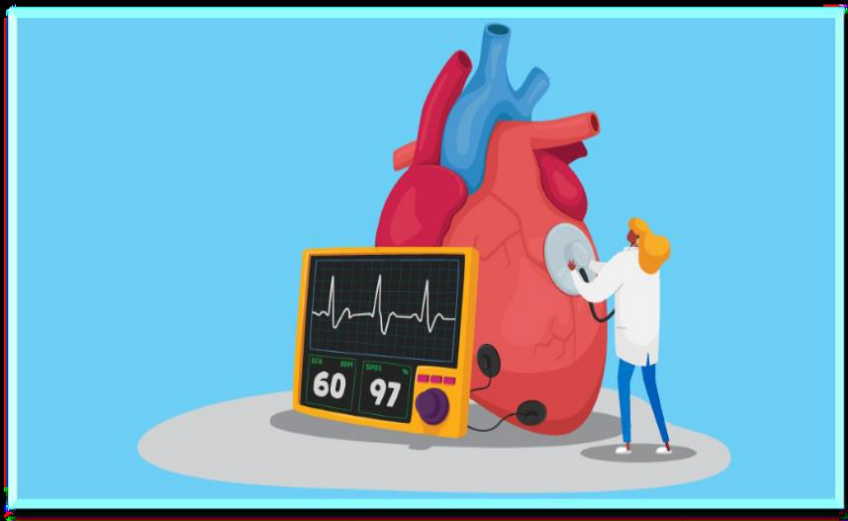




Examination of Arterial Pulse & Arterial blood pressure (Lab 1 & 2)

Practical Physiology

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Introduction

- The arterial pulse is the rhythmic expansion of pressure waves along the walls of the arteries which is produced during each systole of cardiac cycle.
- The strength of the pulse is determined by pulse pressure.
- The pulse pressure is the difference between systolic & diastolic pressure

Parameters of pulse

1.Rate: It is stated as number of pulses per minute

In adults a normal pulse rate after a period of rest is between

60 to 80 beats per minute(bpm)

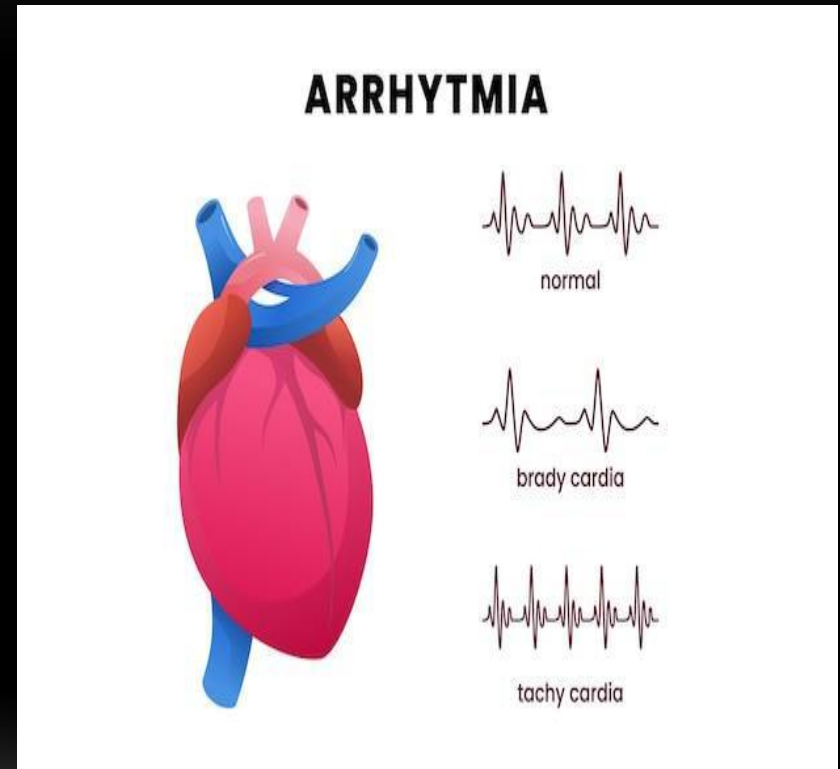
Tachycardia: Pulse > 100 Beats per minute (bpm)

- Causes : • Exercise • Pain • Anxiety, emotional stress

Bradycardia : Pulse <60 bpm

Causes :

- ✓ Sleep
- ✓ Athletic training
- ✓ Hypothyroidism



2. Rhythm

It is the spacing order at which successive pulse waves are felt.

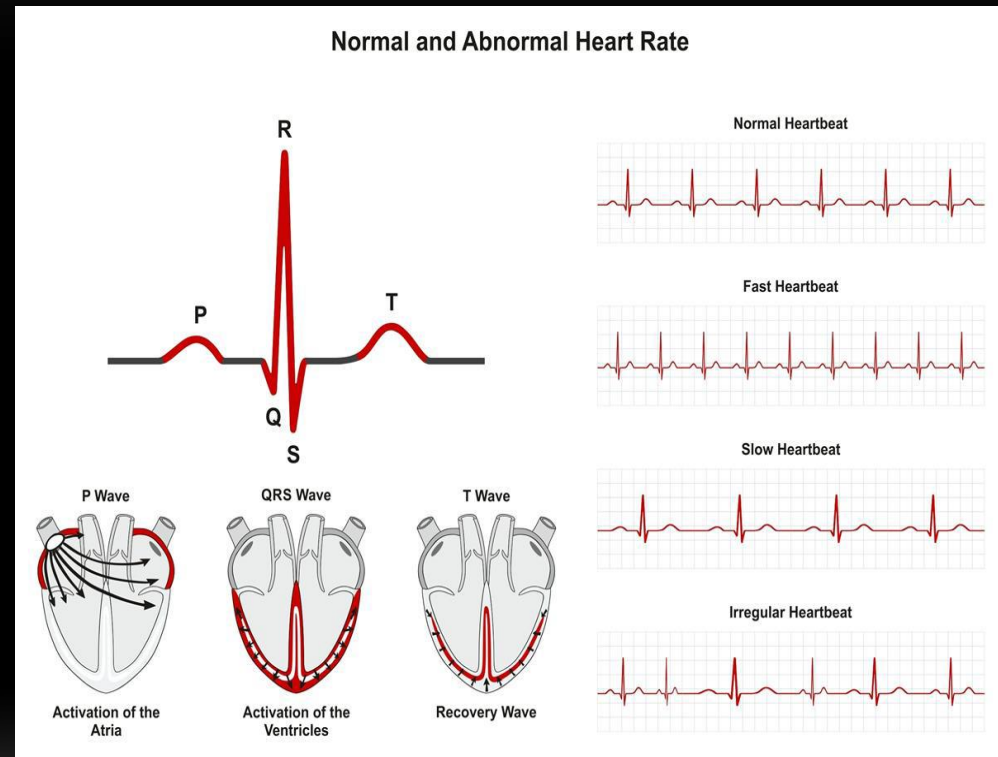
Normal rhythm is called **sinus rhythm** and it is usually regular because it originates from SA (sinoatrial) node

- In young, children and athletes, subjects may show variation in pulse rhythm during respiration (**increase** with inspiration and **decrease** at the beginning of expiration)

Arrhythmia: Abnormal rhythm of pulse.

Examples of it include:

- Sinus tachycardia
- Atrial fibrillation
- Ectopic beats



3. Volume (Amplitude)

It is degree of expansion. It gives idea about the **stroke volume**

❖ **Physiological causes** of increased pulse volume

include: **exercise** , **pregnancy** , **fever**.

❖ **Pathological causes** of increased pulse volume is aortic regurgitation while pulse volume **decreases** in heart failure.

4. Character

Slow rising pulse occurs in aortic stenosis

5. Condition of the vessel wall

In young adult, the wall is just **palpable** while in old people it is like **cord** due to atherosclerosis



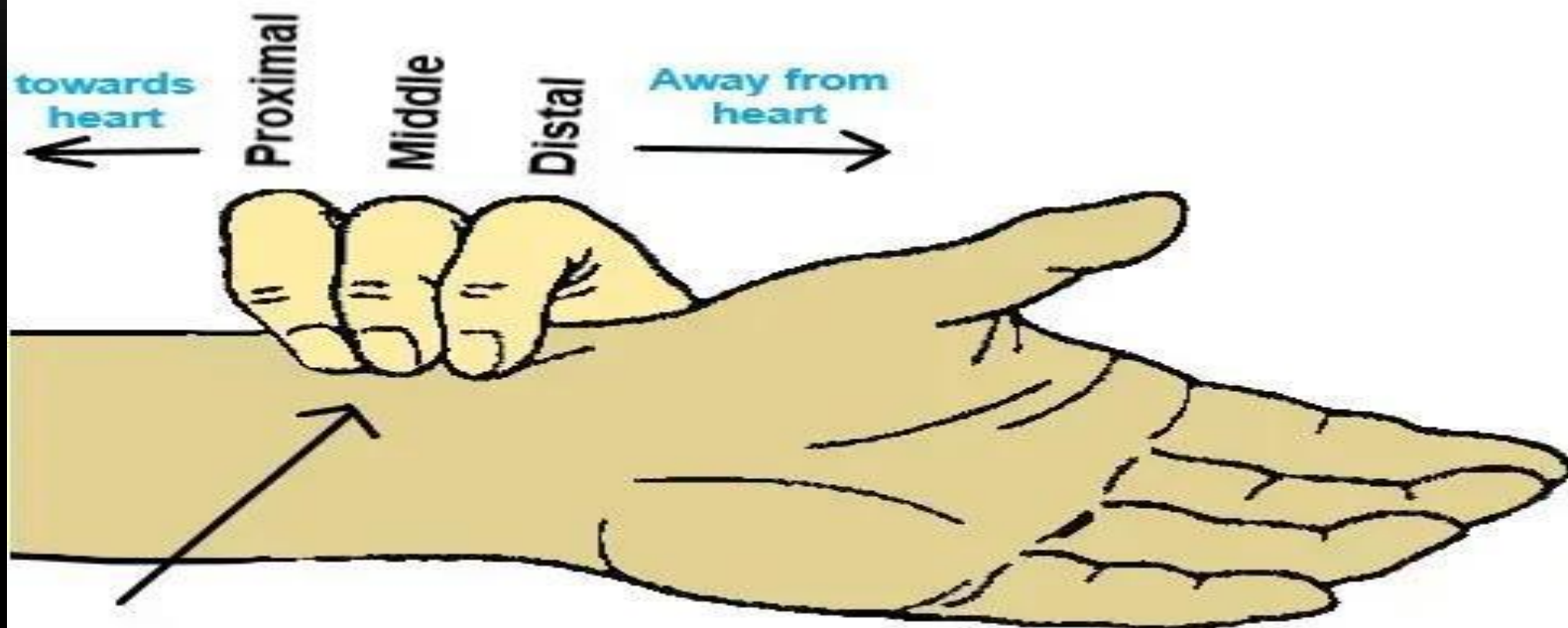
Procedures And Type peripheral Arterial Pulses

To examine **peripheral arterial pulses**

1-The radial artery pulse:

It is best felt just lateral to the tendon of flexor carpi radial is by pressing against radius bone head.

- The three fingers of examiner's hand are used for feeling the pulse.
- Radial pulse is particularly useful in assessing **rate and rhythm of pulse.**



keep fingers in a line
against each other
without gap.

2-The brachial artery pulse:

- It is best felt when artery is compressed by thumb against humerus.



3-The carotid artery pulse:

Patient is **lying on bed**, pulse is detected by pressing thumb on the carotid artery between the larynx and the anterior border of sternomastoid muscle.



4-The femoral artery pulse: Detected at halfway between the pubic tubercle and the anterior superior iliac spine.

5-The popliteal artery pulse: pressing the popliteal artery in middle of popliteal fossa.

Procedures And Type peripheral Arterial Pulses



6-The dorsalis pedis artery pulse: It is best felt by compressed artery against the tarsal

7-Posterior tibial artery pulse.



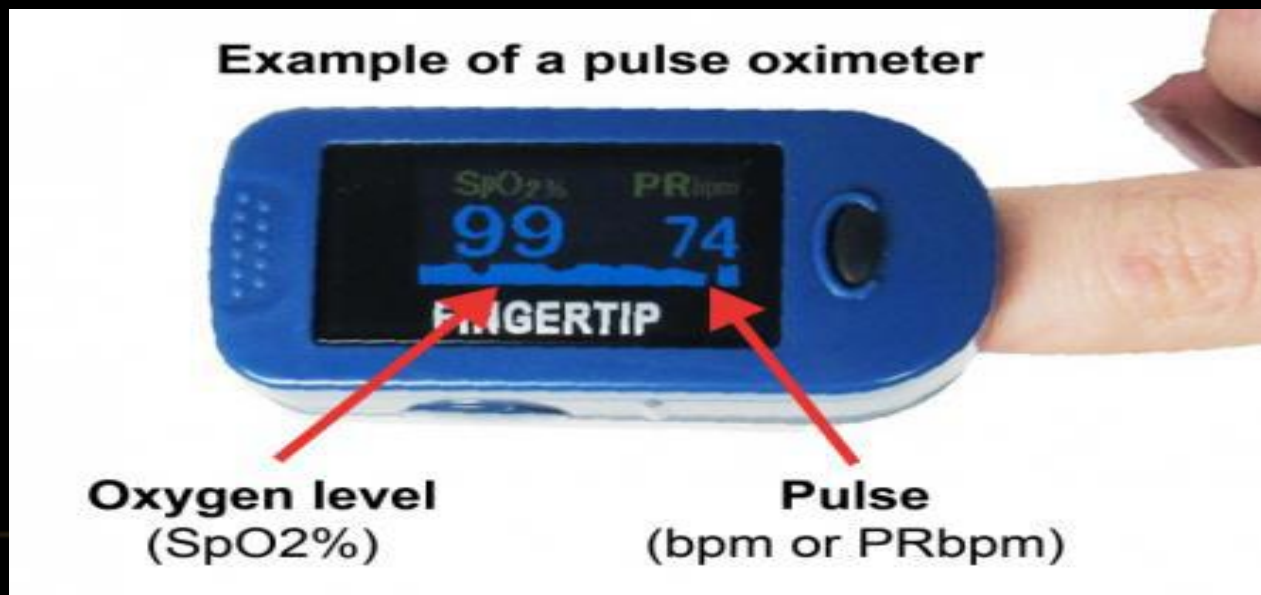
Posterior tibial artery



Dorsalis pedis artery pulse

Automatic measurement of pulse

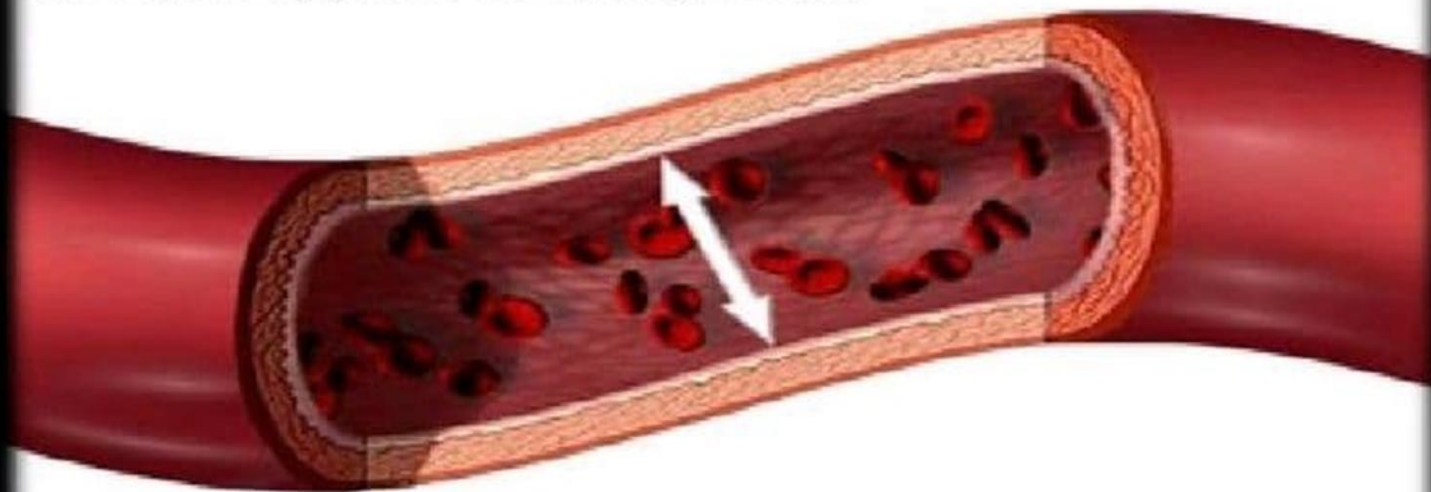
Pulse oximeter is non-invasive devices used to measure a patient's blood-oxygen saturation level and pulse rate.



ARTERIAL BLOOD PRESSURE

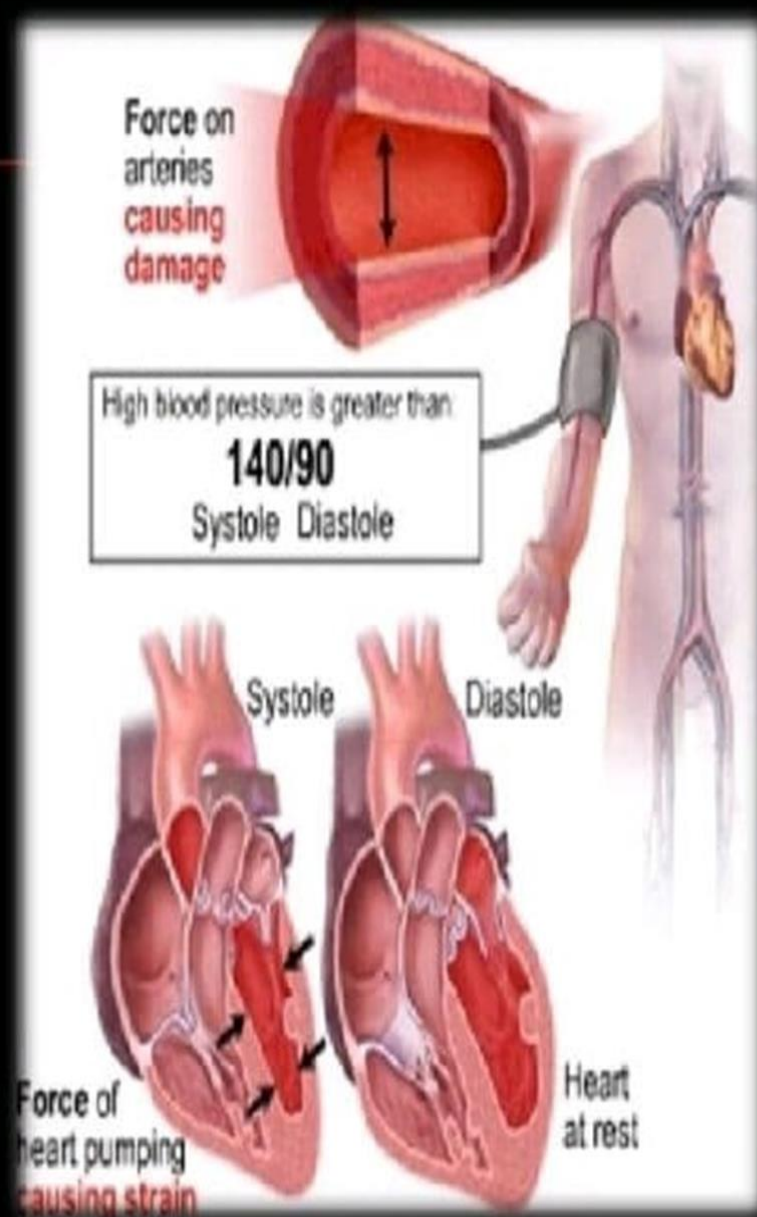
Definition : Arterial blood pressure can be defined as the lateral pressure exerted by the moving column of blood on the walls of the arteries.

Blood pressure is the measurement of force applied to artery walls



SIGNIFICANCE

1. To ensure the blood flow
To various organs.
2. Plays an important role
in exchange of nutrients
and gases across the
capillaries.
3. Required to form urine.
4. Required for the formation
Of the lymph.



Normal Values

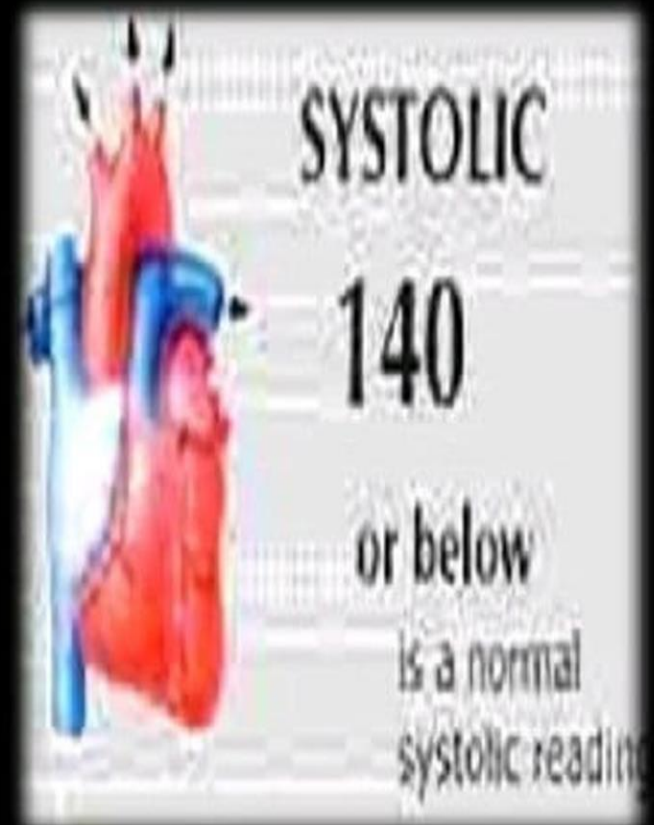
- ❖ Normal Adult range
- ❖ Can fluctuate within a wide range and still be normal
- ❖ Systolic/diastolic
- ❖ 100/60 - 140/80



Systolic B.P (S.B.P)

Defined as the maximum
B.P in the arteries
Attainable during systole.
Normal **120 + 20 mm Hg.**
This is mainly contributed by

1. Force of heart beat
 2. Normal blood volume
 3. Cardiac output.
- Normal range**
90-140 mm Hg.



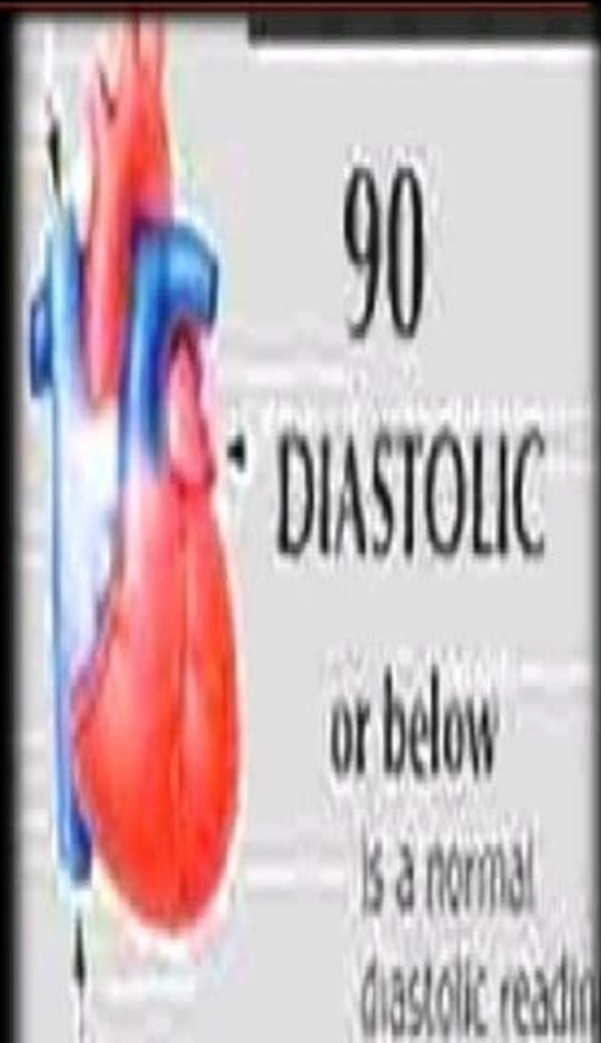
DIASTOLIC B.P (D.B.P)

Def--- as the minimum pressure that is obtained at the end of the ventricular diastole.

Normal range 60 -90 mm Hg.

1. It represents a constant load on the arterial walls with little or no fluctuation at all.

2. It is an index to the peripheral resistance and decides the filling of the Coronary system.



Pulse Pressure (P.P)

Denotes the difference between systolic and diastolic pressure.

**$PP = SBP - DBP = 40$
mm Hg**



PHYSIOLOGICAL VARIATION IN BLOOD PRESSURE

- | | |
|----------------------|---------------------|
| A) Age | G) Gestation |
| B) Build | H) high Altitude |
| C) Climate | I) Infusion/ Intake |
| D) Diurnal Variation | J) Pain |
| E) Exercise | K) Posture |
| F) Fever | L) Sleep |
| | M) sex |

RECORDING OF B.P

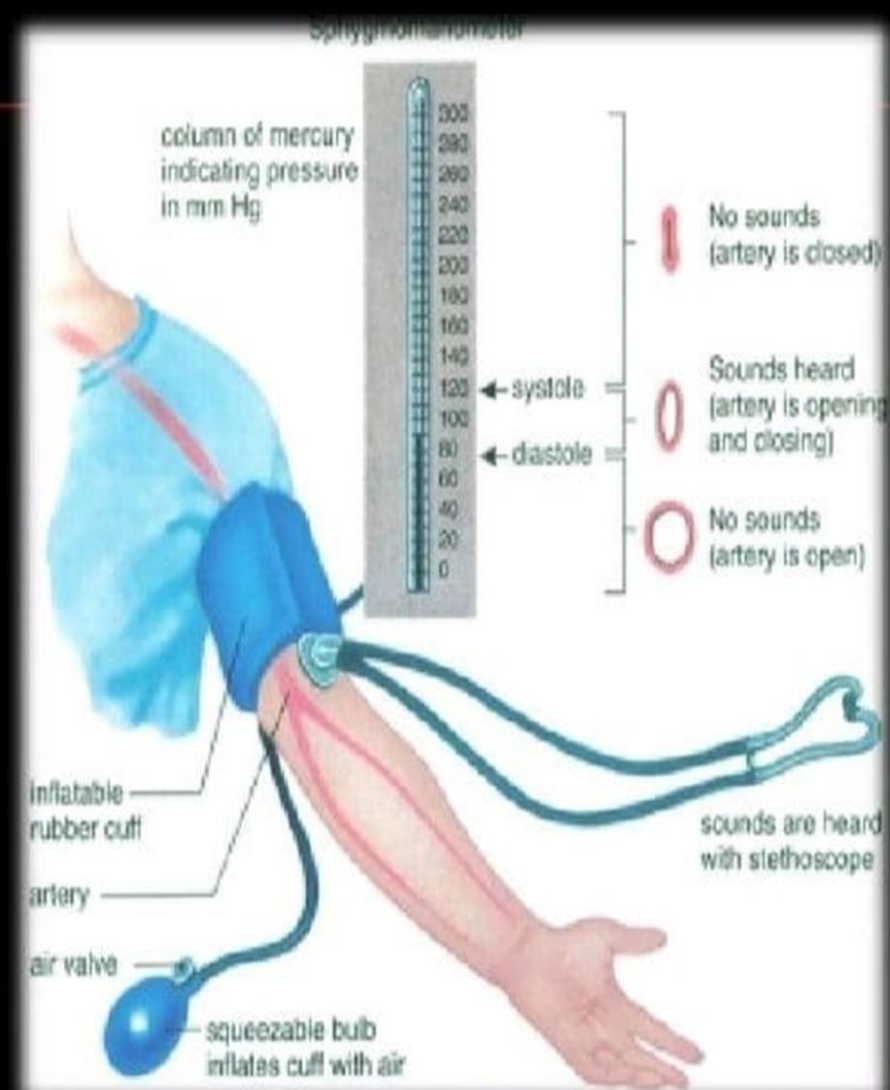
Direct method

Indirect method

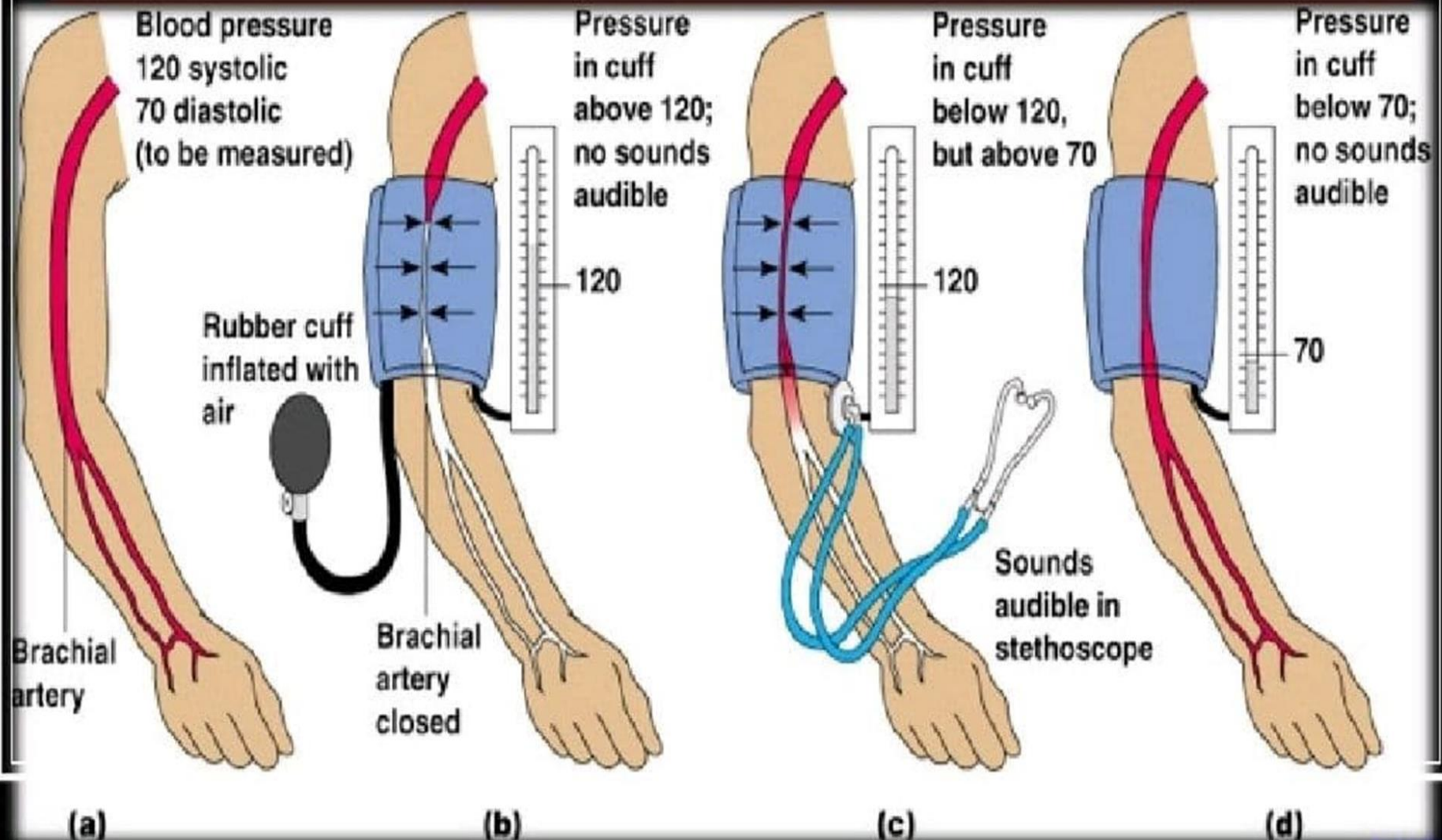
METHODS

Indirect Methods

1. Palpatory method
2. Auscultatory method



PRINCIPLE INVOLVED IN RECORDING BLOOD PRESSURE



AUSCULTATORY METHOD

This method was introduced by a Russian physician
Korotkov

SBP

Recording of
arterial BP by
auscultatory
method

**Korotkov
sounds**

120 mm Hg

Tapping sound 1

110 mm Hg

Murmurish 2

95 mm Hg

Banging sound 3

85 mm Hg

Muffling sound 4

DBP-

80 mm Hg

No sound 5

FACTORS AFFECTING BLOOD PRESSURE

- ❖ Disease
- ❖ Age
- ❖ Heredity
- ❖ Blood Volume
- ❖ Weight
- ❖ Diet
- ❖ Hormones
- ❖ Salt
- ❖ Caffeine
- ❖ Environmental factors
- ❖ Psychological factors
- ❖ Stress/Anxiety
- ❖ Gravity
- ❖ Drugs
- ❖ Alcohol
- ❖ Time of day