
Circulatory and Respiratory Unit: Measuring Blood Pressure & Pulse in 3 positions

Introduction

When you stand, blood tends to collect in the lowest parts of the body. Without something to counteract it, you will faint. Fortunately, blood within the circulatory system is under pressure that is high enough to counteract the force of gravity and allow blood to reach your brain even when you are standing.

Materials (groups of 4)

- Stethoscope
- Alcohol wipes
- Sphygmomanometer
- Stopwatch

Procedure

Practice run (practice steps #2- #10, one to two times before you record actual numbers)

1. Assign each group member a role: subject, person to measure heart rate, person to measure pulse, and a recorder
2. Have the subject sit quietly with feet flat on the floor for 3 minutes
3. Roll up the subject's shirtsleeve. Attach the cuff of the sphygmomanometer snugly around the upper arm.
4. Wipe the stethoscope clean with an alcohol wipe then place the stethoscope directly below the cuff in the bend of the elbow joint..
5. Close the valve of the bulb by turning it clockwise. Pump air into the cuff until the pressure gauge goes a little past 200 mm Hg but not above 250 mm Hg.
6. Turn the valve of the bulb, counterclockwise & slowly release the air from the cuff. Listen for a pulse.
7. When you first hear the heart sound, note the pressure on the gauge. This is the ***systolic pressure***.
8. Continue to slowly release air & listen until the clear thumping sound of the pulse becomes strong and then fades. The last full heart beat, is the diastolic pressure.
9. Blood pressure should be measured within one minute.
10. Using the index & middle finger, the pulse-taker locates the subject's pulse by applying light pressure to the wrist to measure heartbeat. Pulse should be counted in 30 seconds.

Procedure

- Repeat the steps #2-10
- You will take the subjects blood pressure & pulse reading for three positions; sitting, standing and lying down.
- The pulse rate measurer counts the number of pulse beats for 30 seconds then multiplies that number by 2 and calls out the number to the recorder. (Heart rate is expressed as pulse beats per minute)
- Simultaneously, the blood pressure measurer takes measurements for 1 minute and calls out the diastolic & systolic values to the recorder.



Data

Heart Rate

	Beats/30 seconds	Beats/1 minute
Sitting		
Standing		
Lying		

Blood Pressure

	Diastolic (mm Hg)	Systolic (mm Hg)
Sitting		
Standing		
Lying		

Analysis

Graph your data on two bar graphs one for blood pressure & one for heartbeats

Questions

1. How does blood flow to the brain if a person is standing?
2. How does lying down or sitting affect the flow of blood, the blood pressure and the heart rate?
3. How does gravity affect blood flow & blood pressure?

