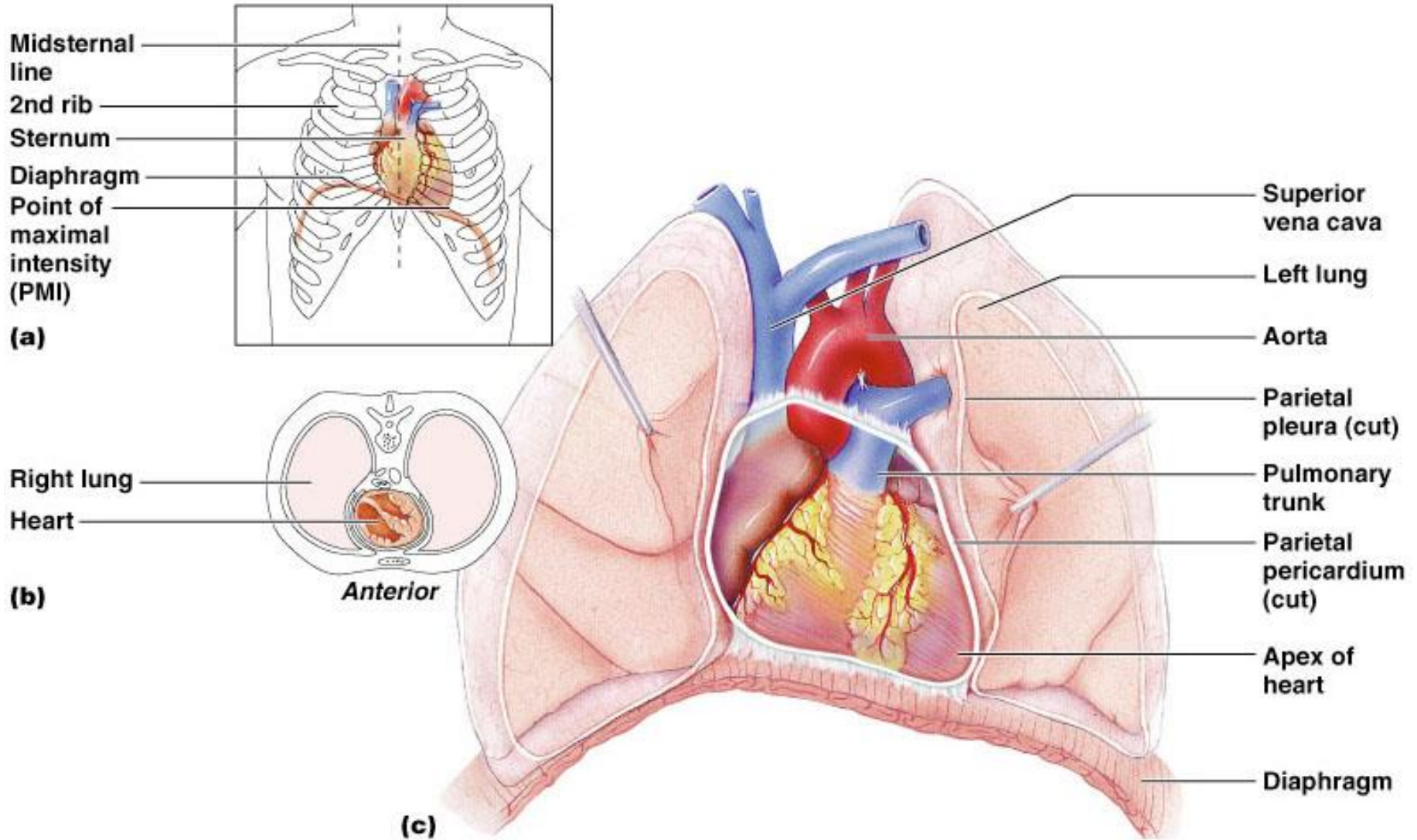


# The Cardiovascular System

## Part -1-

Ms. Mais Abdelhaq

# Heart Anatomy



# Heart Anatomy

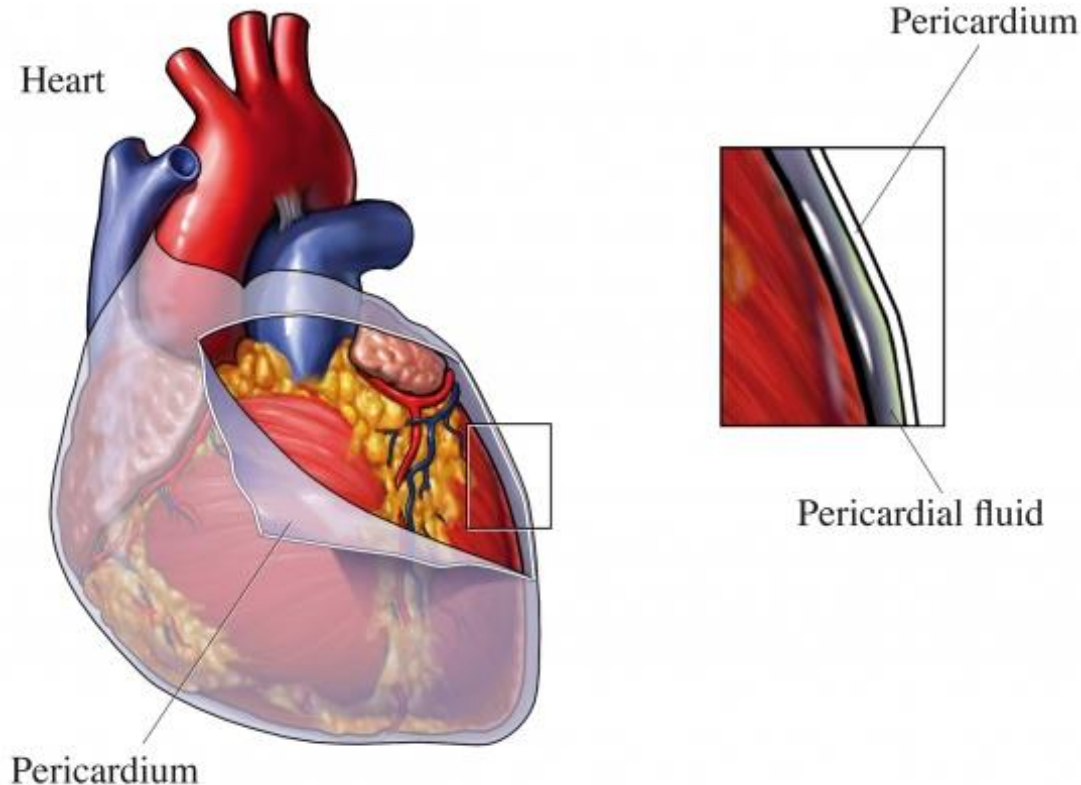
Approximately the size of your fist

## Location

- Superior
- Left
- Anterior
- Posterior

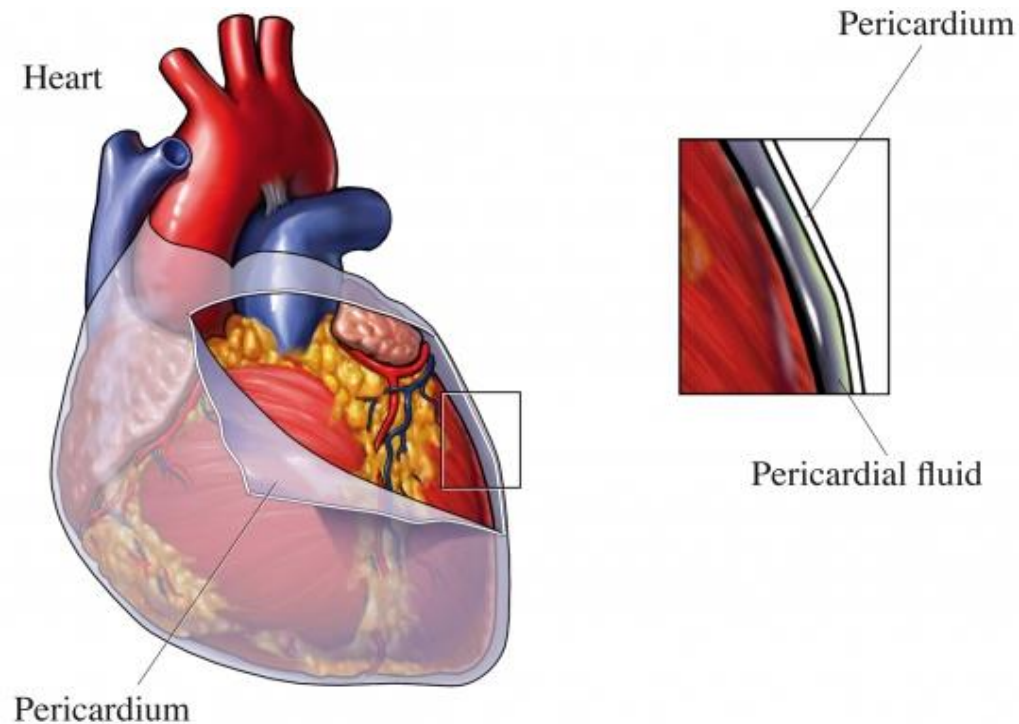
# The Heart

The heart is surrounded by a membrane called **Pericardium**



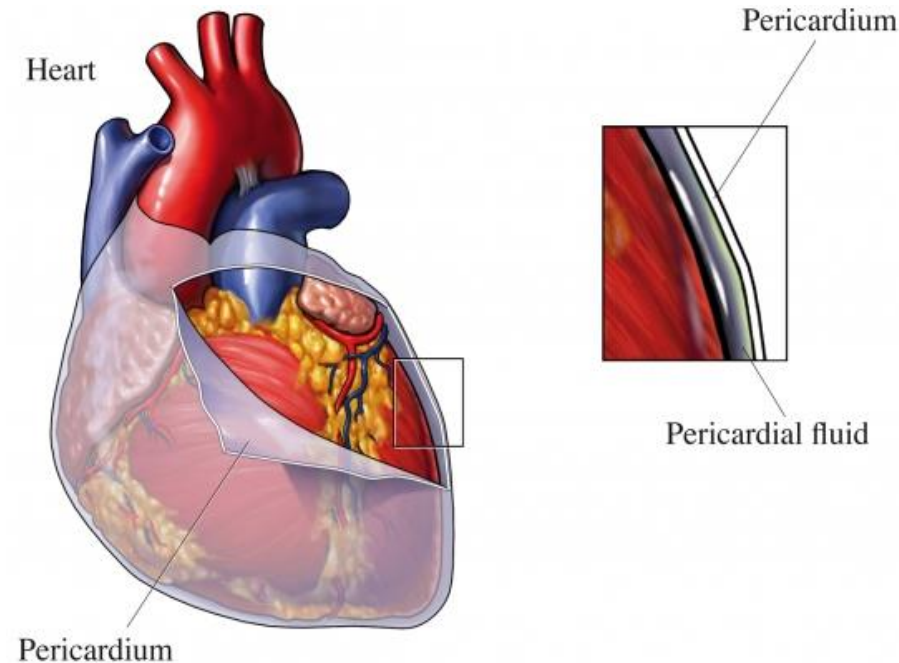
# The Pericardium

- Encloses the heart and the roots of the great vessels
- Lies within the middle mediastinum



# The Pericardium

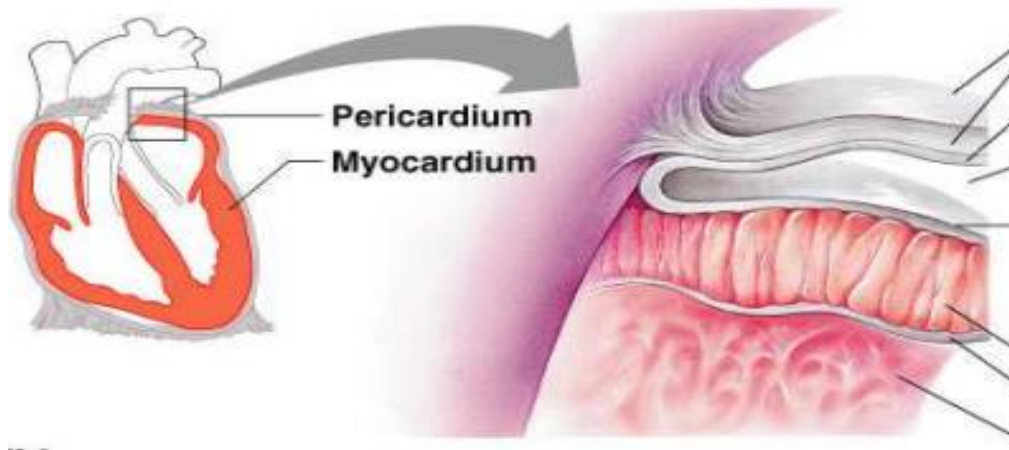
- Protects and anchors the heart
- Allows the heart to work in a relatively friction-free environment



# Coverings of the Heart: Anatomy

**Pericardium** – a double-walled sac around the heart composed of:

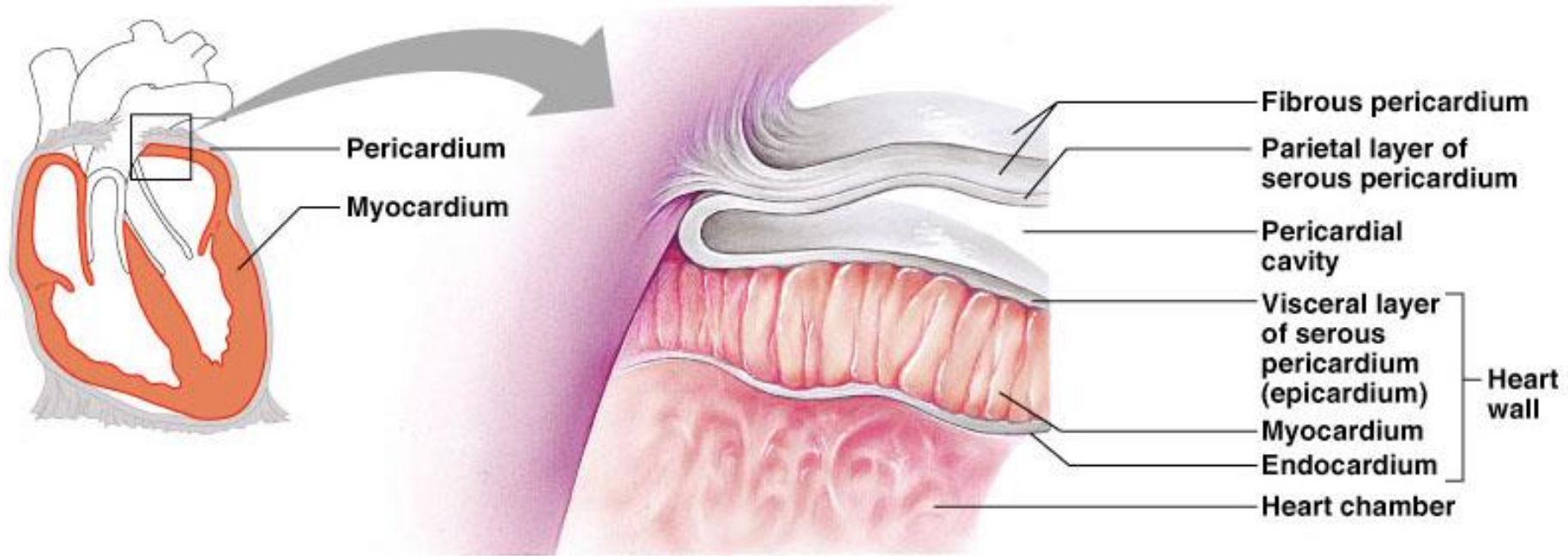
1. A **superficial fibrous pericardium**
2. A **deep two-layer serous pericardium**



- a. The **parietal layer** lines the **internal surface** of the fibrous pericardium
- b. The **visceral layer** or epicardium lines the **surface of the heart**
  - They are separated by the **fluid-filled** pericardial cavity



# Pericardial Layers of the Heart





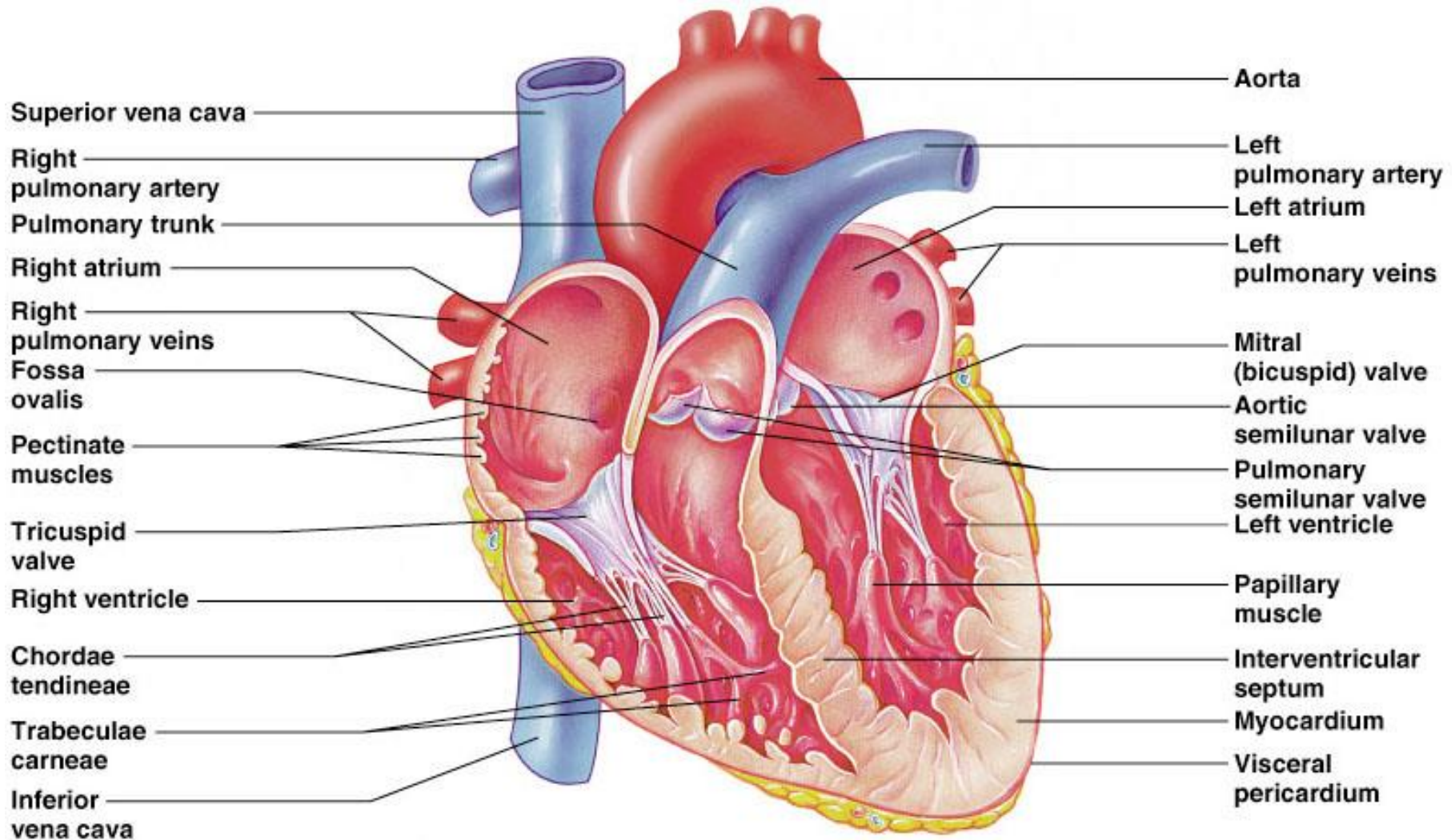
# Heart Wall

**Epicardium** – visceral layer of the serous pericardium

**Myocardium** – cardiac muscle layer forming the bulk of the heart

**Endocardium** – endothelial layer of the inner myocardial surface

# Gross Anatomy of Heart: Frontal Section

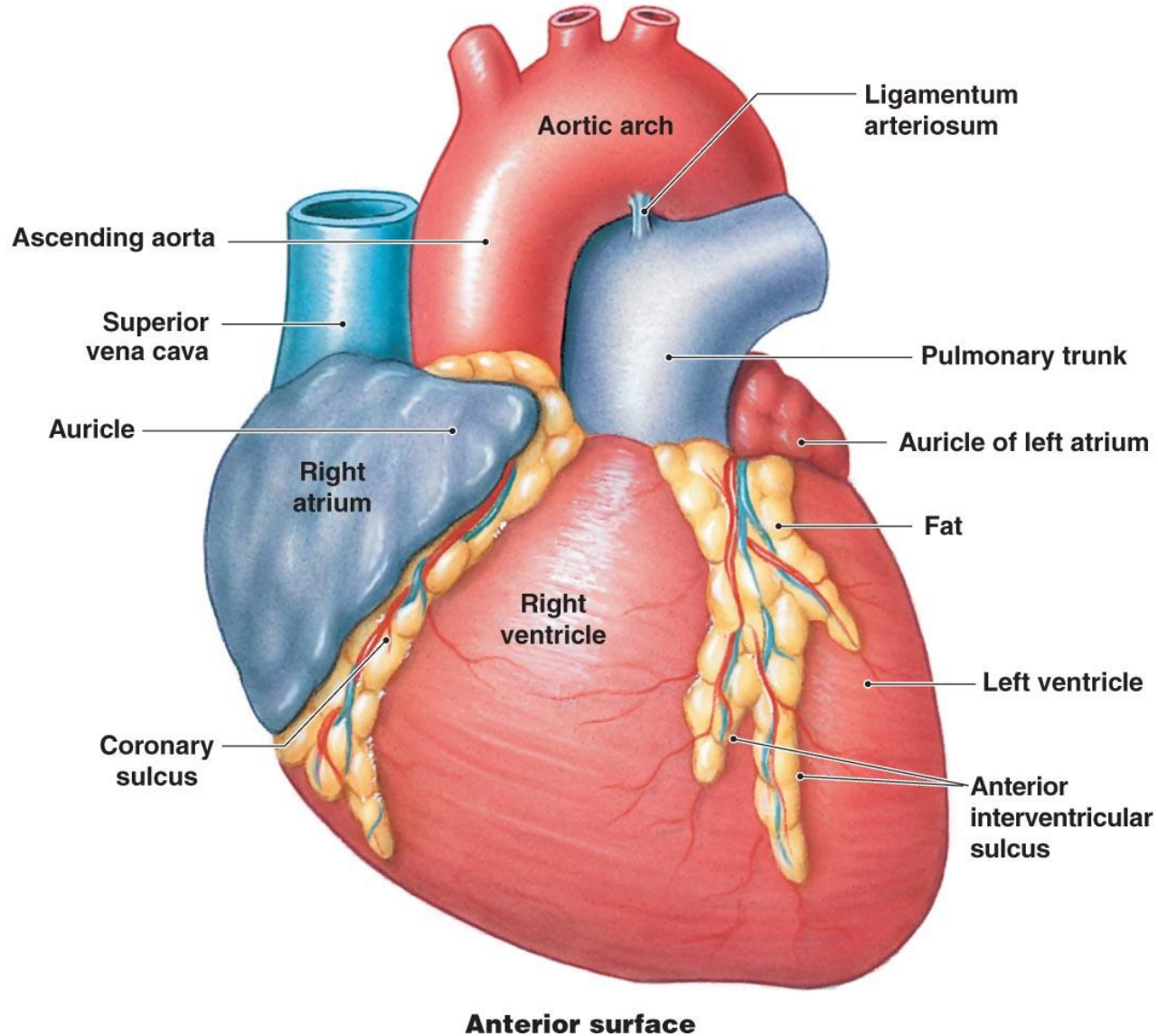


# Atria of the Heart

Atria are the **receiving chambers** of the heart

- Blood enters right atrium **from**
- Blood enters left atrium **from**

A diagrammatic view of the anterior surface of the heart



# Ventricles of the Heart

Ventricles are the **discharging chambers** of the heart

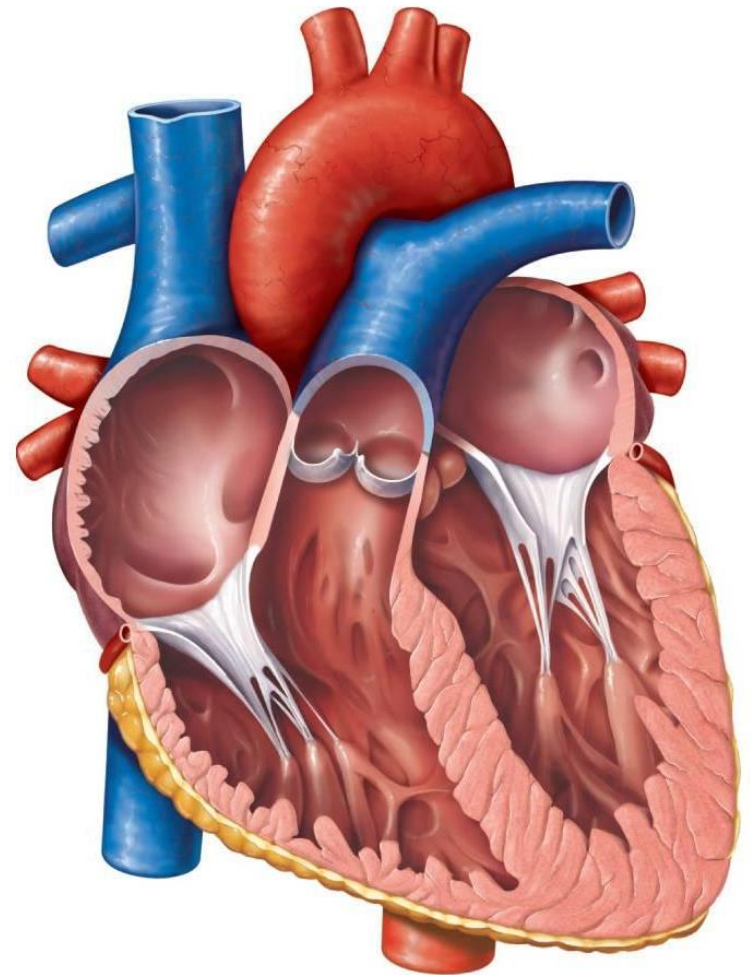
- **Right ventricle** pumps blood into the
- **Left ventricle** pumps blood into the

# Valves of the Heart

- **Atrioventricular (AV)** valves lie between the atria and the ventricles
- AV valves prevent backflow into the atria when ventricles contract
- Chordae tendineae anchor AV valves to papillary muscles

# AV Valves

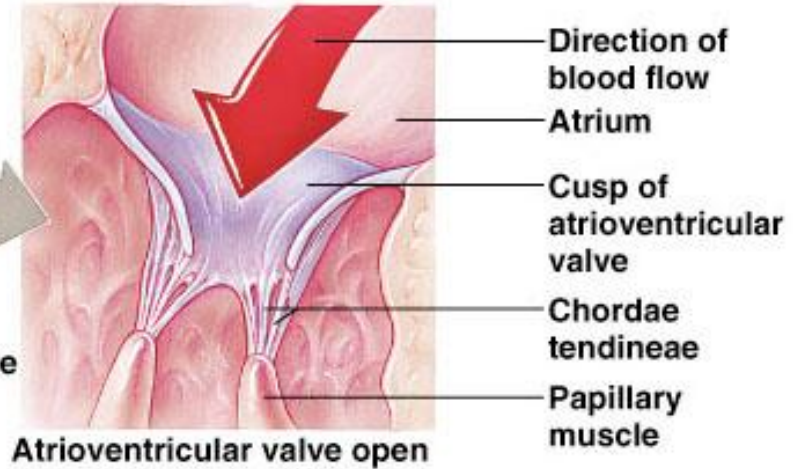
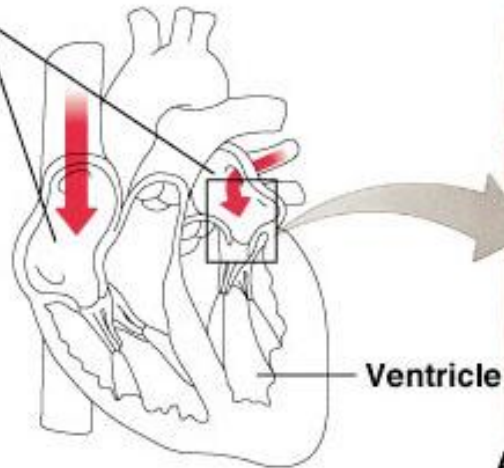
- Tricuspid
- Bicuspid (mitral)





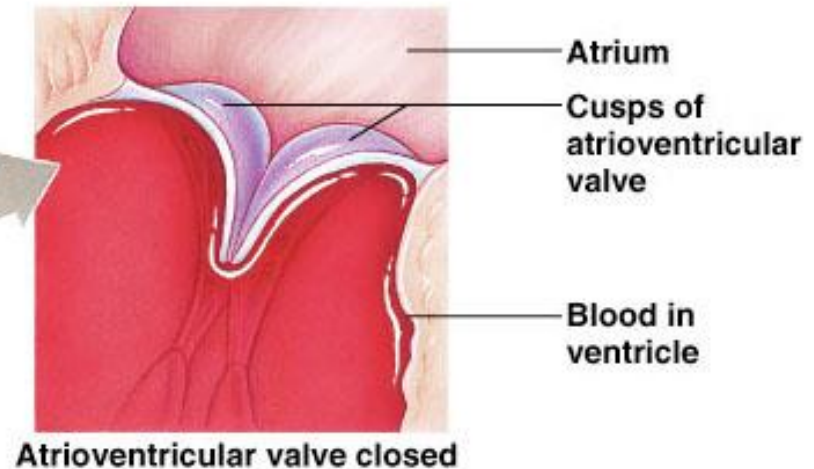
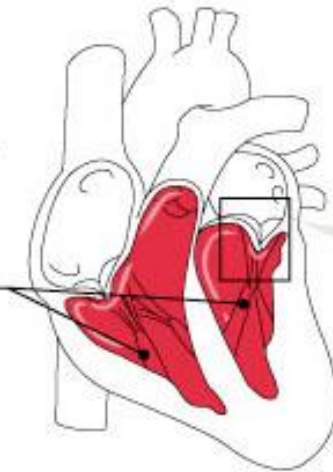
# Atrioventricular Valve Function

- ① Blood returning to the heart fills atria, putting pressure against atrioventricular valves; atrioventricular valves forced open
- ② As ventricles fill, atrioventricular valve flaps hang limply into ventricles
- ③ Atria contract, forcing additional blood into ventricles



(a)

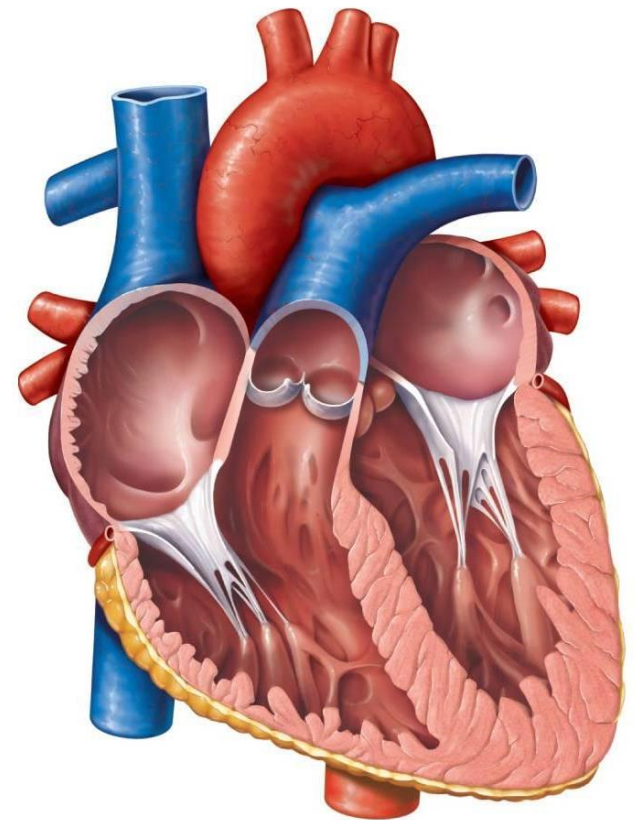
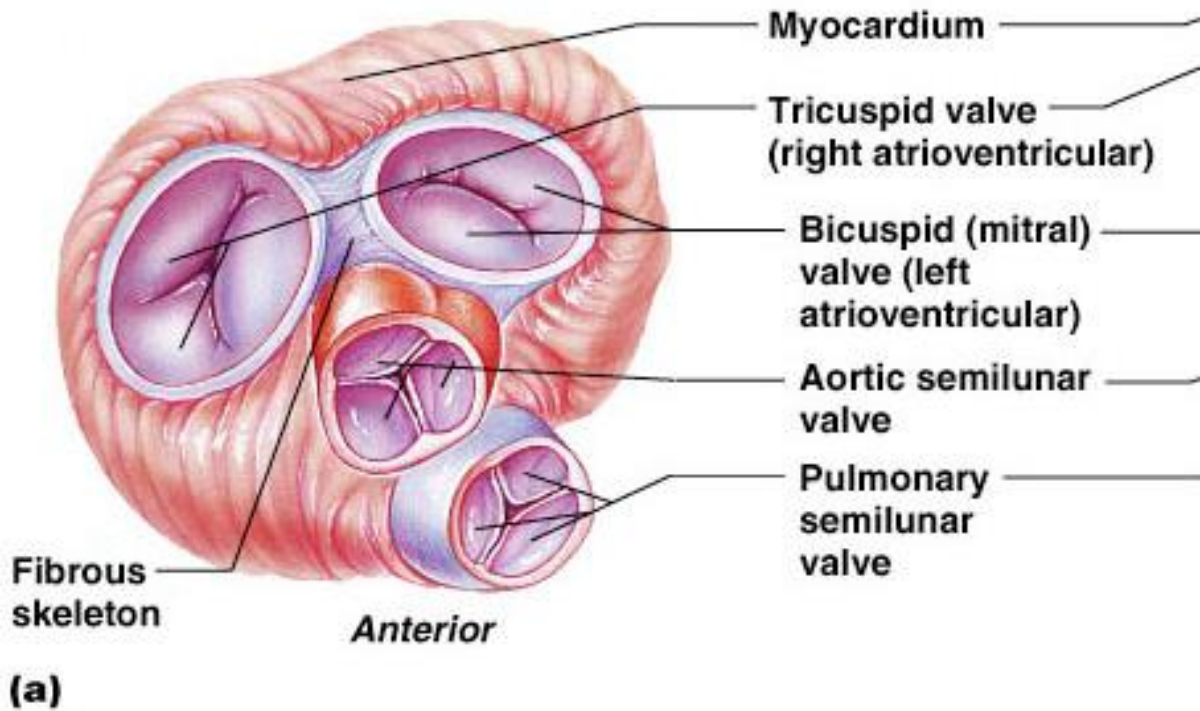
- ① Ventricles contract, forcing blood against atrioventricular valve cusps
- ② Atrioventricular valves close
- ③ Papillary muscles contract and chordae tendineae tighten, preventing valve flaps from everting into atria



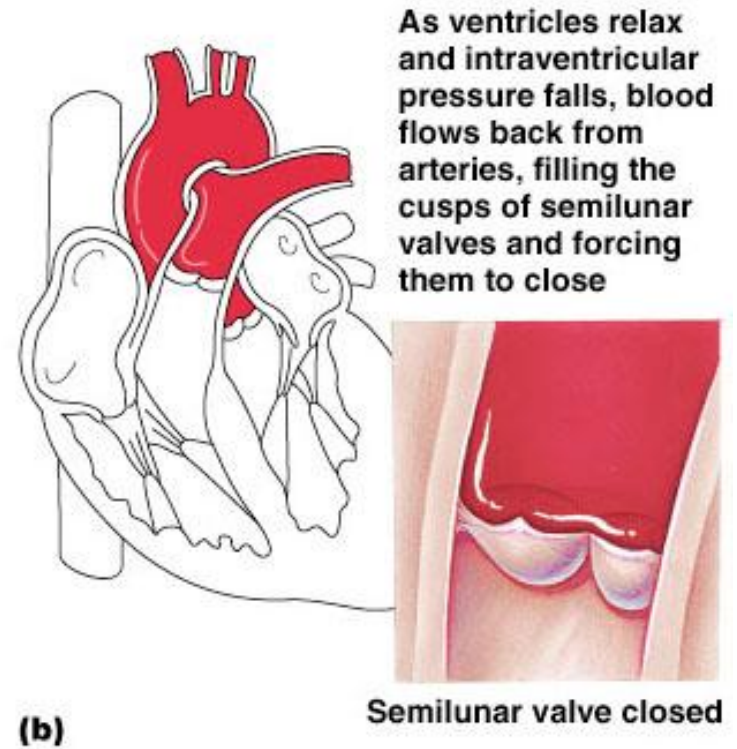
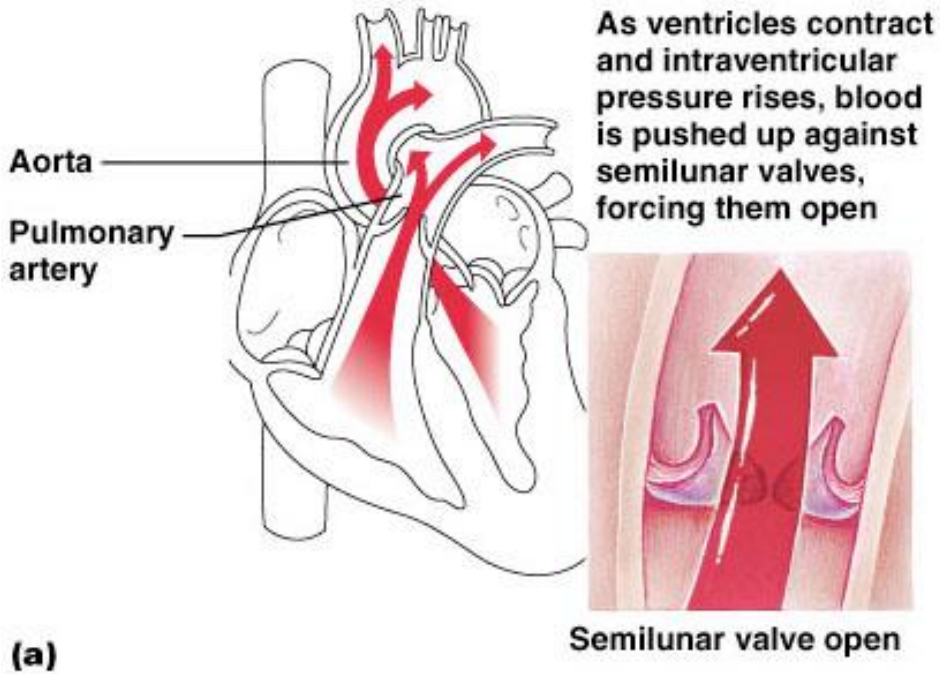
# Semilunar Valves

- **Aortic semilunar** valve lies between the left ventricle and the aorta
- **Pulmonary semilunar** valve lies between the right ventricle and pulmonary trunk
- Semilunar valves prevent backflow of blood into the ventricles

# Semilunar Valves

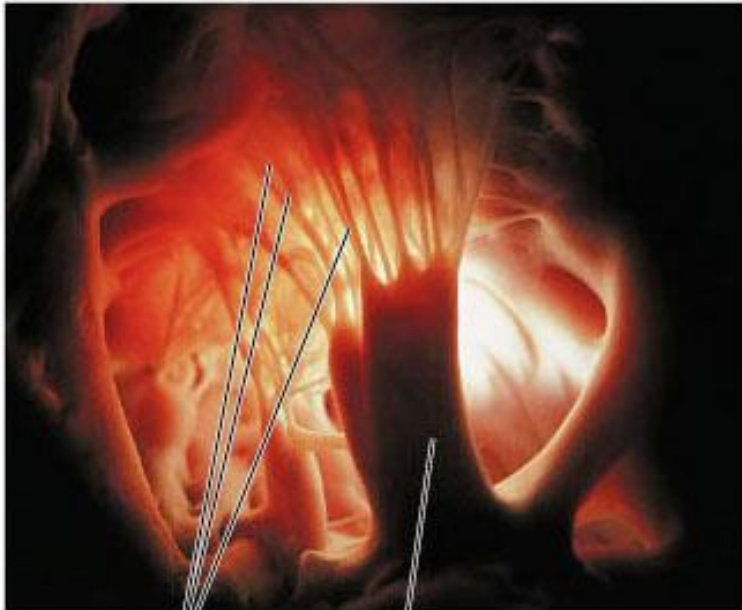


# Semilunar Valve Function



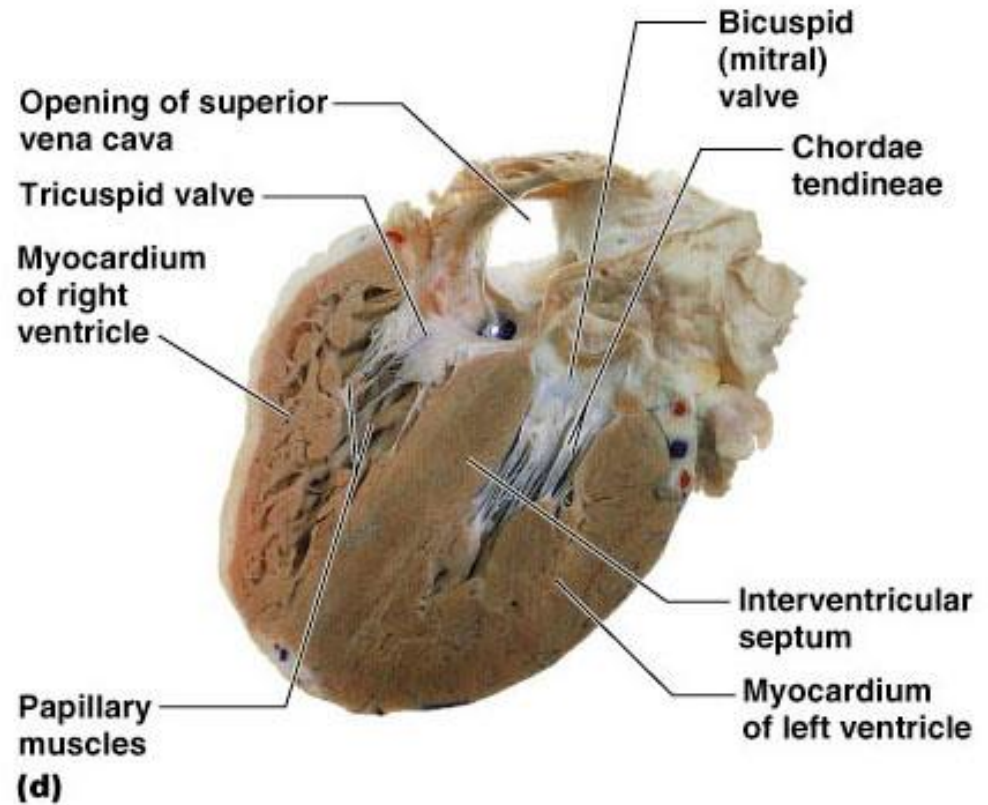


# Heart Valves



Chordae tendineae attached to tricuspid valve flap  
(c)

Papillary muscle



Opening of superior vena cava

Tricuspid valve

Myocardium of right ventricle

Papillary muscles  
(d)

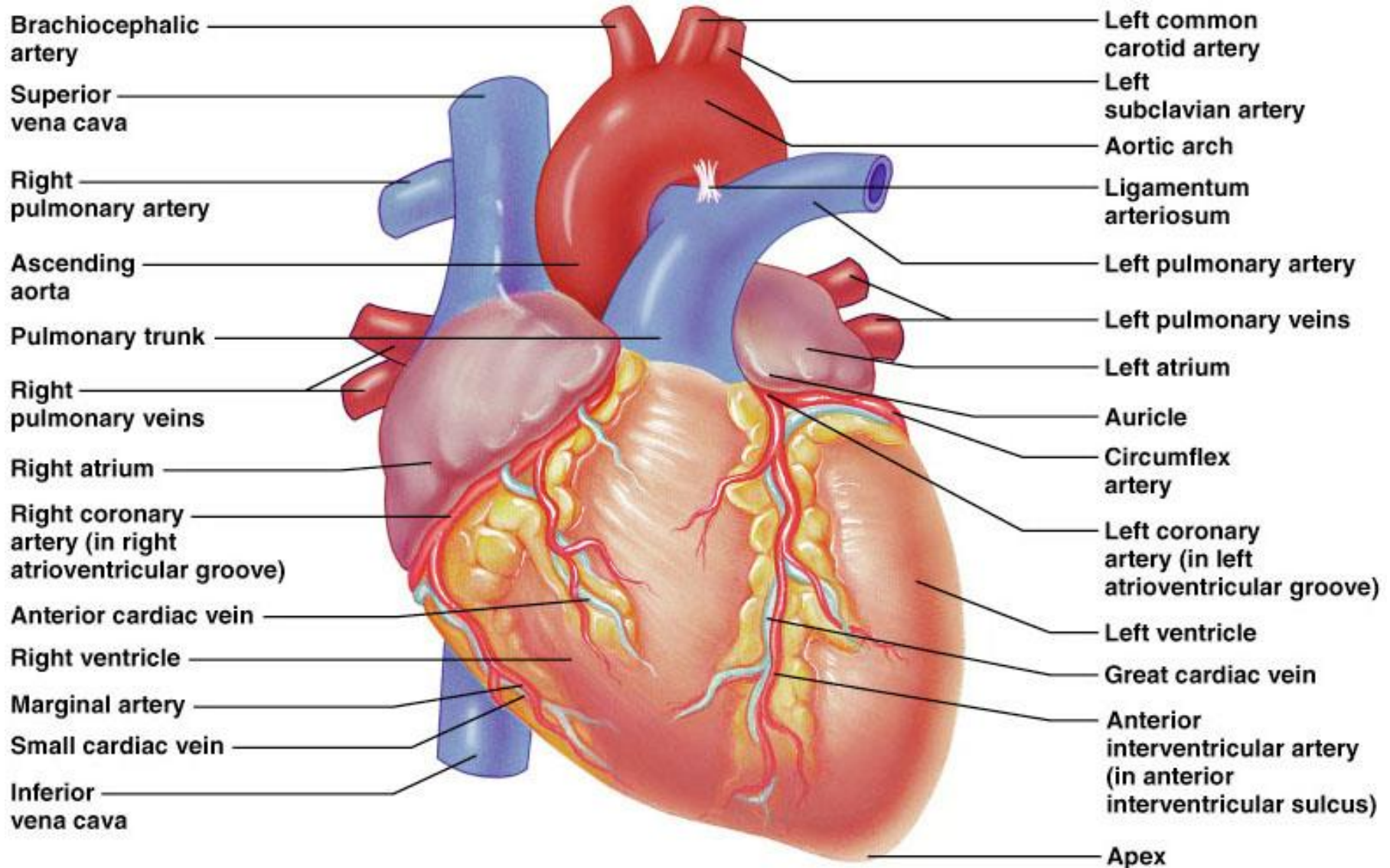
Bicuspid (mitral) valve

Chordae tendineae

Interventricular septum

Myocardium of left ventricle

# External Heart: Anterior View



# External Heart: Major Vessels (Anterior View)

Vessels **returning blood to the heart** include:

1. Superior and inferior **venae cavae**
2. Right and left **pulmonary veins**

Vessels conveying **blood away from the heart** include:

1. **Pulmonary trunk**, which splits into right and left pulmonary arteries
2. Ascending **aorta** (three branches from aortic arch) –
  - a. **B**
  - b. **L**
  - c. **LS**



# Vessels that Supply/Drain the Heart (Anterior View)

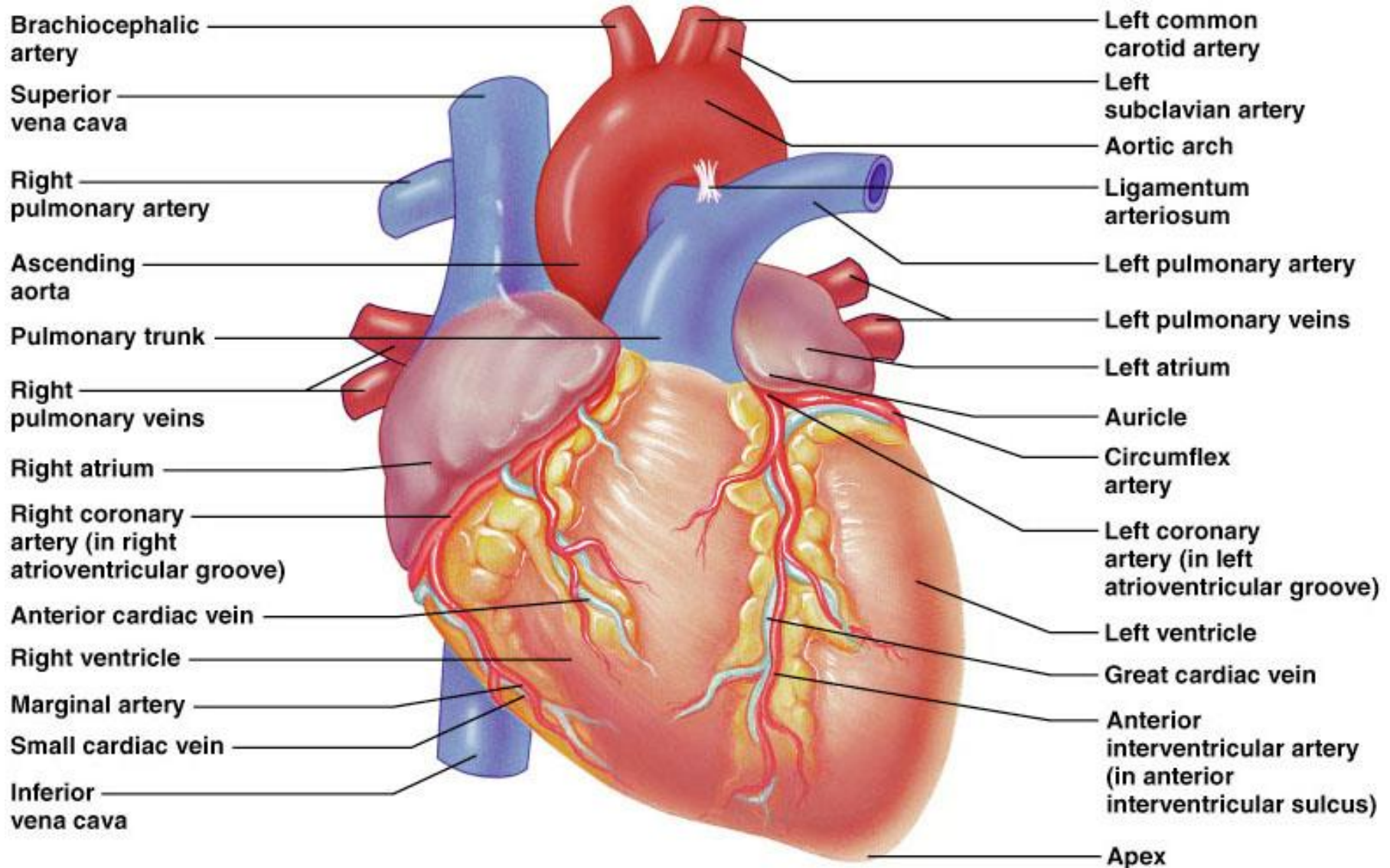
## Arteries –

- right and left coronary (in atrioventricular groove)
- marginal
- Circumflex
- anterior interventricular

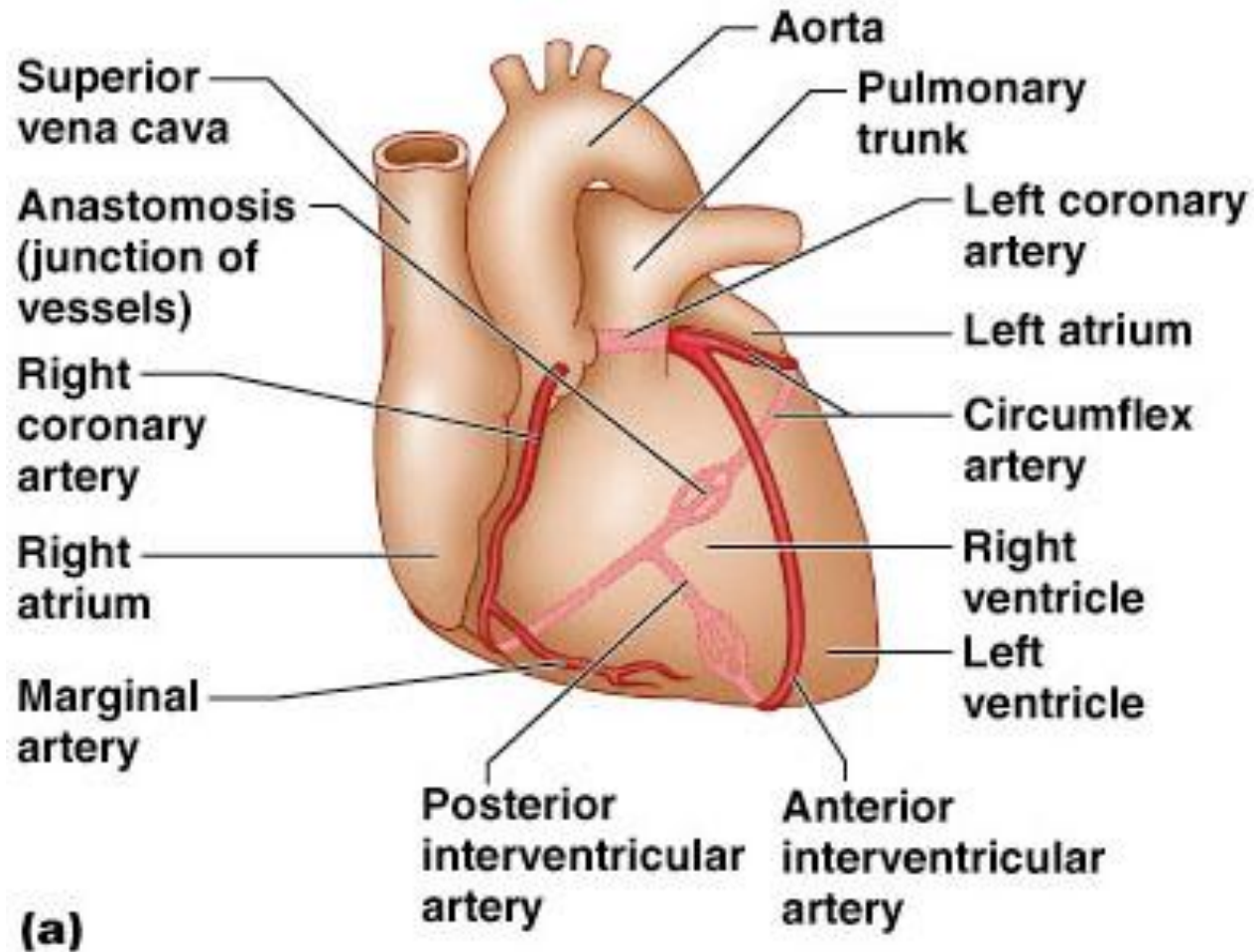
## Veins –

- small cardiac
- middle cardiac
- great cardiac

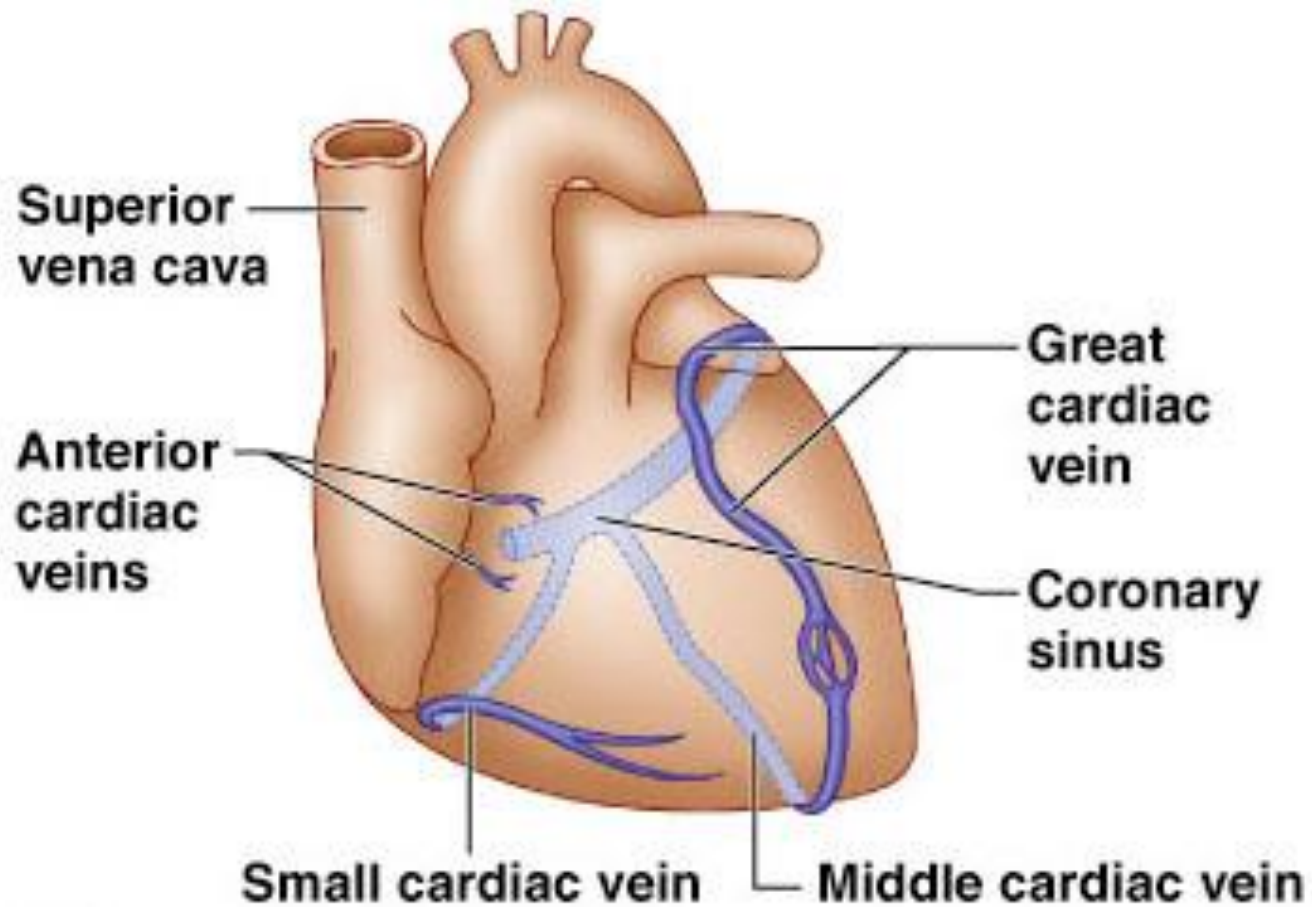
# External Heart: Anterior View



# Coronary Circulation: Arterial Supply

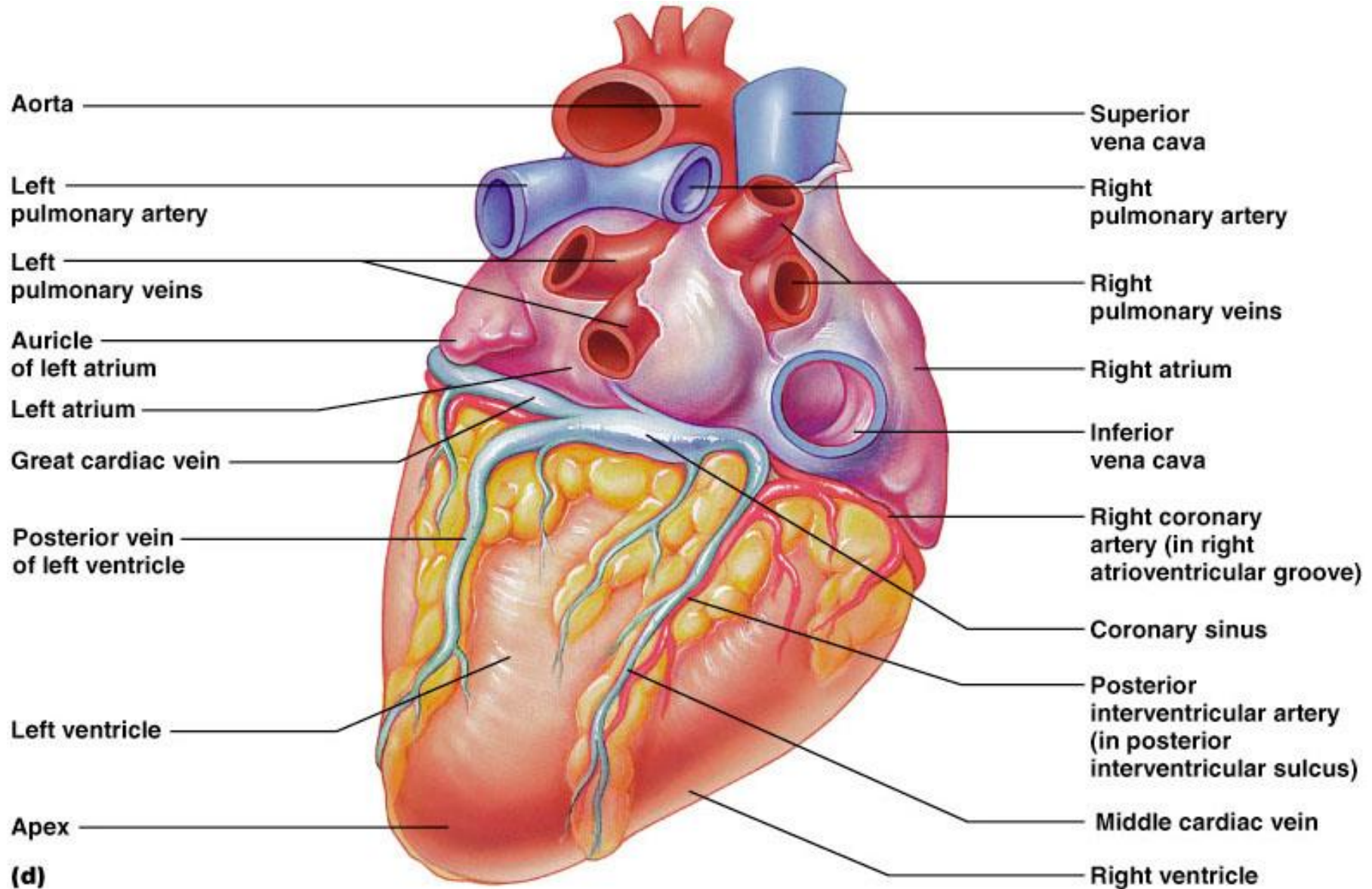


# Coronary Circulation: Venous Supply



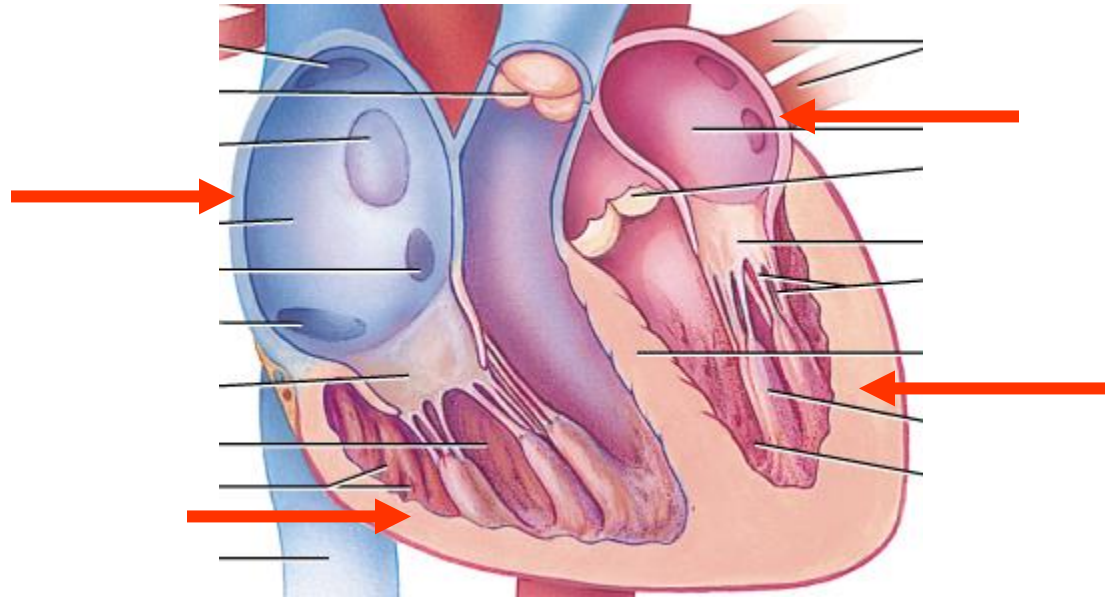


# External Heart: Posterior View



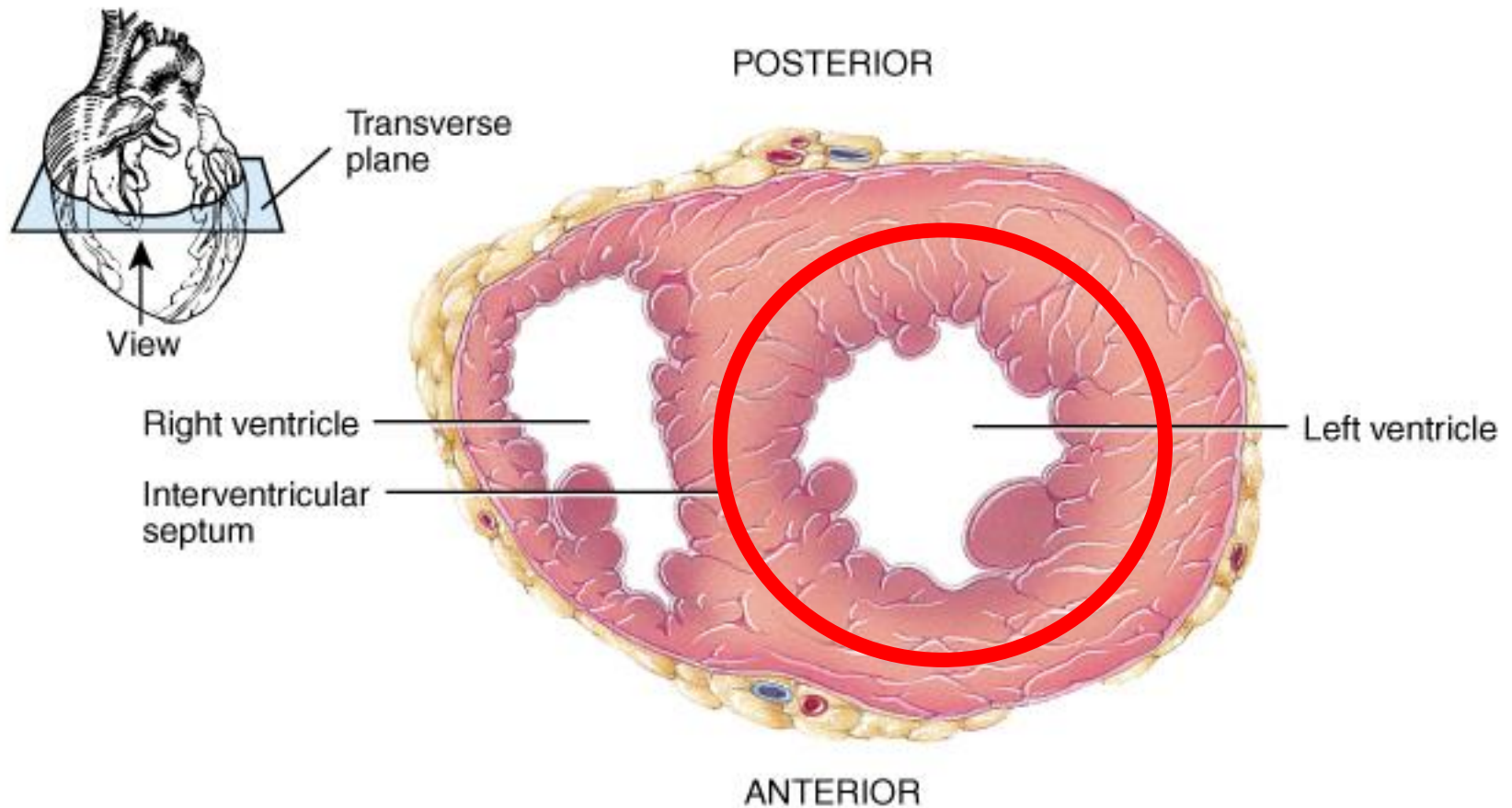
(d)

# Myocardial Thickness and Function



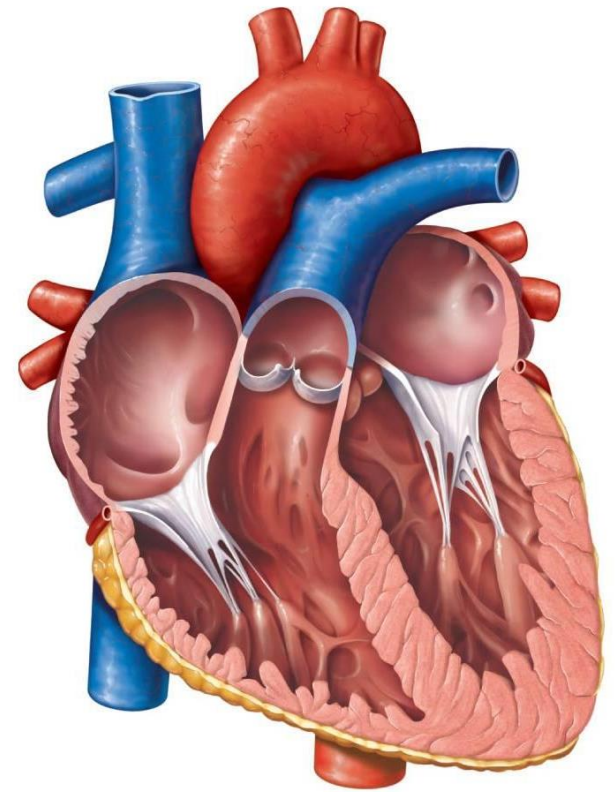
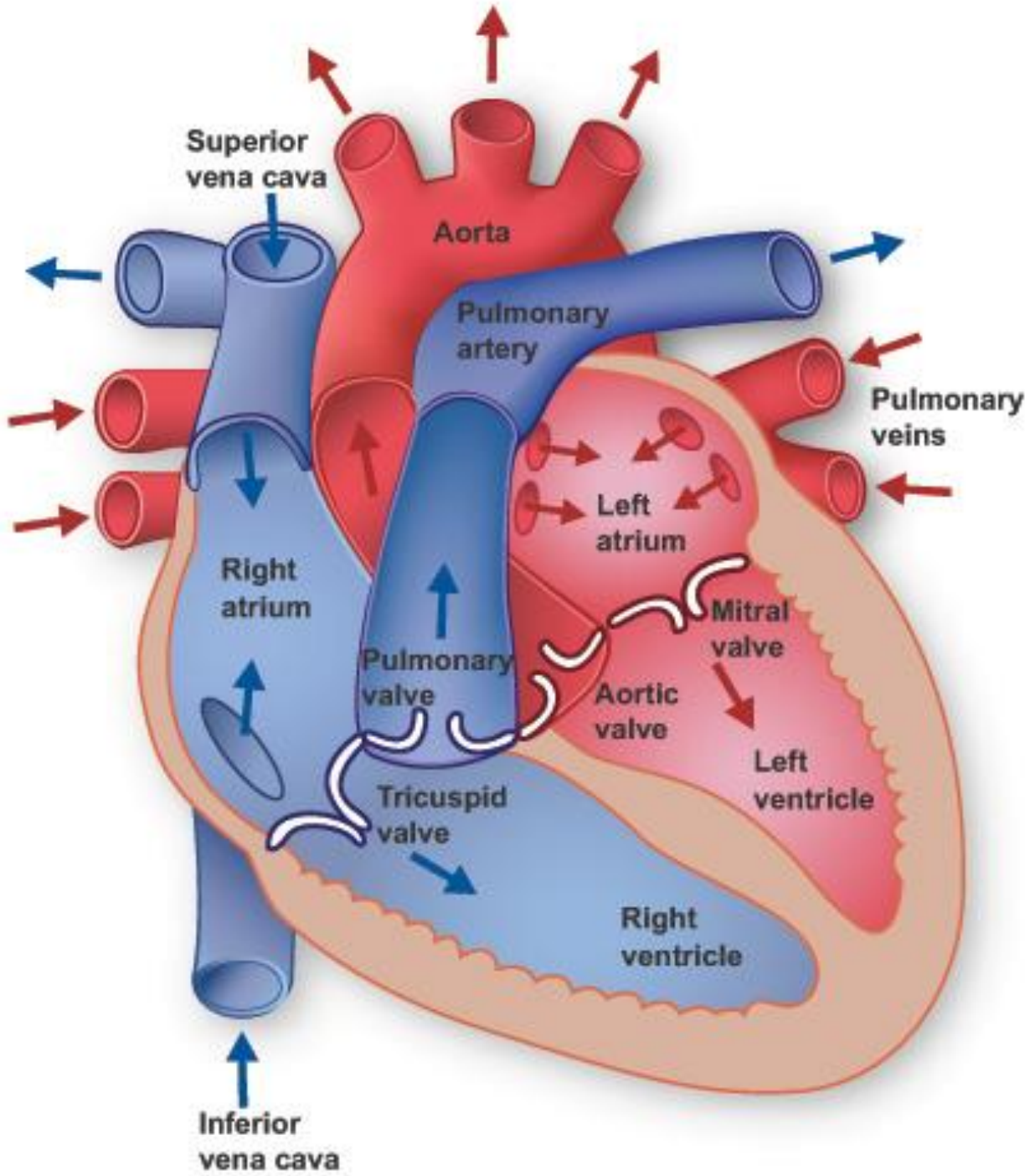
- Thickness of myocardium varies according to.....
  - Atria are thin walled, deliver blood to adjacent ventricles
  - Ventricle walls are much thicker and stronger
  - right ventricle supplies blood to the lungs (little flow resistance)
  - left ventricle wall is the thickest to supply systemic circulation

# Thickness of Cardiac Walls



Myocardium of left ventricle is much thicker than the right.





# Pathway of Blood Through the Heart and Lungs

Right atrium → ..... → right ventricle

Right ventricle → ..... → pulmonary  
arteries → lungs

Lungs → pulmonary veins → left atrium

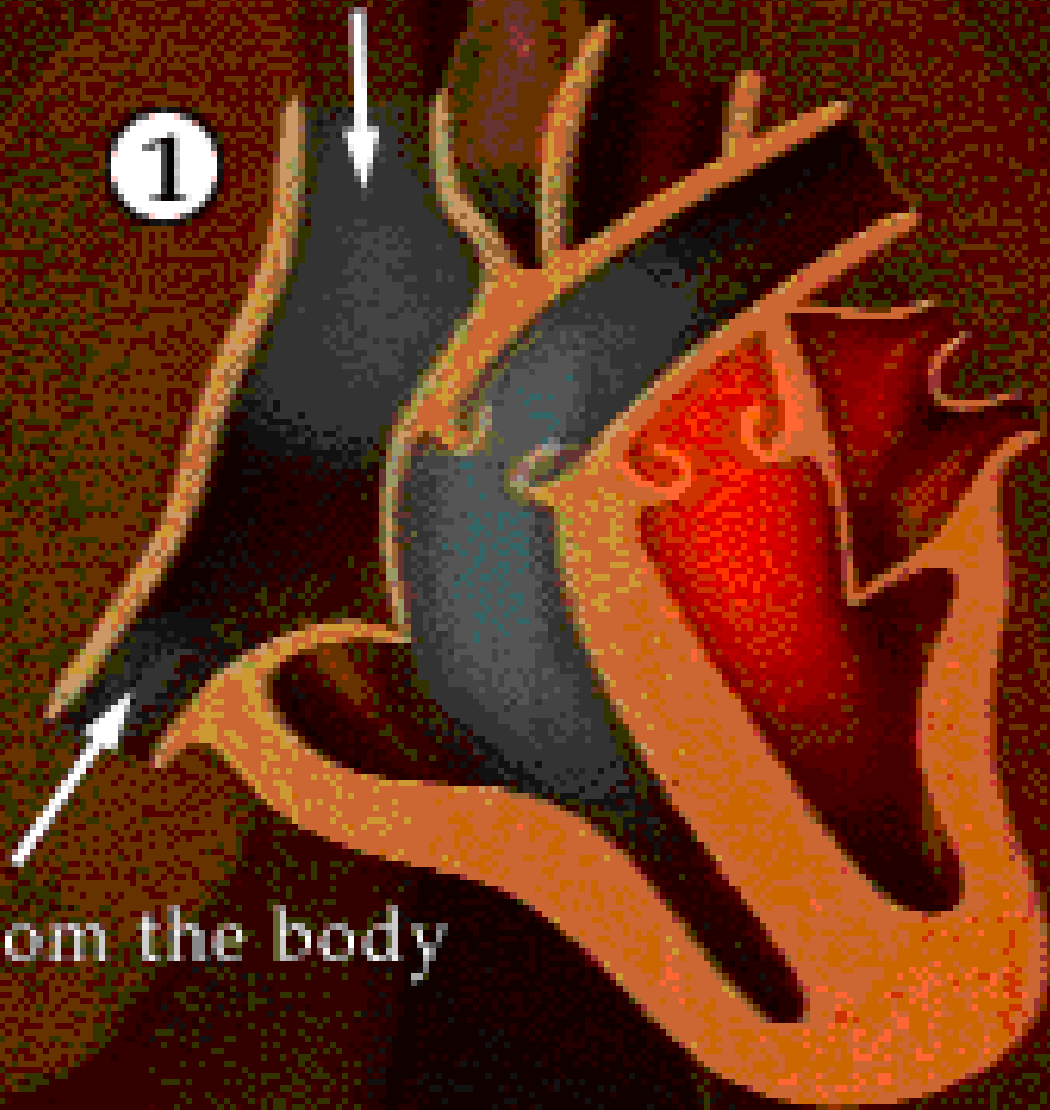
Left atrium → ..... → left ventricle

Left ventricle → ..... → aorta

Aorta → systemic circulation

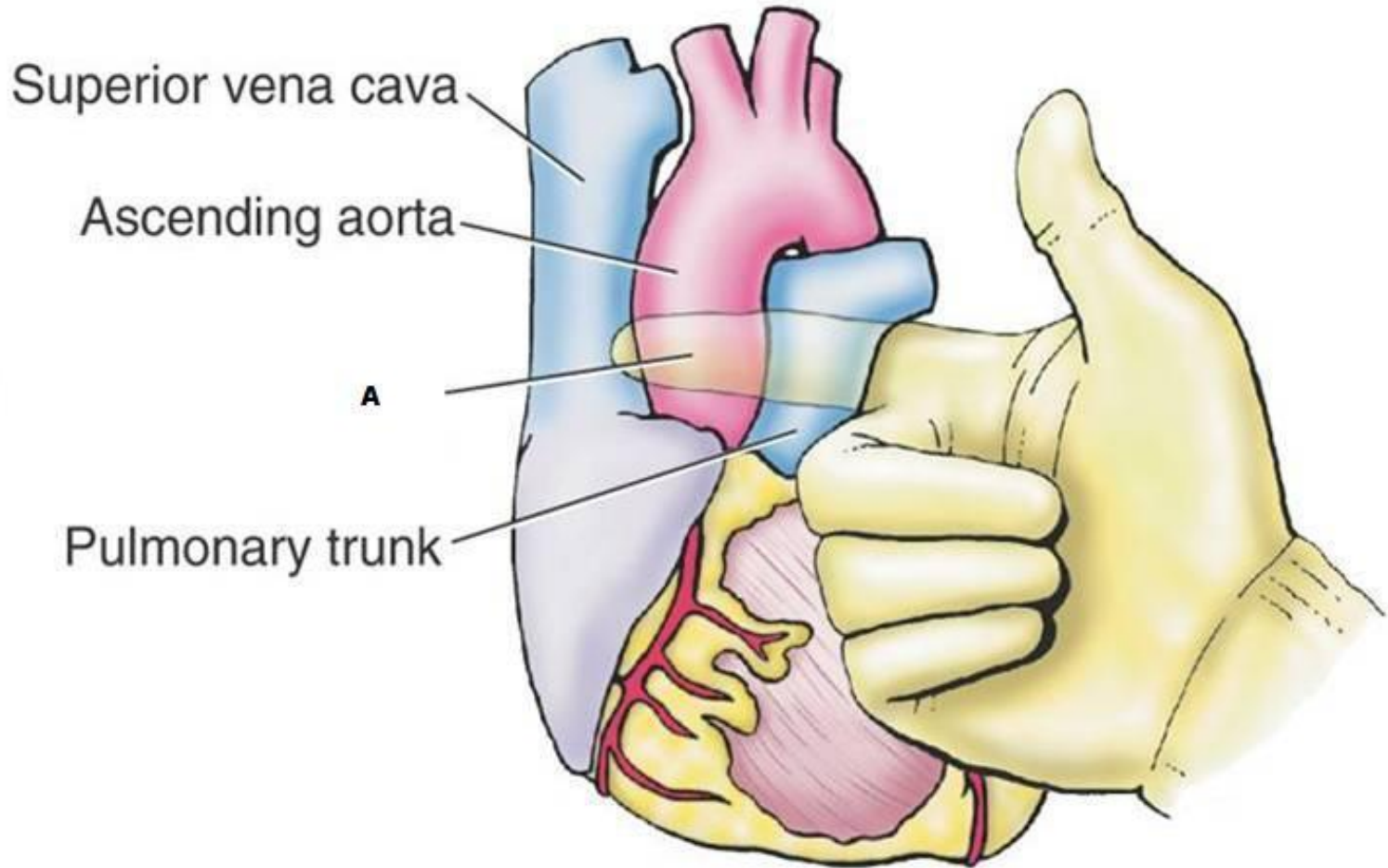
from the body

1



from the body

# Pericardial Sinuses



**Transverse Sinus**

# Oblique Sinus





# Pericardial Sinuses



**Transverse sinus**



**Oblique sinus**

# Thank You

