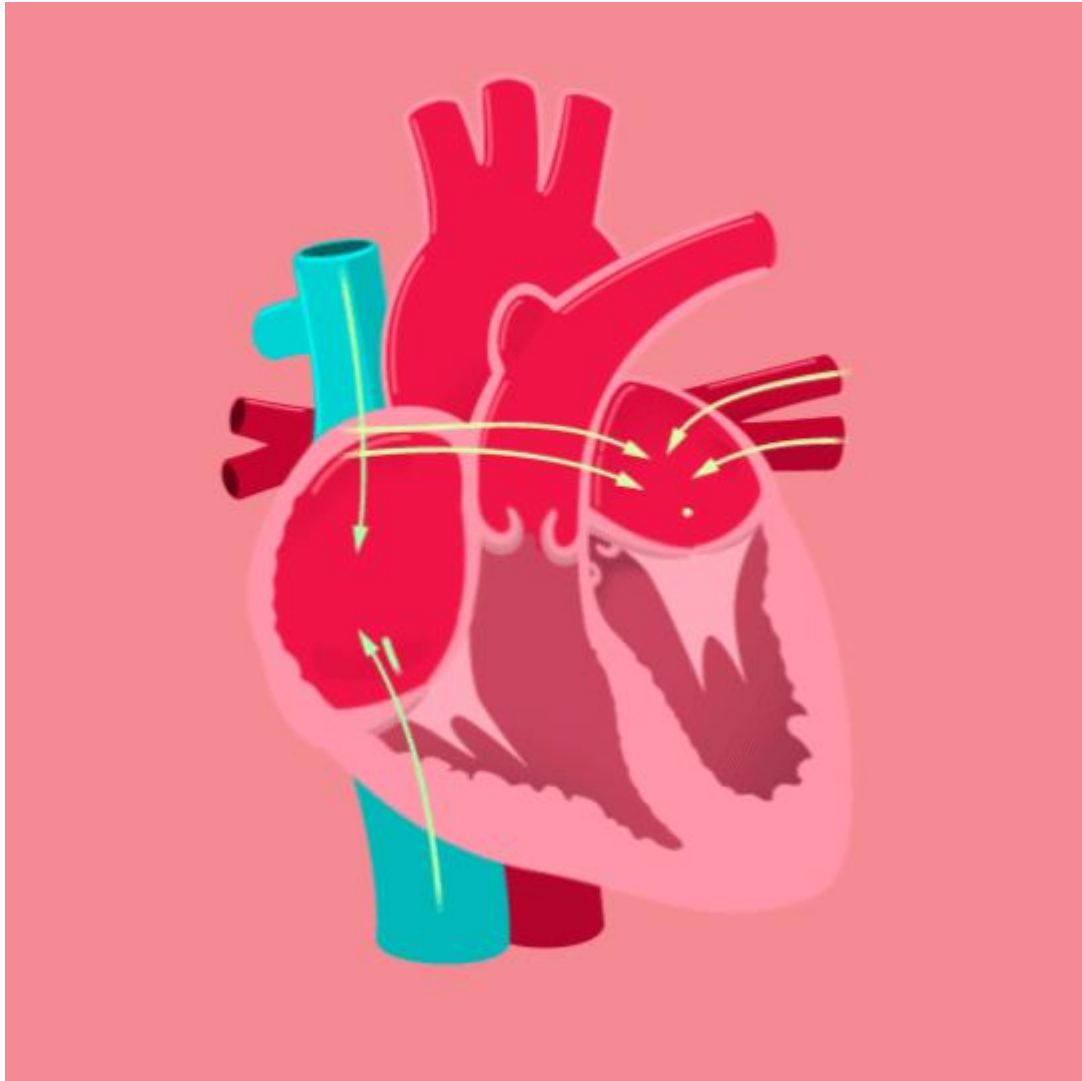




Human Anatomy - 1st year 2020-2021



Pericardium and heart Lecture (5)

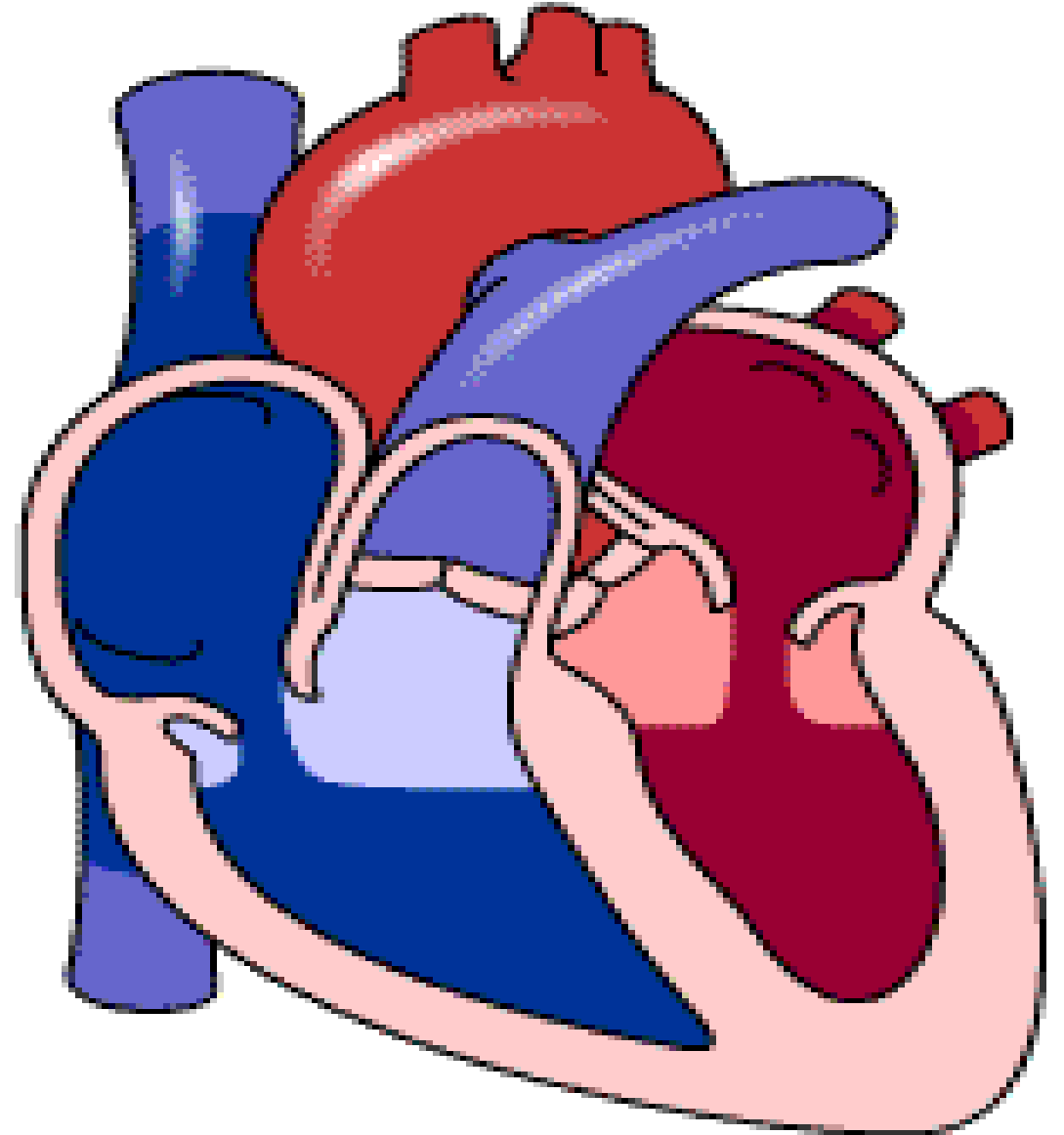
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Objective

Describe

- *Location ,opening and structures of left atrium**
- *Location ,opening and structures of left ventricles**
- *Anatomy of mitral and aortic valve**
- *Anatomy of pulmonary and tricuspid valve**

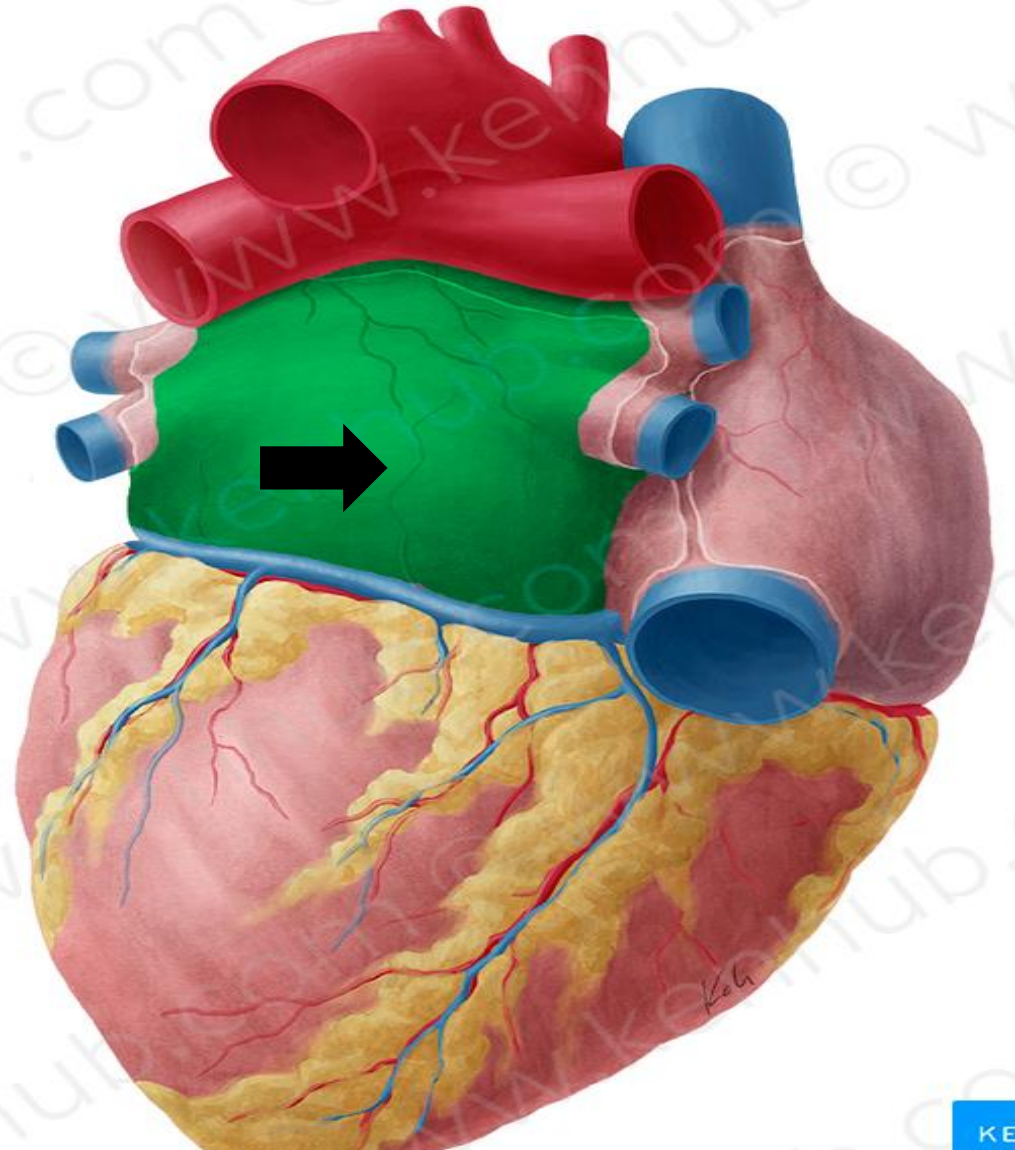


Left Atrium

✓ Has an oval shaped cavity receives oxygenated blood from the four pulmonary veins, and pumps into the left ventricle.

✓✓ **Anatomical position:** It forms the posterior surface (base) of the heart.

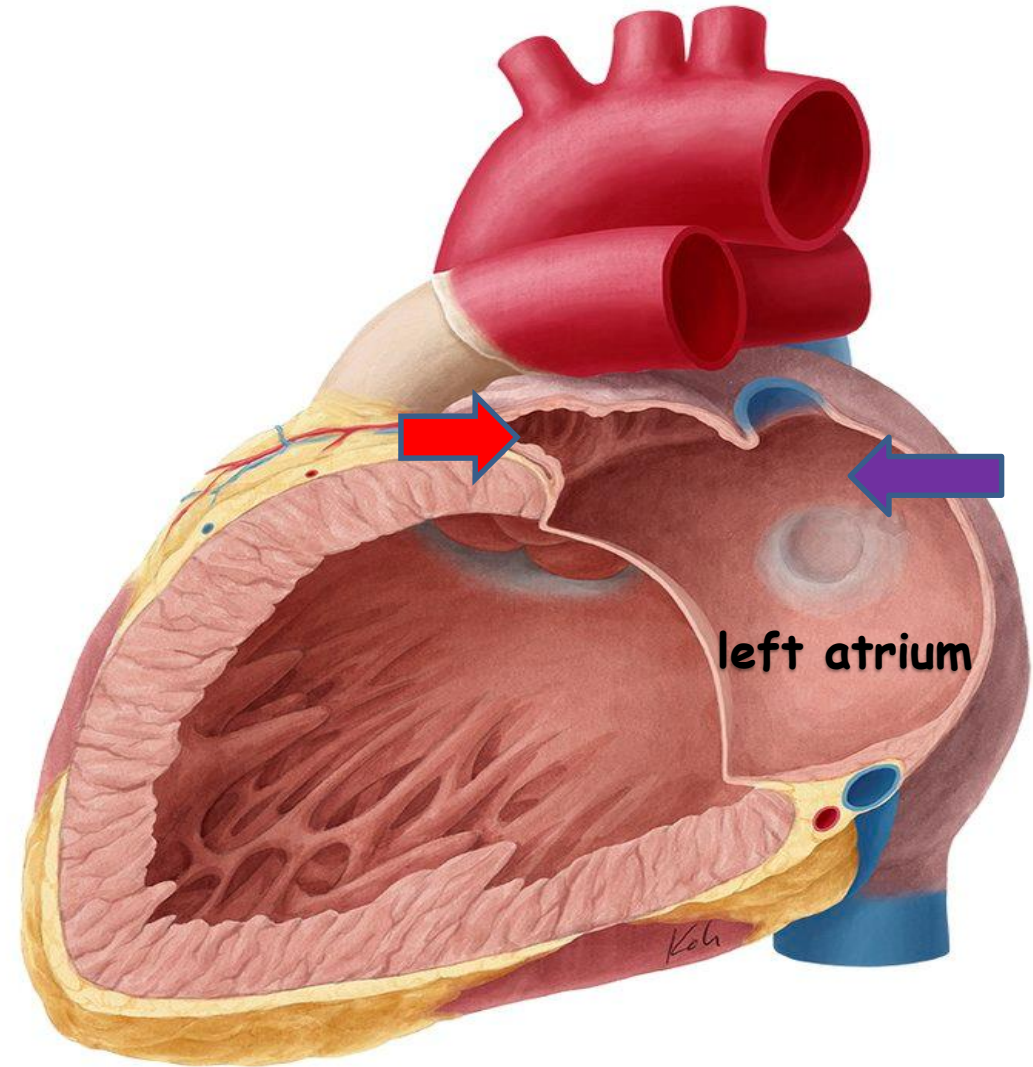
It has a thicker myocardial wall when compared to the right atrium. This is a result of the fact that the left atrium is exposed to higher pressures



Internally the left atrium is divided into :

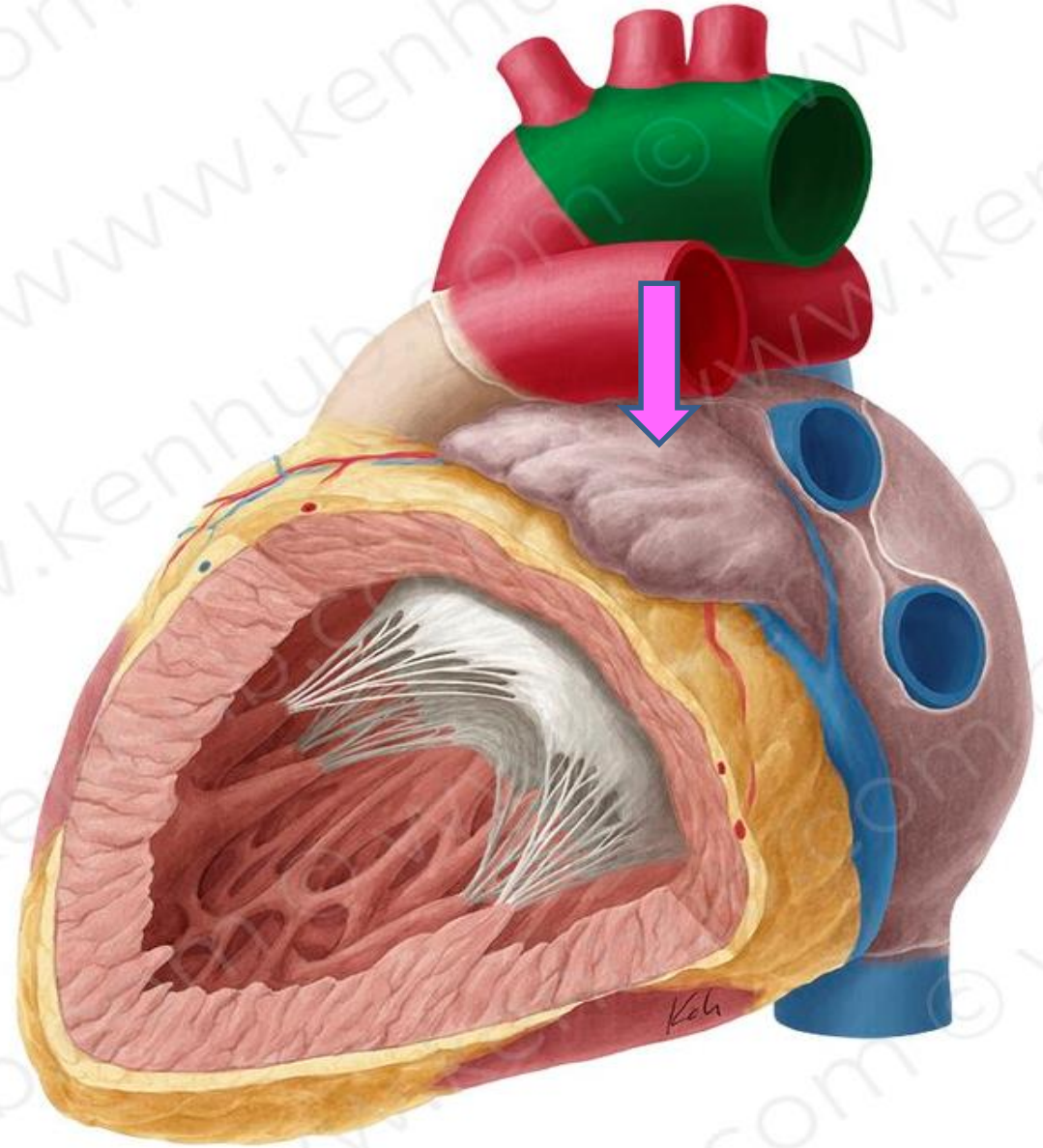
A. Smooth part – located posteriorly receives blood from the pulmonary veins. Its internal surface is smooth .

B. Trabeculated part – located anteriorly, and includes the left auricle that contains pectinate muscles. There is no crista or sulcus terminalis in between these parts.



Left Atrial Appendage(Left auricle)

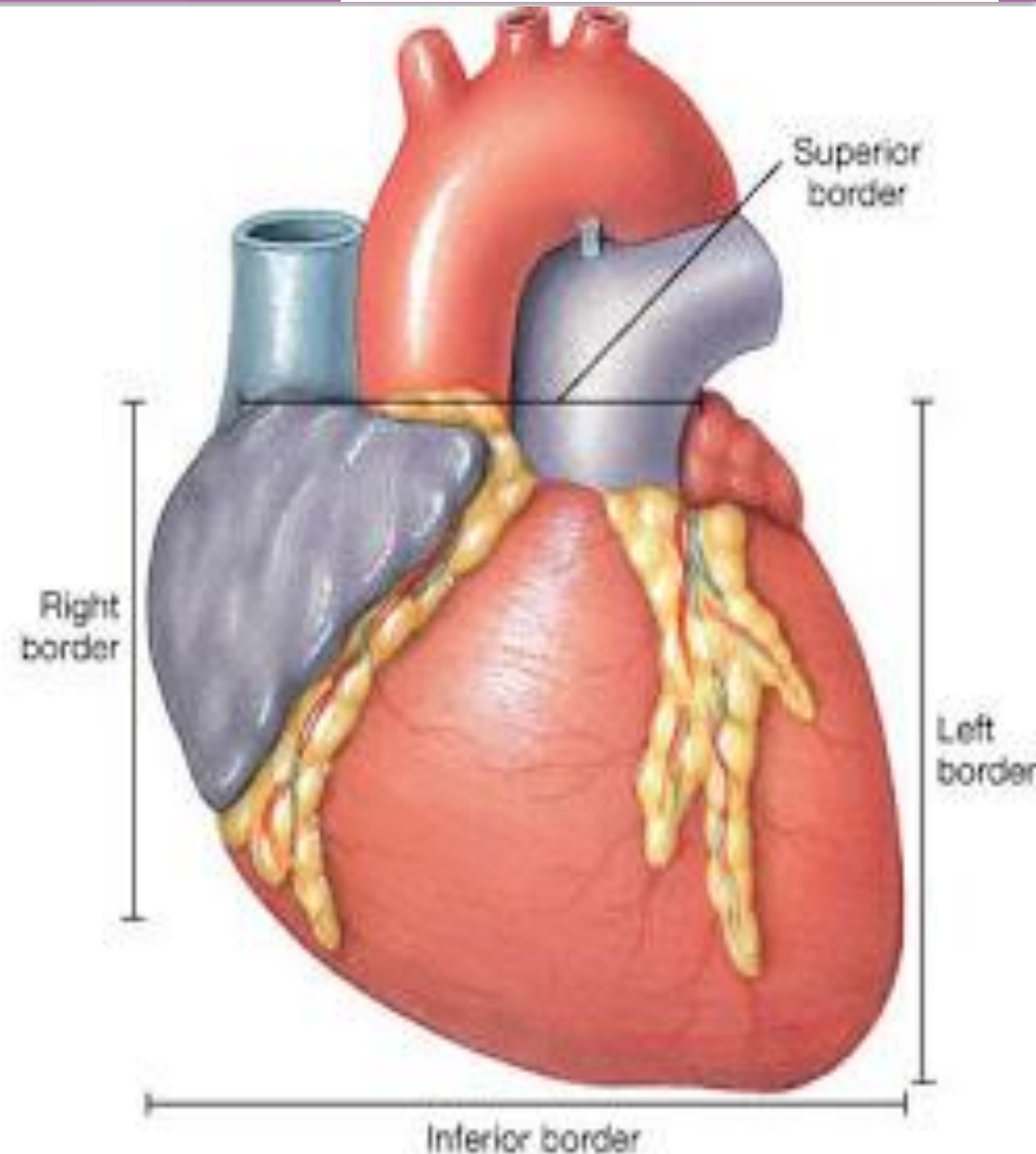
- ✓ Trabeculated part is called left atrial appendage (LAA)
- ✓ Has very important **clinical significant** because it is a site of stagnation of blood which causes clot formation and later on pushed to the aorta and to the blood circulation and cause stroke..



Left Ventricle



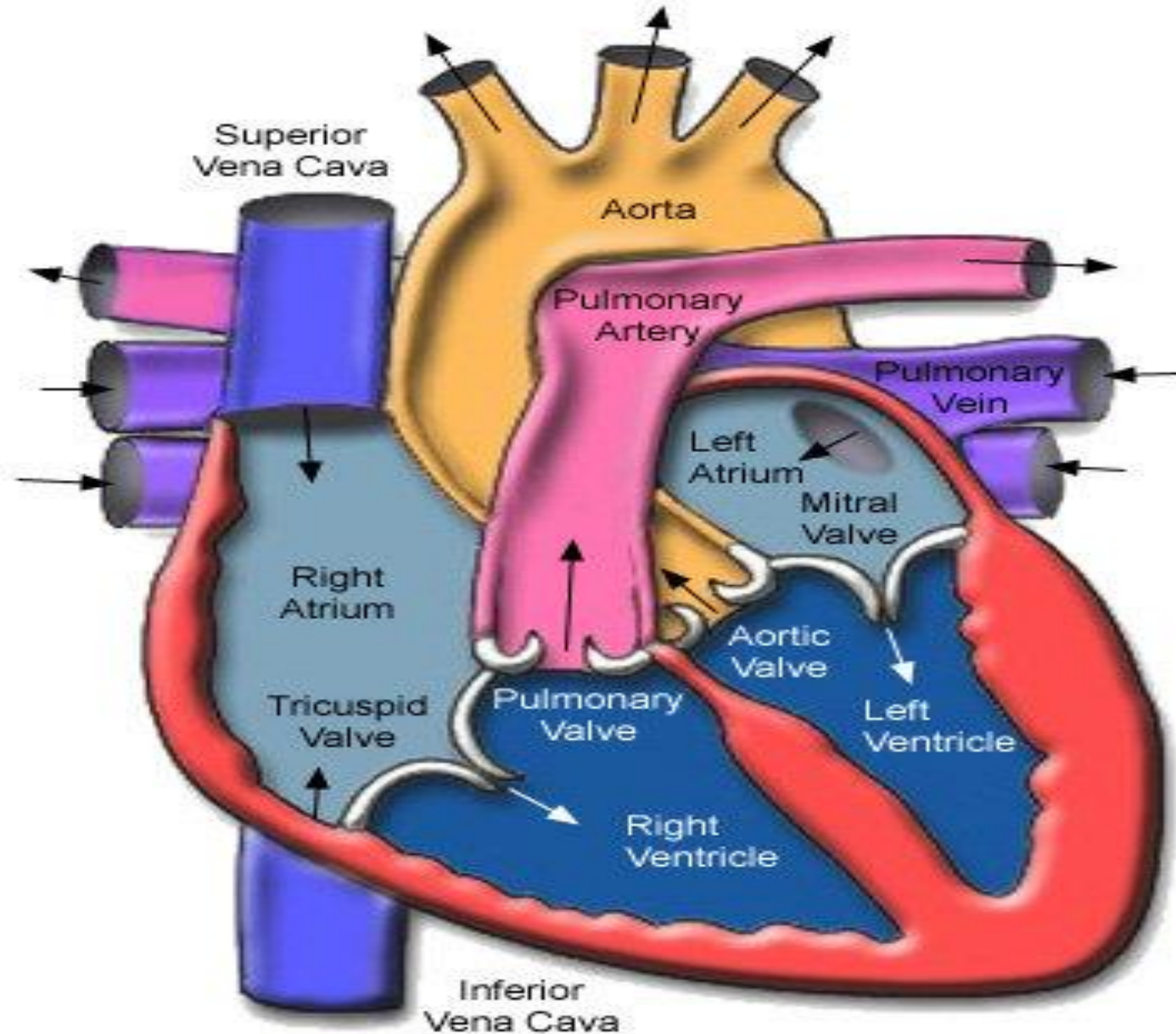
- ✓ Receives oxygenated blood from the left atrium, through mitral valve and pumps it through aortic valve into the aorta.
- ✓ Anatomical position, the left ventricle forms the apex of the heart, as well as the left and diaphragmatic borders and diaphragmatic surface .
- ✓ It is situated more posteriorly
- ✓ Has circular shaped cavity (in cross section).
- ✓ Its wall is thicker and smoother than the right ventricle wall .



Left Ventricle

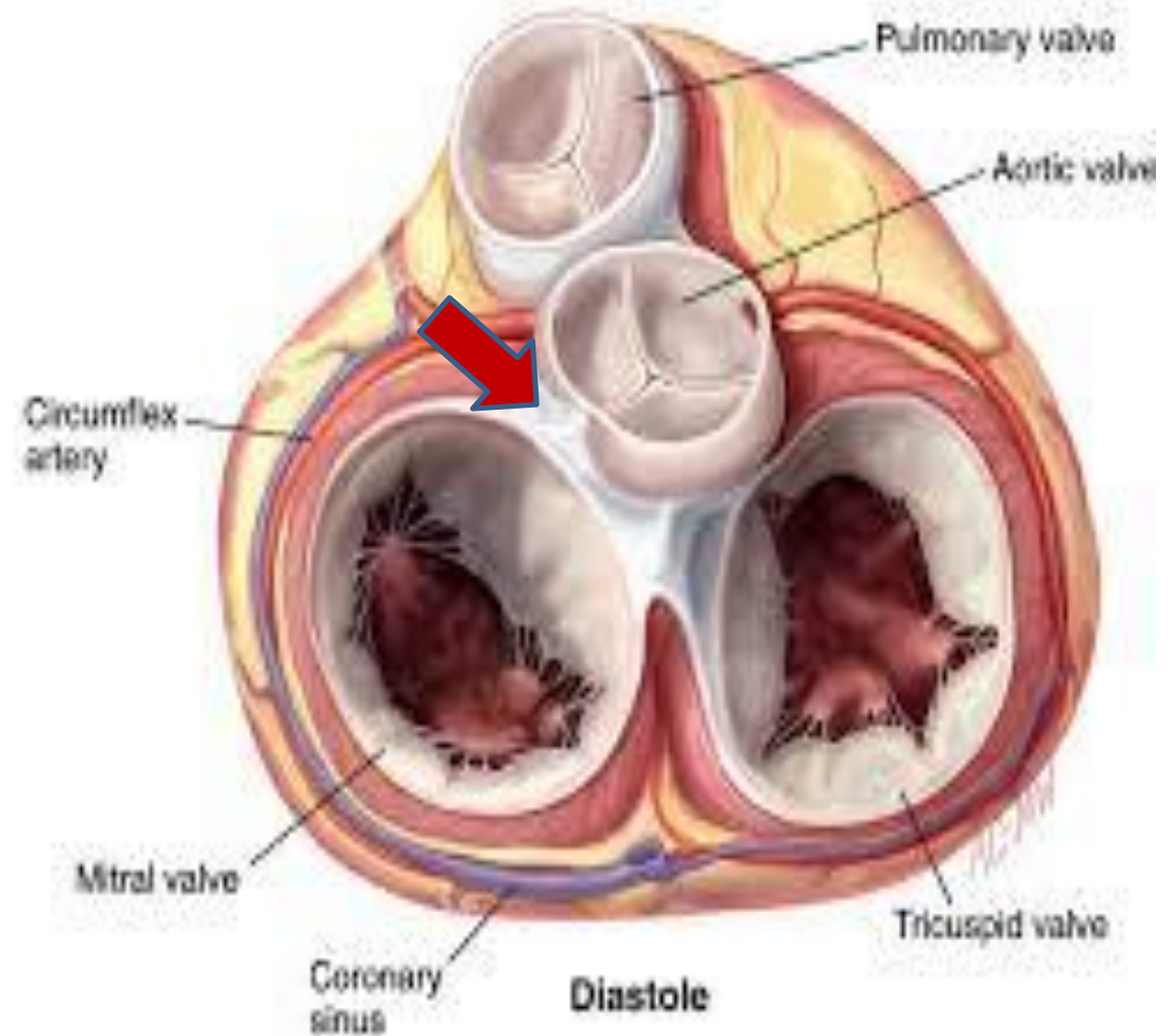
Trabeculated part : The walls of left ventricle has trabeculae carneae,. There are two papillary muscles present which attach to the cusps of the mitral valve by chordae tendinea .

Smooth part known as the aortic vestibule. It is smooth- with no trabeculae carneae.



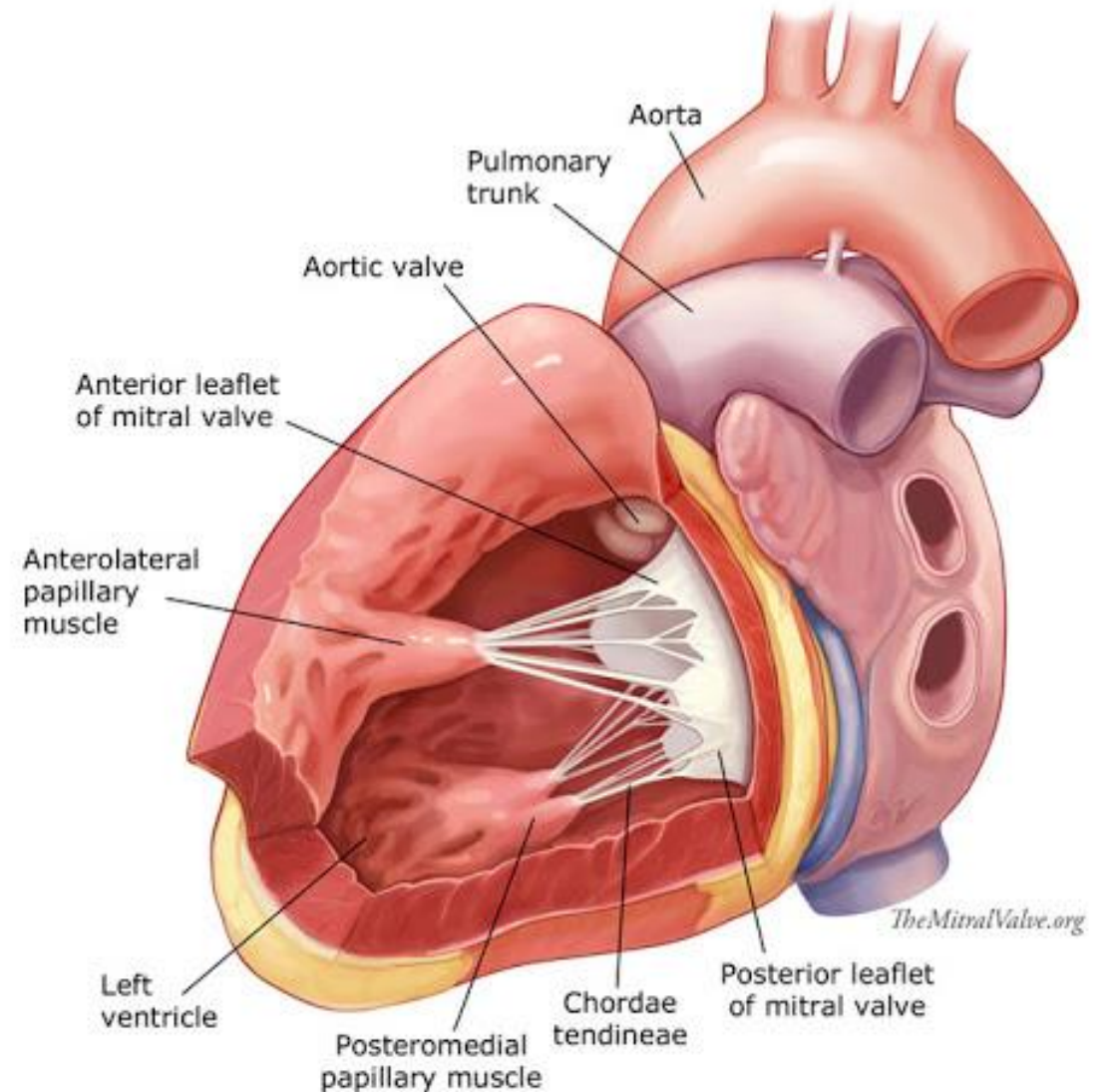
Left Ventricle

There is direct continuity between the mitral valve annulus and the aortic valve annulus called aorto-mitral continuity.



Papillary muscles

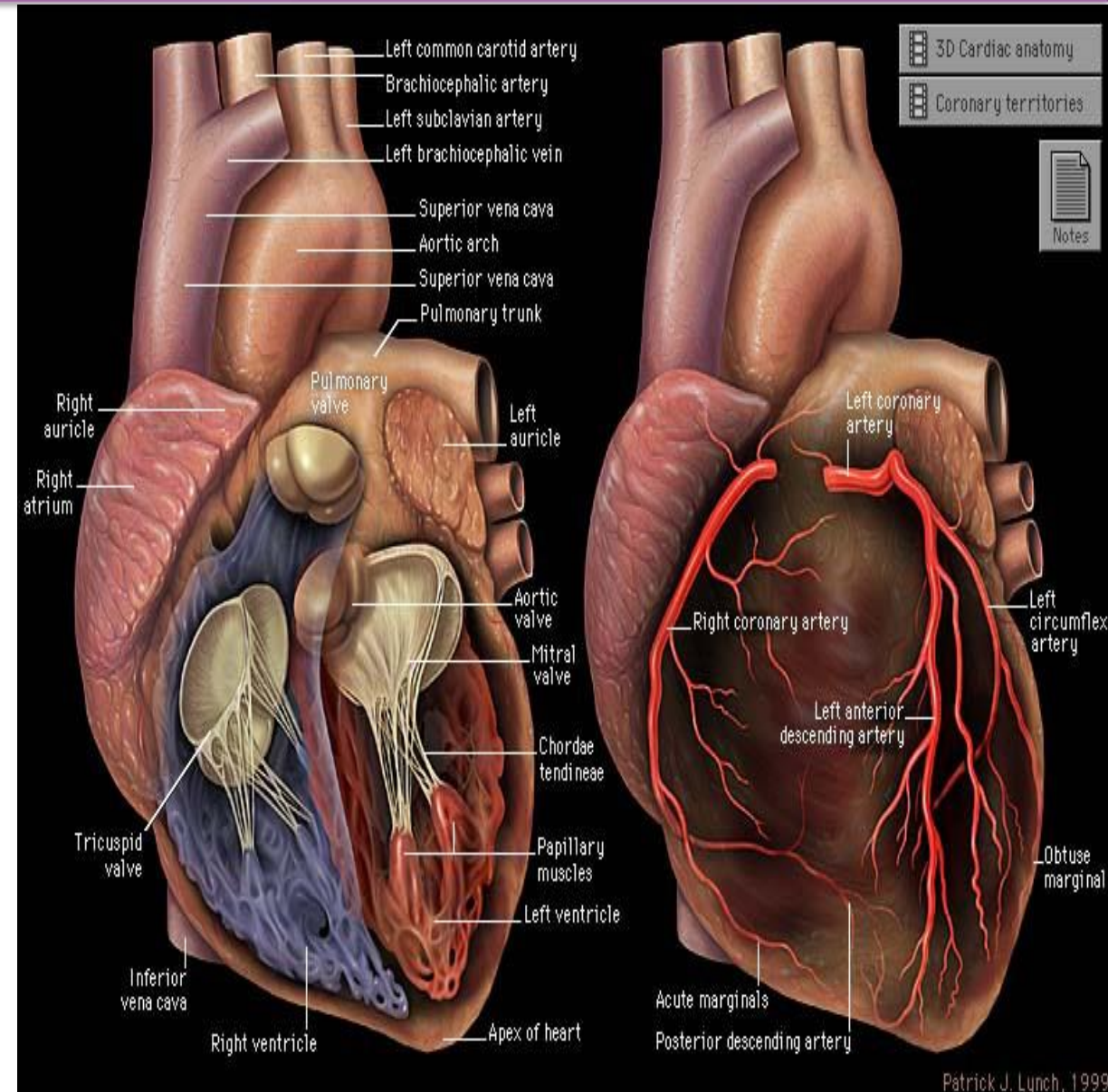
- *Two papillary muscles antero-lateral & postero-medial.**
- *Chordae tendineae from each muscle are attached to both leaflets of the mitral valve.**
- *Each papillary attached by chordae tendineae to both leaflets of mitral valve .Thus, when the left ventricle contracts, the intraventricular pressure forces the valve to close.**



Clinical Note

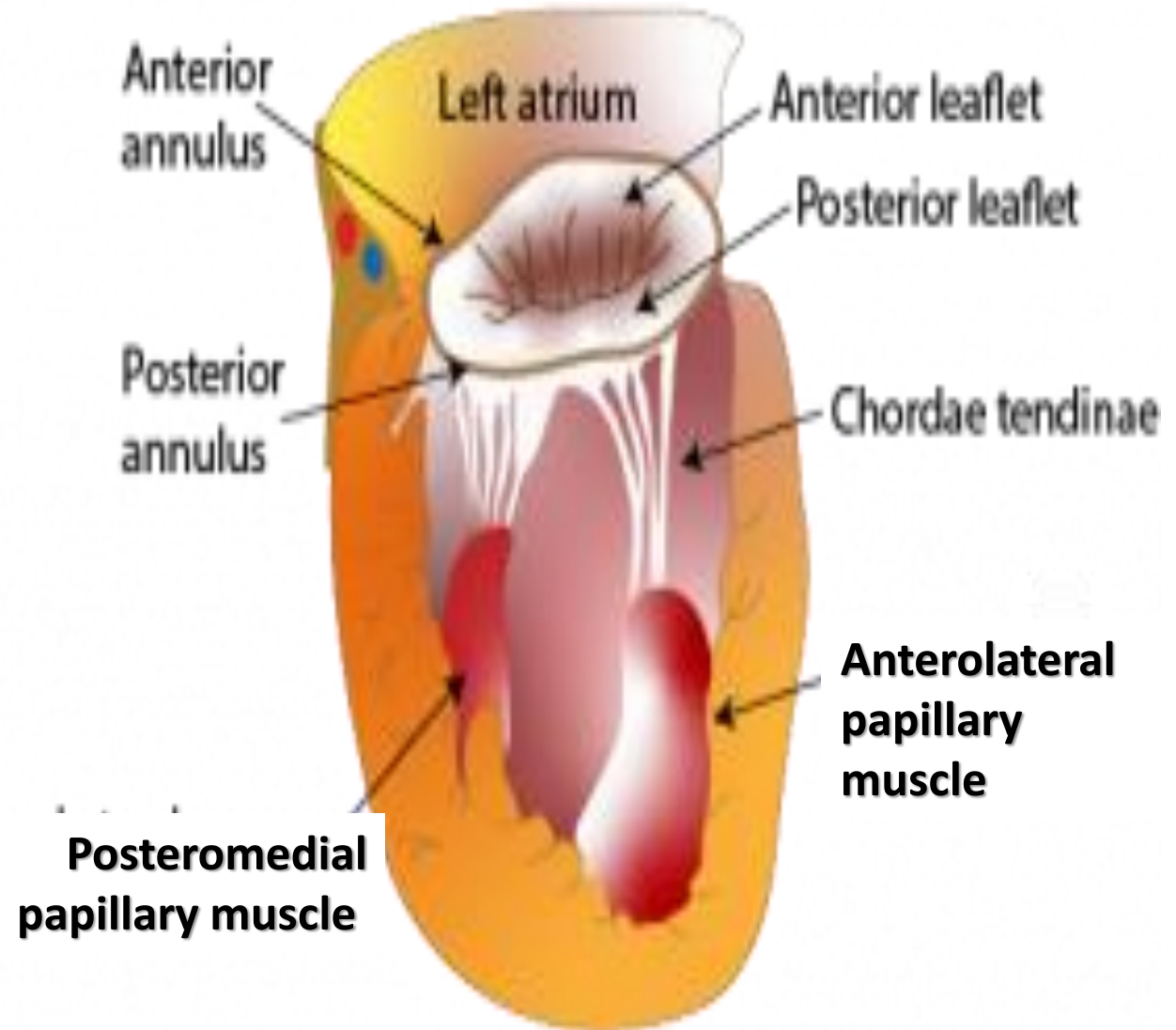
☠️ The posteromedial muscle **expose to ischemia more frequently and more than anterolateral** because it only has one source of blood supply (posterior interventricular artery)

☠️ While the Anterolateral muscle has 2 sources from left anterior descending artery & left circumflex artery .



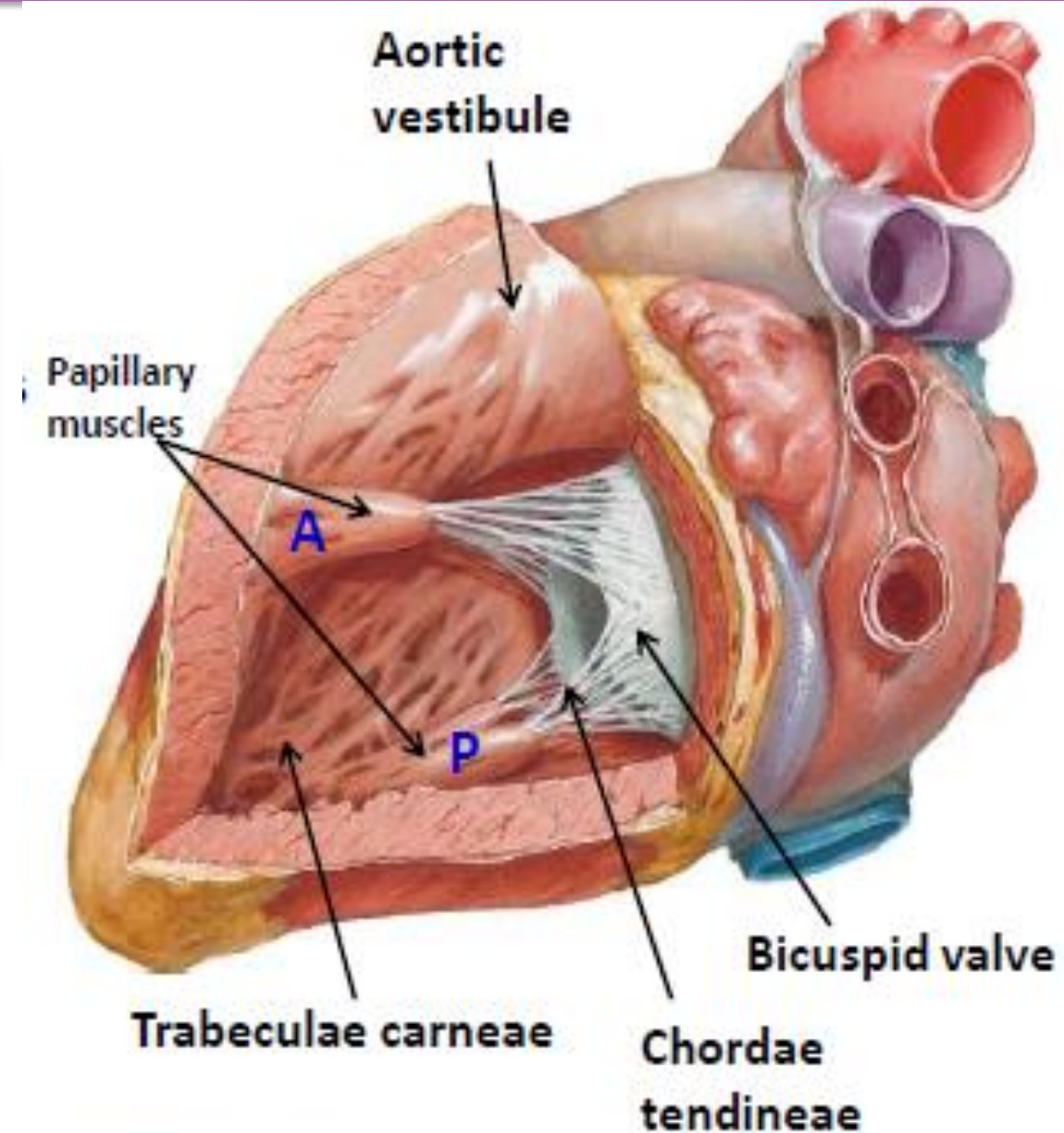
Mitral Valve

- *The mitral valve, is bicuspid valve .It lies more basal and guards the opening between the left atrium and the left ventricle. It consists of**
- *Fibrous ring known as the mitral valve annulus surrounds the opening between the left atrium and ventricle .**
- * Two cusps, or leaflets, anterolateral (anterior) and posteromedial(posterior) leaflets**



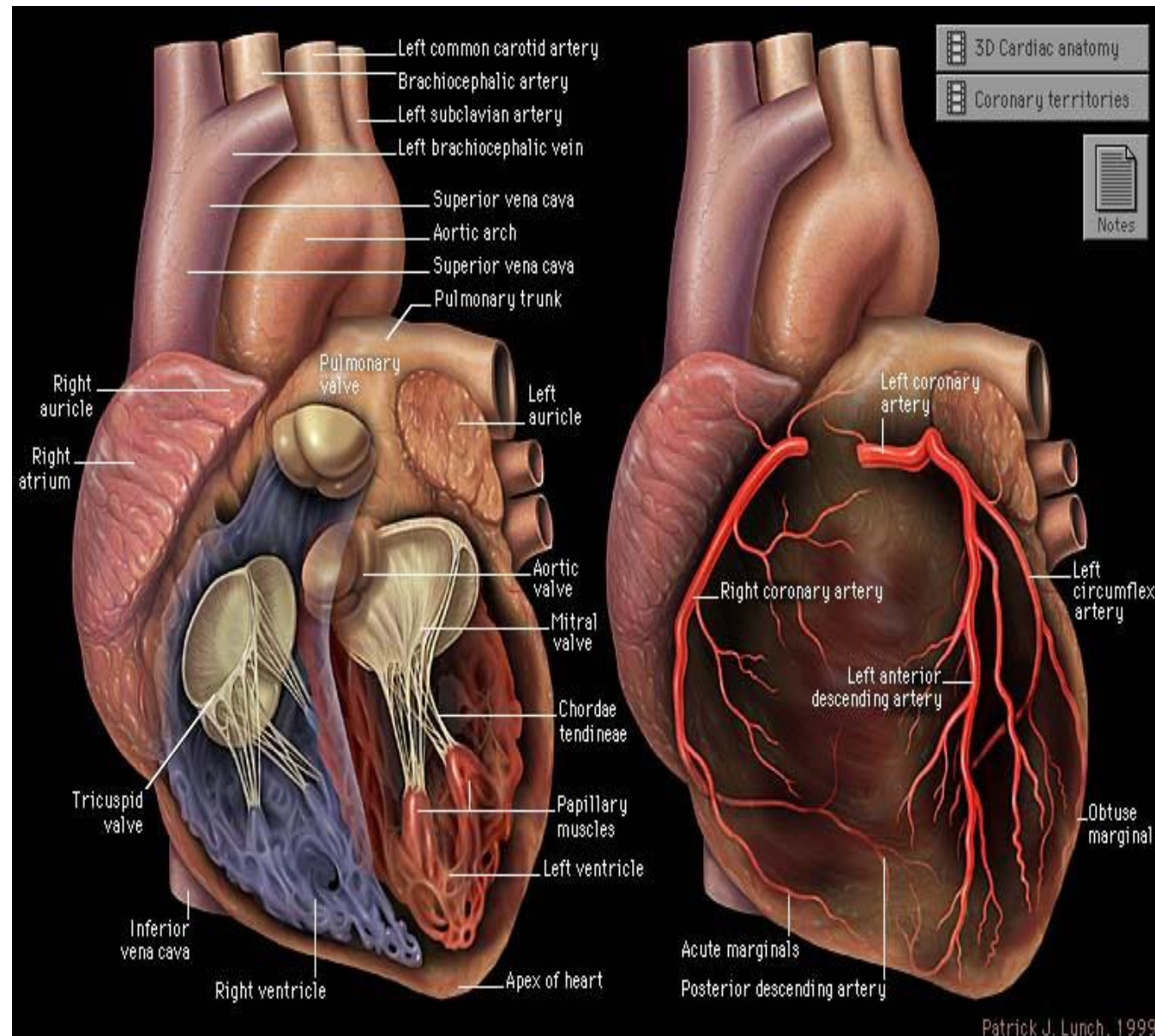
Mitral Valve

The chordae tendineae are attached at one end to the papillary muscles and at the other to both leaflets of the mitral valve.



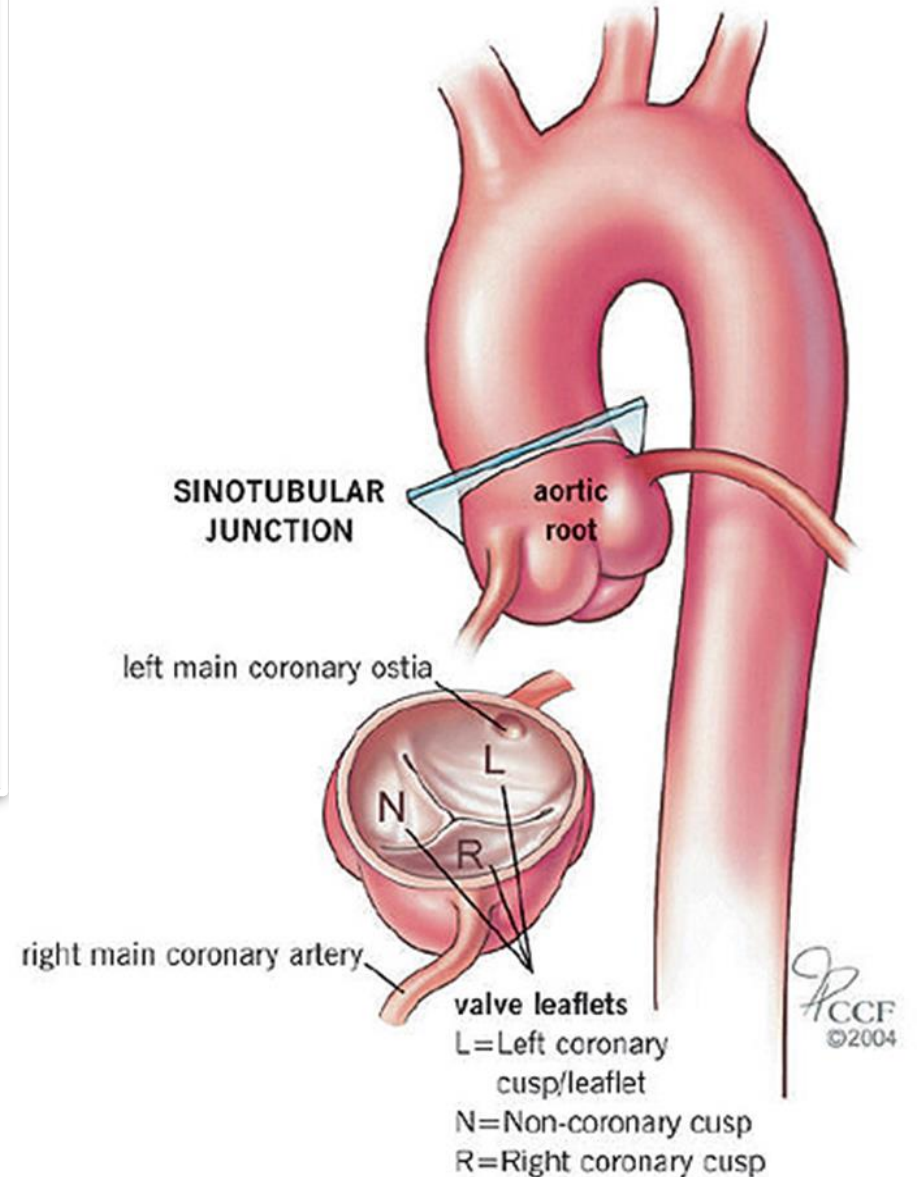
Clinical Note

Mitral valve incompetence is due to degeneration & calcification in the old age person of short post leaflet so the blood within the left ventricle return to the left atrium instead of going to the aorta



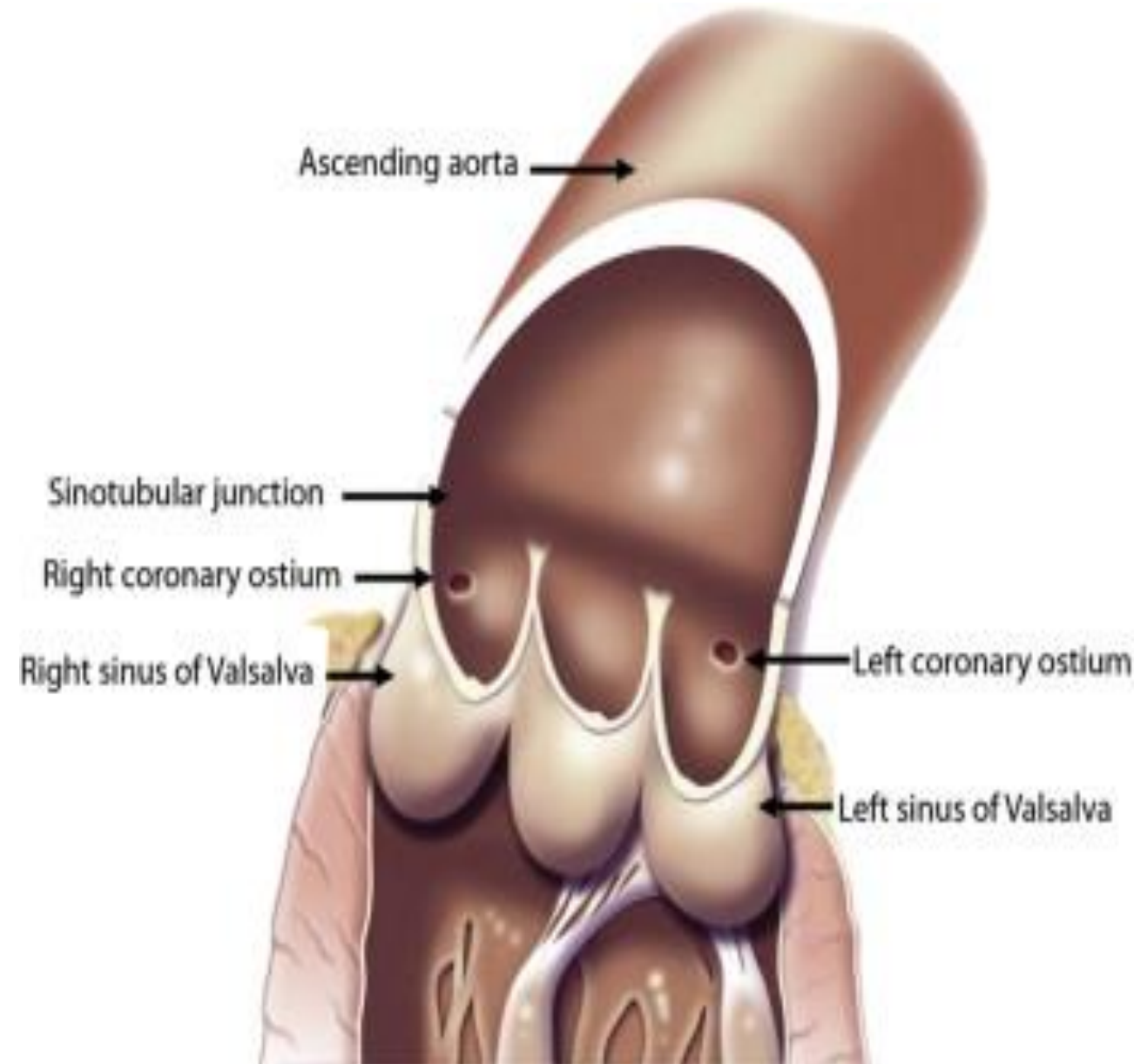
Aortic Valve

- ✍ **Semilunar valve guards the aortic orifice between the left ventricle and the aorta.**
- ✍ **It has fibroelastic annulus and 3cusps.**
- ✍ **One cusp is situated on the anterior wall known as right cusp (Right coronary cusp)**
- ✍ **Two cusps are located on the posterior wall known as left cusp (Left coronary cusp) and posterior (none coronary cusp).**



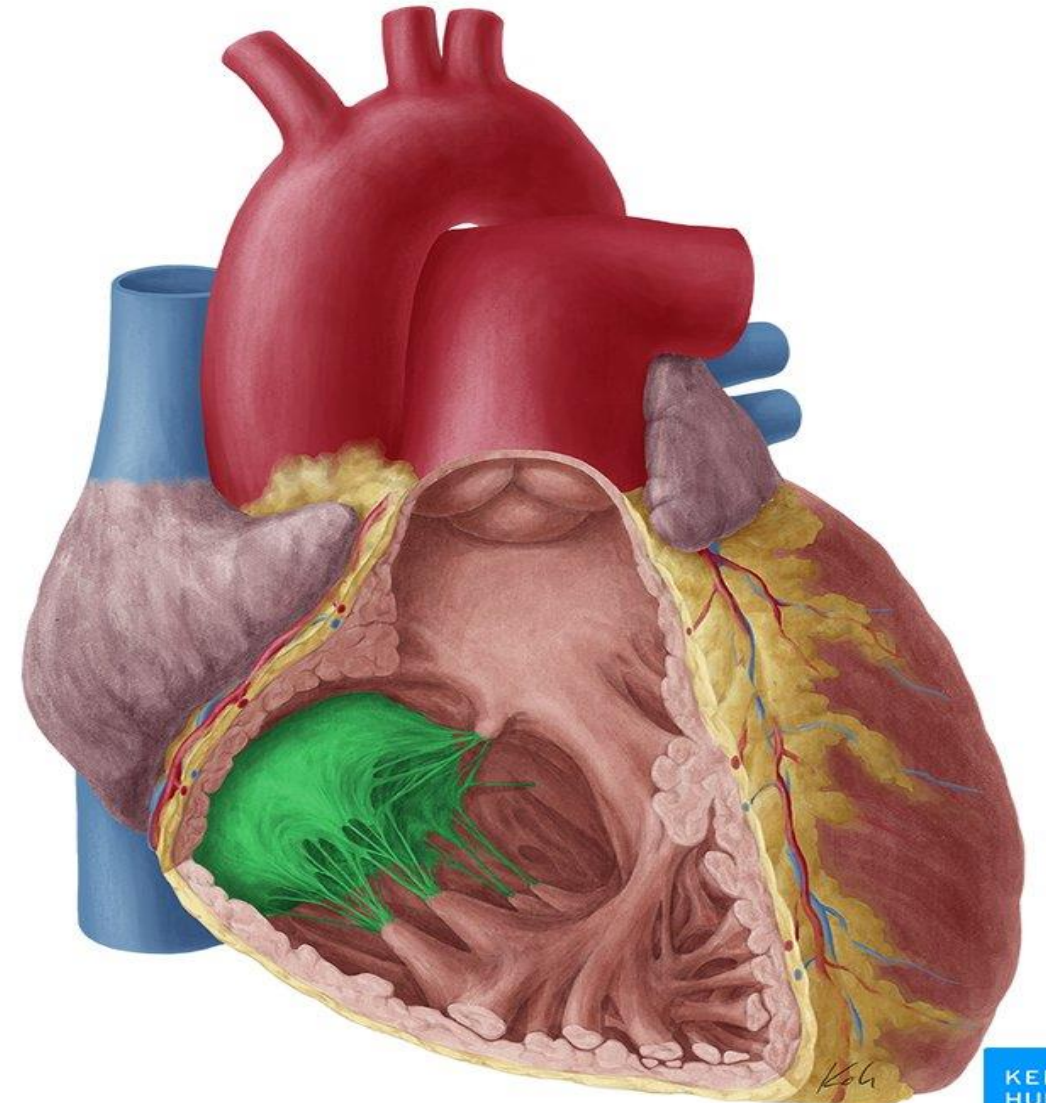
Aortic Valve

- ✍ A small dilatation of the proximal aorta associated with each cusp are referred to as the **sinuses of Valsalva** or aortic sinuses.
- ✍ The anterior(right) aortic sinus gives origin to the **right coronary artery**, and the posterior (left) sinus gives origin to the **left coronary artery**



Tricuspid valve

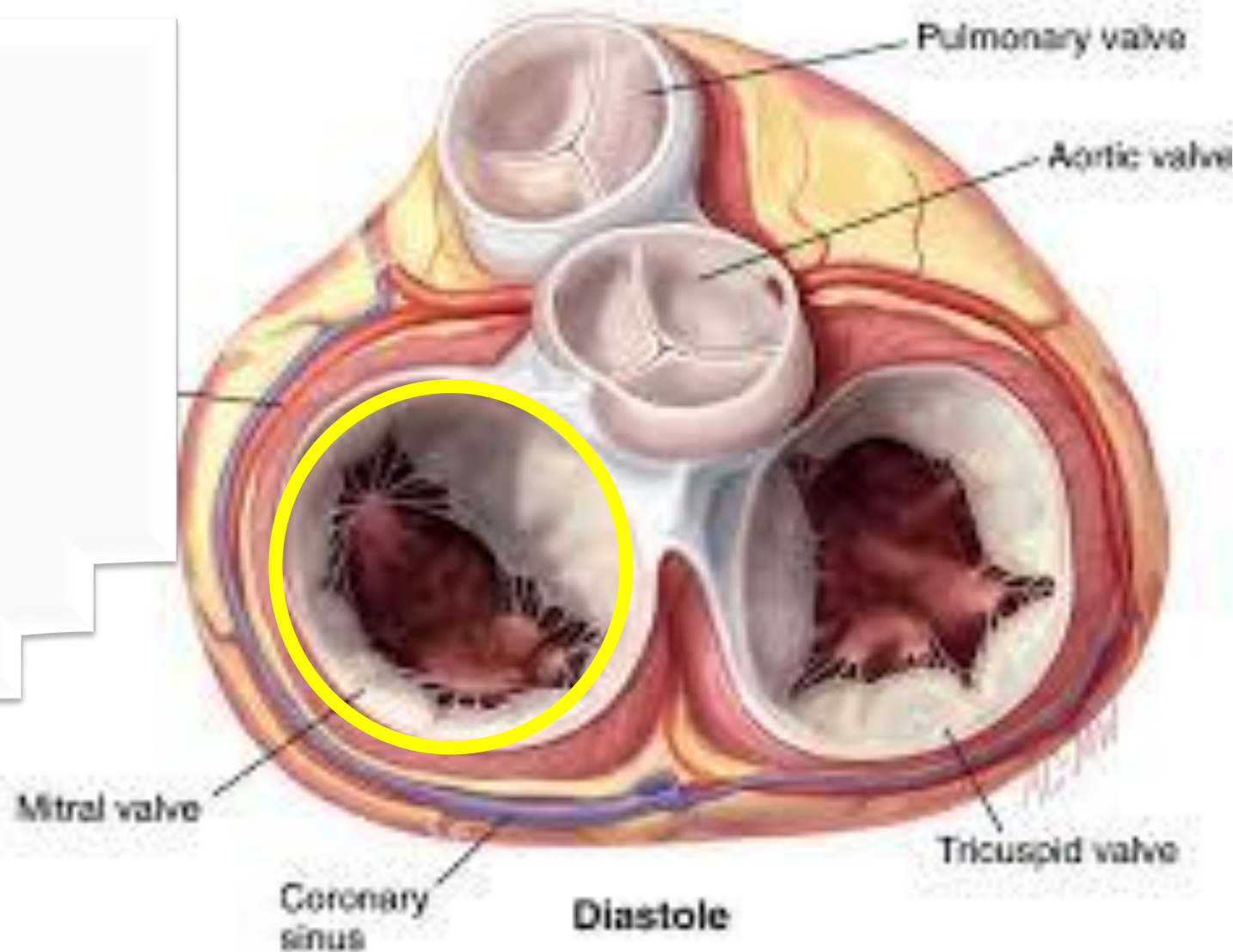
The Right atrioventricular orifice is guarded by tricuspid valve. The function of the valve is to close when the ventricle contracts and pumps blood into the pulmonary trunk.



Tricuspid valve

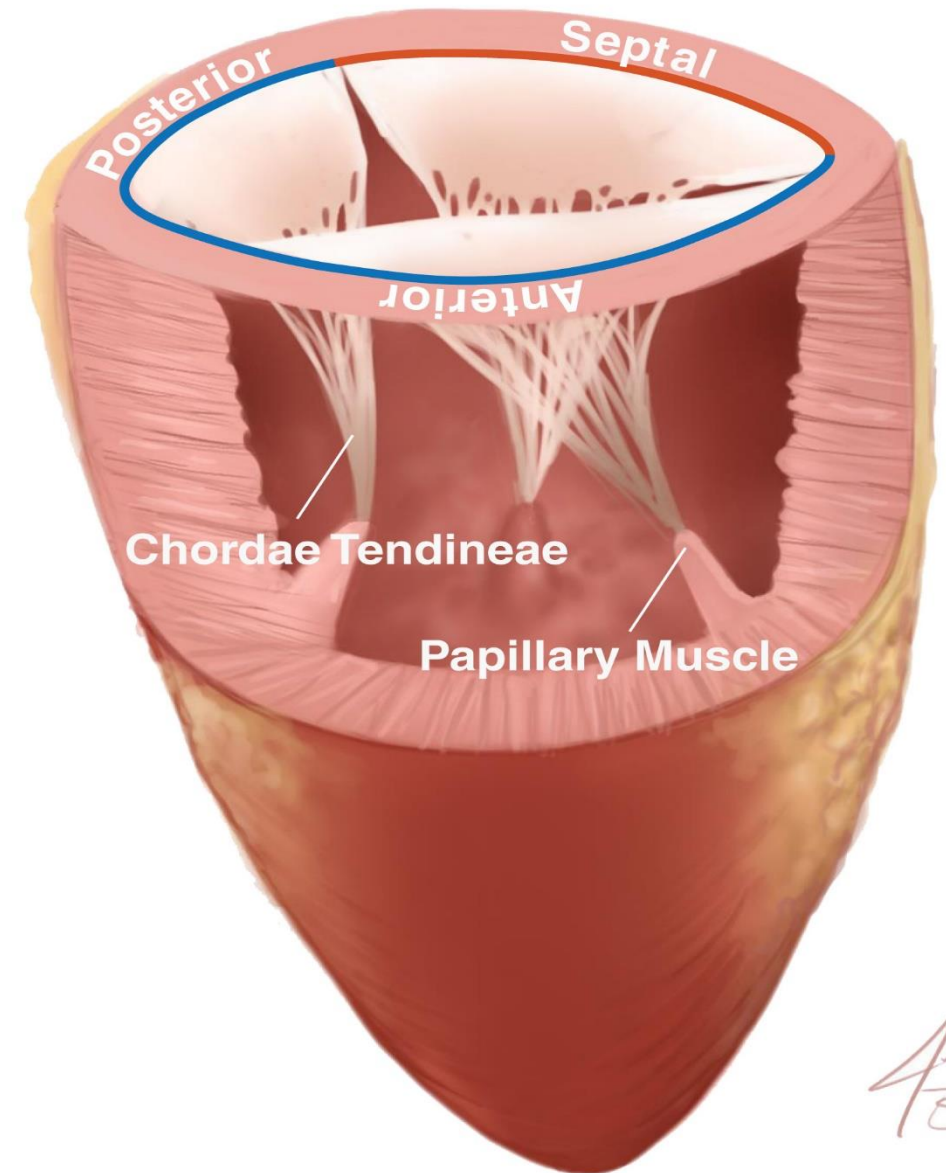
It consisted of:

- *fibro elastic skeleton ring**
- tricuspid valve annulus**
- *3 leaflets connected to the papillary muscles by chordae tendineae**



Tricuspid valve :: Has 3 leaflet(Cusp)

- * **Anterior leaflet** : the longest and most freely mobile.
- * **Posterior (marginal) leaflet** , the next longest and is named for its posterior relationship to the margin of the right ventricle
- * **Septal leaflet**: the smallest and arises directly from the tricuspid annulus above interventricular septum



Pulmonary valve

It is semilunar valve between right ventricle and pulmonary trunk

It has

☠ **Pulmonary valve annulus.**

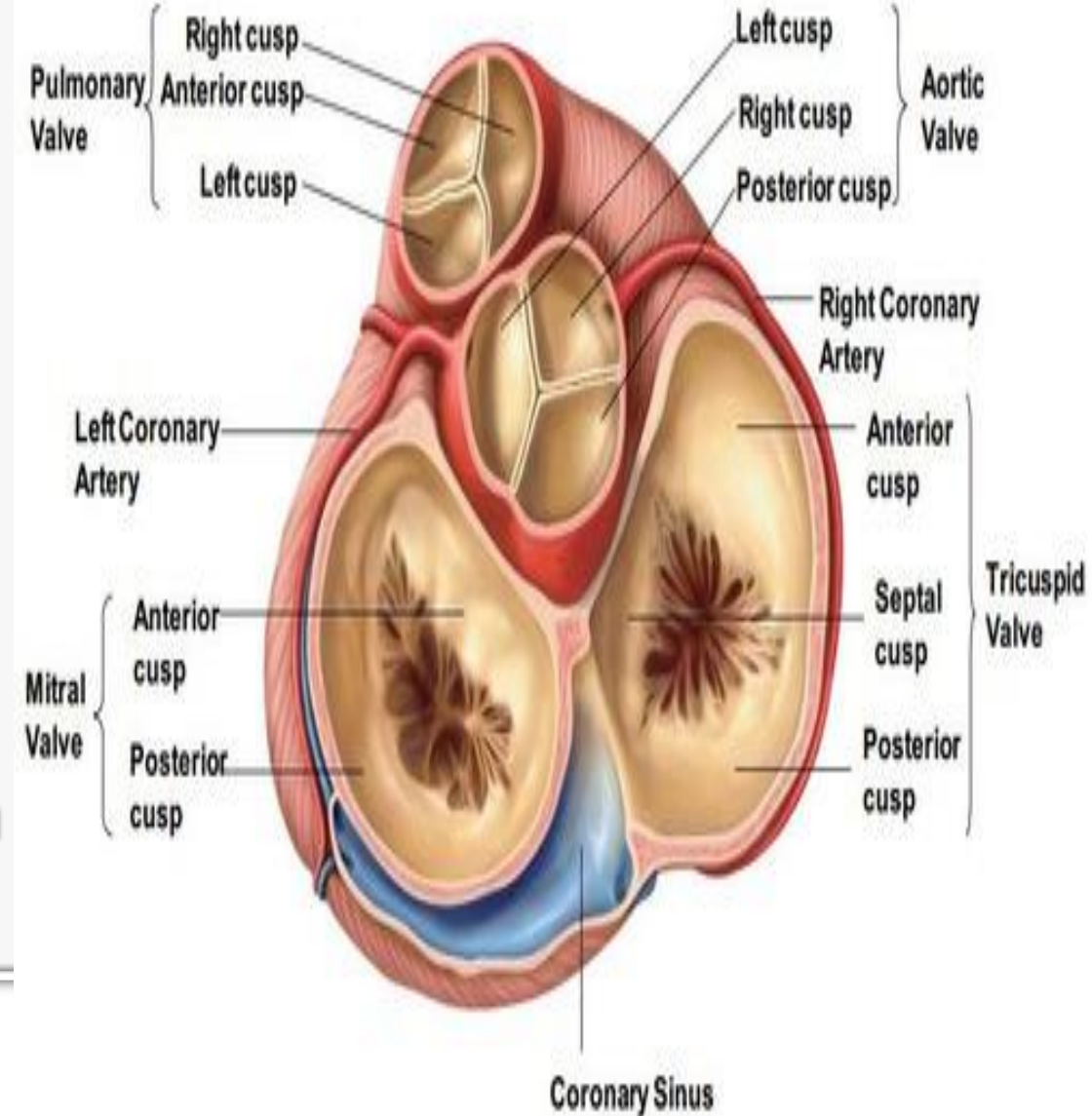
☠ **3 cusps**

Anterior cusp

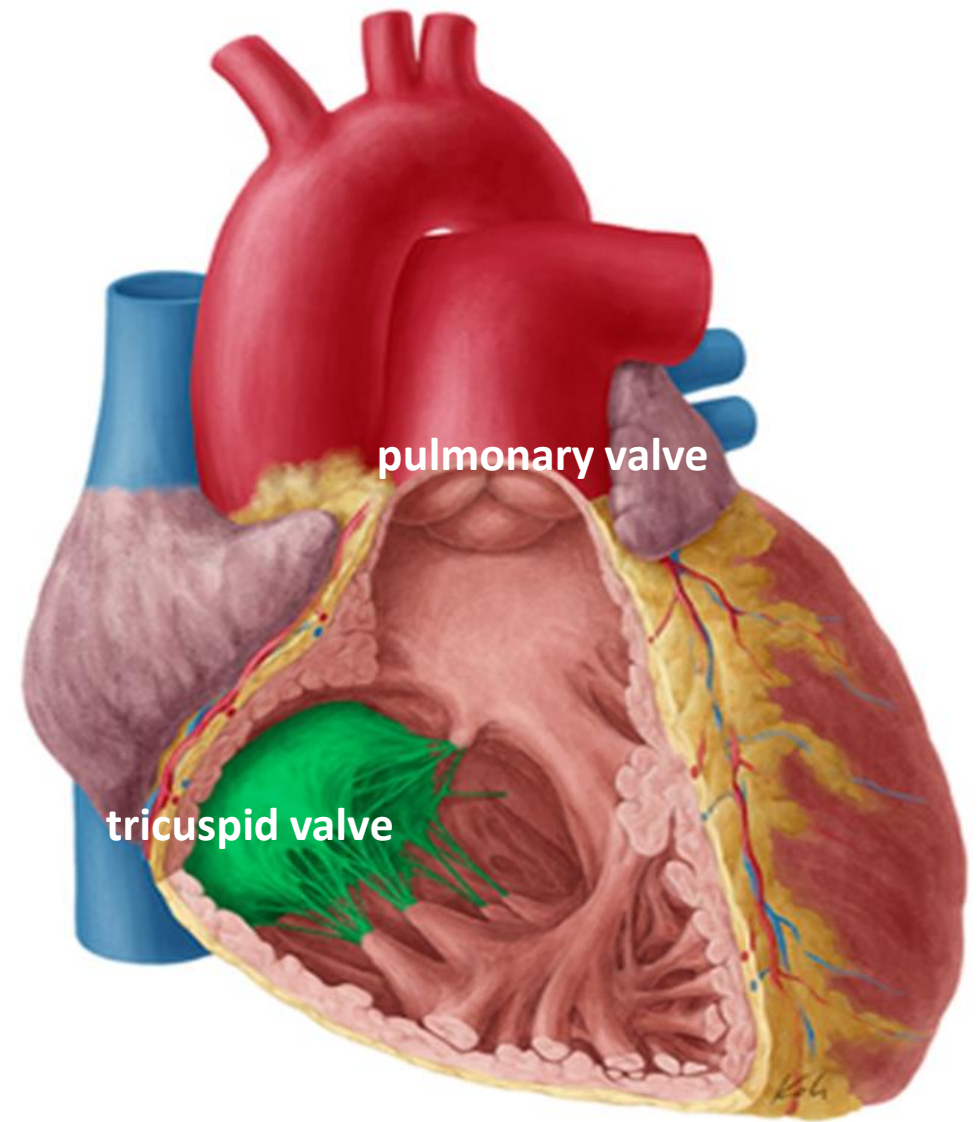
Right cusp

Left cusp

A small dilatation associated with each cusp called pulmonary sinuses .

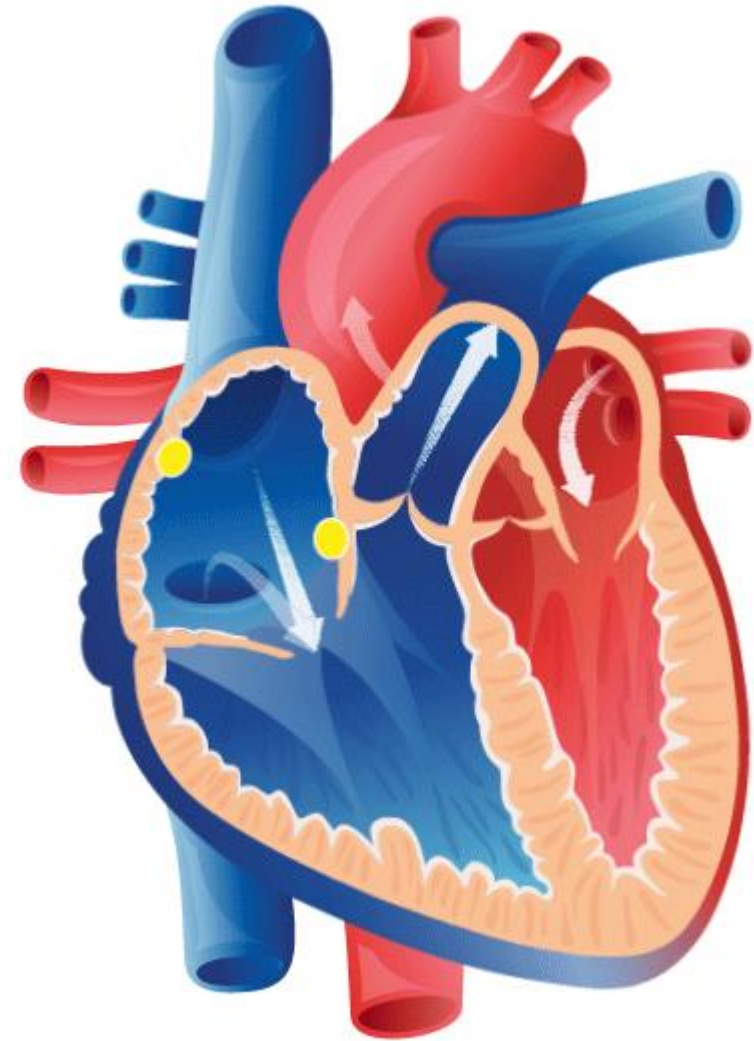


The pulmonary valve annulus is separated from tricuspid valve annulus by infundibular septum ,which means there is no direct community between these two valves .



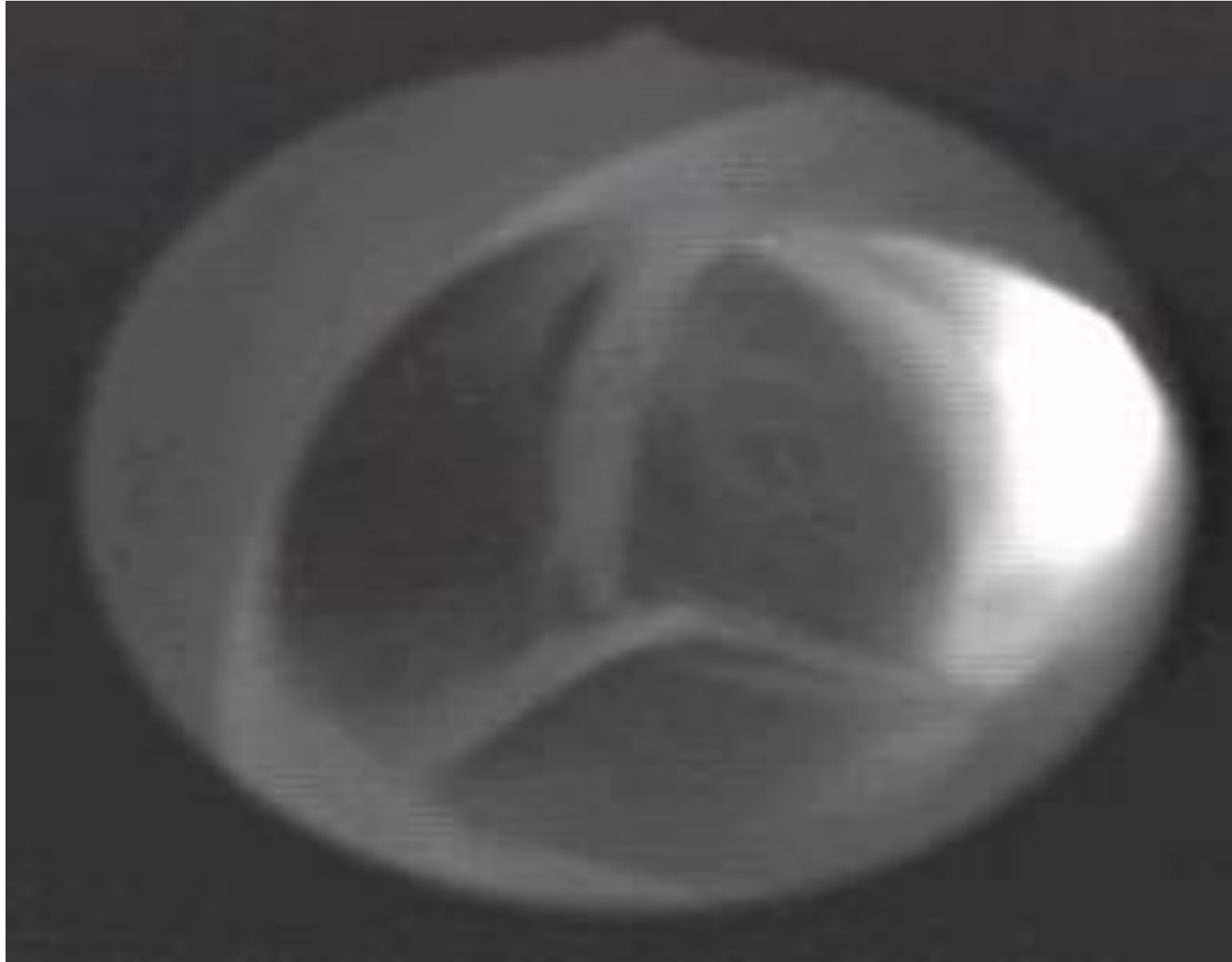
Semilunar valves closure and opening

The valve is opened by the increased blood pressure of the ventricular systole (contraction of the muscular tissue), pushing blood out of the heart and into the artery. It closes when the pressure drops inside..



Semilunar valves closure and opening

Filling of sinuses with blood lead to the closure of the valve and prevents the blood from return back to ventricles during relaxation



Nerve Supply of the Heart

The heart is innervated by sympathetic and parasympathetic fibers of the autonomic nervous system .

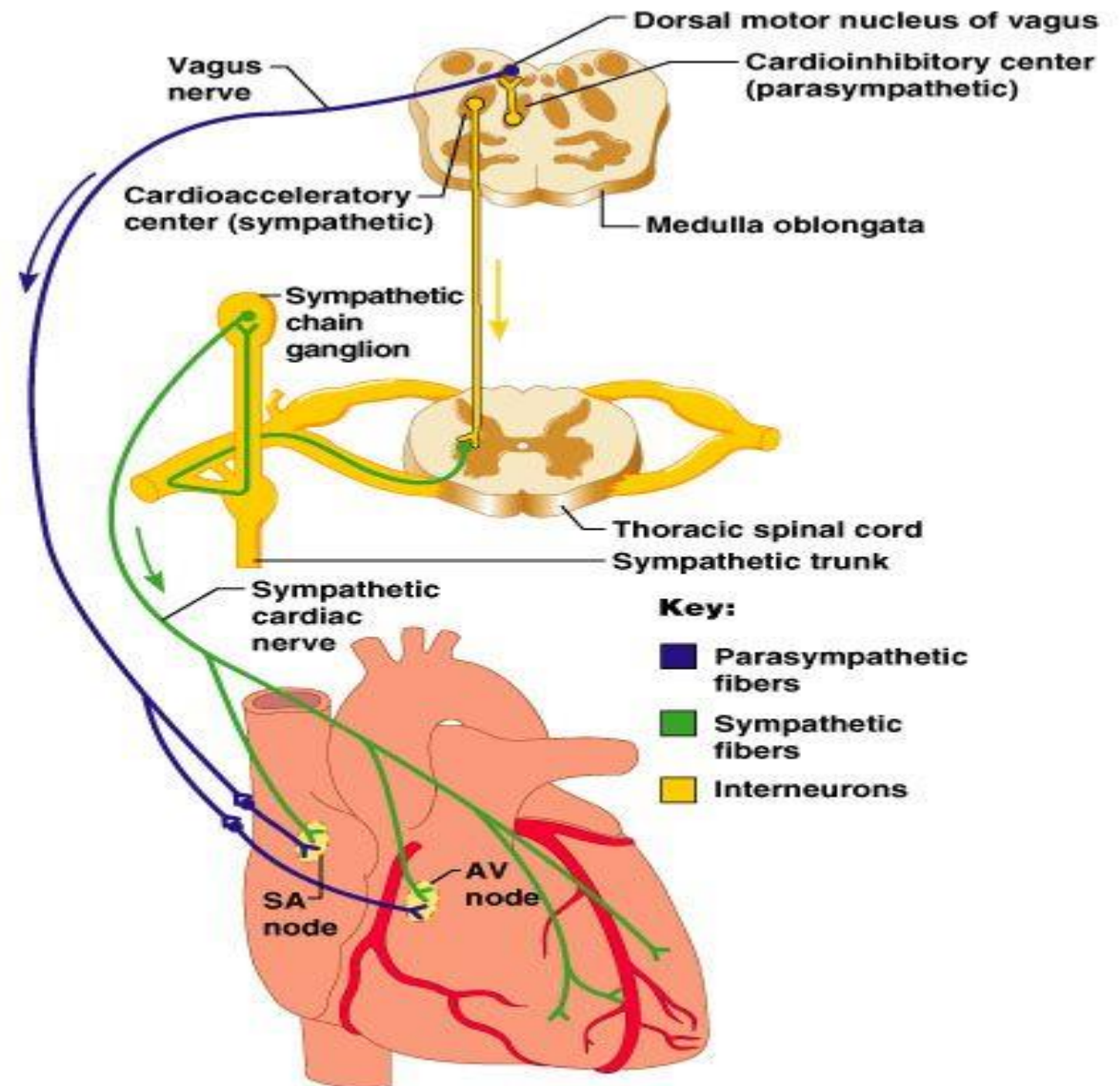
1. Sympathetic supply arises from the cervical and upper thoracic portions of the sympathetic trunks.

- * Increase heart rate (tachycardia)
- * coronary vasodilatation

2- Parasympathetic comes from the vagus nerves.

- * Decrease heart rate (bradycardia)
- * Coronary vasoconstriction

3. Pain fibers from upper thoracic segments of the spinal cord .



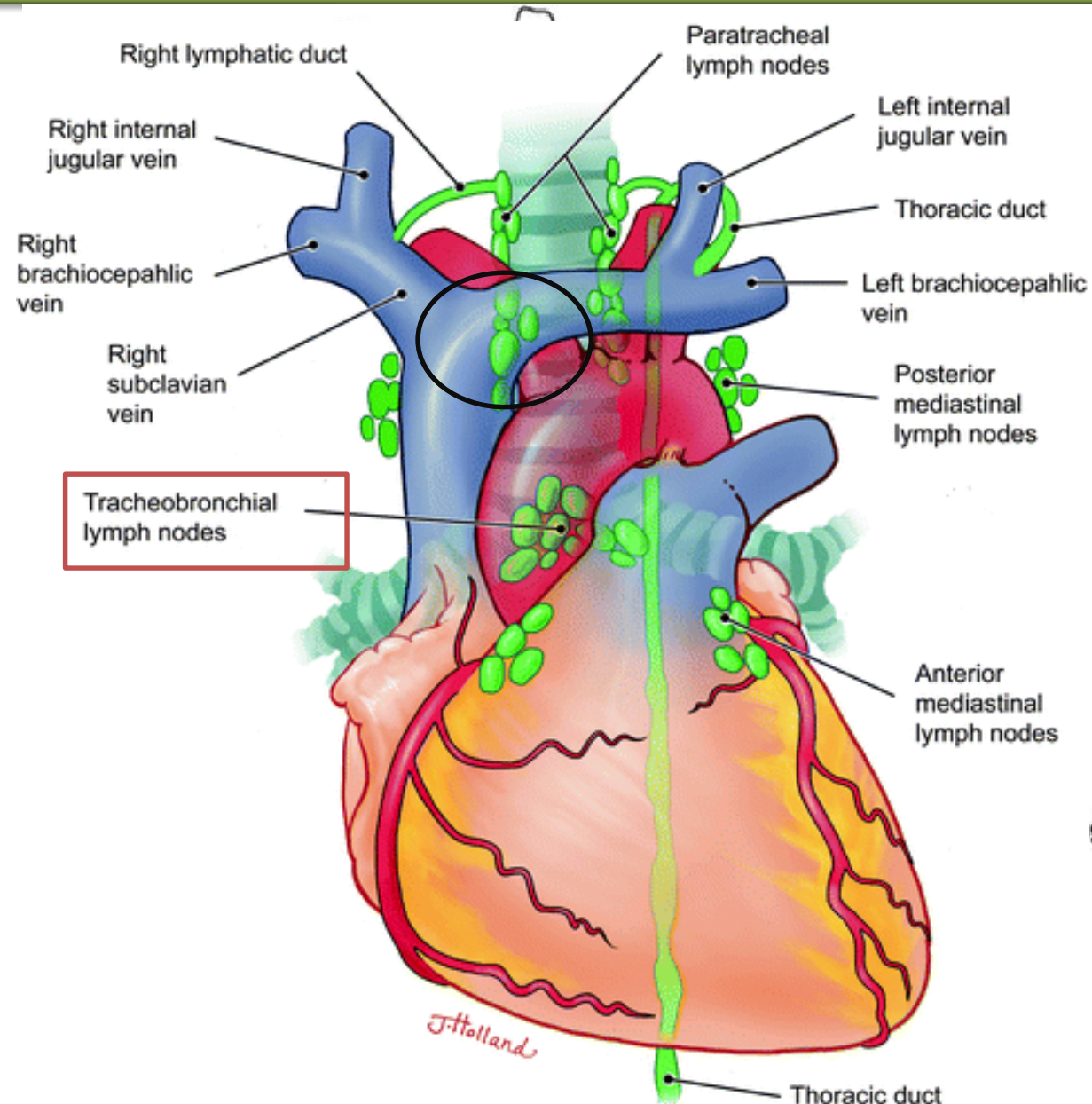
Lymphatics of the Heart

The lymphatic channels of the heart starts in myocardium and subendocardium .Then the lymphatic vessels drain to subepicardial lymphatic plexus.

* Efferent vessels from subepicardial plexus then form two trunks :

1. The left trunk receives lymph from both ventricles. Then unites with diaphragmatic lymphatic channels and drain towards the tracheobronchial lymph nodes.

2. The right trunk drains lymph from the right atrium, diaphragmatic aspect of the right ventricle and drain its content to brachiocephalic nodes.





THANK

YOU

So much!