Measurement of arterial blood pressure

Practical Physiology

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MSc Oral physiology

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

- In young adult human the ABP fluctuates between systolic levels of 120 mmHg, and a diastolic level of 80 mmHg. The ABP is written as systolic pressure over diastolic pressure (120/80 mmHg).

Measurement of ABP:

- 1- **Direct method**: - A cannula or needle filled with anticoagulant is inserted in artery. Then it is connected to the manometer.

- 2- **Indirect method**:

- Auscultatory method:

- **B- Auscultatory method:** It is standard method of taking a patient blood pressure by use technique developed by Korotkoff in 1905. The arterial pressure in human is routinely measured by this method by using instrument which is called a sphygmomanometer.

The number of precautions must be observed:-

1- **The cuff must be at heart level**

2- Using standard arm cuff A cuff that is too small will produce a falsely high reading; one that is too large, a falsely low reading.

3- Compare blood pressure in both arms, when examining an individual for first time. Presences of difference between them indicate vascular obstruction.

4- Tell the subject not to talk during measurement of pressure.

5- A void using an arm with I.V, edema, injury or paralysis.

6- Smoking and drinking alcohol within last 15 minutes alter reading.

7- Pain, anxiety and discomfort give a falsely high pressure.

Sphygmomanometer: -

1- Graduated vertical limb which open to atmosphere. It has marking from 0 – 250 mmHg from below upward.

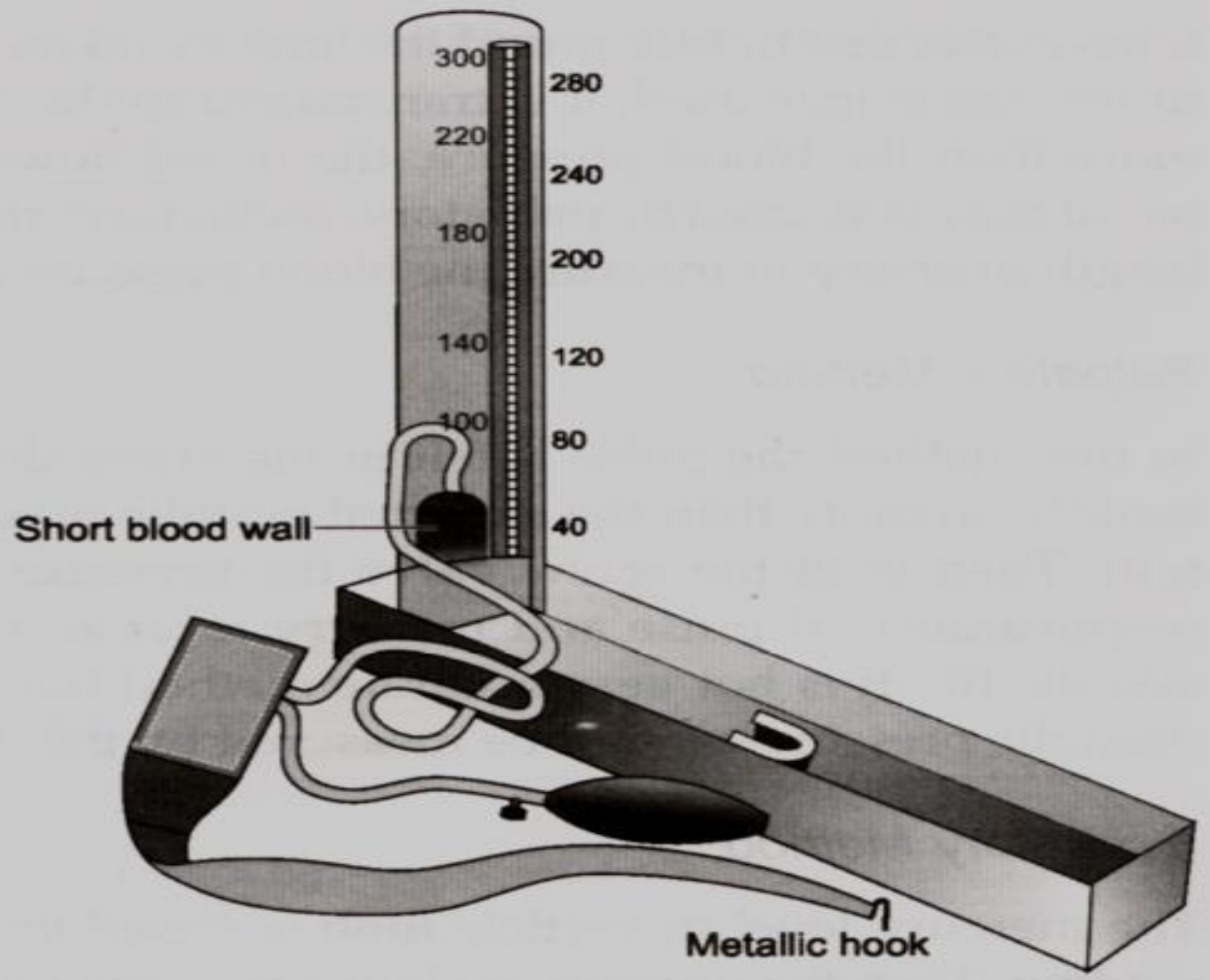
2- Rubber bag covered with linen cuff. **See figure 4-3**.

3- Rubber bulb with valve.

4- Release screw.

5- Mercury reservoir.

6- Rubber tub


300
220
180
140
100
280
240
200
120
80
40
Short blood wall
Metallic hook

Objective:-

To measure the ABP in human.

Materials and instruments:-

1- Sphygmomanometer.

2- Stethoscope.

3- Subject.

Procedure :

1- Subject should be relaxed, sitting or lying for five minutes.

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

3- All clothing should be removed from upper arm.

4- Inflatable arm cuff is applied around the upper arm not too tightly, leaving one to two inches between the lower end and the cubital fossa, at level of heart.

5- Cuff is connected with a mercury or aneroid manometer.

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

7- Cuff is inflated by a rubber squeeze bulb to pressure above expected SBP (no sound is heard) 20 to 30 mmHg. Wait 15 – 30 seconds.

8- The pressure in the cuff is lowered slowly to hear soft sound by open release valve. So pressure falls at 2 -3 mmHg per second.

9- When the first sound (step 1 of Korotkoff's sound) is heard, the SBP is measured. Listen for the onset of at least two consecutive beats.

10- When the sound disappears, at this level DBP is measured in adult.

11- Wait 1 - 2 minutes before repeating pressure on the same arm.