

The chambers of the heart that receive blood:

- atrium

The lower portion of the heart that is formed by the tip of the left ventricle is the :

- apex

The middle and thickest layer of the heart :

- myocardial

Doubled-walled sac that encloses the heart and helps protect it from trauma and infection :

- pericardium

The innermost layer of the heart is the :

- endocardial

The top or posterior surface of the heart is the:

- base

The middle area of the thoracic cavity is the :

- mediastinum

The heart is about \_\_\_\_\_ long.

- 5 in

The outermost layer of the heart

- epicardial

The chambers of the heart that eject blood are the:

- ventricles

### **Introduction to Electrocardiography**

- **Electrocardiography (ECG or EKG):**  
The study and recording of the **electrical activity of the heart**.
- **Electrocardiograph:**  
The **instrument** used to record the electrical impulses of the heart.
- **Electrocardiogram (ECG/EKG):**  
The **tracing or printed record** of the heart's electrical activity.

### **Purpose of an ECG:**

- Detects **abnormal heart rhythms (arrhythmias)**
- Identifies **heart enlargement**
- Detects **myocardial infarction (heart attack)**
- Monitors **heart rate and rhythm changes**

### Anatomy and Location of the Heart

- The heart is a **muscular organ** located in the **mediastinum**, the middle area of the thoracic cavity.
- It is about **5 inches long** and the size of a **fist**.
- The **apex** is the **lower pointed end** of the heart (formed by the left ventricle).
- The **base** is the **top or posterior surface** of the heart.

### Layers of the Heart Wall

Layer	Description
<b>Endocardium</b>	Innermost layer; lines the heart chambers and valves
<b>Myocardium</b>	Middle and thickest layer; made of cardiac muscle responsible for contraction
<b>Epicardium</b>	Outermost layer of the heart wall
<b>Pericardium</b>	Double-walled sac that encloses and protects the heart from trauma and infection

### Chambers of the Heart

Chamber	Function
<b>Right Atrium</b>	Receives deoxygenated blood from the body via the superior and inferior vena cava
<b>Right Ventricle</b>	Pumps deoxygenated blood to the lungs via the pulmonary artery
<b>Left Atrium</b>	Receives oxygenated blood from the lungs via the pulmonary veins
<b>Left Ventricle</b>	Pumps oxygenated blood to the body through the aorta

#### Remember:

- **Atria = Receiving chambers**
- **Ventricles = Pumping (ejecting) chambers**

### Heart Valves and Blood Flow

#### 1. **Deoxygenated Blood Flow (right side):**

- Superior/Inferior vena cava → Right atrium → **Tricuspid valve** → Right ventricle → **Pulmonic valve** → Pulmonary arteries → Lungs

#### 2. **Oxygenated Blood Flow (left side):**

- Lungs → Pulmonary veins → Left atrium → **Mitral (bicuspid) valve** → Left ventricle → **Aortic valve** → Aorta → Body

## **Electrical Conduction System of the Heart**

<b>Structure</b>	<b>Function</b>
<b>SA Node (Sinoatrial Node)</b>	The heart's <b>natural pacemaker</b> ; initiates electrical impulse
<b>AV Node (Atrioventricular Node)</b>	Slows the impulse to allow the ventricles to fill
<b>Bundle of His</b>	Conducts impulse from AV node to bundle branches
<b>Right and Left Bundle Branches</b>	Carry impulses down the interventricular septum
<b>Purkinje Fibers</b>	Distribute impulse throughout ventricles, causing contraction

## **Purpose of ECG in Clinical Settings**

- Identify **heart rate and rhythm**
- Detect **conduction abnormalities**
- Evaluate **pacemaker function**
- Monitor **effects of medications or cardiac stress**
- Assist in **diagnosing myocardial injury or infarction**
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## **Key Facts to Remember**

- **Normal ECG paper speed:** 25 mm/sec
- **Normal QRS duration:** 0.06–0.10 seconds
- **Heart's pacemaker:** SA node
- **ECG measures:** **Electrical activity**, not the mechanical pumping action