



Lab A2-1 Blood Pressure Measurement

Blood pressure is the force exerted by blood against the walls of arteries and veins. It is created by the pumping action of the heart. Blood pressure is measured in millimeters of mercury (mm Hg) and is expressed by two numbers—120/80, for example. The higher number is systolic blood pressure, the maximum pressure that occurs when the heart contracts. The lower number is diastolic blood pressure, the pressure when the heart is relaxed between contractions.

Equipment

1. Sphygmomanometer (A sphygmomanometer consists of an inflatable bag inside a covering called a cuff, an inflating bulb, a manometer from which blood pressure can be read, and a valve that is used for deflation.)
2. Stethoscope
3. Chair
4. Table or other surface to support arm

Preparation

For the person being tested: Wear clothing that allows your upper arm to be bare. Avoid heavy exercise or eating prior to the test. Don't smoke or ingest caffeine for at least 30–60 minutes before being tested. Sit quietly for several minutes before the test begins.

Instructions

1. The subject should sit comfortably, with the arm slightly flexed, palm up, and the forearm supported at heart level on a table or other smooth surface. If such a surface isn't available, you will need to support the subject's forearm while you take the measurements.
2. Place the deflated cuff on the subject's upper arm, with the lower edge of the cuff about 1 inch above the inner elbow crease. The inflatable bag should rest on the brachial artery, which is on the inner part of the upper arm. The inflatable bag should encircle at least 80% of the arm; if it does not, use a larger sphygmomanometer.
3. Apply the stethoscope lightly to the arm, just at the inner elbow crease. Make sure the stethoscope doesn't touch the cuff or any of the tubing from the sphygmomanometer.
4. While watching the manometer and listening for pulse sounds through the stethoscope, inflate the bag about 30 mm Hg above the point at which pulse sounds disappear. (Inflating the bag closes off the blood flow in the brachial artery, causing the pulse sounds to stop.)
5. Slowly deflate the bag at a rate of about 3 mm Hg per second (or per heartbeat). As you release the pressure, pulse sounds will become audible, go through several changes in clarity and intensity, and then disappear again. You must listen carefully to the pulse sounds while you watch the readings on the manometer.
 - Systolic pressure is the point at which pulse sounds first become audible. You should hear faint but clear tapping sounds.
 - Diastolic pressure is the point at which the pulse sounds disappear.

(Note: If you are measuring blood pressure as part of an exercise test, the method for determining diastolic pressure is somewhat different. Sometimes during exercise the sounds are audible all the way down to 0 mm Hg. If this occurs, diastolic pressure is the point at which there is a definite change in the loudness of the sound—an abrupt muffling.)

(over)

LAB A2-I (continued)

6. Wait 1–2 minutes and then repeat the test. Record both results and indicate which arm was used for the measurements. For more accurate results, readings should be taken by several different people or on several different occasions.

Systolic	Diastolic		
_____	_____	___ Right arm	___ Left arm
_____	_____		

Blood Pressure Classification

Average the results of the two sets of measurements. Refer to the table below for the rating.

Average pressure: $\frac{\text{_____}}{\text{(systolic)}}$ / $\frac{\text{_____}}{\text{(diastolic)}}$ Classification: _____

Category ^a	Systolic (mm Hg)		Diastolic (mm Hg)
Normal ^b	Below 120	and	Below 80
Prehypertension	120–139	or	80–89
Hypertension ^c			
Stage 1	140–159	or	90–99
Stage 2	160 and above	or	100 and above

^aWhen systolic and diastolic pressure fall into different categories, the higher category should be used to classify blood pressure status.

^bThe risk of death from heart attack and stroke begins to rise when blood pressure is above 115/75.

^cBased on the average of two or more readings taken at different times. In persons older than 50 years, systolic blood pressure greater than 140 is a much more significant CVD risk factor than diastolic blood pressure.