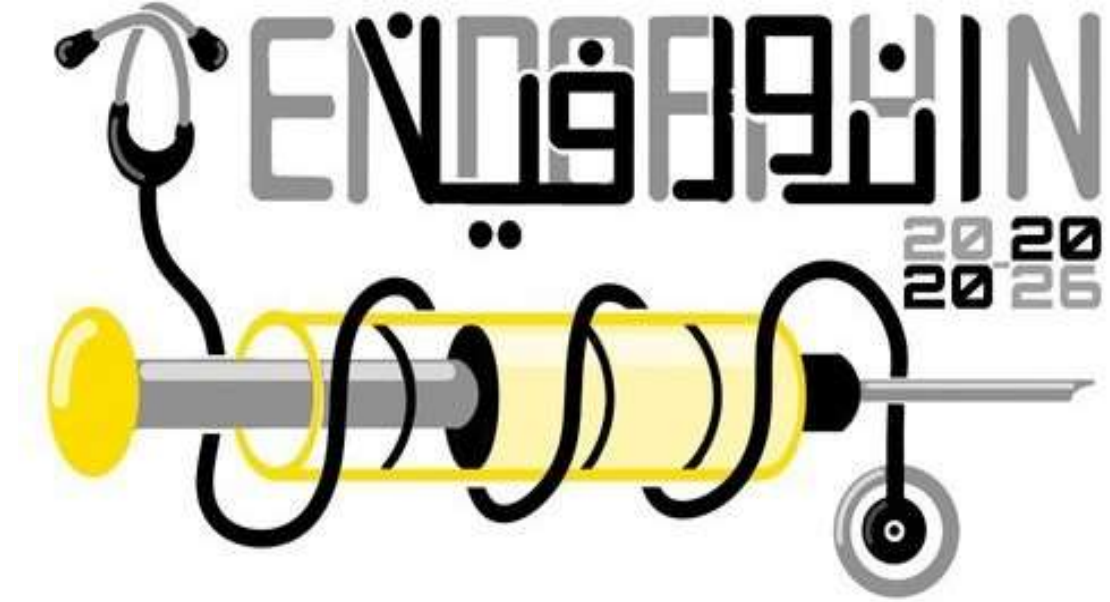


Anatomy



Sheet:3

Lecture title: Heart 2

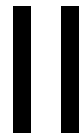
Date:

Done by: Suhaib Alalami

Edited by:

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HEART



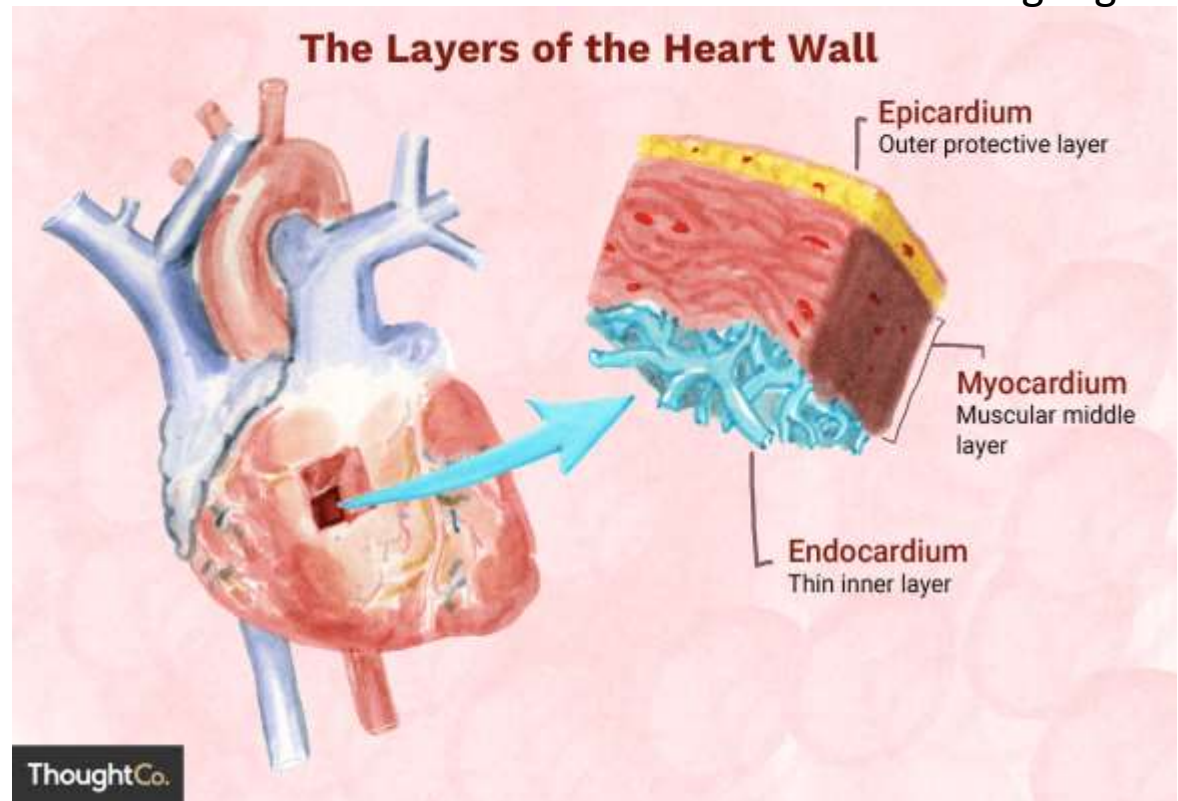
Dr. Silvia
Boyajian

Structure of the Heart

The walls of the heart are composed of:

- a thick layer of cardiac muscle, the **myocardium**
- covered externally by the **epicardium**
- and lined internally by the **endocardium**.

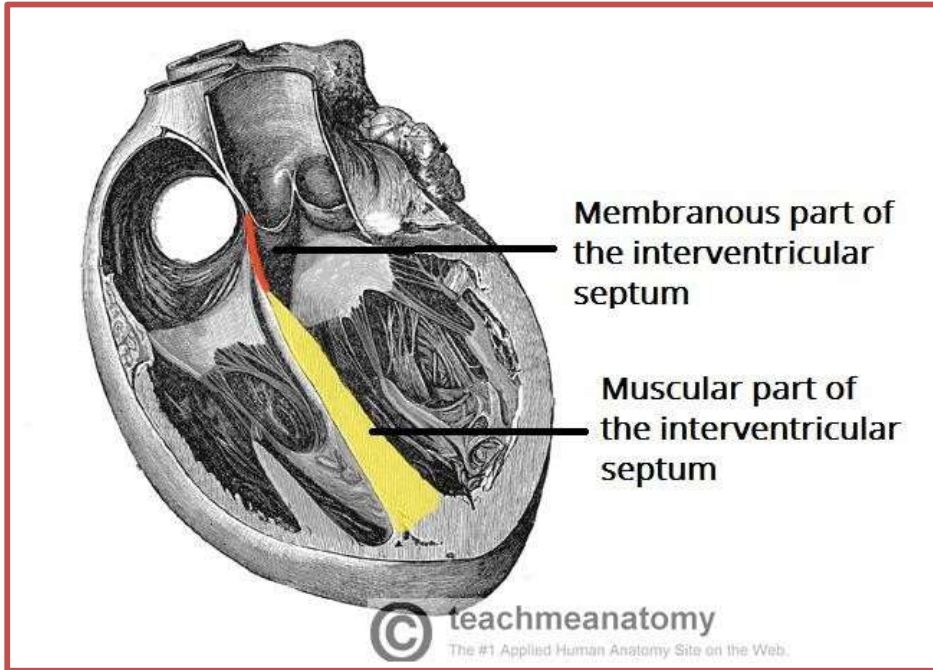
From google



The interventricular or ventricular septum

- **septum (IVS) composed of :**
- ## MUSCULAR & MEMBRANOUS parts
- is a strong, obliquely placed partition between the *right and left* ventricles forming part of the walls of each.
 - Because of the much higher blood pressure in the left ventricle, the muscular part of the IVS, which forms the majority of the septum, has the **thickness** of the remainder of the wall of the **left ventricle** (two to three times as thick as the wall of the right ventricle)

The smaller upper part of the septum is thin and **membranous** and attached to the fibrous skeleton.



Fibrous skeleton of the heart

- Is a collection of dense, fibrous connective tissue

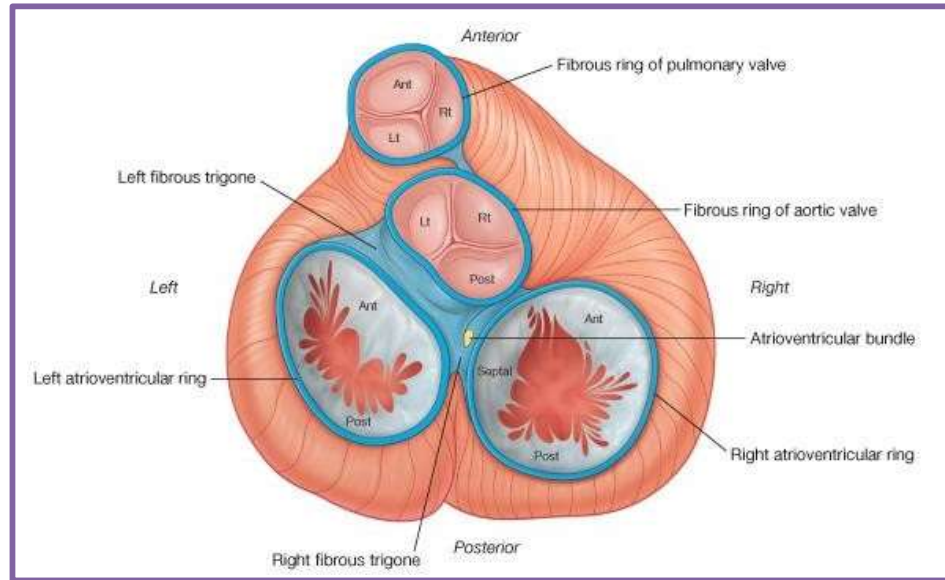
- four rings with interconnecting areas in a plane between the atria and the ventricles.

- The four rings of the cardiac skeleton surround the two atrioventricular orifices, the aortic orifice and opening of the pulmonary trunks.

- The interconnecting areas include:

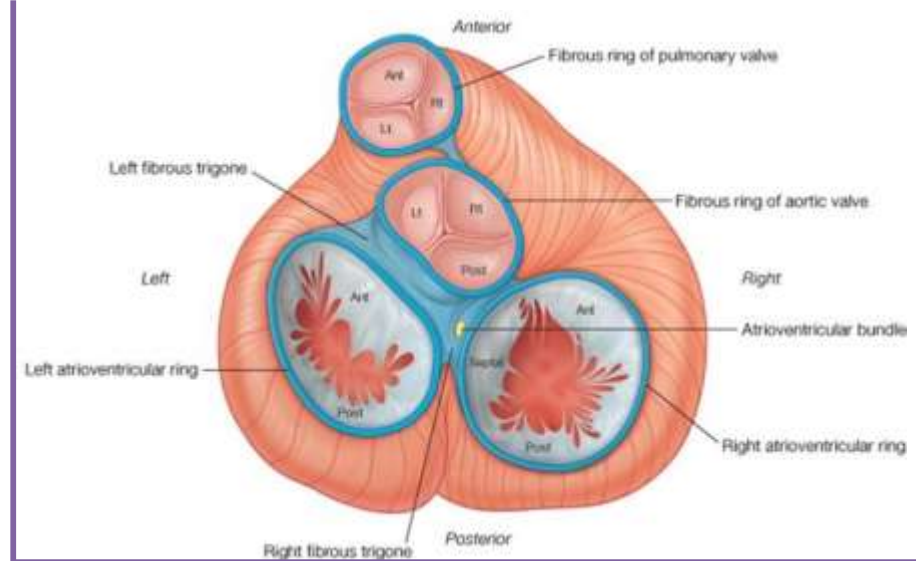
- I. the **right fibrous trigone**, which is a thickened area of connective tissue between the aortic ring and right atrioventricular ring.

- II. the **left fibrous trigone**, which is a thickened area of connective tissue between the



Trigone: means an area where there is a connecting between different fibrous rings.

- Left Trigone ; aortic ring + left AV ring .
- Right Trigone ; aortic ring + Right AV ring.



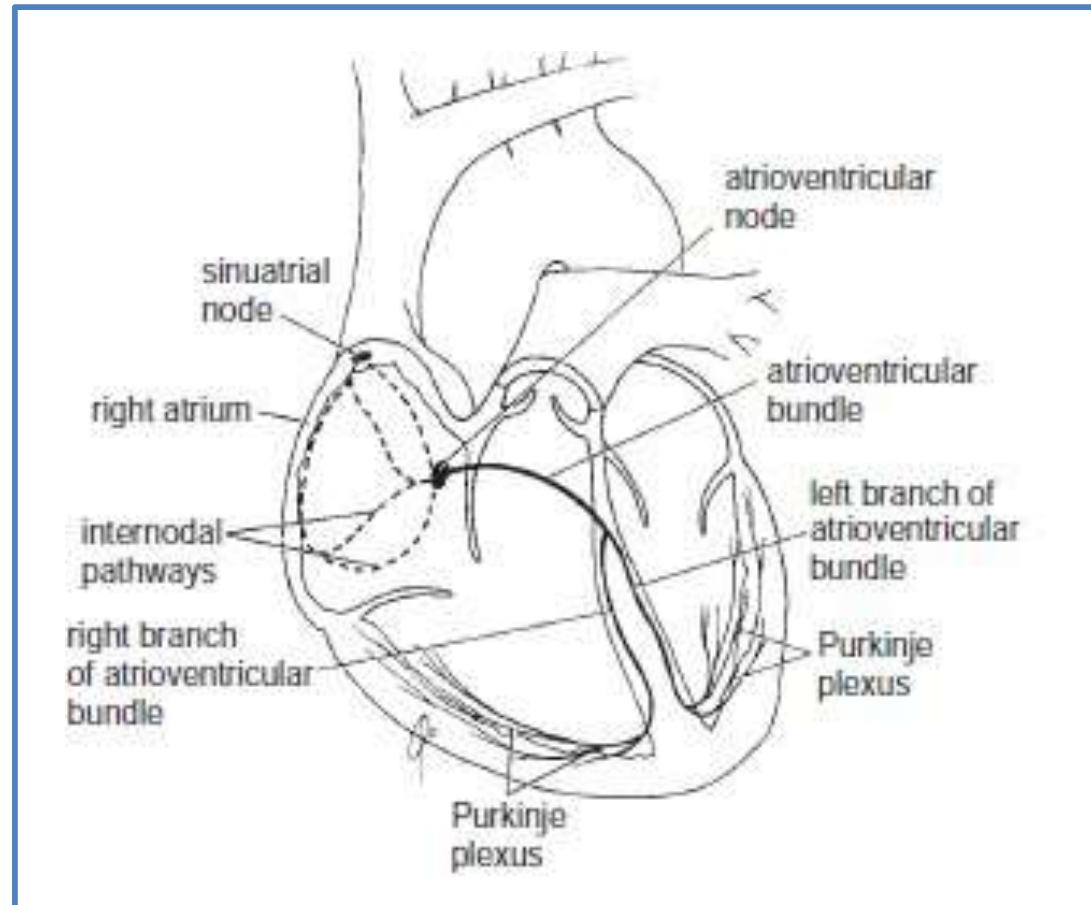
The fibrous skeleton of the heart:

- Keeps the orifices of the AV and semilunar valves patent and prevents them from being overly distended by an increased volume of blood pumping through them.
- Provides attachments for the leaflets and cusps of the valves.
- Provides attachment for the myocardium
- Forms an electrical “insulator,” by separating the myenterically conducted impulses of the atria and ventricles so that they contract independently

Conductive system of the heart

#Read only

- The system is formed of specialised cardiac muscle cells which are difficult to distinguish from cardiac muscle.
- It comprises the **Sinu-atrial (SA) node**, the **Atrioventricular (AV) node**, the **Atrioventricular bundle (AV bundle, or bundle of His)**, its right and left branches and a terminal subendocardial plexus (**Purkinje fibres**).
- This system initiates the complex cardiac muscle contractions comprising the cardiac cycle, and controls its regularity.



NERVE SUPPLY OF THE HEART

Nerve Supply of the

Heart

The heart is innervated by **sympathetic and parasympathetic fibers** of the autonomic nervous system via the **cardiac plexuses** situated below the arch of the aorta.

- The sympathetic supply arises from the **cervical and upper thoracic** portions of the sympathetic trunks
- The parasympathetic supply comes from the **vagus** nerves.

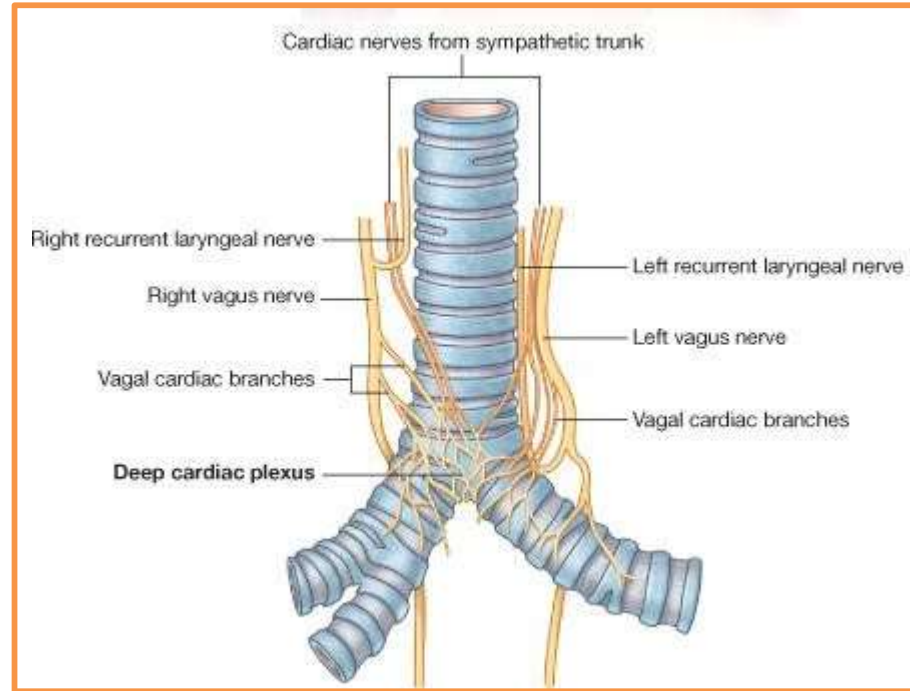
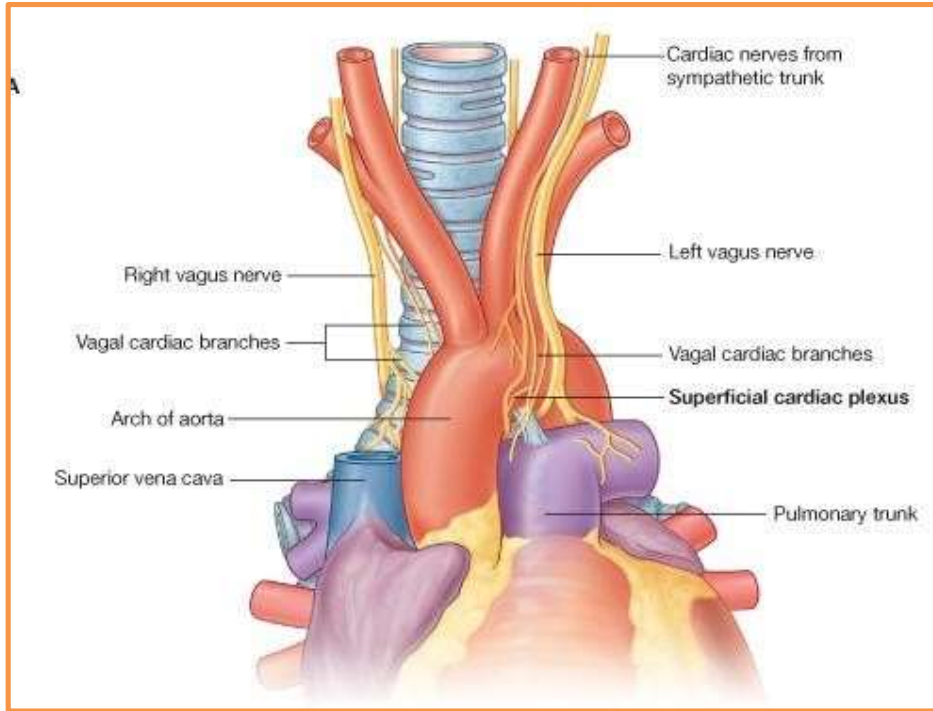
The postganglionic **sympathetic fibers** terminate on the sinuatrial and atrioventricular nodes, on cardiac muscle fibers, and on the coronary arteries.

Activation of these nerves results in:

- **Cardiac acceleration**
- **Increased force of contraction** of the cardiac muscle
- **Dilatation of the coronary arteries.**

The postganglionic **parasympathetic fibers** terminate on the sinuatrial and atrioventricular nodes and on the coronary arteries.

Activation of the parasympathetic nerves results in:
~~Reduction in the rate and force of contraction~~ of the heart



Surface anatomy of the heart

The lines cover the front, side, and back of the thorax

Midsternal line (anterior median line) & Lateralsternal borders : Runs down the midline and lateral side of the sternum.

Parasternal line: midway between the lateral sternal border & midclavicular line.

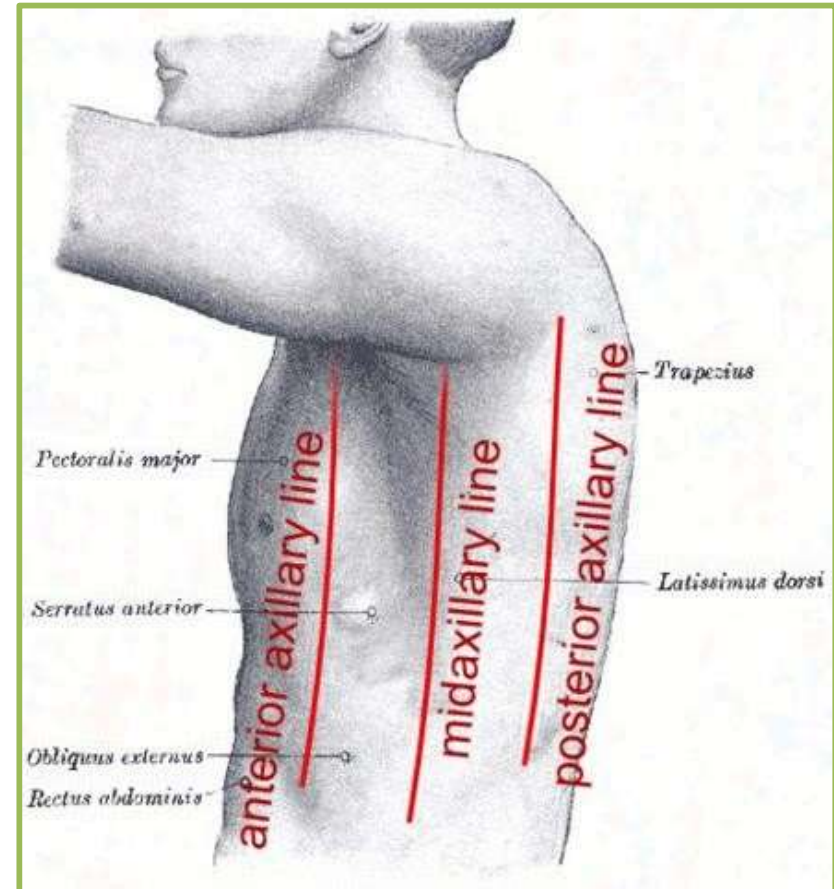
Right and left midclavicular lines: Run parallel with the midsternal line, passing through the midpoint of each clavicle



Anterior axillary line: Runs along the anterior axillary fold, close to the front of the thorax.

Posterior axillary line: Runs parallel with the anterior axillary line along the posterior axillary fold, close to the back.

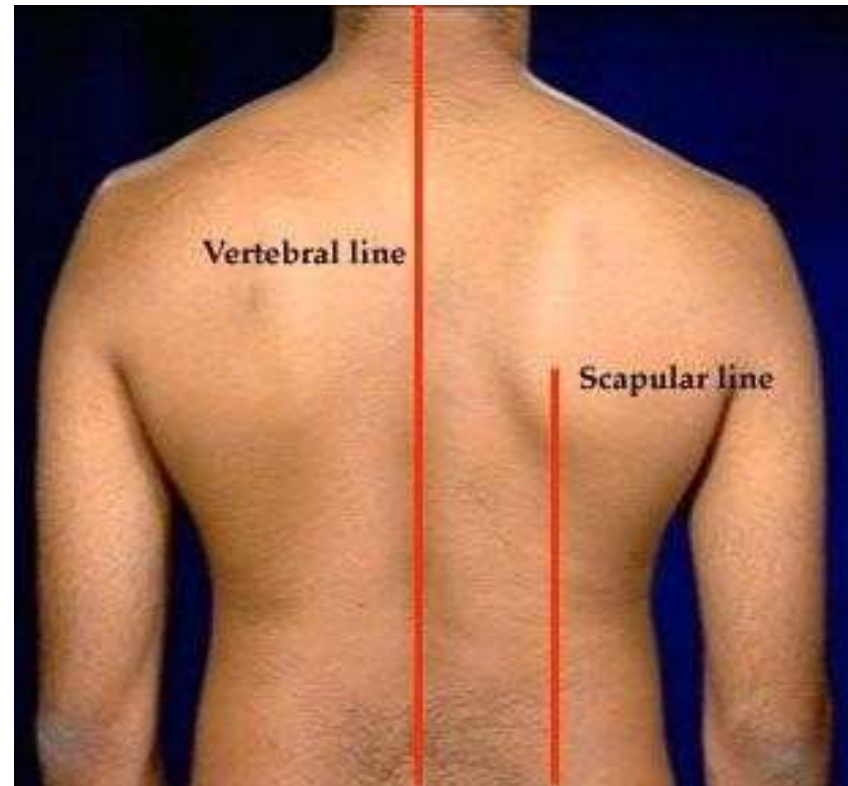
Midaxillary line: Runs midway between the anterior and posterior axillary lines, starting at the deepest part of the axilla.



Midvertebral (posterior median) line:

Runs vertically down the midpoint of the spine.

Right and left scapular lines: Run parallel with the midvertebral line pass through the inferior angles of scapulae



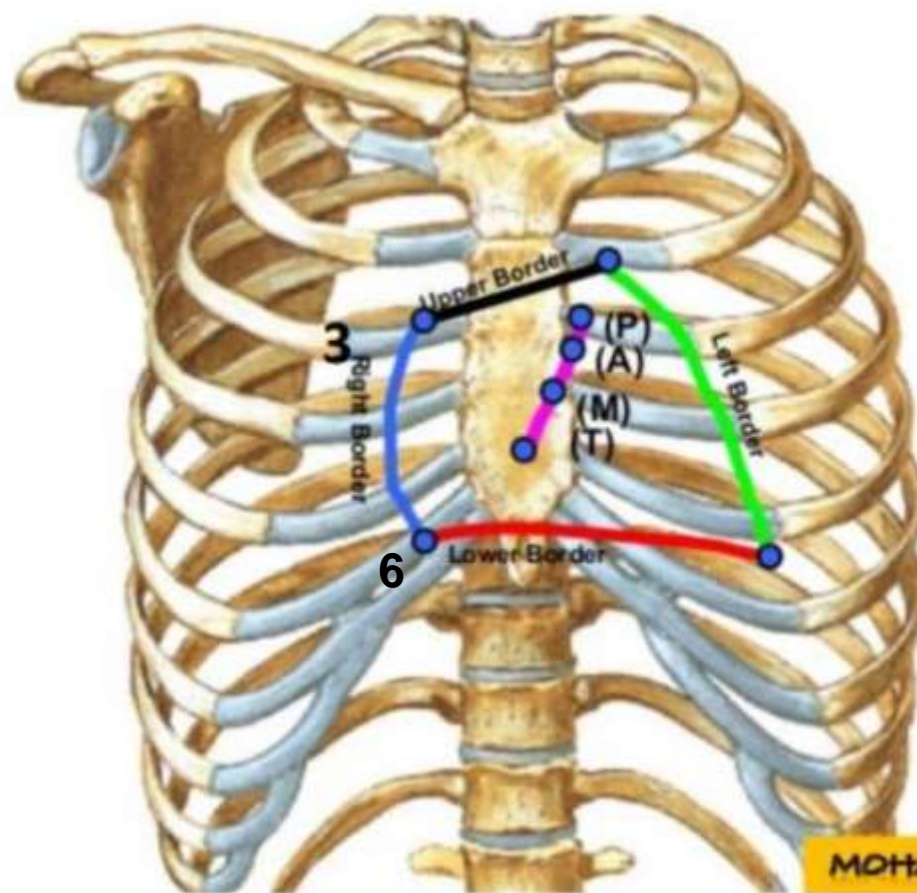
the upper limit of the heart reaches as high as:

- The **3rd costal cartilage** on the **right** side of the sternum
- The **2nd intercostal space** on the **left** side of the sternum

- (both 1.2cm from the sternal border).

#Extra to help u memorize

intercostal space ال يكونوا left
costal cartilage ال يكونوا right
بالارقام دائما بنزيد واحد للجهة اليمنى

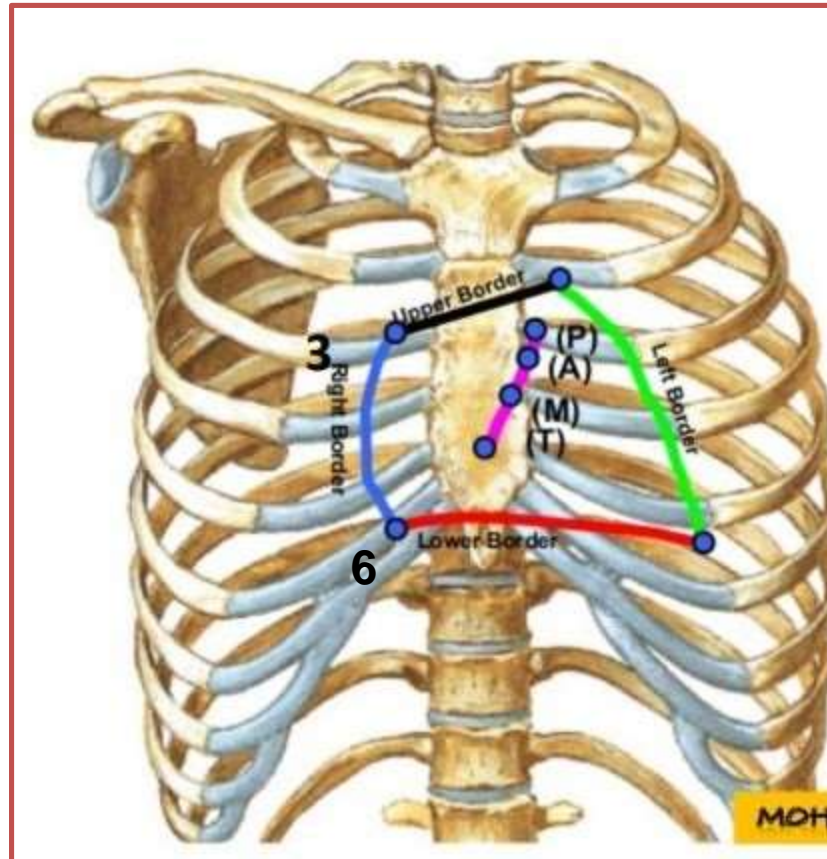


The right margin of the heart extends from

- the right **3rd costal cartilage** to near the right **6th costal cartilage**.

The **left** margin of the heart descends laterally from:

- the **2nd intercostal space** to the **apex** located near the midclavicular line in the **5th intercostal space**.



The **lower margin** of the heart extends from:

- the sternal end of the right **6th costal cartilage** to the apex in the **5th intercostal space** near the midclavicular line (or 9cm from the midline).

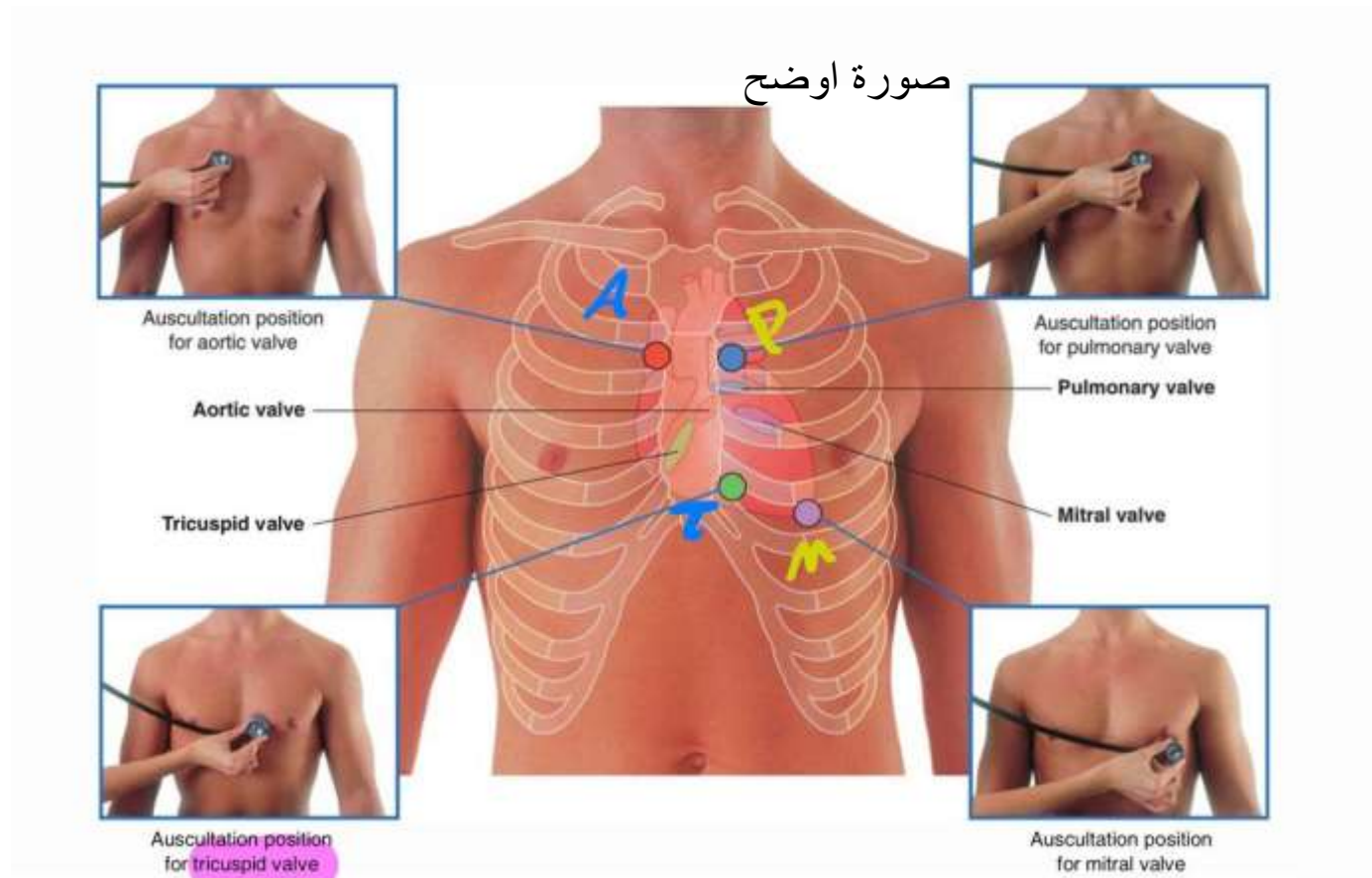
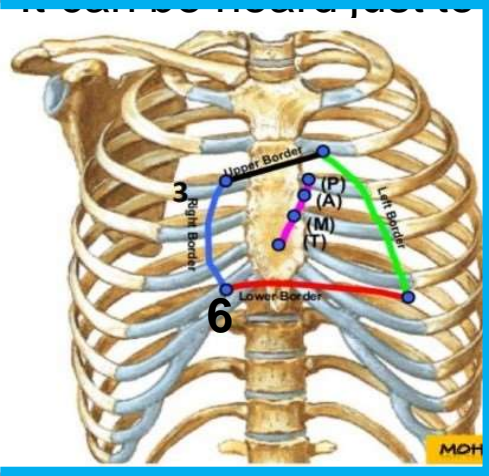
Heart valves and where to listen for heart sounds

sounds

The **tricuspid valve** is:

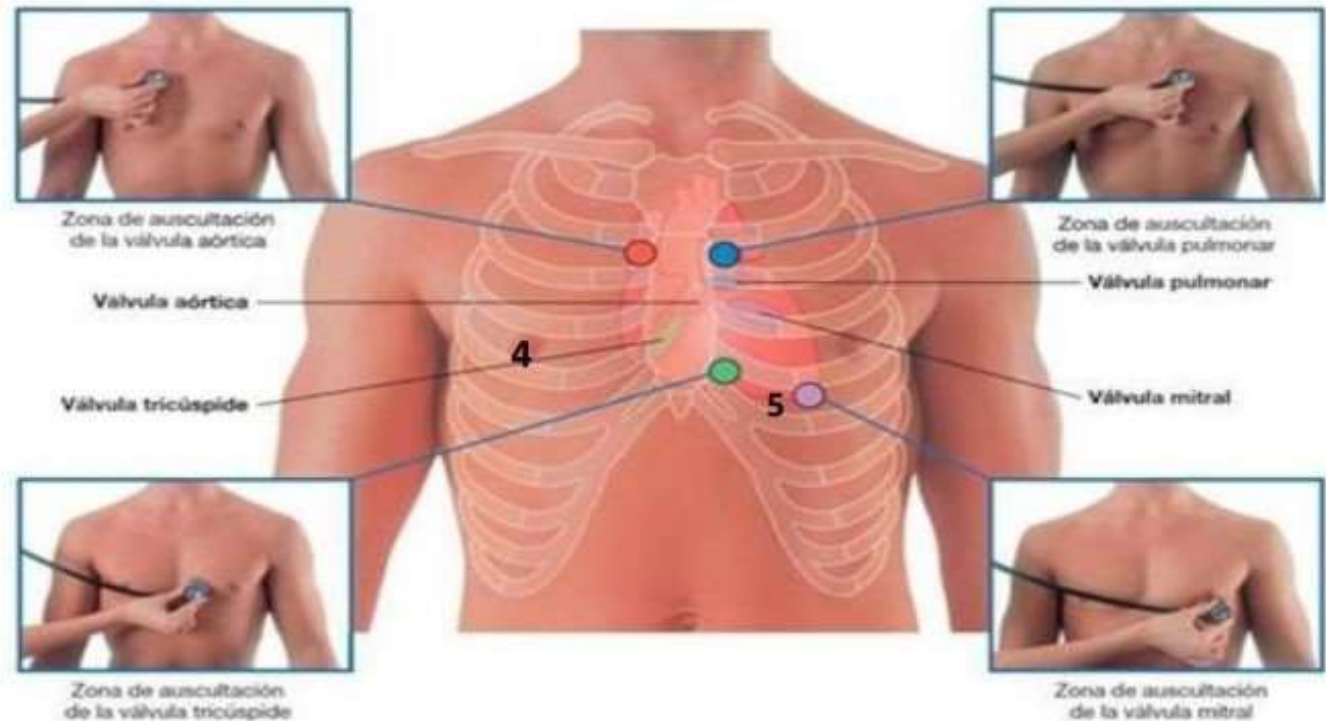
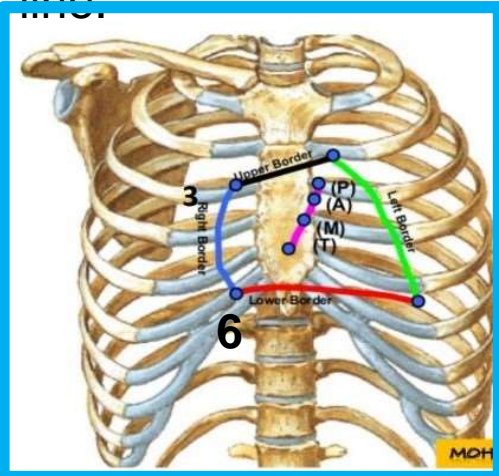
Almost vertical and centred at the **4th intercostal space** just to the right of the midline.

It can be heard just to the **left** of the lower part of the sternum **near the 5th**



The mitral valve:

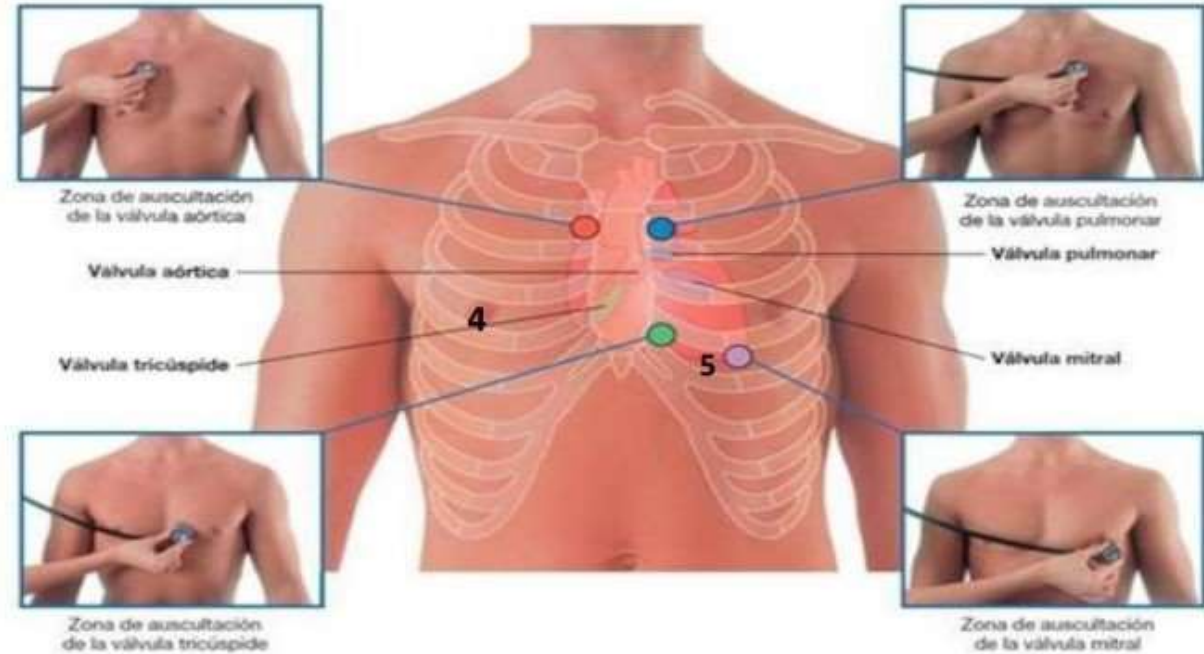
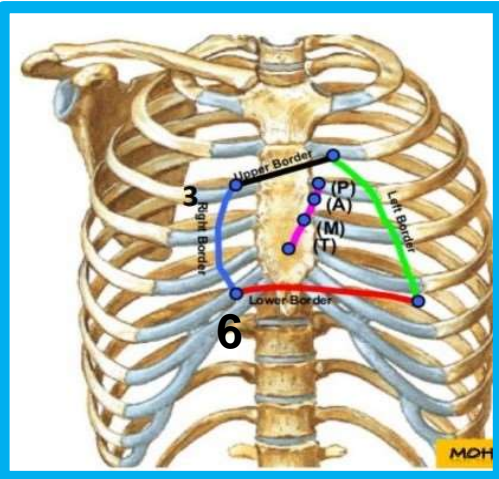
is oblique, running down and **left**, starting opposite the **4th costal cartilages** and lying beneath the left side of the sternum. It can be heard over the apex of the heart in the **left 5th intercostal space** at the midclavicular line.



The pulmonary valve:

valve:

is horizontal and centered at the **3rd left chondro-sternal joint**. It is heard over the medial end of the **left 2nd intercostal space**.



The aortic valve:

is oblique, running down and right, starting from the medial end of the **3rd left intercostal space**.

It can be heard over the medial end of the **right 2nd intercostal space**

THANK
YOU