University of Al-Ameed
College of Pharmacy

Practical physiology

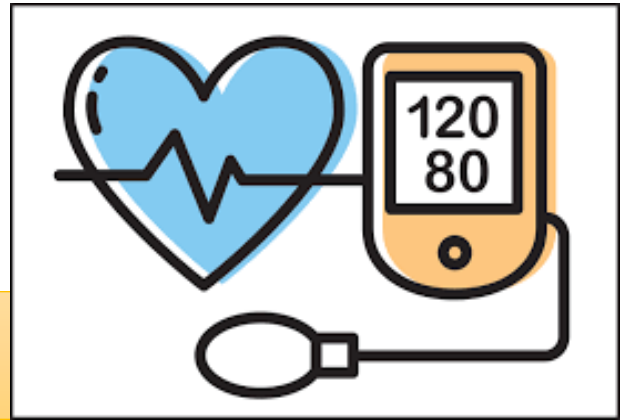
Blood pressure

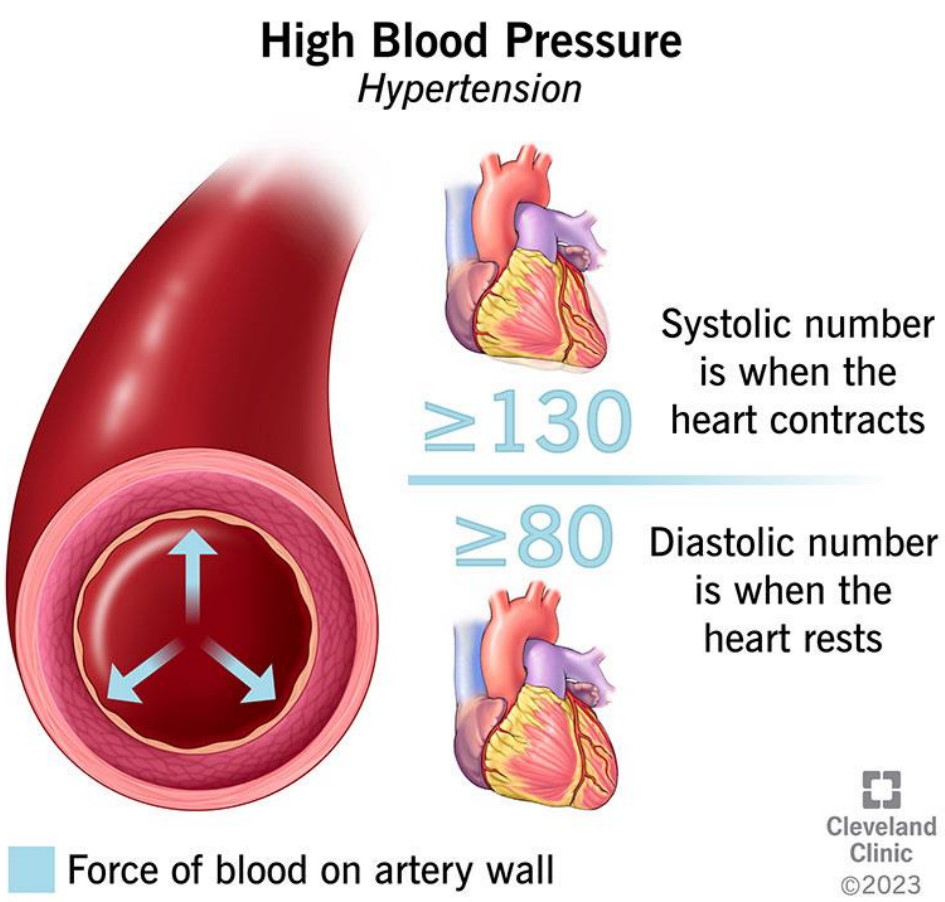
Blood pressure

The blood pressure means the force of blood exerted against the blood vessel wall.

Systolic blood pressure is the first number. It measures the pressure blood is pushing against artery walls when the heart beats.

Diastolic blood pressure is the second number. It measures the pressure blood is pushing against artery walls while the heart muscle rests between beats.




High Blood Pressure
Hypertension
≥130
Systolic number is when the heart contracts
≥80
Diastolic number is when the heart rests
Force of blood on artery wall
Cleveland Clinic
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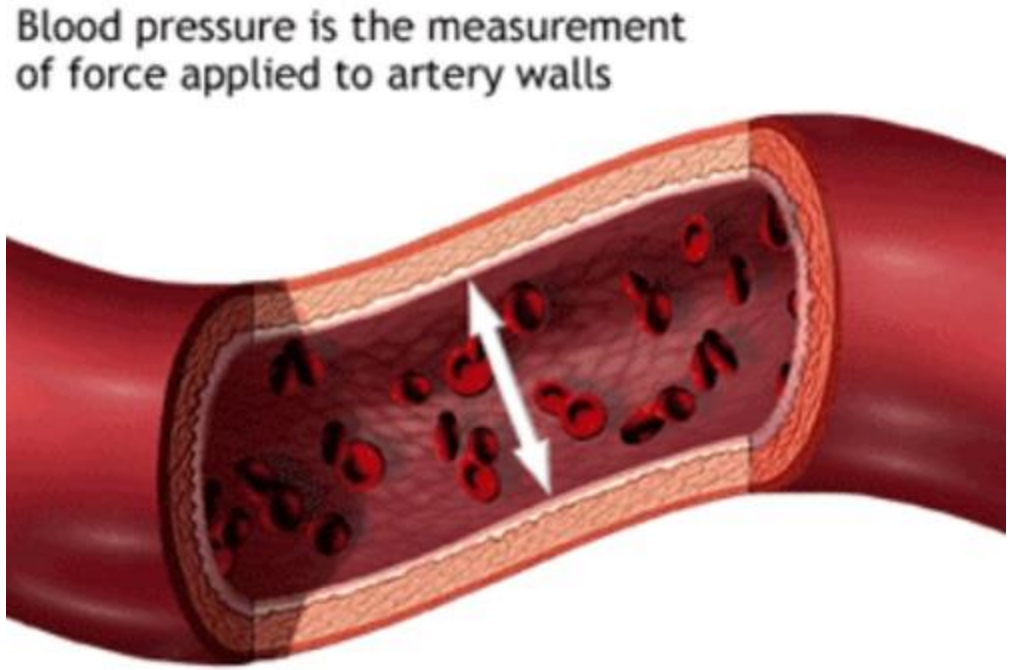
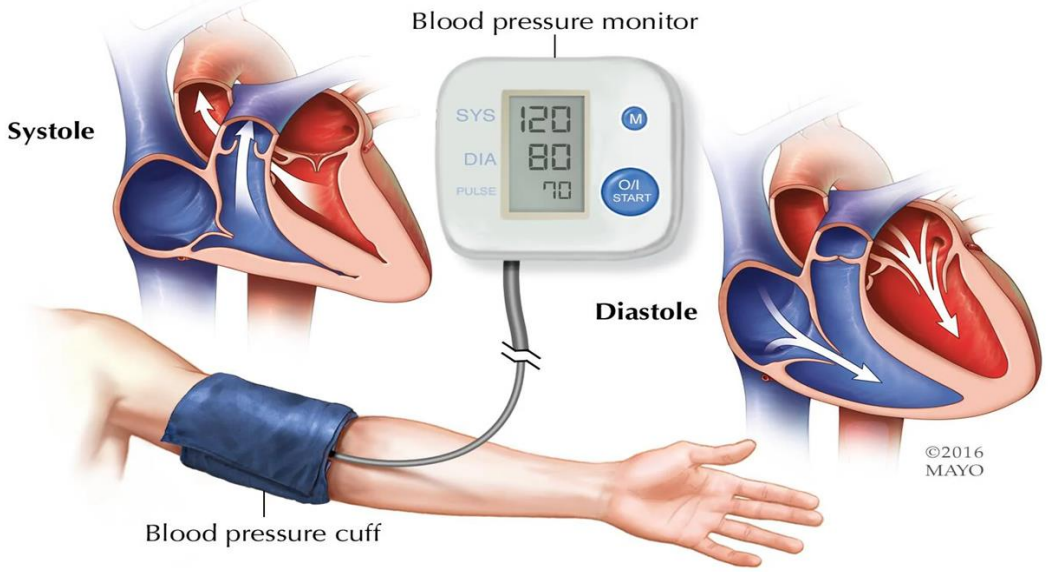

Blood pressure is the measurement of force applied to artery walls



- Which factors affect blood pressure?
- Age. Blood pressure tends to rise with age. ...
- Family history and genetics. High blood pressure often runs in families. ...
- Lifestyle habits. ...
- Medicines. ...
- Race or ethnicity.

pulse rate: is the number of heart beats per minute. the resting pulse rate for an average adult is between 50 and 90 beats per minute.

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Calculations

Blood pressure calculations

- MAP = SBP + (2 X DBP)/ 3
- M : mean arterial pressure
- SBP : systolic blood pressure
- DBP : diastolic blood pressure
- Pulse pressure = systolic pressure – Diastolic pressure
- BP = C.O x P.R
- CO : cardiac output
- PR : Peripheral resistance

Mean arterial pressure :The definition of mean arterial pressure (MAP) is the average arterial pressure throughout one cardiac cycle, systole, and diastole. MAP is influenced by cardiac output and systemic vascular resistance

Normal range between 70 and 100 mmHg .

Which is enough to perfuse the organs.

Peripheral resistant : the resistance in the circulatory system that is used to create blood pressure

As blood vessels constrict, resistance to blood flow increases,
but as these vessels dilate, peripheral resistance declines.

Blood pressure is then affected by changes in cardiac output, total peripheral resistance, or by changes in both cardiac output and total peripheral resistance

Physiological Variation

- 1- The ABP increase with age.
- 2- In women is slightly less than men.
- 3- It is more at evening & less in morning.
- 4- It is less in sleep & in lying position.
- 5- It is more after meal, exercise, anxiety.

Pathological Variations

- 1. Hypertension
- 2. Hypotension
- 3. Orthostatic or Postural Hypotension

procedure

- **Auscultatory method**.
- Standard method, (1905) developed by Korotkoff by using an instrument

‘’sphygmomanometer’’.

The pressure at which the sound is first

heard (phase 1 of korotkoff sound) represents the systolic blood pressure (SBP). The sounds become louder, then muffled and finally they disappear. The point at which the sound becomes muffled

is taken as the diastolic pressure

Korotkoff sounds

- 1- Phase 1, tapping sound.
- 2- Phase 2, louder sound.
- 3- Phase 3, dull sound.
- 4- Phase 4, muffled sound.
- 5- Phase 5, disappeared sound.

Parts of Sphygmomanometer

Objective:

To measure the ABP in human.

Materials and instruments:

1- Sphygmomanometer.

2- Stethoscope.

3- Human arm.

Procedure

1- Subject be relaxed, sitting or lying for 5 min.

2- Manometer is placed at level of observer's eyes.

3- All clothing should be removed from upper arm.

4- The arm of subject should be supported .

5- Inflatable arm cuff is applied around the upper arm not too tightly, usually taken in left arm.

procedure

6- The bell or diaphragm of stethoscope is placed slightly on the brachial artery. Don’t put too much pressure on bell that may occlude arterial flow.

7- Cuff is inflated by a rubber squeeze bulb to pressure above expected SBP (no sound is heard) 20 to 30 mmHg.

9- The pressure in the cuff is lowered slowly to hear soft sound by open release valve.

procedure

pressure falls at 2 -3 mmHg per second.

10-When the first sound (step 1 of Korotkoff's sound) is heard, the SBP is measured.

11-When the sound disappears, at this level DBP is measured in adult or listen for a muffled sound (phase 4 of korotkoff's sound)

12-Wait 1-2 min before repeating pressure on the

same arm


22-32cm
DATE
SYS
DIA
PUL
WHO
S
M

Radial pulse

Examination of the peripheral pulses

-A pressure wave (pulse) can be felt particularly where the arteries are superficial and pass over bone.

- The peripheral pulses can be examined from the radial,brachial,carotid,femoral,popliteal,dorsalis paedis and temporal arteries.

Factors effect

1-age

2-sex (F < M)

3-fever

4-emotion

5-time (autonomic recovery…)

6-posture (standing, sitting.)

7- exercise

Factors effect

Normal findings

Pulse Rate min/90 – 50

➢Tachycardia? Is a rapid,above normal,

➢Bradycardia? is a slower than normal heart rate.

Thank You