**Power to the Patient: Learning to take Blood Pressure**

*1. Palpatory Method*

1. Have the subject seated, with his or her arm resting on a table.  Wrap the pressure cuff snugly around the bare upper arm, making certain that the inflatable bag within the cuff is placed over the inside of the arm where it can exert pressure on the brachial artery.  Wrap the end of the cuff around the arm and tuck it into the last turn, or press the fasteners together to secure the cuff on the arm.  Close the valve on the bulb by turning it clockwise.
2. With one hand, palpate (feel) the radial pulse in the wrist.  Slowly inflate the cuff by pumping the bulb with the other hand and note the pressure reading when the radial pulse is first lost.  Then increase the pressure to around 20 mm Hg above this point.  Slowly reduce the pressure in the cuff by turning the valve counterclockwise slightly to let air out of the bag.  Note the pressure when the radial pulse first reappears.  This is systolic blood pressure, the highest pressure in the systemic artery.
3. Let all the air out of the cuff, allow the subject to rest, and then run a second determination.  Do *not*leave the cuff inflated for more than 2 minutes, because it is uncomfortable and will cause a sustained increase in blood pressure.
4. The systolic pressure recorded with the palpatory method is usually around 5 mm Hg lower than that obtained using the auscultatory method.  A major disadvantage of the palpatory method is that it cannot be used to measure the diastolic pressure.

*2. Auscultatory Method*

In the auscultatory method, the pressure cuff is used as in the palpatory method, and a stethoscope is used to listen to change in sounds in the brachial artery.

1. Place the bell of the stethoscope below the cuff and over the brachial artery where it branches into the radial and ulnar arteries (Figure 17.2). Use your fingers, rather than your thumb, to hold the stethoscope over the artery; otherwise you may be measuring the thumb arterial pressure rather than the brachial artery pressure.  With no air in the cuff no sounds can be heard.
2. Inflate the cuff so the pressure is above diastolic (80-90 mm Hg), and you will be able to hear the spurting of blood through the partially occluded artery.  Increase the cuff pressure to around 160 mm Hg; this pressure should be above systolic pressure so that the artery is completely collapsed and no sounds are heard.
3. Now, open the valve and begin to slowly lower the pressure in the cuff.  As the pressure decreases you will be able to hear four phases of sound changes; these were first reported by Korotkoff in 1905 and are called Korotkoff sounds.
   * Phase 1. Appearance of a fairly sharp thudding sound that increases in intensity during the next 10 mm Hg of drop in pressure.  The pressure when the sound first appears is the systolic pressure.
   * Phase 2. The sounds become a softer murmur during the next 10 to 15 mm Hg of drop in pressure.
   * Phase 3. The sounds become louder again and have a sharper thudding quality during the next 10 to 15 mm Hg of drop in pressure.
   * Phase 4. The sounds suddenly become muffled and reduced in intensity.  The pressure at this point is termed the diastolic pressure.  This muffled sound continues for another drop in pressure of 5 mm Hg, after which all sound disappears.  The point where the sound ceases completely is called the end diastolic pressure.  It is sometimes recorded along with the systolic and diastolic pressures in this manner: 120/80/75.

A. Postural Effects on Blood Pressure

Measure your partner's blood pressure by *Auscultatory Method* while she or he is lying down (supine), sitting, and standing.  Record your results and think about what might cause the changes in pressure that accompany these changes in body position.

B. Blood Pressure During *Exercise*

This test examines the short-term effects of exercise on blood pressure.

Note – The subject should be in good health, with no known cardiovascular or respiratory problems.

1. Have the subject sit comfortably.
2. Record the systolic and diastolic blood pressure every 5 minutes until a constant level is obtained.
3. Have him or her run up and down several flights of stairs, and then return to the sitting position.
4. Obtain and record the blood pressure immediately, then every minute for 5 minutes.
5. Think about what might cause the changes in pressure that accompany these changes in physical activity.

*C.* Cold Pressor Test and Blood Pressure

This test is used to demonstrate the effect of a sensory stimulus (cold) on blood pressure.  A normal reflex response to such a cold stimulus is an increase in blood pressure (both systolic and diastolic).  In a normal individual the systolic pressure will rise no more than 10 mm Hg, but in a hypertensive individual the rise may be 30 to 40 mm Hg.

1. Have the subject sit down comfortably or lie supine.
2. Record the systolic and diastolic blood pressure every 5 minutes until a constant level is obtained.
3. Immerse the subject's free hand in ice water (approximately 5 °C) to a depth well above the wrist.
4. After a lapse of 10 to 15 seconds, obtain the blood pressure every 20 seconds for 1 or 2 minutes and record.  If there is insufficient time to obtain both systolic and diastolic pressure, just measure the systolic value.
5. Think about what might cause the changes in pressure that you observed.