

The Valves of the Heart

The four valves of the heart are:

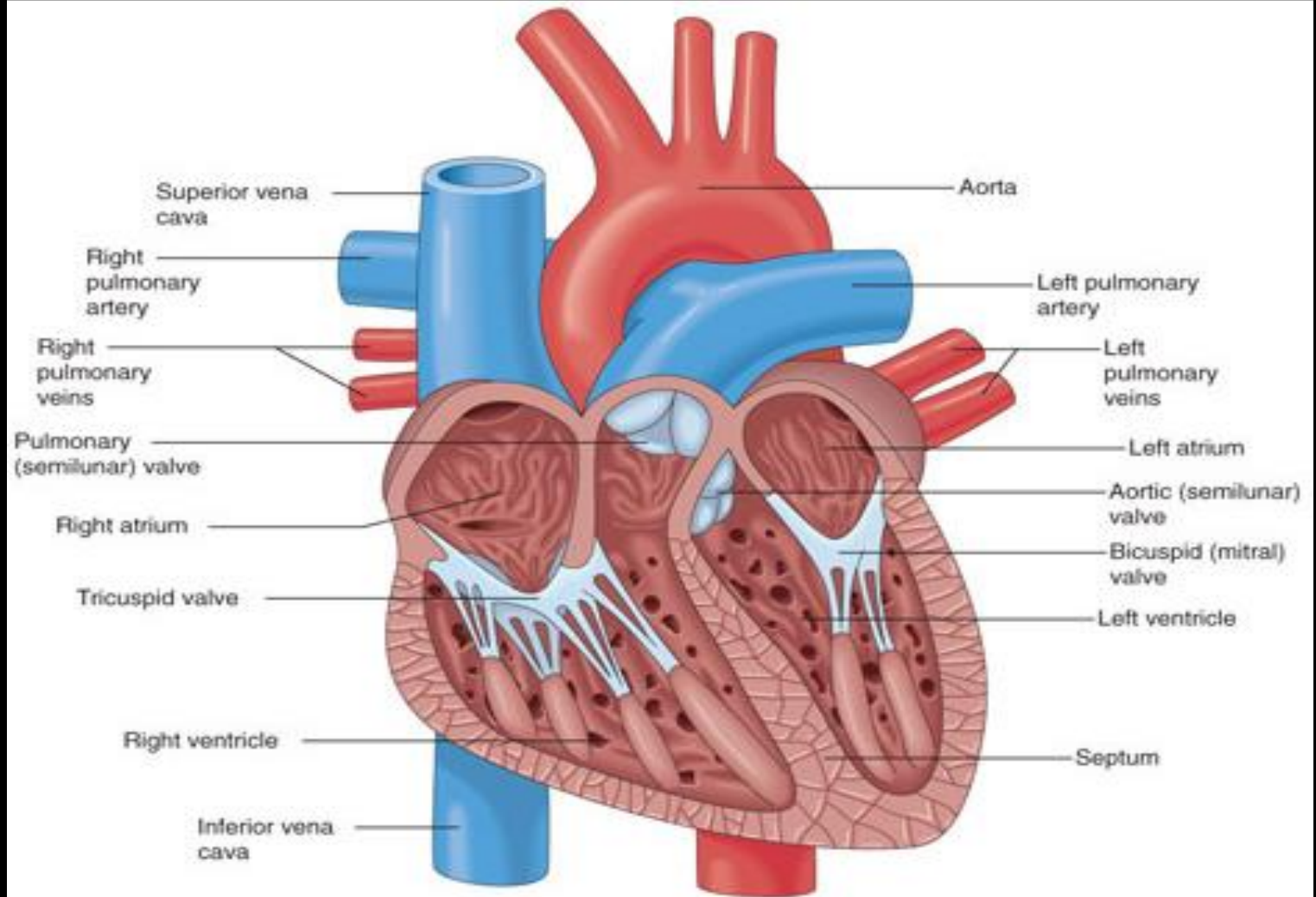
Bicuspid or mitral valve

Tricuspid valve

Pulmonary valve

Aortic valve

- **Atrioventricular**
 - **Tricuspid** (three cusps)
 - Between right atrium and right ventricle
 - **Bicuspid** (two cusps)
 - Between left atrium and left ventricle
- **Semilunar**
 - **Pulmonary**
 - Right ventricle
 - Pulmonary trunk exits the heart
 - **Aortic**
 - Left ventricle
 - Ascending aorta leaves the heart



Pathway of Blood Through the Heart and Lungs

- Right atrium → **tricuspid valve** → right ventricle
- Right ventricle → **pulmonary semilunar valve** → pulmonary arteries → lungs
- Lungs → pulmonary veins → left atrium
- Left atrium → **bicuspid valve** → left ventricle
- Left ventricle → **aortic semilunar valve** → aorta
- Aorta → systemic circulation

The Heart: Electrical Activity

- **Sinoatrial (SA) node: pacemaker; initiates impulse →**
- **Atrioventricular (AV) node: sends impulse to AV bundle→**
- **Bundle of His: sends impulses to both sides of system→**
- **Purkinje's fibers: send impulse to myocardial cells**

The SA Node > Atrial Contraction > The AV Node > Bundle of His > Purkinje Fibers > Ventricular Contraction

Superior vena cava

① Sinoatrial (SA) node (pacemaker)

Internodal pathway

② Atrioventricular (AV) node

③ Atrioventricular (AV) bundle (Bundle of His)

④ Bundle branches

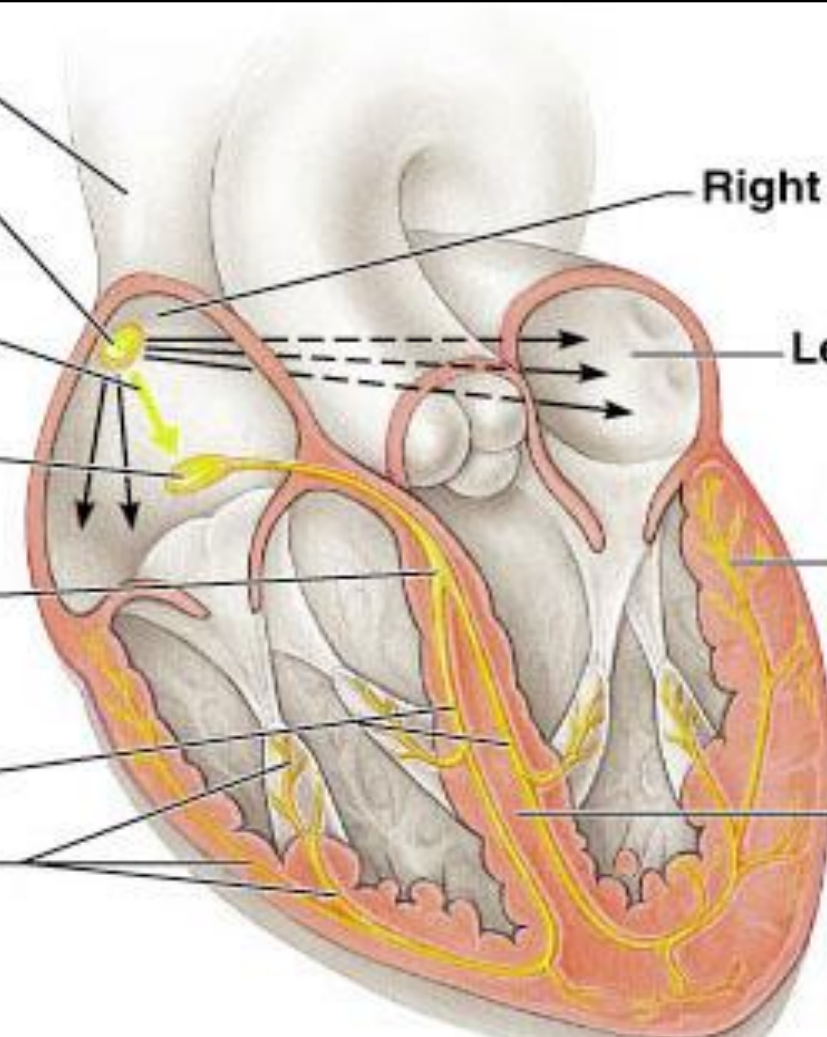
⑤ Purkinje fibers

Right atrium

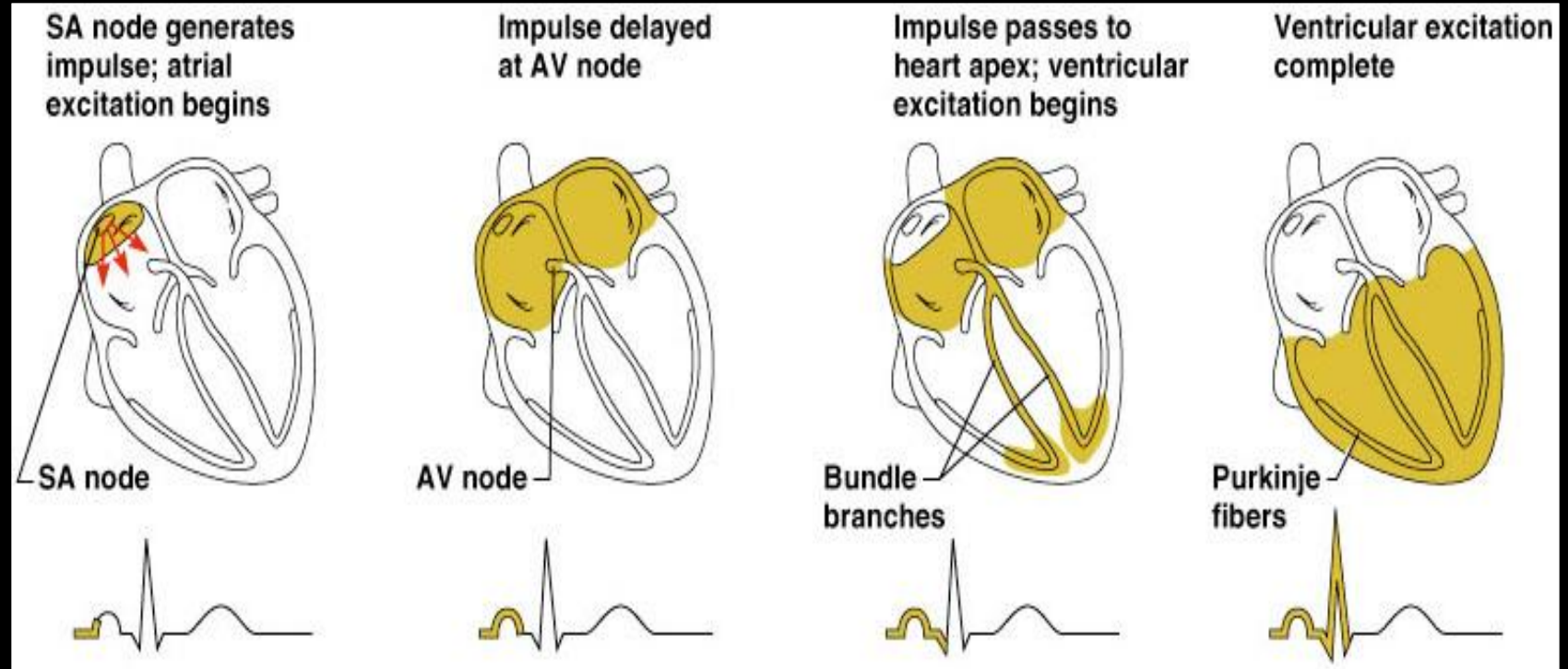
Left atrium

Purkinje fibers

Inter-ventricular septum

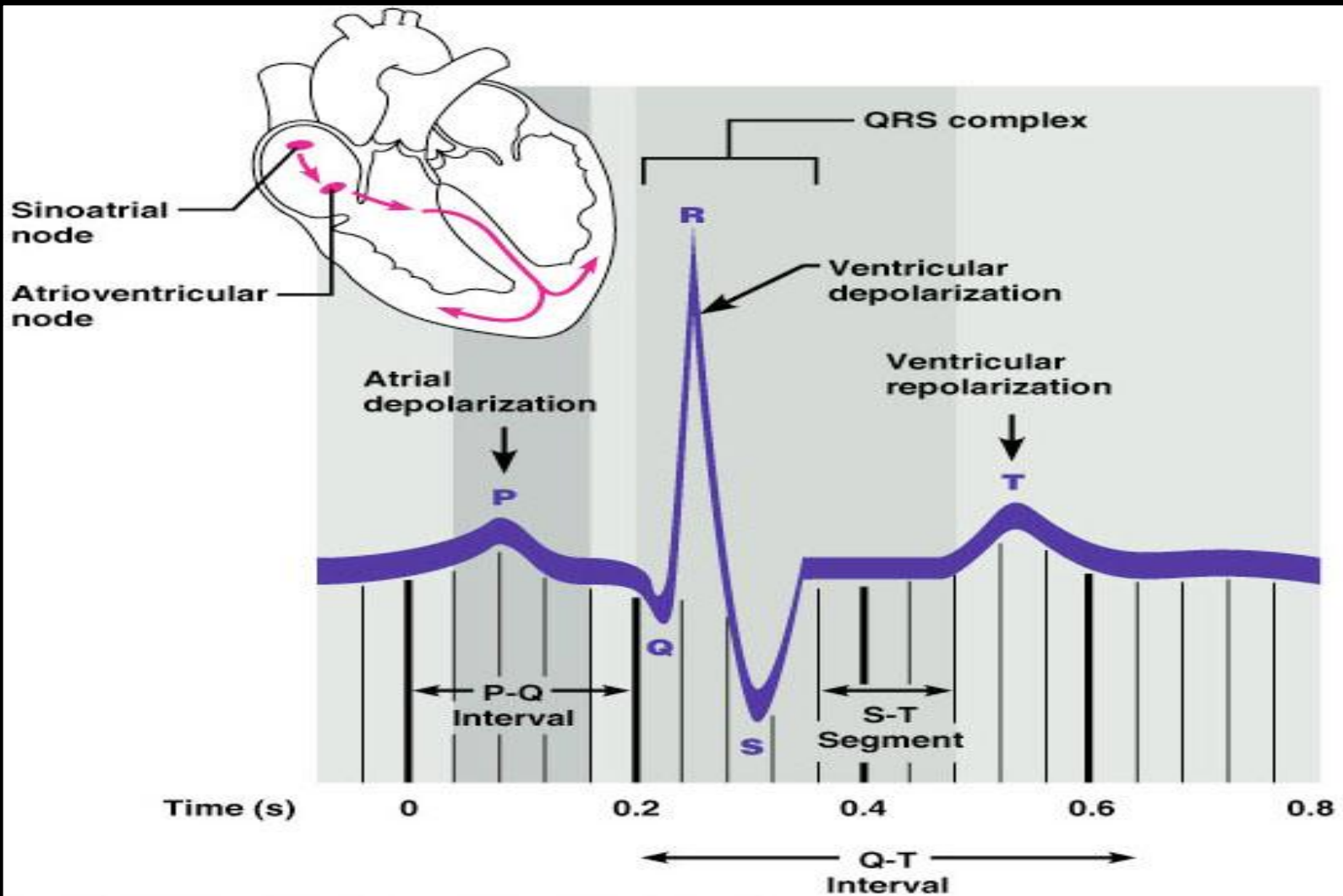


Heart Excitation Related to ECG



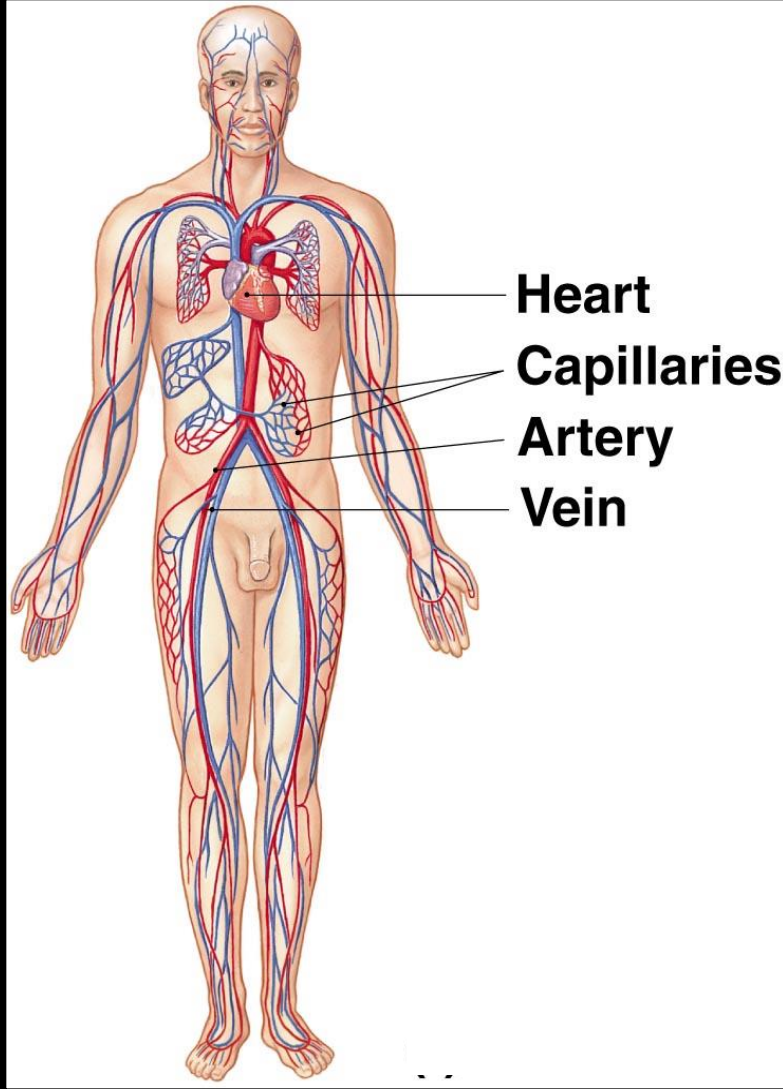
Electrocardiography

- **Electrical activity is recorded by electrocardiogram (ECG)**
- **P wave corresponds to depolarization of SA node**
- **QRS complex corresponds to ventricular depolarization**
- **T wave corresponds to ventricular repolarization**
- **Atrial repolarization record is masked by the larger QRS complex**



Cardiovascular system

- ▶ **The cardiovascular system is transport system of body**
- ▶ **It comprises blood, heart and blood vessels.**
- ▶ **The system supplies nutrients to and remove waste products from various tissue of body.**



Heart

Capillaries

Artery

Vein

FUNCTION OF CARDIOVASCULAR SYSTEM

- ▶ **Transport nutrients, hormones**
- ▶ **Remove waste products**
- ▶ **Gaseous exchange**
- ▶ **Immunity**
- ▶ **Blood vessels transport blood**
 - **Carries oxygen and carbon dioxide**
 - **Also carries nutrients and wastes**
- ▶ **Heart pumps blood through blood vessels**

BLOOD VESSELS

- **Blood Vessels -A closed network of tubes**
- **These includes:**
 - **Arteries**
 - **Capillaries**
 - **Veins**

ARTERIES

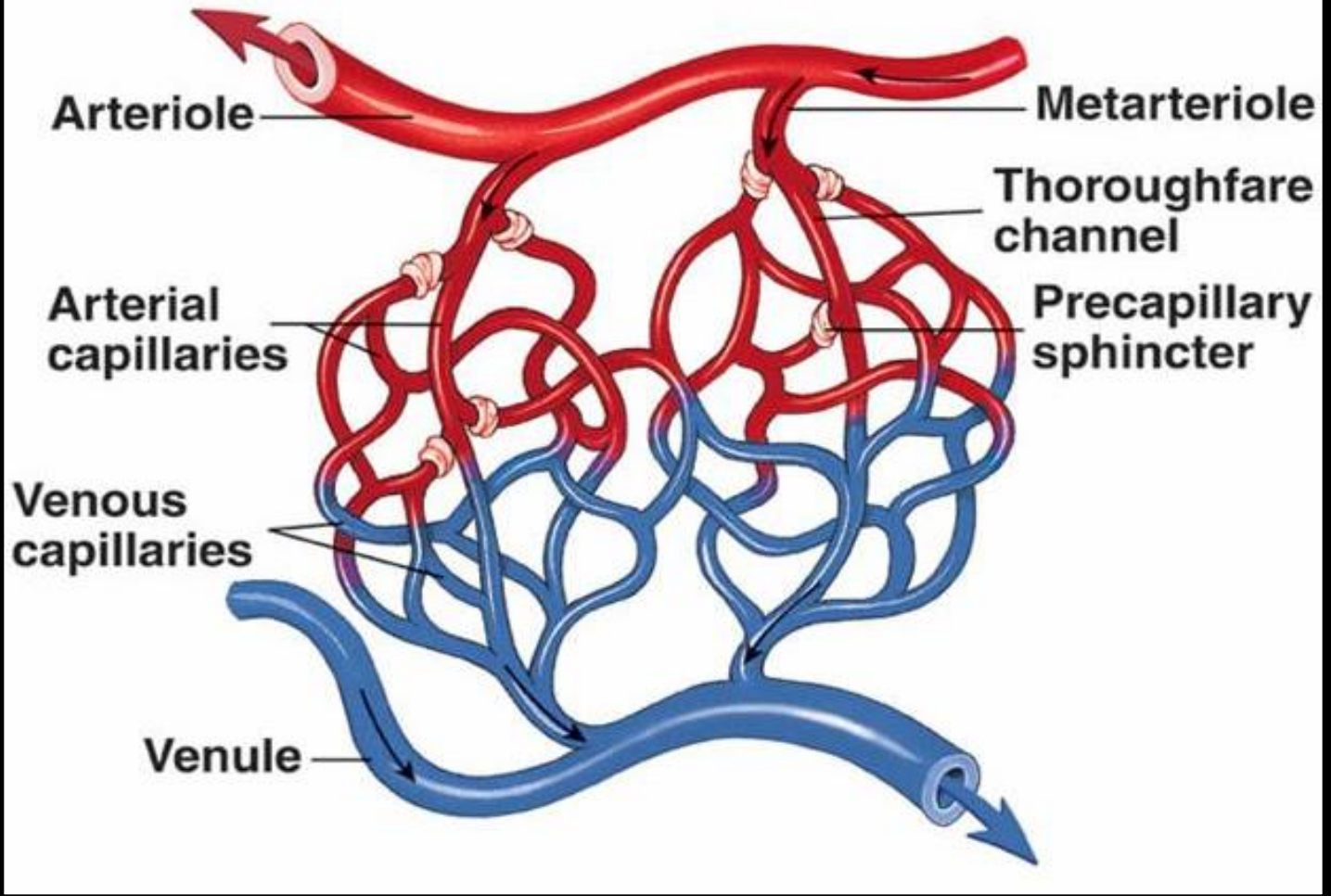
- ▶ **Blood vessels that carry blood away from the heart are called arteries.**
- ▶ **They are the thickest blood vessels and they carry blood high in oxygen known as oxygenated blood (oxygen rich blood).**

CAPILLARIES

- **The smallest blood vessels are capillaries and they connect the arteries and veins.**
- **This is where the exchange of nutrients and gases occurs.**

VEINS

- **Blood vessels that carry blood back to the heart are called veins.**
- **They have one-way valves which prevent blood from flowing backwards.**
- **They carry blood that is high in carbon dioxide known as deoxygenated blood (oxygen poor blood).**



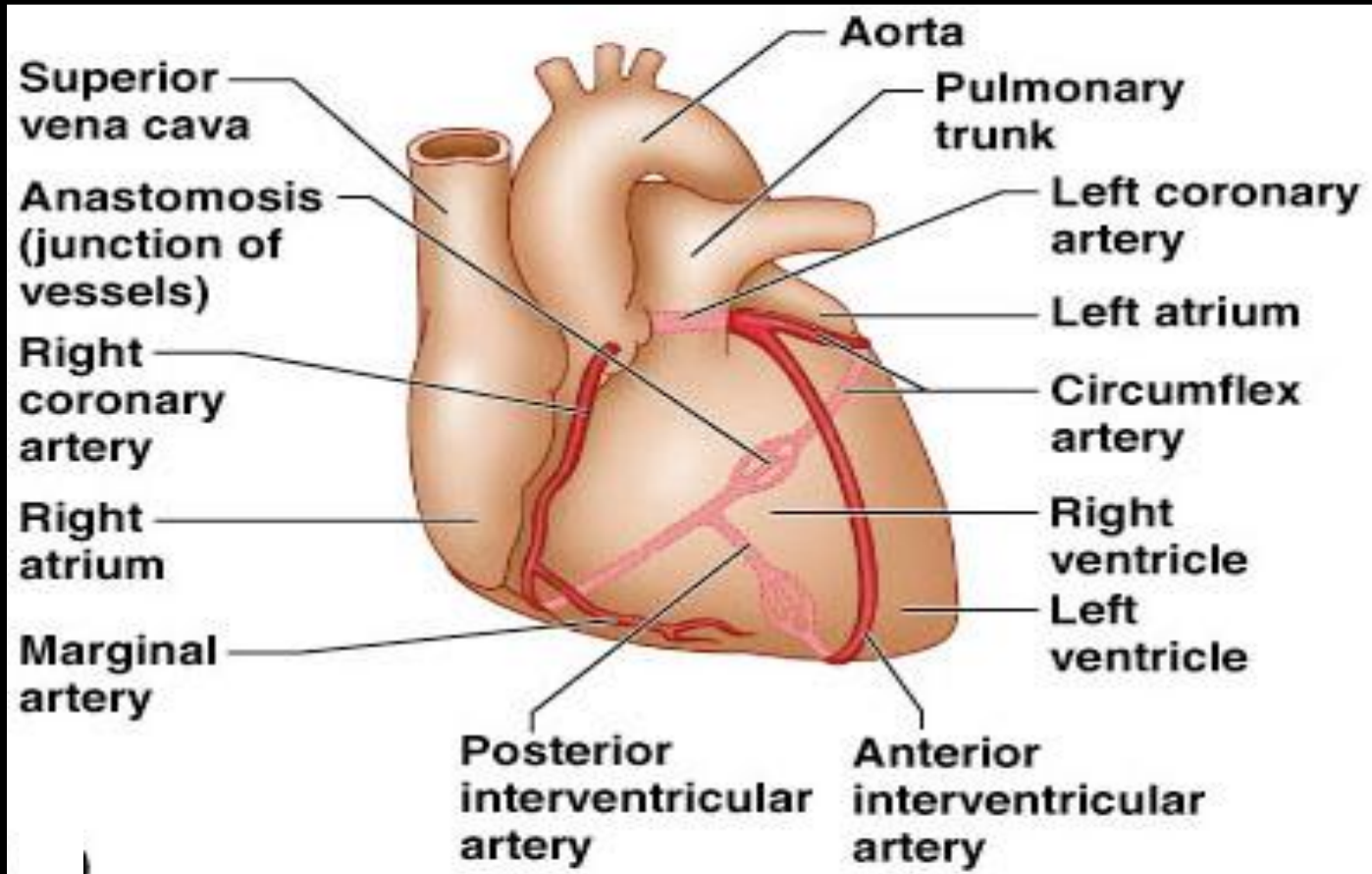
CIRCULATION

Coronary circulation – the circulation of blood within the heart.

Pulmonary circulation – the flow of blood between the heart and lungs.

Systemic circulation – the flow of blood between the heart and the cells of the body.

CORONARY CIRCULATION



SYSTEMIC AND PULMONARY CIRCULATION

