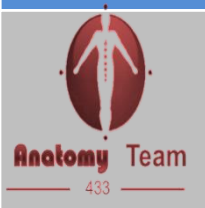
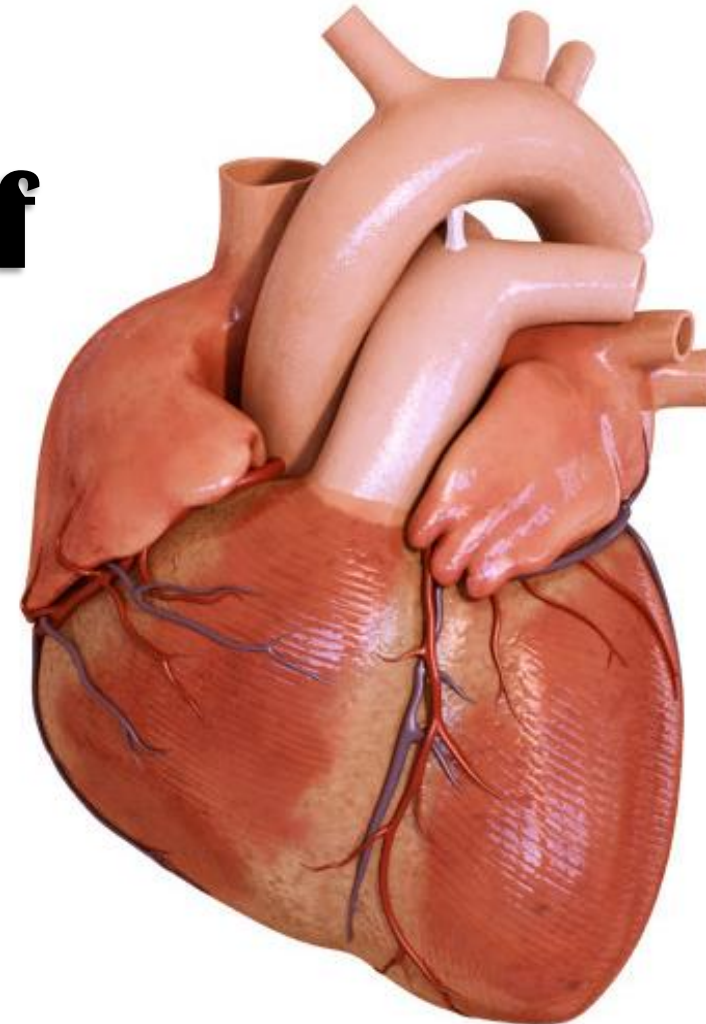




Blood supply of the heart

Done By: Kholod Aldossary
Revised By : Sarah Alseneidi



Index color

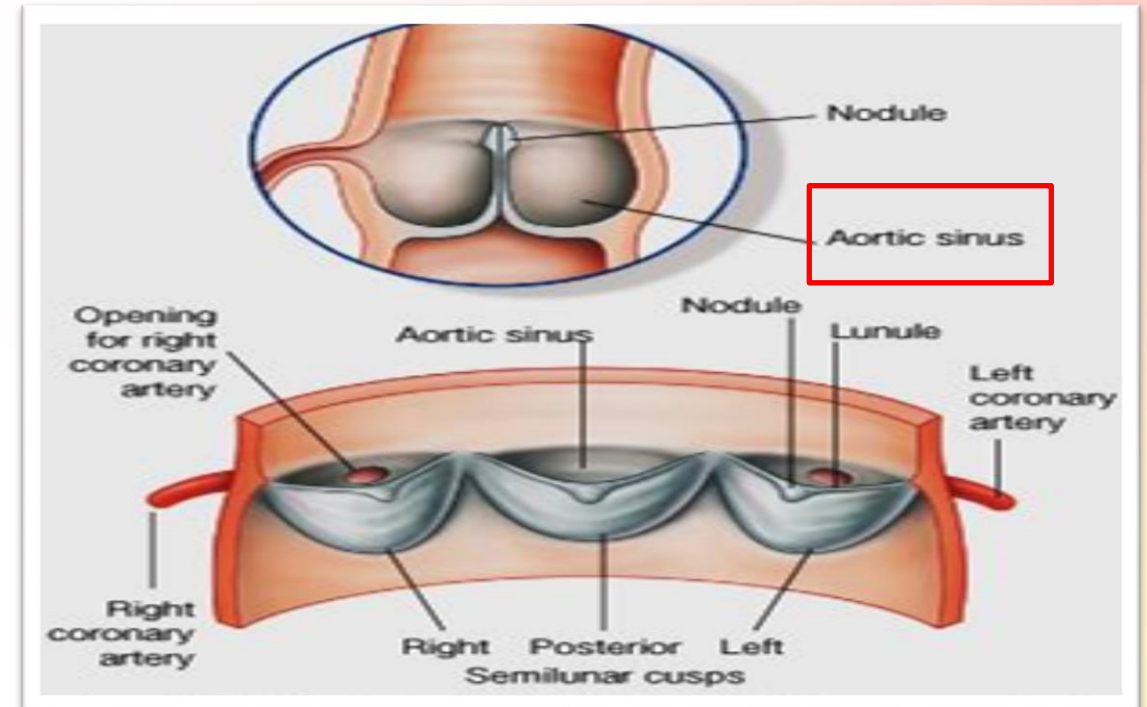
- ♥ Important
- ♥ Explanation
- ♥ Additional Notes

INTRODUCTION

- Blood supply means arterial supply and venous drainage.
- Heart takes the arterial supply from **two arteries : right & left coronary arteries.**
- The two coronary arteries and their branches are **distributed over the cardiac surface within the subepicardium (Endocardium) connective tissue.**
- Origin of coronary arteries: **they arise from the initial part of the Ascending Aorta (Aortic Sinuses).**
- Between the left ventricle and aorta there is aortic valve. Above this valve, there is aortic sinuses and when the aortic valve is close these aortic sinuses arrange as one in right side (anterior) and 2 in left side (anterior and posterior).

- **Right coronary artery** arise from the **right anterior aortic sinus**.
- **Left coronary artery** arise from the **left posterior aortic sinus**.

N.B. **Left anterior aortic sinus** does not relate to coronary arteries.

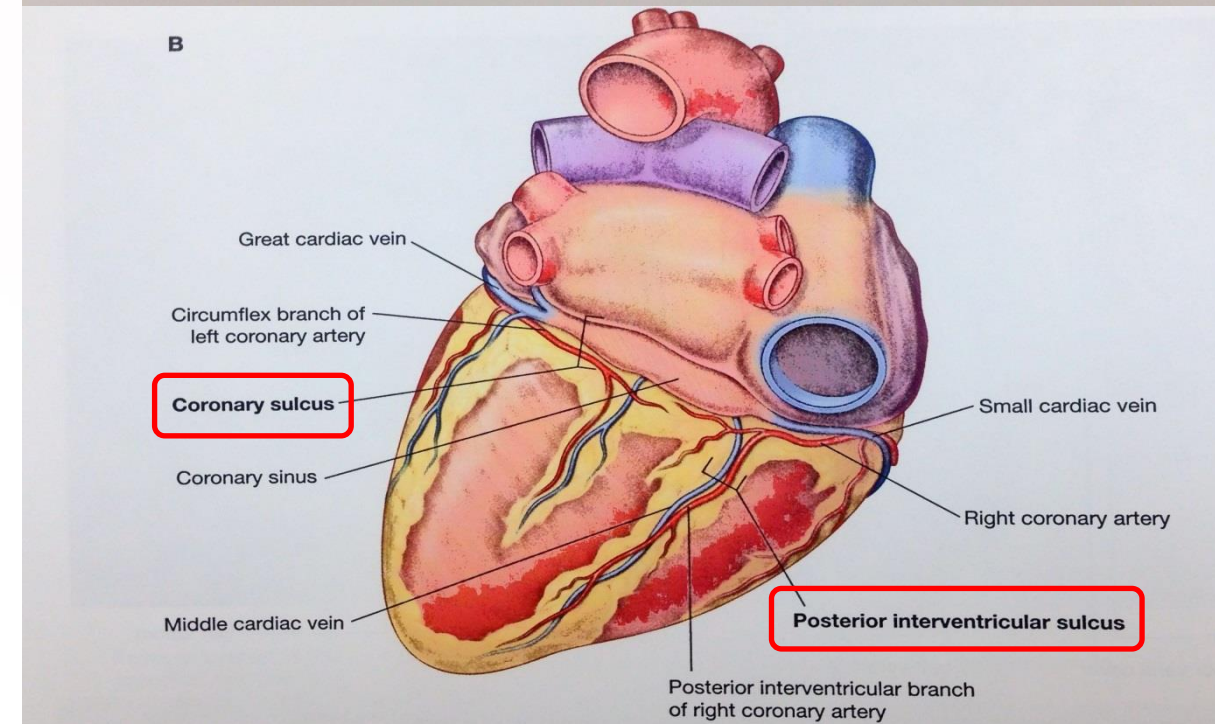
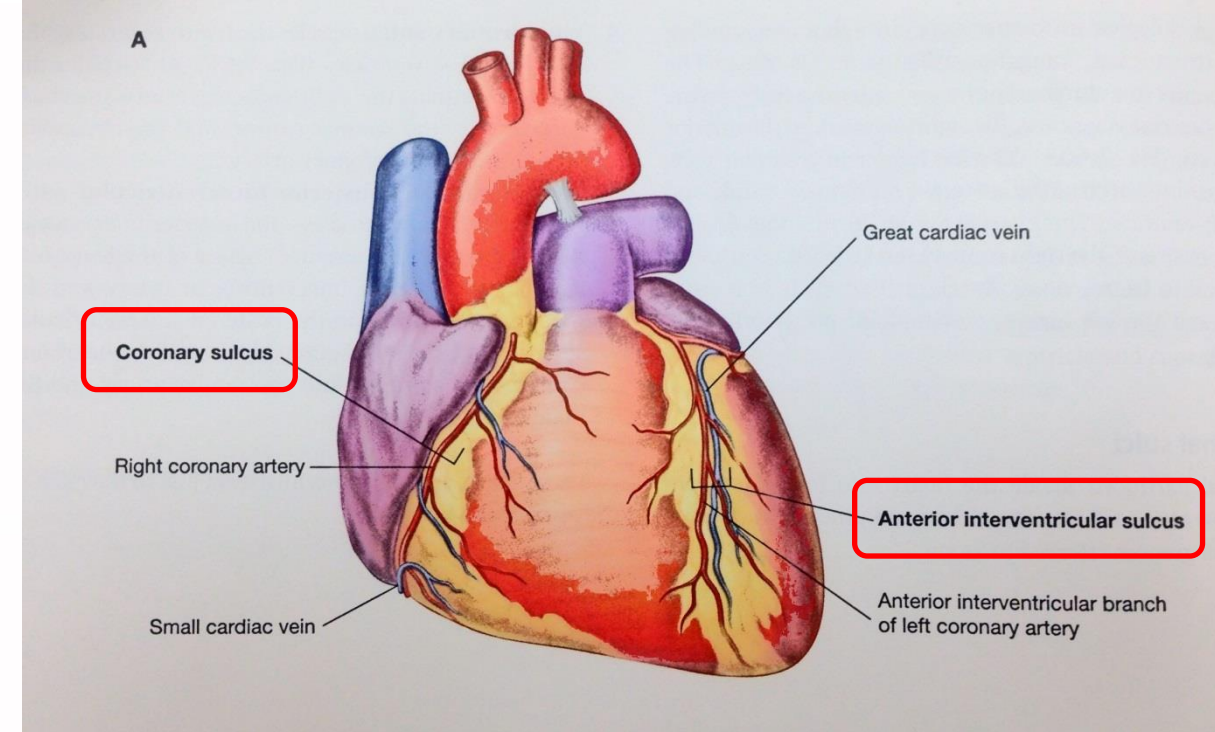


GROOVES OF THE HEART

1-The groove that separates the atria from the ventricles is the **atrioventricular groove** (coronary groove, **coronary sulcus**). *Sulcus = groove*

2-On the front (anterior) and back (posterior) surfaces between the **right and left ventricles** are additional shallow grooves called the **anterior and posterior interventricular grooves**.

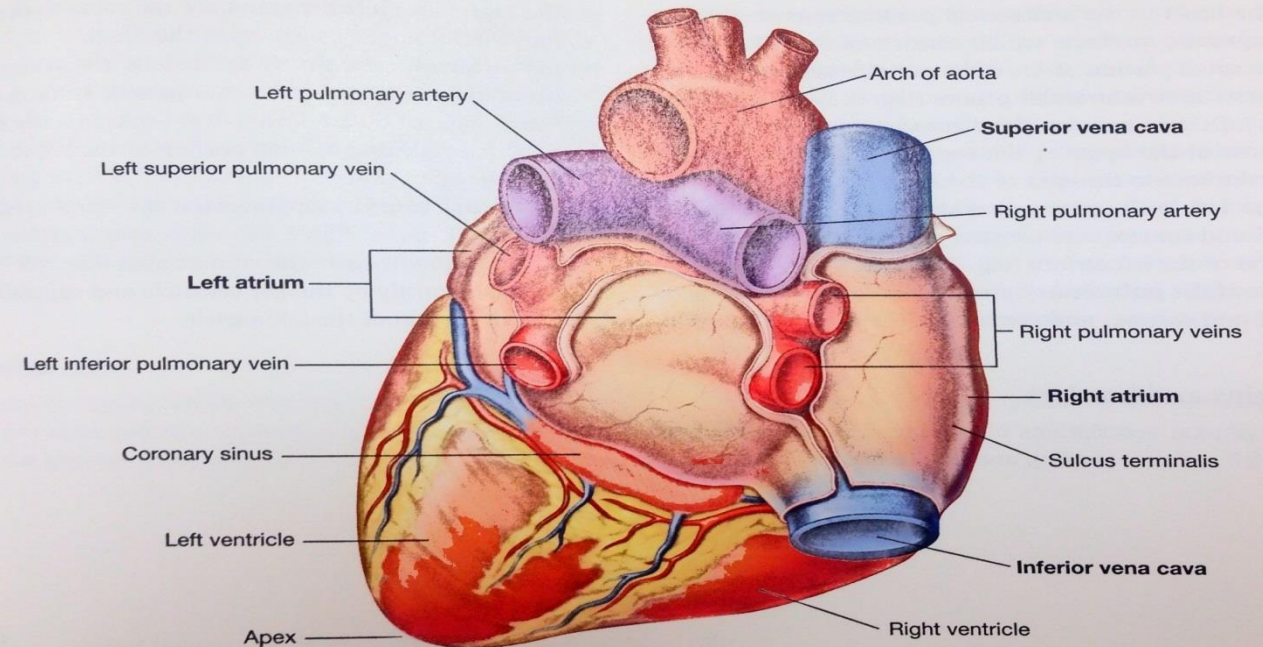
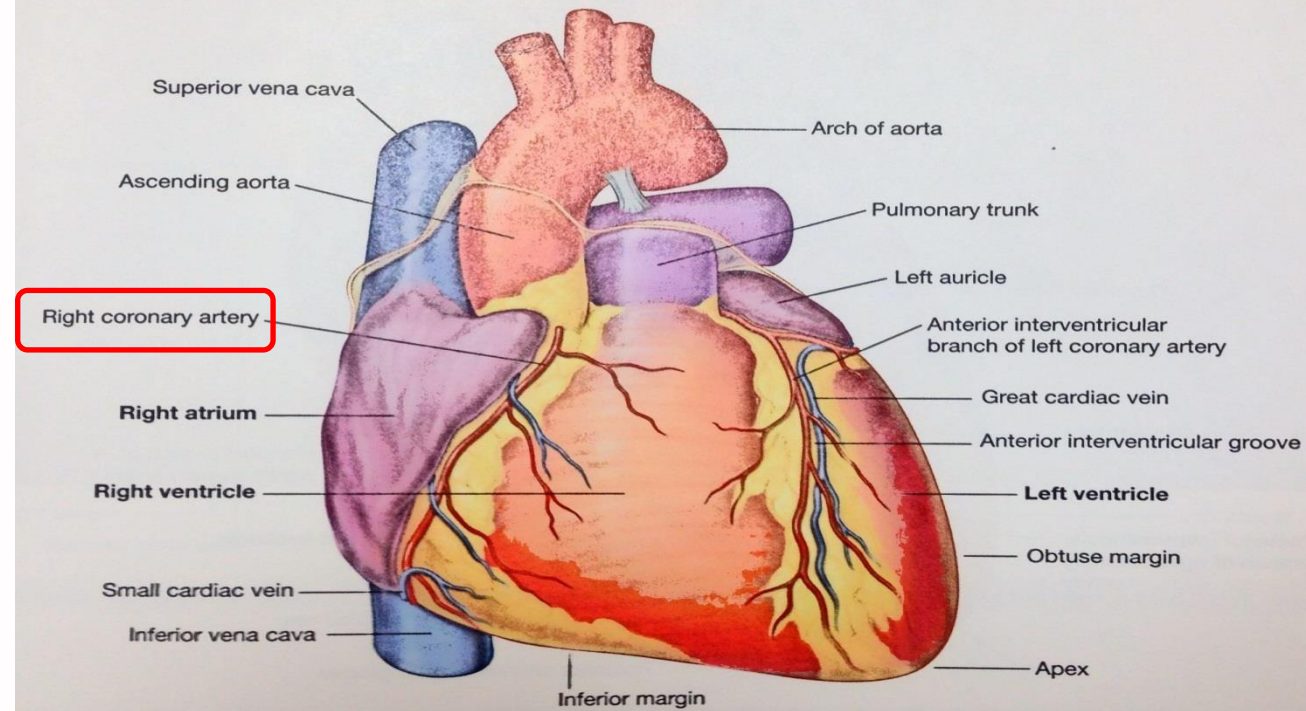
- Within these grooves are the coronary arteries and their branches, as well as the cardiac veins.



This Slide is For best understanding

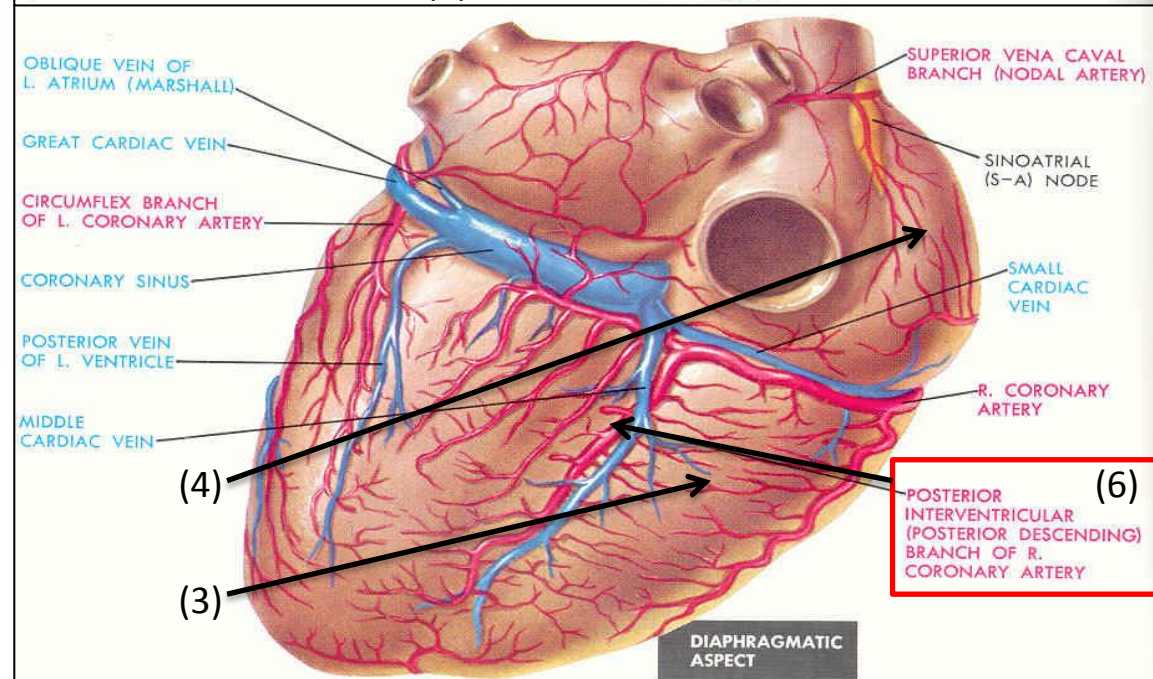
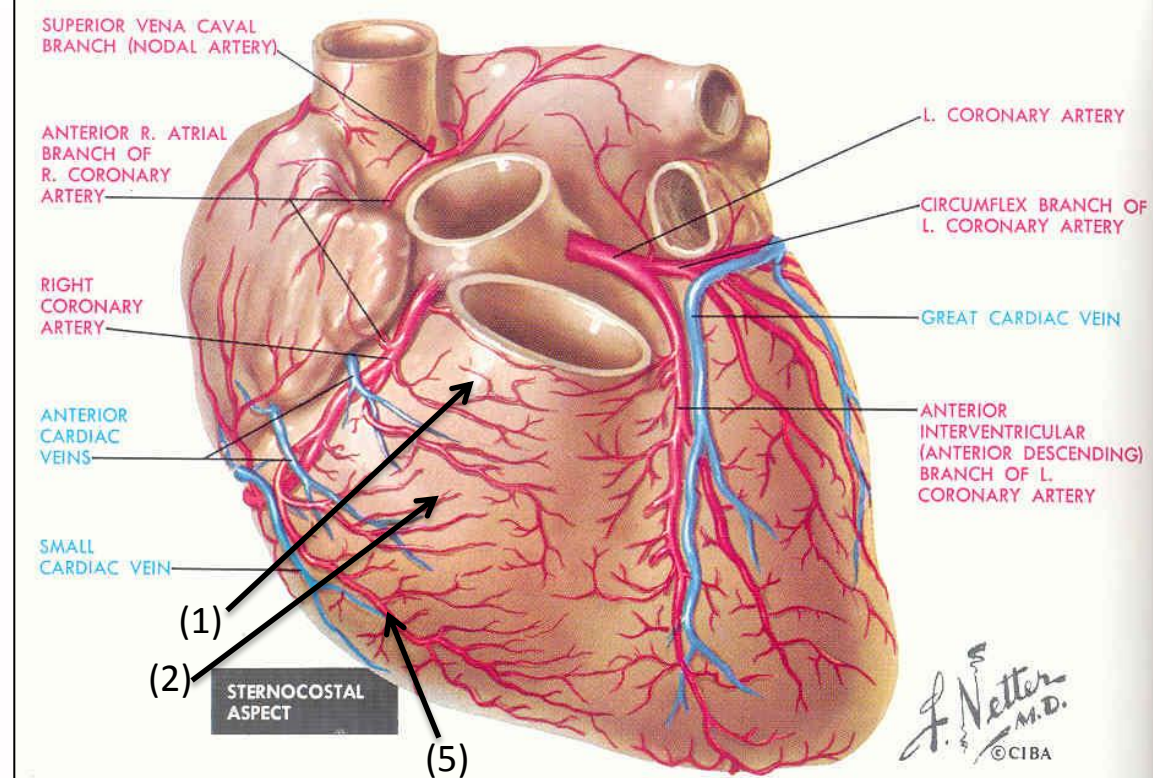
RIGHT CORONARY ARTERY

- Arise from **the right anterior aortic sinus** of the ascending aorta. It passes **between the right auricle and the pulmonary trunk** and then descends vertically in the **coronary sulcus**. On reaching the inferior margin of the heart it turns posteriorly and continuous in the **posterior interventricular sulcus**. It terminates by anastomosing with left coronary artery.
- The **right coronary artery supply**: right atrium and right ventricle, part of left atrium, left ventricle and atrioventricular septum, most of conducting system.
- Right coronary is the **smallest but it distributes more & most conducting system depend on it**.



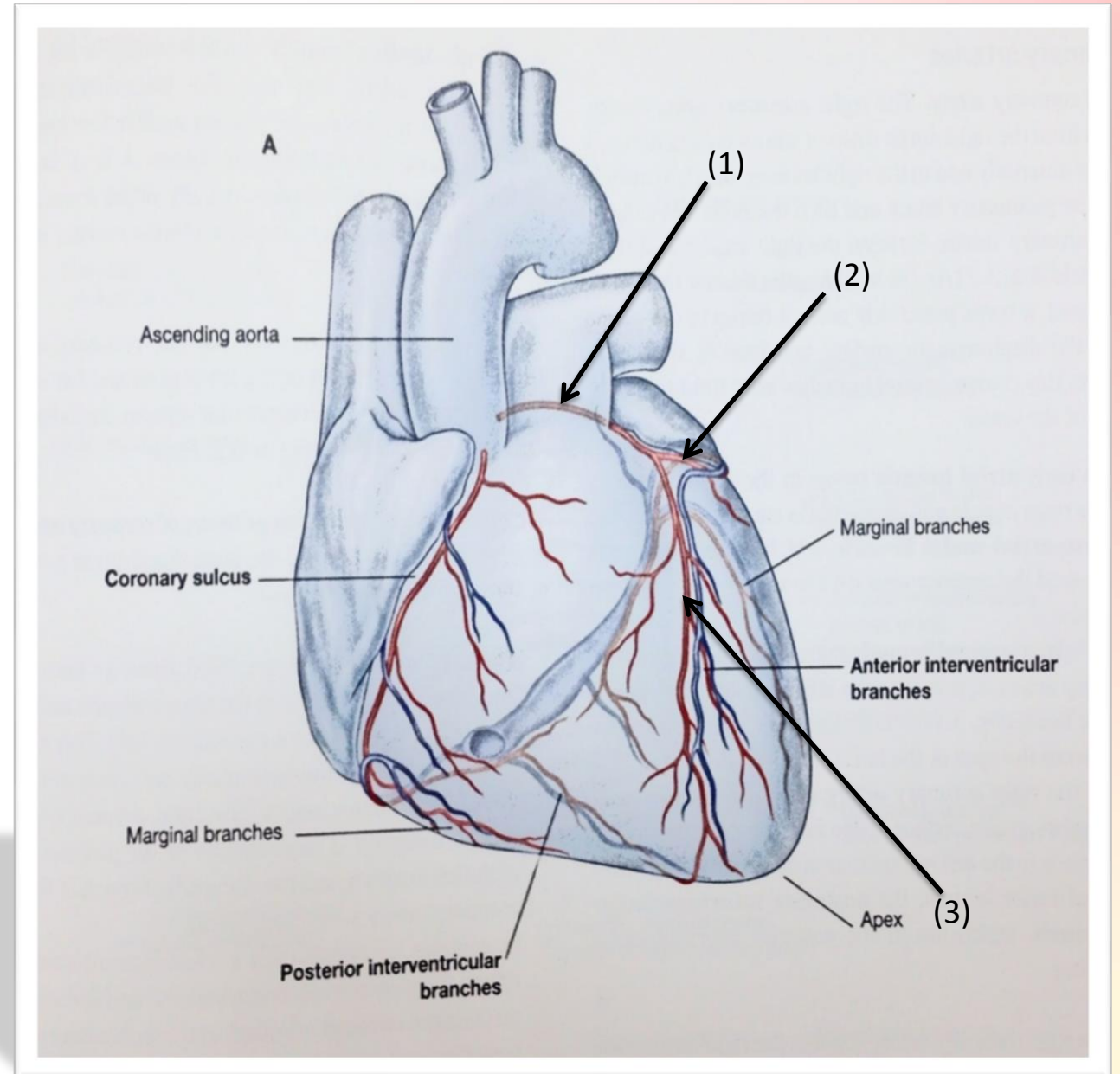
BRANCHES OF RIGHT CORONARY ARTERY

Artery	Description
Right conus(1) Conus=infundibulum	Supplies infundibulum (upper part of the anterior surface of the right ventricle)
Anterior ventricular branches(2)	Supply anterior surface of the right ventricle
Posterior ventricular branches(3)	Supply diaphragmatic surface of the right ventricle
Atrial branches(4)	Supply the anterior and lateral surface of the right atrium . One branch supplies posterior surface of right and left atria
Marginal artery(5)	Is the largest branch runs along the lower margin of the heart and (it is accompanied by the small cardiac vein)
Posterior interventricular artery (6)	(The largest branch) Lies in the posterior inter ventricular groove . It supplies the right and left ventricles , inferior wall and posterior part of interventricular septum EXCEPT APEX (it is accompanied by the middle cardiac vein)
Artery of the sinuatrial node	Supplies the SA node and both atria In 35% it arises from left coronary artery



LEFT CORONARY ARTERY (1)

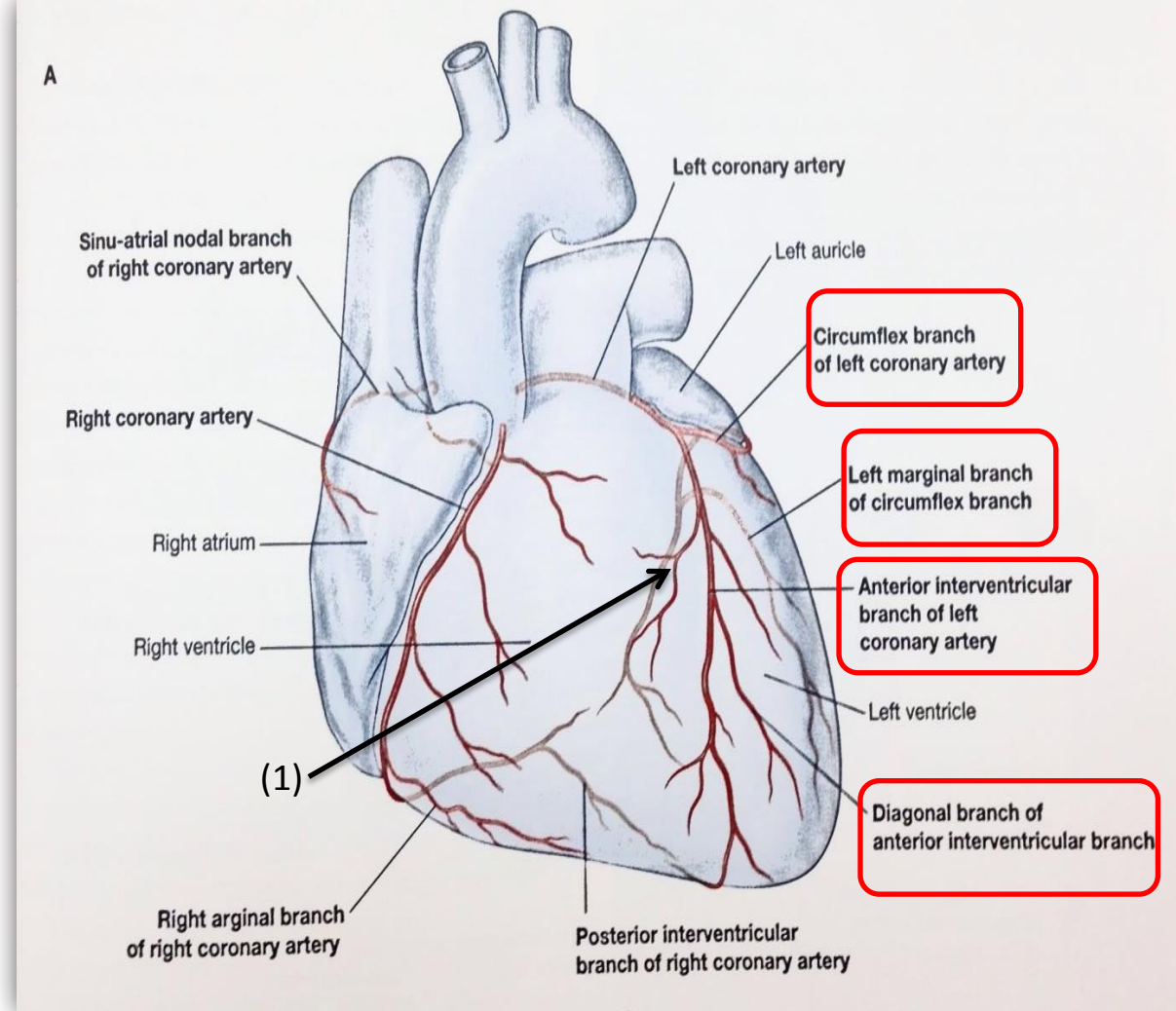
- The largest of two coronaries. Arise from the **left posterior aortic sinus**. It passes between the **left auricle and the pulmonary trunk**. Before entering the coronary groove. While still posterior(behind)to the pulmonary trunk .
- the **artery divides into two terminal branches**:
 - * **circumflex (2)**
 - * **Anterior interventricular arteries.(3)**



BRANCHES OF LEFT CORONARY ARTERY

Artery	Description
Circumflex artery	Winds around the left margin of the heart in the atrioventricular groove
Anterior interventricular artery	Descending in the anterior interventricular groove to the apex of the heart (accompanied by great cardiac vein)
Left conus(1)	Artery for pulmonary conus(infundibulum)
Atrial branches	Supply greater part of left atrium
Anterior and posterior ventricular	Supply left ventricle
Left diagonal artery	(the largest branch) One of the ventricular branches or may arise from left coronary
Left marginal artery (circumflex Branch)	Supplies the left ventricle down to apex

Branches of anterior interventricular artery



Note :

- **Marginal artery** : branch of right coronary artery.
- **Left marginal artery** : branch of circumflex Branch.

VARIATION OF CORONARY ARTERIES

▪Right Dominance(use right hand):

In (90 %) of population, the Posterior Interventricular artery is a branch of the Right Coronary.

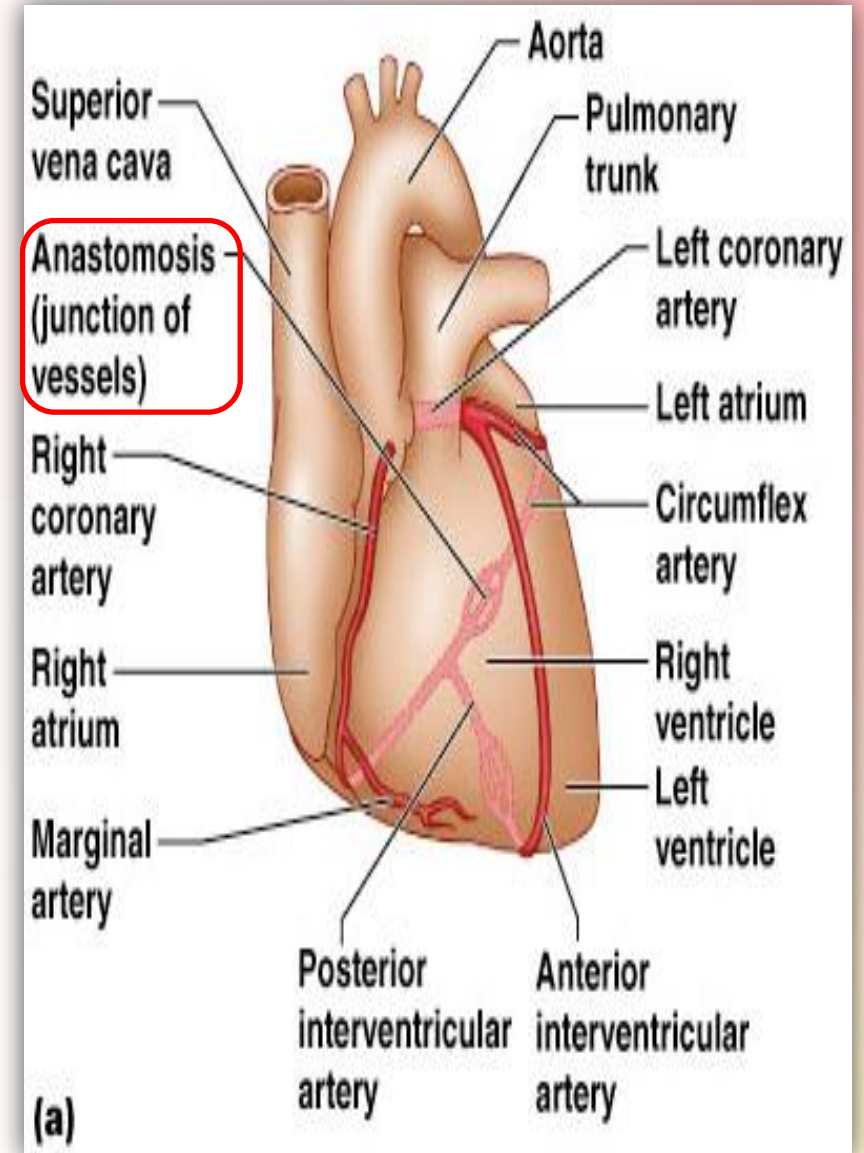
▪Left Dominance(use left hand):

In the rest (10%), the Posterior Interventricular artery arises from the Circumflex branch of the Left Coronary artery

CORONARY ANASTOMOSIS

- In most of people, the **terminal branches of the right and left coronaries anastomose in posterior interventricular groove**
- However this anastomosis is not large enough to provide adequate blood supply in case of coronary occlusion(Functional End arteries*).

The terminal branches do anastomose with those of adjacent arteries but the **anastomosis is insufficient to keep the tissue alive if one of the arteries is occluded.*



ARTERIAL SUPPLY OF CONDUCTING SYSTEM

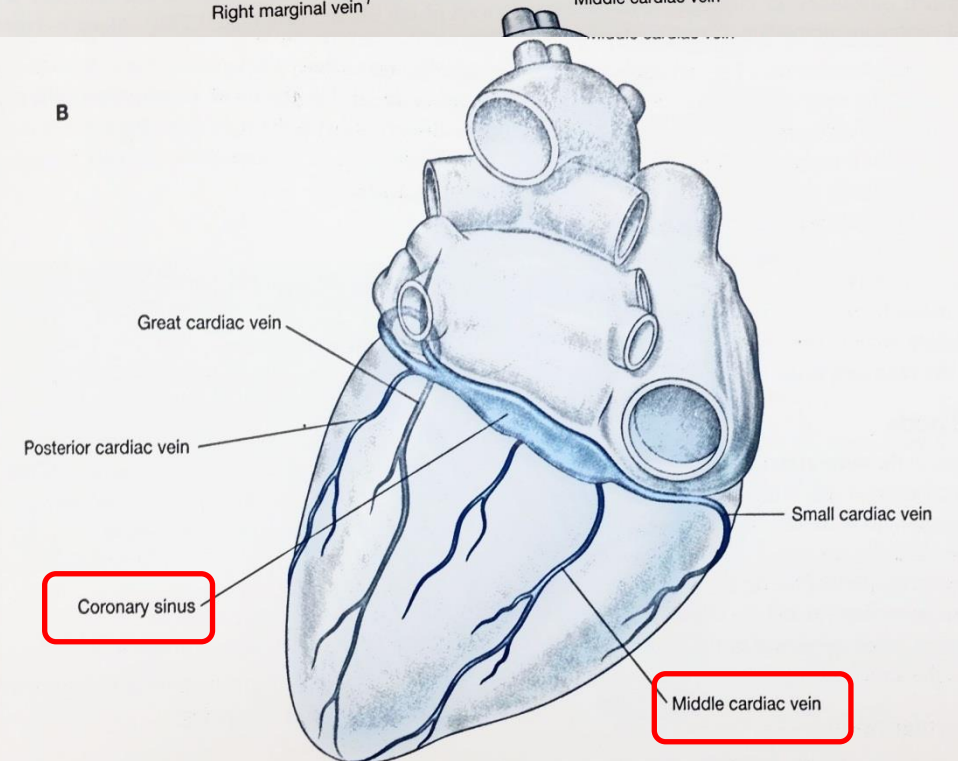
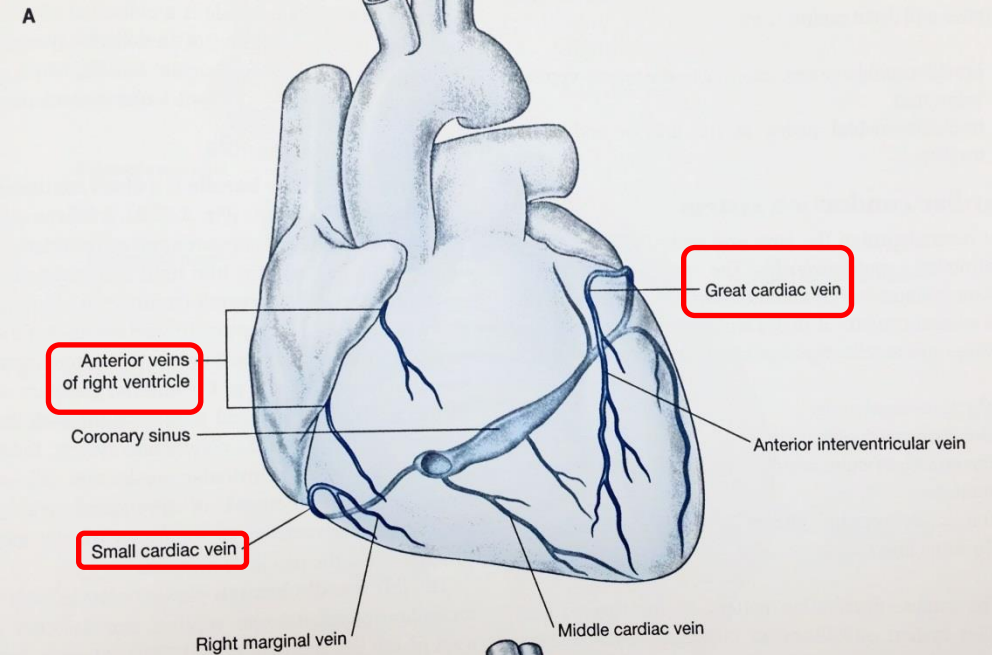
- SA node ,AV node and AV bundles supplied by **right coronary artery** .
- **Right bundle branch** >> supplied by **left coronary artery**.
- **Left bundle branch** >> supplied by **both right and left coronary artery** .

CORONARY SINUS

- Drains most of the venous blood of the heart.
- It lies in the **posterior part of the atrioventricular groove**.
- origin : it is **direct continuation of the great cardiac vein**.
- The coronary sinus **receives four major tributaries**: 3 cardiac veins (great, middle and small) and oblique vein of left atrium (vein of Marshall).
- Termination : it **empties into right atrium**.
- Its opening is inferior & to **the left of the IVC opening**.
- It is guarded by a valve.

VEINS DRAINING OUTSIDE CORONARY SINUS

- 1- Anterior cardiac veins : open directly into **right atrium**.
- 2-venae cordis minimi : open into the heart chambers.



1)What is the arterial supply of the apex ?

- A) Right coronary artery
- B) Left coronary artery
- C) Circumflex artery

2)Which vein is accompanied with marginal artery ?

- A) Great cardiac vein
- B) Middle cardiac vein
- C) Small cardiac vein

3)Right coronary artery lies in :

- A) Atrioventricular groove
- B) Ant.interventricular groove
- C) Post.interventricular groove

4)Which artery supply the infundibulum ?

- A) Left marginal artery
- B) Right conus
- C) Left diagonal artery

MCQs

5) Left coronary artery arise from :

- A) Right anterior aortic sinus
- B) Left Anterior aortic sinus
- C) Left posterior aortic sinus

6)Which one of these arteries supply the left margin of the heart ?

- A) Circumflex artery
- B) Left marginal artery
- C) Anterior interventricular artery

7)Coronary sinus empties into:

- A) Right ventricle
- B) Left atrium
- C) Right atrium

8)Right AV bundle supplied by ?

- A) Right coronary artery
- B) Left coronary artery
- C) BOTH (A+B)