Al-Zahraa (A.S.) University for Women
College of Health and Medical Techniques
Department of Radiological Techniques

Heart Sounds & Electrocardiogram (ECG) Lab3+4

Practical Physiology

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Outlines

Student should know:

- What Causes the Heart Sounds?
- What Creates Heart Sounds?
- Types Of Heart Sounds
- Methods of study of heart sounds
- What is Electrocardiogram (ECG)?
- Why ECG is done?
- How is an ECG carried out? (ECG Test Procedure)

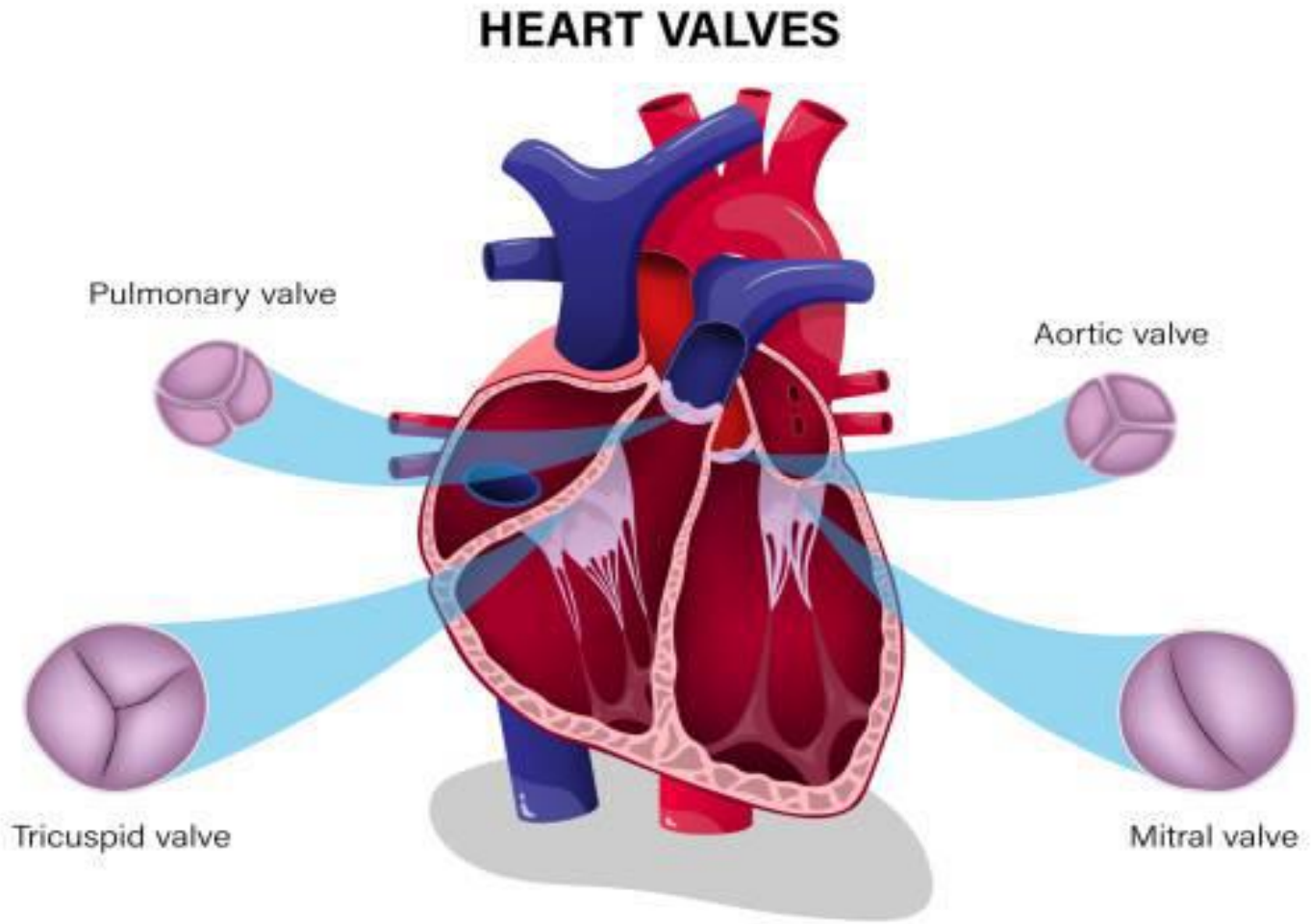
Heart Sounds

• **Heart sounds** are sounds produced by the mechanical activities of the heart during each cardiac cycle.

• These sounds are generated by the flowing of blood in and out of the chambers of the heart through the valves as and when it closes and opens.

Practical

Heart Sounds



Functioning Of The Heart

- The human heart is a muscular structure that has four chambers that pump and receive blood throughout the body.
- The left atrium picks up the oxygenated blood from the lungs, pumping it into the left ventricle, which in turn pumps the oxygen-rich blood all through the body via a mesh of arteries.

Creation of Heart Sounds

A few functions of the heart which generate heart sounds are:

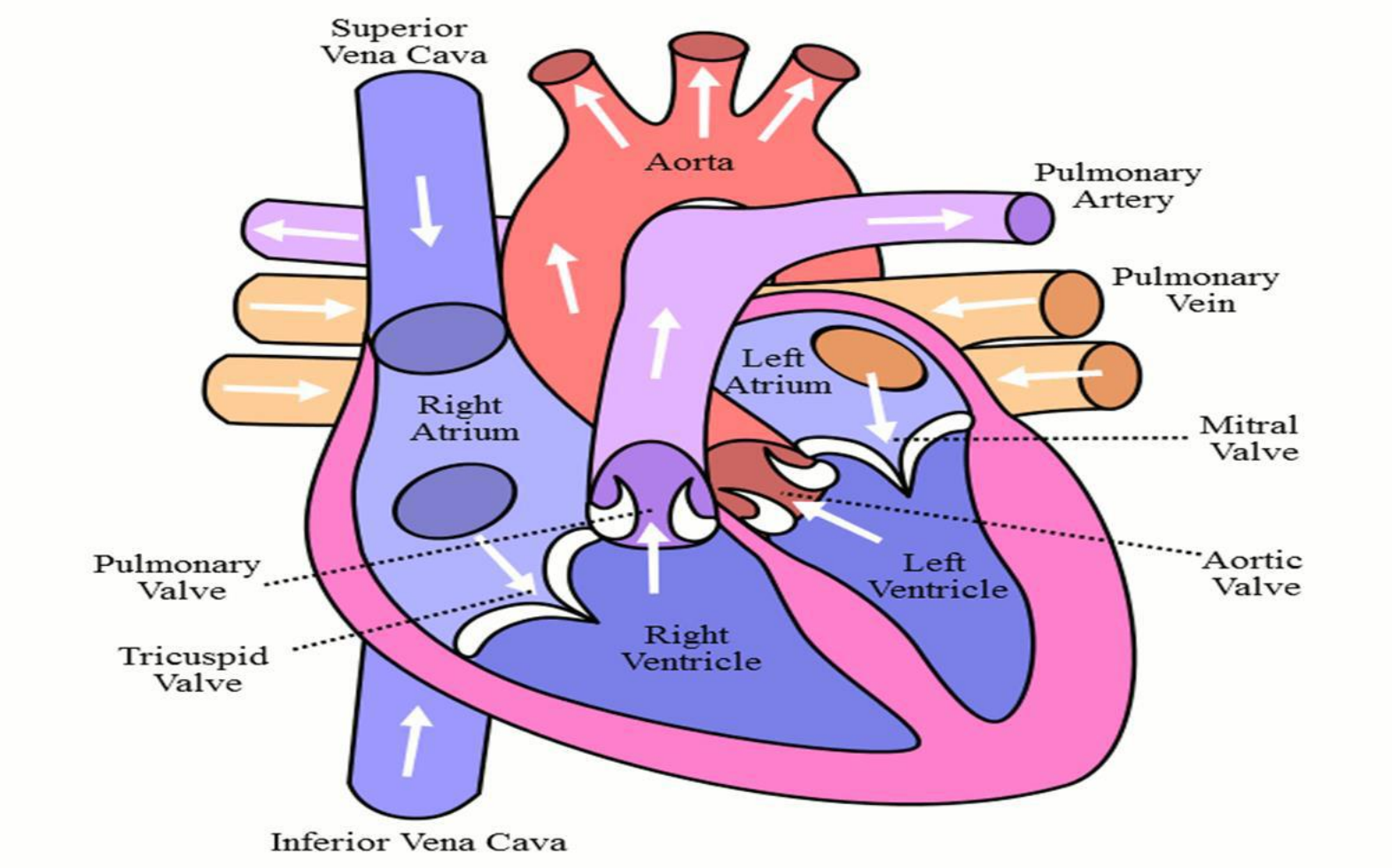
I. Blood flow through the valve opening

II. Rubbing of cardiac surfaces

III. Closing and opening of the valves of the heart

IV. Blood flow into the ventricles of the heart

Creation of Heart Sounds



Types Of Heart Sounds

There are 4 types of heart sounds :

1.S1–"lub" caused by the closing of the atrioventricular (AV) valves .

2.S2–"dub" caused by the closing of semilunar valves

3.S3–linked with flow of blood into the ventricles

4.S4 –linked with atrial contraction

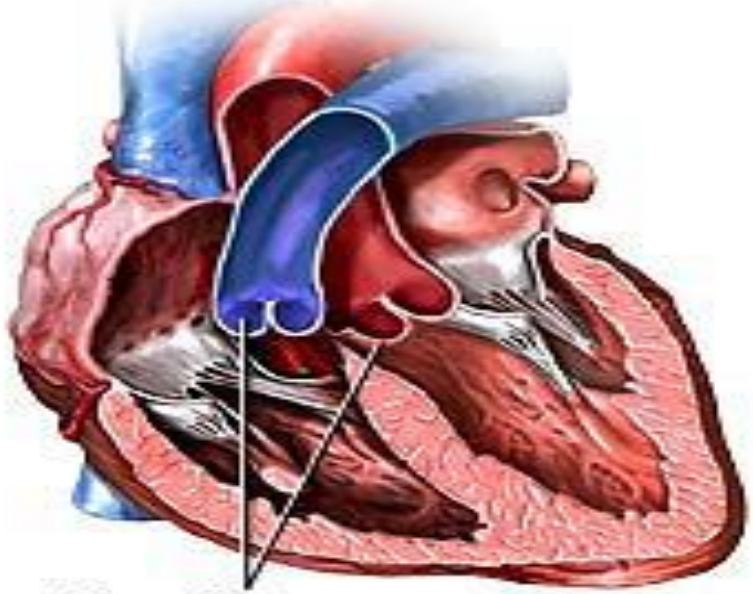
- Generally, the heart makes two sounds –"lub" and "dub".
- The third and fourth sounds are audible in individuals

Types Of Heart Sounds

First heart sound, "lub", occurs when atrioventricular valves close

Atrioventricular valves

Second heart sound, "dup", occurs when semilunar valves close

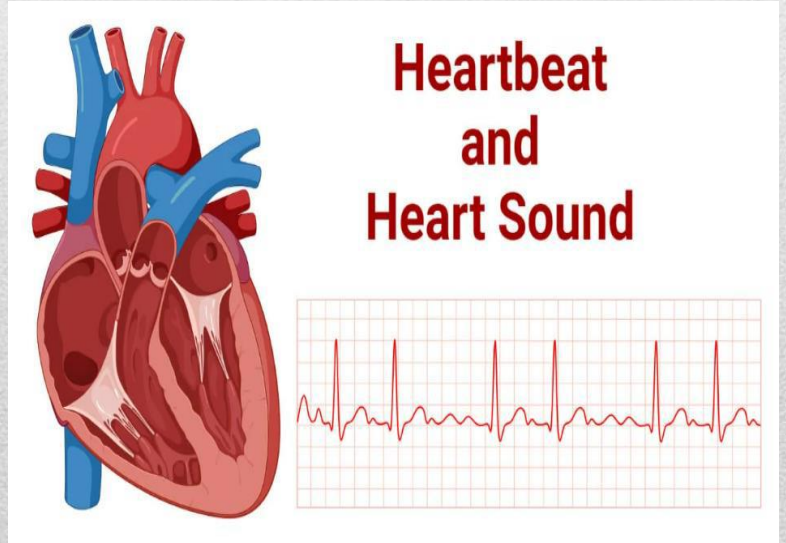


Semilunar valves

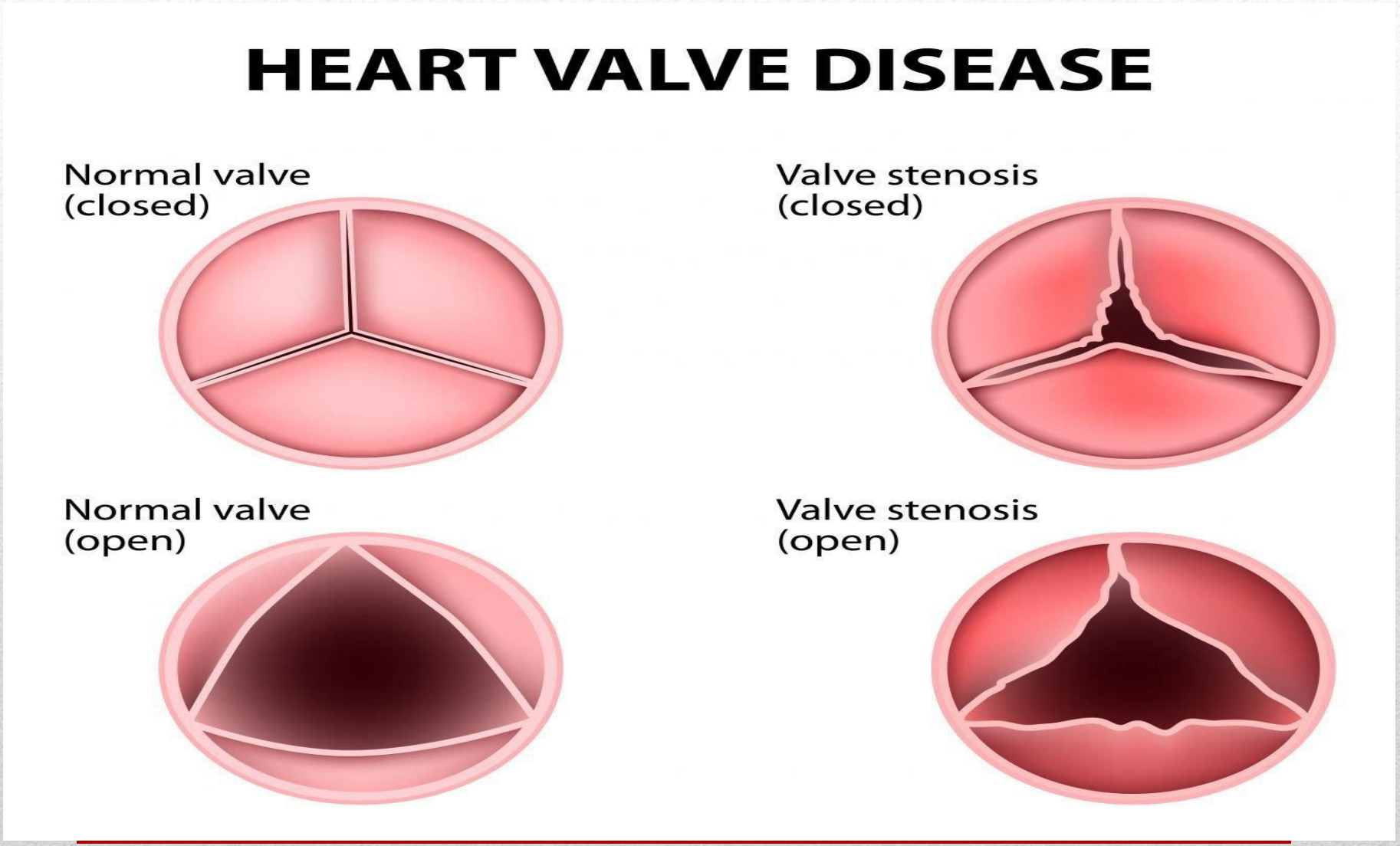
Heart Murmurs

Heart murmurs are ectopic or abnormal heart sounds.

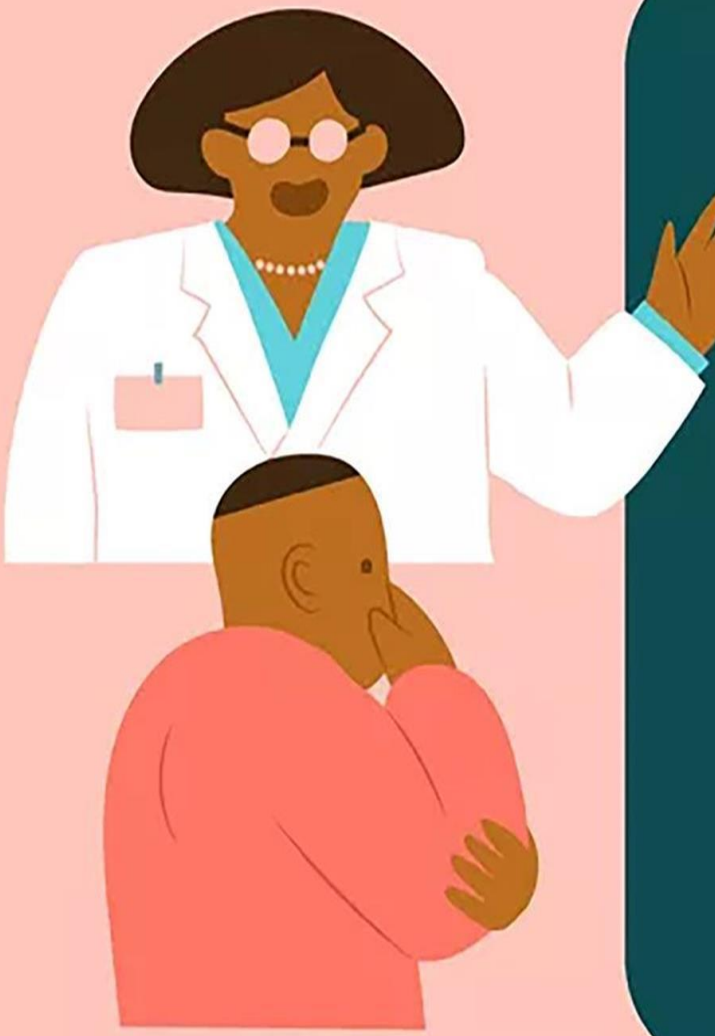
These occur when there aresome valvular or other abnormalities that cause turbulence in the flow of blood, either because of the high velocity of ejection or their regurgitation



Heart Murmurs



What Are Systolic and Diastolic Blood Pressures?



120

80

Systolic Blood Pressure

- Pressure exerted when blood is ejected into arteries
- Normal systolic blood pressure is 120 mmHg or below

Diastolic Blood Pressure

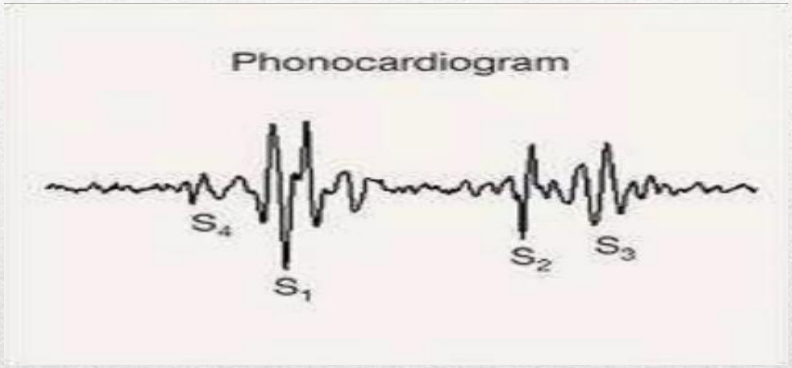
- Pressure blood exerts within arteries between heartbeats
- Normal diastolic blood pressure is 80 mmHg or below

Methods of study of heart sounds:

Heart sounds are studied by three methods by using:

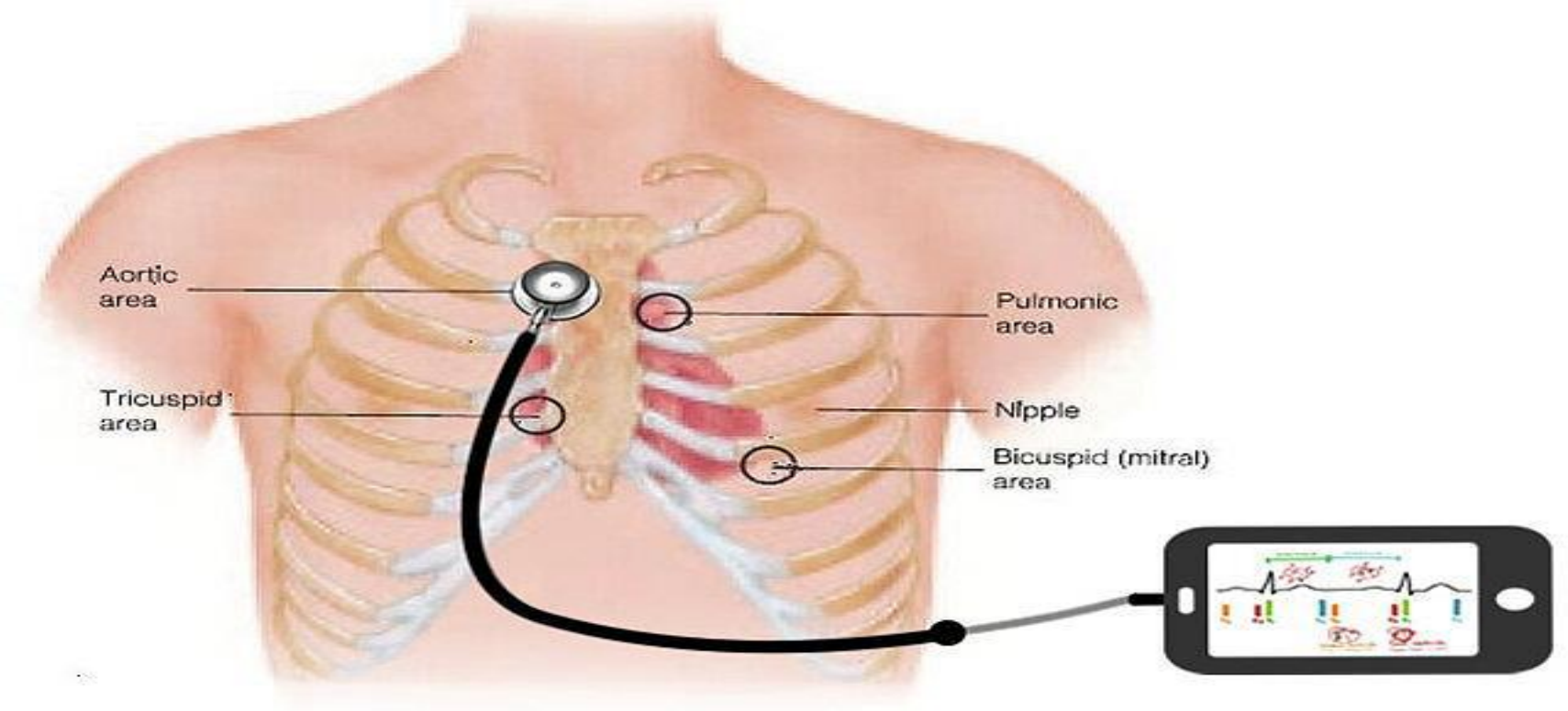
1. Microphone

3.Phonocardiogram



2. Stethoscope

Methods of study of heart sounds:



Schematic diagram for heart sound acquisition using a smartphone. The stethoscope is used to enhance the acoustic wave and the microphone on the earphone line is fixed in the hollow tube of the stethoscope.

Electrocardiogram (ECG)

An electrocardiogram (ECG) : is a graphic record produced by an electrocardiograph that provides details about one's heart rate and rhythm and any other related abnormalities.

Why ECG is done?

An ECG is used to measure:

- Any heart damage and weakness in various parts of heart muscle.
- How quickly your heart beats and whether it normally beats.
- The size and position of your heart chambers.
- To diagnose abnormal heart rhythms.
- The effects of drugs or devices used to control your heart (such as heart pacemarker).

ECG Test Procedure

An ECG is a safe and painless test that usually takes only a few minutes.

- Using adhesive patches to bind leads from an electrocardiograph system to the skin on your hands, legs, and chest. This leads to your heart reading signals and sending this information to the electrocardiograph.
- On a paper strip or on a monitor, the computer then prints the text.
- The ECG test takes about only a few minutes

What to Expect During an Electrocardiogram

1. 10 electrodes are attached to you

2. Electrodes transmit heart's electrical activity to ECG machine

3. ECG machine creates wave pattern representing heart's rhythm