Heart Anatomy

Occluded coronary artery
Heart Coverings

- Pericardium
- Myocardium
- Fibrous pericardium
- Parietal layer of serous pericardium
- Pericardial cavity
- Visceral layer of serous pericardium (epicardium)
- Myocardium
- Endocardium
- Heart chamber

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Heart Wall Layers

- Pericardial cavity
- Parietal pericardium
- Fibrous pericardium
- Coronary blood vessel

Endocardium
Myocardium
Epicardium (visceral pericardium)
Heart and Pericardium

- Aorta
- Pulmonary trunk
- Left auricle
- Fibrous pericardium
- Cut edge of parietal pericardium
- Heart (covered by visceral pericardium)
- Left ventricle

- Right lung
- Left lung
- Superior vena cava
- Diaphragm
- Right auricle
- Right atrium
- Atrioventricular sulcus
- Right ventricle

- Pericardial cavity
- Interventricular sulcus
Capillary beds of lungs where gas exchange occurs

Pulmonary Circuit

Pulmonary arteries
Venae cavae
Right atrium
Left atrium
Left ventricle

Systemic Circuit

Capillary beds of all body tissues where gas exchange occurs

Right ventricle
Muscular interventricular septum

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Heart Valves

Pulmonary valve

Opening of coronary artery

Aortic valve

Tricuspid valve

Bicuspid valve

Fibrous skeleton

Posterior
Mitral Valve Prolapse

- Valve cusps stretch/bulge
- Chest pain, palpitations, fatigue, anxiety
- Susceptibility to endocarditis
Heart Valves

- Pulmonary valve
- Aortic valve
- Tricuspid valve
- Bicuspid valve
- Opening of coronary artery
- Fibrous skeleton
- Posterior
Heart Blood Flow Blockages

• Ischemia
• Angina pectoris
• Myocardial infarction
Cardiac Veins

- Superior vena cava
- Pulmonary trunk
- Aorta
- Left atrium
- Right atrium
- Coronary sinus
- Anterior cardiac vein
- Great cardiac vein
- Small cardiac vein
- Left ventricle
- Inferior vena cava
- Right ventricle
- Middle cardiac vein
Coronary Circulation Overview

- Aorta
  - Right coronary artery
    - Posterior interventricular artery
      - Ventricular walls
    - Marginal artery
      - Walls of right atrium and right ventricle
  - Left coronary artery
    - Circumflex artery
      - Walls of left atrium and left ventricle
    - Anterior interventricular artery
      - Ventricular walls

- Cardiac veins
  - Coronary sinus
    - Right atrium
Cardiac Muscle
Properties of Heart Contraction

• Autorythmicity
  – Some cardiac muscle cells self excitable
  – Initiates contraction

• "All or None" rule
  – Entire heart contracts as a coordinated unit
The graph illustrates the relationship between membrane potential and tension over time. It shows the following key points:

- **Membrane potential (mV)**: The vertical axis measures the membrane potential in millivolts (mV).
- **Tension (g)**: The right vertical axis measures tension in grams (g).
- **Time (ms)**: The horizontal axis represents time in milliseconds (ms).

Key features in the graph:

- **Action potential**: A sharp rise in membrane potential followed by a rapid decrease.
- **Plateau**: A period of relatively constant membrane potential.
- **Tension development (contraction)**: A gradual increase in tension over time, reaching a peak and then declining.

The graph also highlights the **absolute refractory period**, indicated by the shaded area, which is a critical phase in the muscle's response to stimulation.