Session No. 6

Pulse Rate & Arterial blood pressure Measurement

The pulse gives an idea about the condition of the vessel walls and amount of variation of pressure of the contained blood, therefore state of the heart and circulation may be obtained. Your pulse is the rate at which your heart beats. As your heart pumps blood through your body, you can feel a pulsing in some of the blood vessels close to the skin's surface.

Examination of pulse:

Arterial pulse may be examined in the radial, brachial, femoral, posterior tibial and dorsalis pedis. Examination of radial pulse is more commonly practiced, figure (1 a, b).

Feel the pulse (palpate) by placing two or three fingers on the radial artery. Do not use the thumb. Forearm is pronated and the wrist slightly flexed.

Pulse Rate: count beats for not less than 1/2 minute. The rate is accelerated (tachycardia), by emotion, exercise, fever, and atrial fibrillation. The rate is slowed (bradycardia) in heart block. The typical pulse of healthy adult man should be at rate of 72/min.

Figure (1, a)

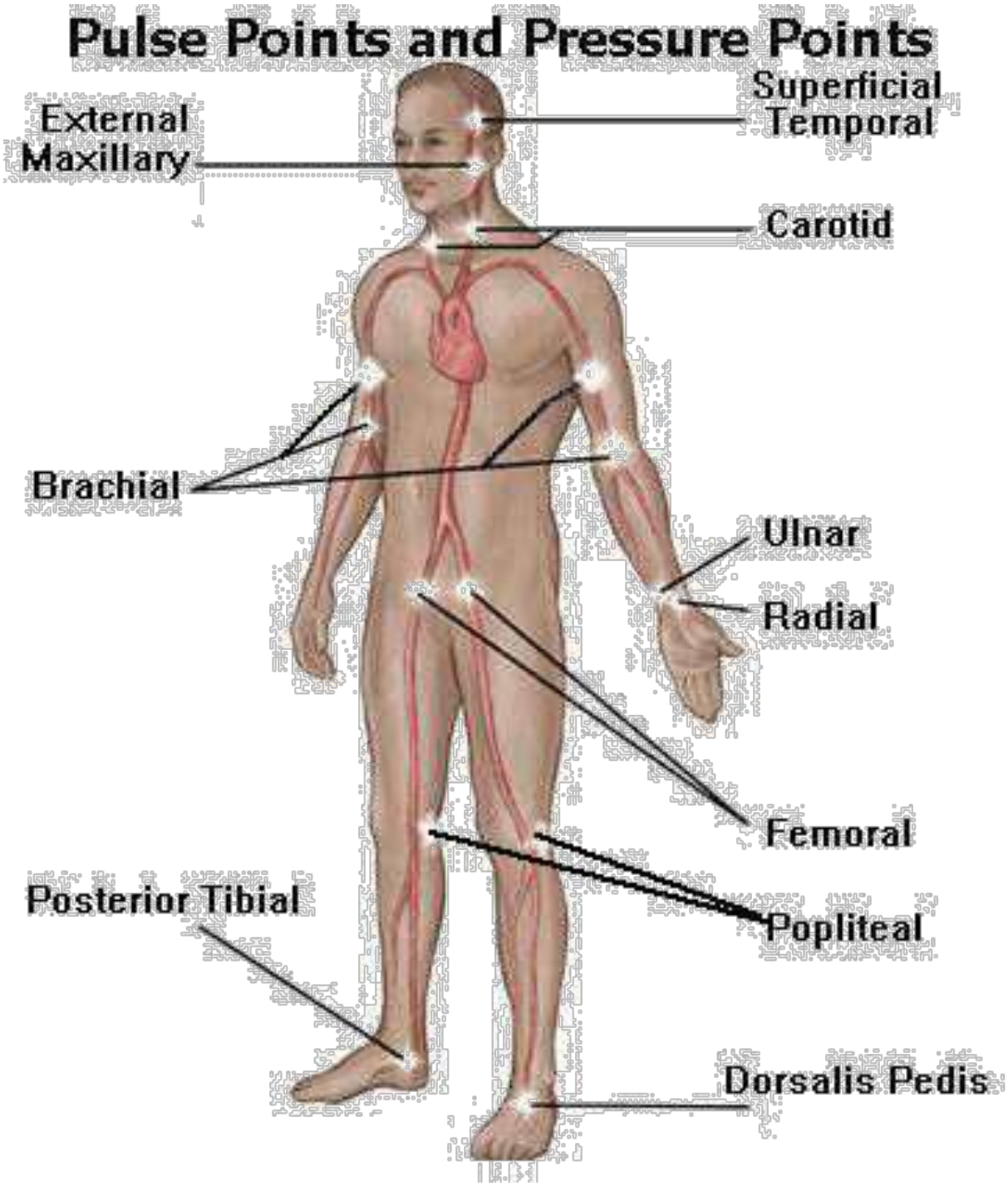

Figure (1, b)

Part Two: Arterial blood pressure

Blood pressure is defined as the pressure exerted against any unit area of the blood vessel walls and is generally measured in arteries. Because the heart contracts and relaxes, the resulting rhythmic flow of blood into the arteries causes the blood pressure to rise and fall during each beat. There are two types of blood pressure (recorded in millimeters Mercury (mm Hg)) Figure (2)

1. **The systolic pressure:** is the pressure in the arteries at the peak of ventricular ejection. When your heart beats, it squeezes and pushes blood through your arteries to the rest of your body. This force creates pressure on those blood vessels, and that's your systolic blood pressure. The diastolic pressure: it reflects the pressure during the ventricular relaxation.

2. **The diastolic reading**, or the bottom number, is the pressure in the arteries when the heart rests between beats. This is the time when the heart fills with blood and gets oxygen. For example, if the systolic blood pressure is 120 and the systolic blood pressure is 80, the blood pressure is expressed as 120/ 80 (120 over 80).

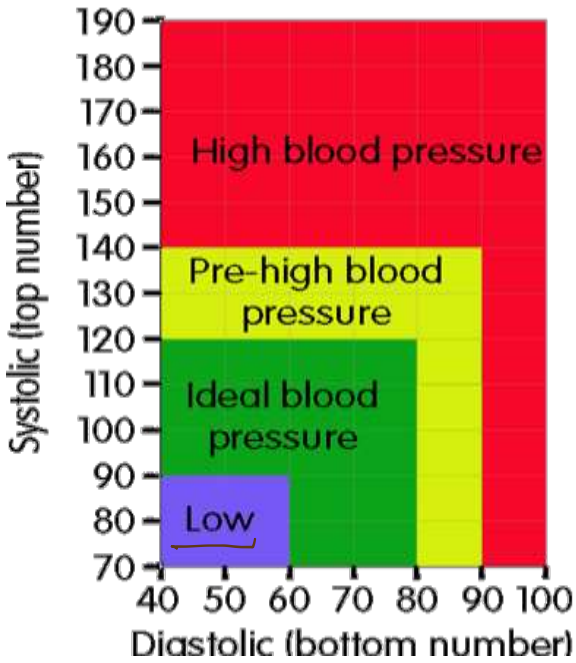

Figure (2)

Abnormal blood pressure values:

1. **Hypertension**: if the systolic pressure > 140 mm Hg or the diastolic pressure > 90 mm Hg.
2. **Hypotension**: if the systolic pressure < 90 mm Hg or the diastolic pressure < 60 mm Hg.

Materials:

1. Stethoscope.
2. Sphygmomanometer (mercury, inflatable cuff, pulb).

Procedure:

The blood pressure is estimated mainly by a sphygmomanometer and stethoscope (auscultatory method).

1. Clean the earpieces of the stethoscope with alcohol swab, and check the cuff for the presence of trapped by compressing it against the laboratory table.

2. The subject should sit in a comfortable position with one arm resting on the laboratory table (approximately at the heart level if possible).
3. Wrap the cuff around the subjects' elevated arm, just above the elbow, with the inflatable area on the medial arm surface (over the **brachial** artery) (figure 3). Secure the cuff by tucking the distal end under the wrapped portion or by bringing the Velcro areas into position.
4. Palpate the brachial pulse and lightly mark its position with a felt pen. Place stethoscope diaphragm over the pulse point. The cuff should not inflate for more than one minute.
5. Inflate the cuff to approximately 160-mm Hg pressure, and slowly release the pressure valve. Watch the pressure gauge as you listen carefully for the **first soft** thudding sounds of the blood spurting through the partially occluded artery. Note this pressure (**systolic** pressure), and continue to release the cuff pressure. You will notice first an increase, then a muffling, of the sound.

Note: Make two blood pressure determinations, and record your result below.

Effect of various factors on blood pressure:

Many factors—age, weight, time of day, exercise, body position, emotional state, and various drugs for example alter blood pressure

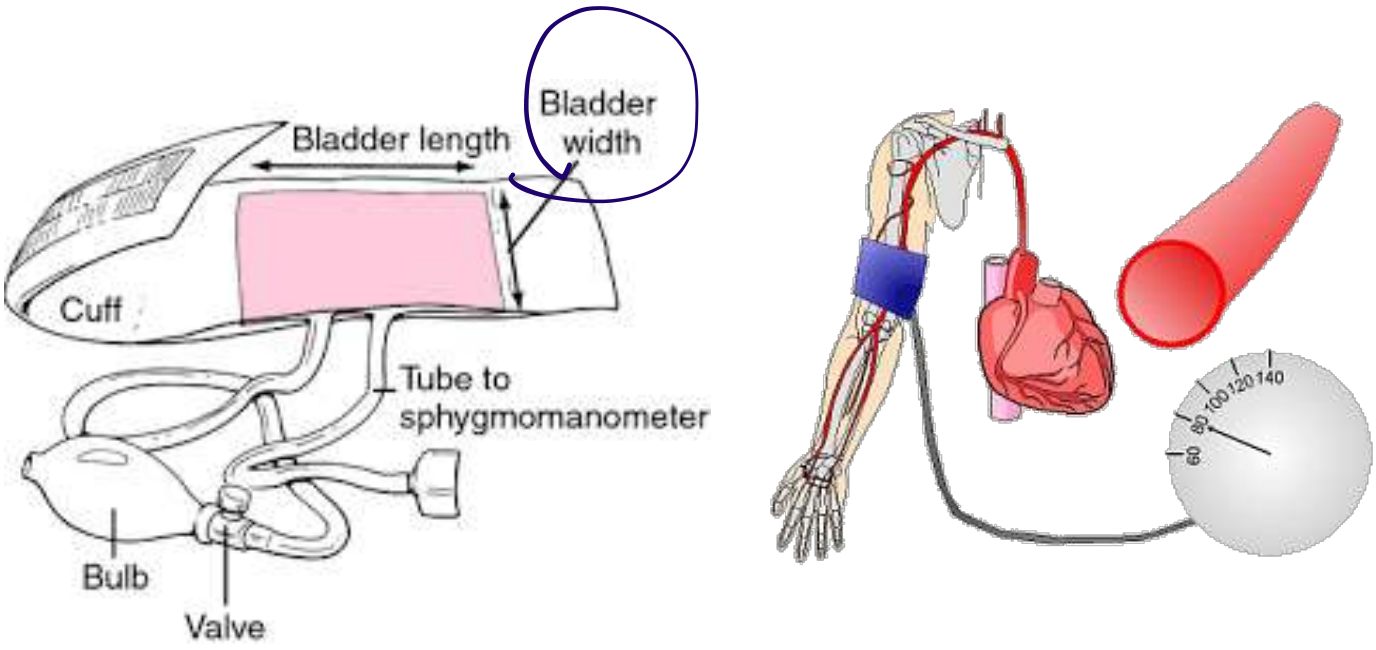

Figure (3): Sphygmomanometer