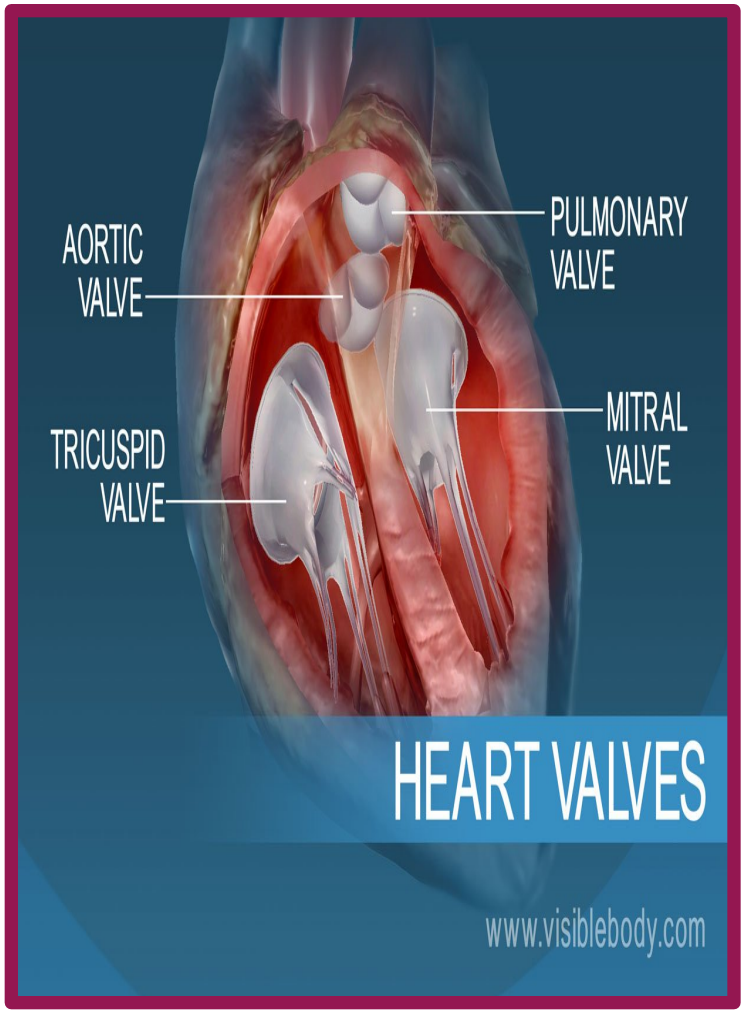
Blood coming from lungs through the pulmonary veins filled with oxygen is going to left atrium ,from which to the left ventricle to the aorta and the to all arteries of the body



Heart valves

The mitral **valve** and tricuspid **valve** are located between the atria (upper **heart** chambers) and the ventricles (lower **heart** chambers) called the atrioventricular valves

. The aortic **valve** and pulmonic **valve** are located between the ventricles and the major blood vessels the aorta and pulmonary trunk ,they are called semi lunar valves, leaving the **heart**.



Heart valves

Position of the heart valves on the chest wall and site of auscultation

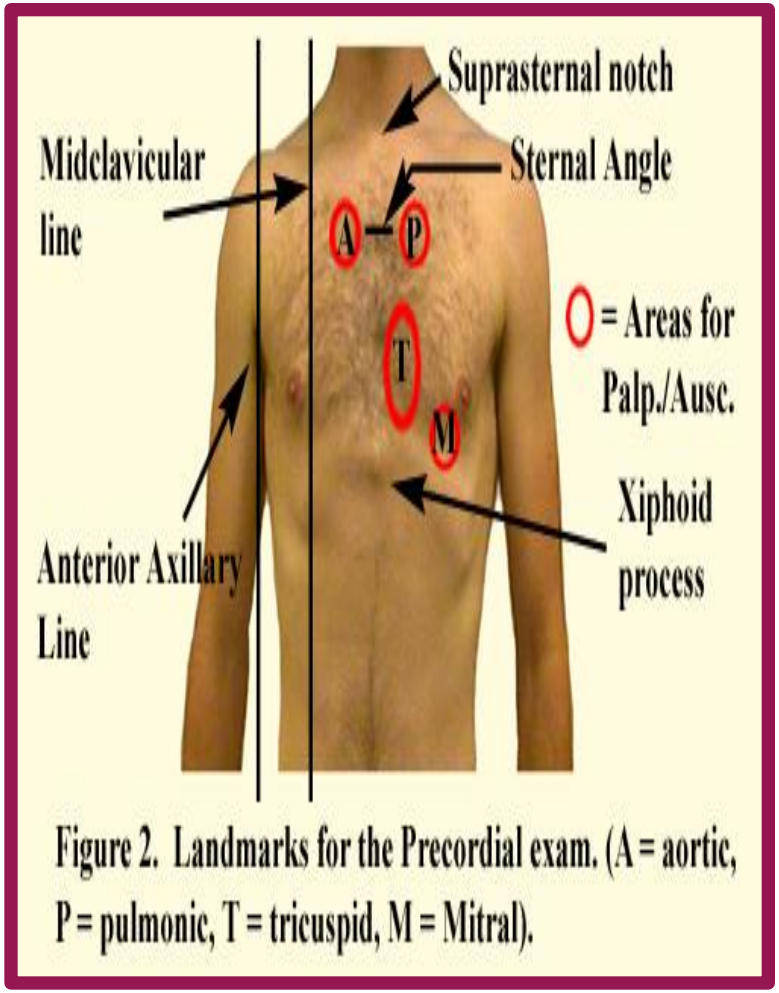


Figure 2. Landmarks for the Precordial exam. (A = aortic, P = pulmonic, T = tricuspid, M = Mitral).

Youtubes

- https://youtu.be/SwHjwO7BnsI
- https://youtu.be/qmpd82mpVO4
- https://youtu.be/jBt5jZSWhMI
- https://youtu.be/_4fqzp58BfY
- https://youtu.be/c3YuWX6QO-Q

Thank You