Blood Pressure Measurement

Due Date: 14/05/2018

Procedure

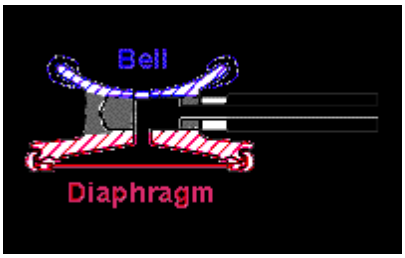
The relaxed subject sits on a chair with the lower arm supported as before. The blood pressure cuff is placed on the subject's right arm, allowing 1 inch between the bottom of the cuff and the crease of the elbow. **Figure 1** The brachial pulse was palpated just above the angle of the elbow (the "antecubital fossa")

One group member puts on a stethoscope, with the earpieces on the headpiece angled forward. The recording end of the stethoscope was twisted, so that the diaphragm and not the bell was activated. This can be

tested by tapping lightly on the diaphragm.

Figure 2

a. 

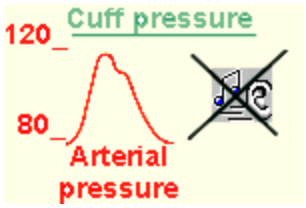
b. 

The diaphragm was placed over the brachial artery in the space between the bottom of the cuff and the crease of the elbow (**Figure 2 a**). At this point no sounds should be heard; **b**. diaphragm.

The cuff pressure was inflated quickly to a pressure about 30 mm Hg higher than the systolic pressure determined by the method of palpation (**Figure 3 a**).

Then the air 2 was let out of the cuff at a rate such that cuff pressure falls at a rate of about 5 mm Hg/sec. At some point the person listening with the stethoscope was begin to hear sounds with each heartbeat. This point marks the systolic pressure. The sounds are called Korotkoff sounds; as the pressure is lowered further, the character of the Korotkoff sounds should change. At some point, the sounds will disappear (**Figure 3 b**). The pressure reading at this point gives the diastolic pressure (**Figure 3 c**).

Figure 3 Cuff relative blood pressures and Korotkoff sounds

a. 

b. 

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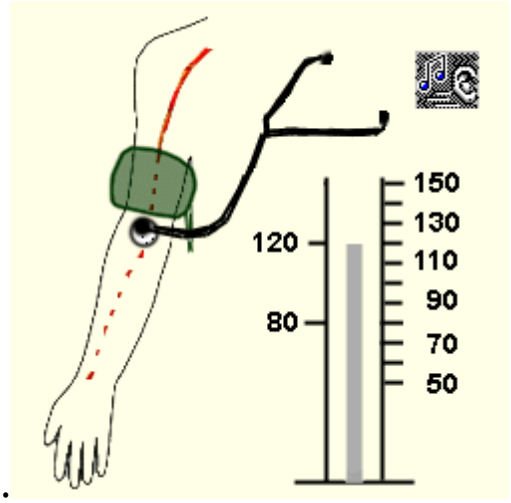
c. 

Summary of the auscultatory method

Initially the cuff was inflated to a level higher than the systolic pressure. Thus the artery was completely compressed, there was no blood flow, and no sounds were heard. The cuff pressure was slowly decreased. At the point where the systolic pressure exceeds the cuff pressure, the Korotkoff sounds were first heard and blood passes in turbulent flow through the partially constricted artery. Korotkoff sounds was continue to be heard as the cuff pressure is further lowered. However, when the cuff pressure reaches diastolic pressure, the sounds disappear. Now at all points in time during the cardiac cycle, the blood pressure was greater than the cuff pressure, and the artery remains open.

Result:

Roll no.	NAME	Gender	Age	Height (cm)	Weight (kg)	Systolic Pressure (mmHg/kPa)	Diastolic Pressure (mmHg/kPa)	Pulse Pressure (mmHg/Kpa)	Pulse rate (Beats/min
916905004	Andy	Male	20	170	70	120	79	41	70

Discussion:

Why we firstly select Right arm to check blood pressure?

The answer is simple that we have heart on left side and the flow of blood is higher in right arm as compared to left arm.

Why is the first sound Systolic and second diastolic?

The first heart sound is produced by vibrations generated by closure of the mitral (M_1) and tricuspid valves so it is systolic sound.

The second heart sound is produced by the closure of the aortic and the pulmonary valves at the end of systole. The laminar flow that normally occurs in arteries produces little vibration of the arterial wall and therefore no sounds. However, when an artery is partially constricted, blood flow becomes turbulent, causing the artery to vibrate and produce sounds.

When measuring blood pressure using the auscultation method, turbulent

blood flow will occur when the cuff pressure is greater than the diastolic pressure and less than the systolic pressure. The "tapping" sounds associated with the turbulent flow are known as Korotkoff sounds. Remember that these sounds are not to be confused with the heart sounds produced by the opening and closing of the heart valves

Errors in blood pressure readings:

1. The cuff was not of the proper size: if the cuff was too small the blood pressure readings may be artefactually high. If the cuff was too big, the readings may be artefactually low.

2. The cuff was positioned too loosely: the blood pressure may be artefactually high.

3. The center of the cuff bladder was not positioned over the brachial artery.

4. The cuff was inflated slowly: a slow inflation causes venous congestion, which in turn causes the Korotkoff sounds to be faint; this result in false readings with the systolic value being too low and the diastolic reading too high.

5. If the cuff was re-inflated immediately after an initial reading (trying to re-check the reading): a rapid re-inflation could cause venous distension, the Korotkoff sounds become more muffled. The initial

Korotkoff sound may be missed so the systolic reading would be falsely low, and the diastolic reading would be falsely high because the last Korotkoff sounds could not be heard.

Reference:

- ✓ Principles for clinical medicine
- ✓ Medical physiology
- ✓ Guyton and hall