

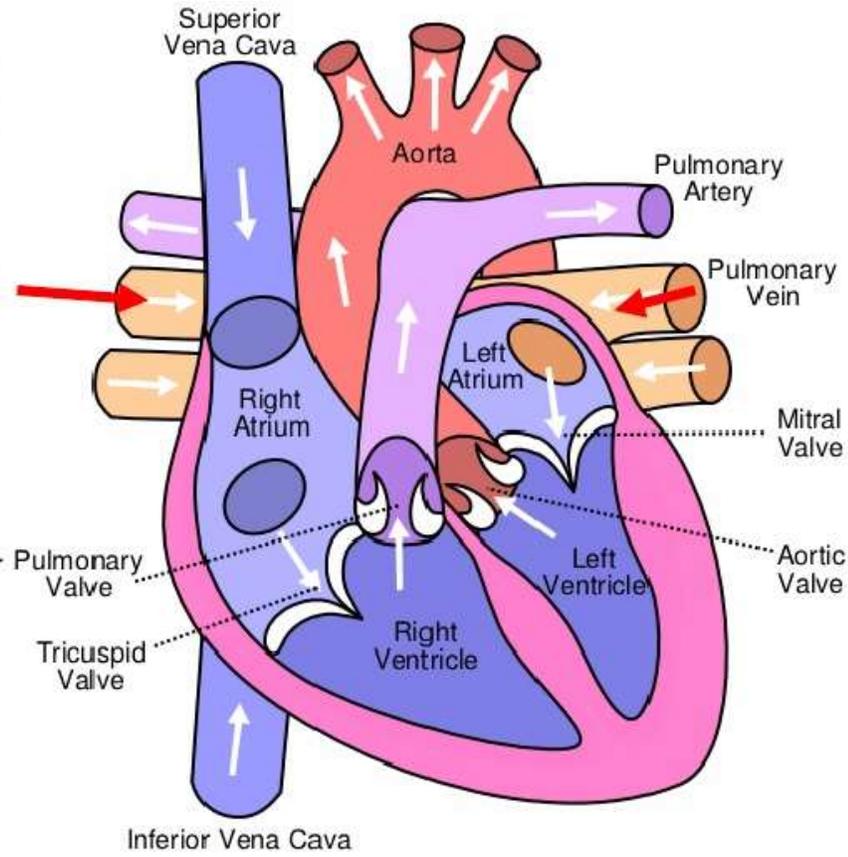
Physiology of Cardiac Muscle

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Pulmonary and systemic circulation

Oxygenated blood from the right lung returns to the heart through the right pulmonary vein.
Oxygenated blood from the left lung returns to the heart through the left pulmonary vein.

THE PULMONARY VEINS ARE THE ONLY VEINS THAT CARRY OXYGENATED BLOOD.



Clinical topography of the heart

Holotopy

intercostal middle of mediastinum

Sceletopy right to left

Upper border

3rd rib horizontal

Right border

1.5cm 3rd to 5th rib parasternal

Lower border

5th rib cartilage to 5th intercostal obliquely

Left border

5th intercostal Apex to 3rd rib

Left to right ; AV openings 3rd to 6th rib sternal junction 5th stethoscope

aortic and pulmonary 3rd to 4th sternal junction 2nd stethoscope

Syntopy

Anteriorly sternum

Inferiorly diaphragm

Laterally pleural of the lung

Posteriorly esophagus and vasculature

Superiorly great blood vessels

Layers of the heart

Endocardium direct contact with blood, valves

Myocardium

Atrium 2 layers sup circular, deep long; pectinate muscle

Ventricles 3 layers sup longitudinal; vortex of the heart deep longitudinal (trabeculae carneae and papillary muscle), middle layer surround each ventricles

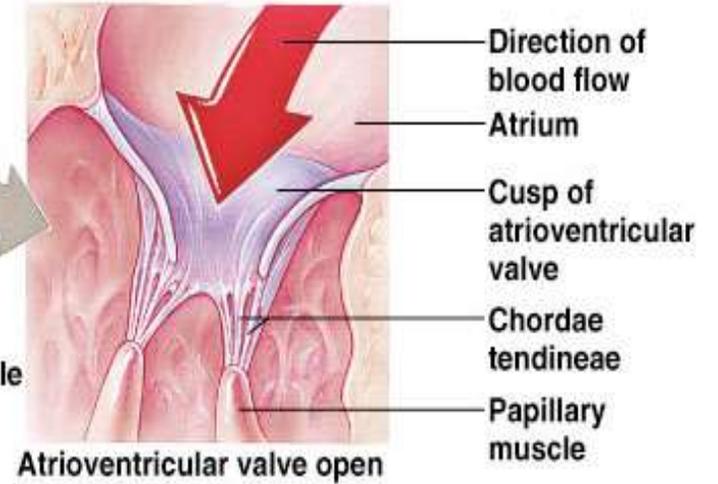
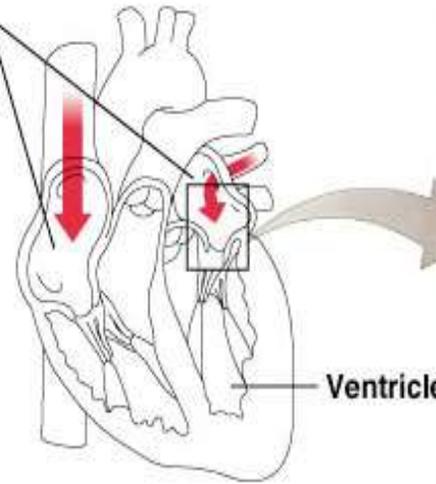
Fibrous ring

Pericardium serous and fibrous

Serous : visceral and parietal

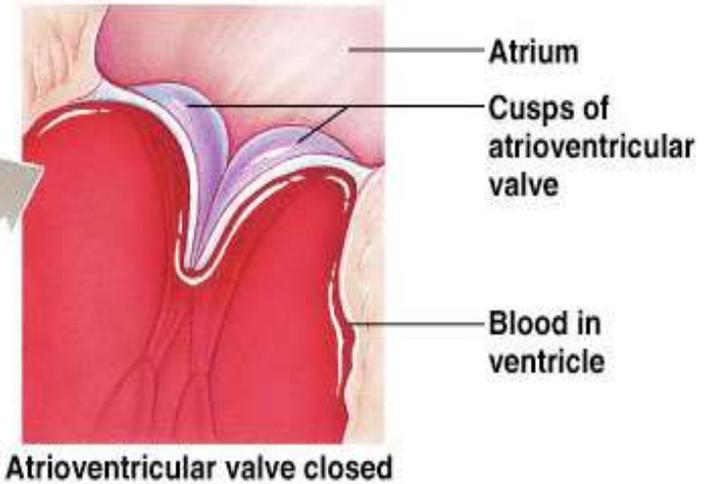
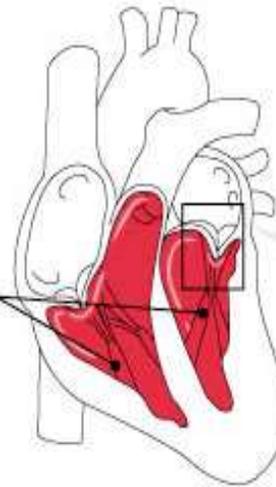
Atrioventricular valve function

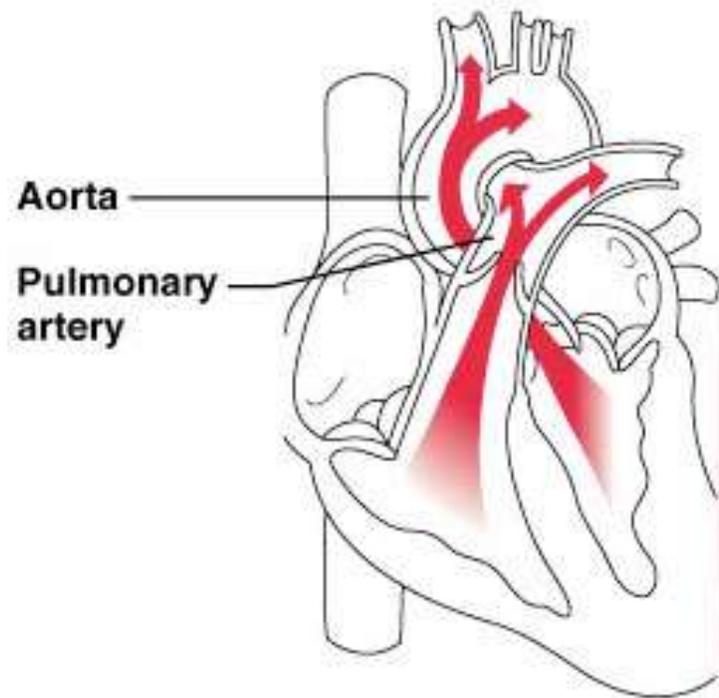
- ① Blood returning to the heart fills atria, putting pressure against atrioventricular valves; atrioventricular valves forced open
- ② As ventricles fill, atrioventricular valve flaps hang limply into ventricles
- ③ Atria contract, forcing additional blood into ventricles



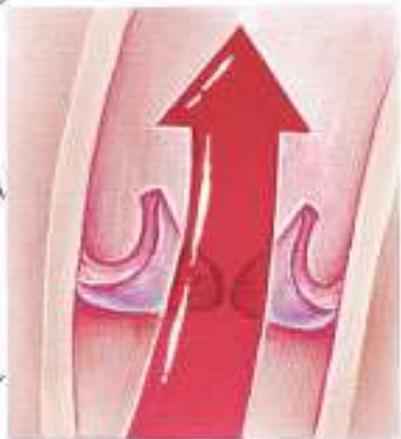
(a)

- 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



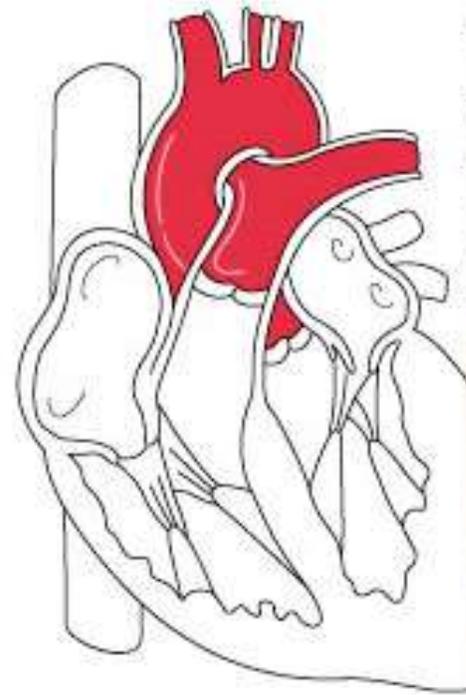


As ventricles contract and intraventricular pressure rises, blood is pushed up against semilunar valves, forcing them open

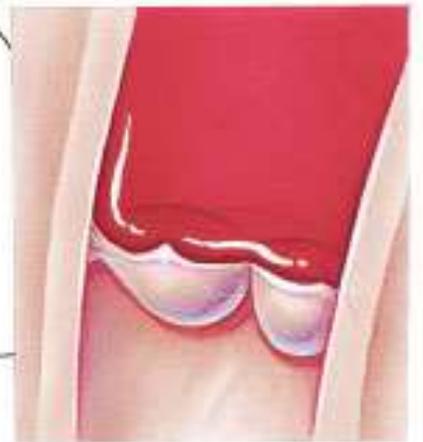


Semilunar valve open

(a)



As ventricles relax and intraventricular pressure falls, blood flows back from arteries, filling the cusps of semilunar valves and forcing them to close



Semilunar valve closed

(b)

External and internal heart structures

- Coronary sulcus ; the atriums from ventricles
- Anterior interventricular sulcus to posterior separate the right from left ventricles
- Right Atrium

Anterior and lateral pouch auricles

Superior vena cava

Between sinus venarum

Posterior inferior vena cava, valve of inferior vena cava to oval fossa during fetal life (blood from right to left atrium) no pulmonary circulation

Medial wall

Fossa ovale

Coronary sinus

Inferior wall

Right atrioventricular opening (tricuspid valve)

- Right ventricles

right atrioventricular opening

Tricuspid valve (2 margin fibrous ring and tendinous chord)

Opening of pulmonary trunk

Pulmonary valve

Trabecula carneae (potential air embolism)

- Left atrium

Left auricles pectinate muscle

4 opening of posterior pulmonary veins

Left ventricular opening

Bicuspid valve

- Left ventricular

Bicusps valve , commissural cusps

Aortic opening 3 semilunar cusps

Limiting product is oxygen

Timely manner function properly

Coronary arteries

Myoglobin (storage of O₂)

Mitochondria

Fuel

Glucose pyruvate

Fatty acids beta oxidation

Lactate pyruvate

Amino acids ketogenic and non-essential one

Ketone bodies fasting state

Myocardium clinical disorders

Angina pectoris

Due to strenuous activity

Tissue becomes ischemia

Pain subsides at rest

Nitroglycerin

Myocardial infarction (heart attack)

Death of cardiac muscle replaced by scar tissue and could lead to death