

Cardiovascular System Lab – Part 2

Blood Vessels and CV Physiology

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Blood Vessels

Microscopic structure of blood vessels

Utilizing the cardiovascular system board:

Examine walls of arteries and veins in the CV board. Describe the principle components of the blood vessel wall tunics.

1. tunica interna
2. tunica media
3. tunica externa

How do the tunics of arteries and veins differ?

Why do arteries have a thicker tunica media?

Describe the composition of capillary walls.

Utilizing the Viewmaster Set 68 – Circulatory System:

Examine the various perspectives of Set 68 and compare them with the descriptions put forth in the preceding section. Drawing optional.

- 3) Cross-section of artery and vein
 - The three tunics of the artery wall are clearly visible
 - The tunics of the vein are thinner and less obvious
 - Why are the walls of veins thinner?
 - Which layer(s) is/are thinner in veins?
- 8) Aortic semilunar valve
 - This three-flap valve can be found between the base of the aorta and the _____ ventricle.
 - The aortic semilunar valve prevents backflow of blood into the _____

Pathway of Blood

Utilizing the tall CV model that contains the kidneys, heart, and many blood vessels:

Obtain a 3-dimensional perspective of the cardiovascular system using this model. Be sure to view the CV system from angles other than straight ahead. Pay close attention to the size and pathway of the aorta as it travels up, down, and out from the heart. Also observe how the entire venous system eventually ends up in the superior and inferior vena cavae and finally the right atrium

Cardiovascular Physiology

Heart sounds

Auscultating (listening to) heart sounds with a stethoscope

- Obtain a stethoscope and clean the earpieces with an alcohol wipe. Allow to dry.

- Don the stethoscope. Place the diaphragm of the stethoscope on your partner's thorax, just medial to the left nipple. Listen carefully for heart sounds.
 - NOTE: *Heart sounds are best auscultated if the subject's outer clothing is removed, so a male subject is preferable.*
- Record the number of beats in thirty seconds. Double this value to determine beats per minute.

_____ beats/30sec translates to _____ beats/minute

The Pulse

Define pulse _____

- Determine a subject's pulse by palpating two different superficial pulse points
 - Use the pads of your fingers to better feel the alternating expansion and contraction that characterizes the alternating surges of pressure of the pulse
- Record the number of pulses in thirty seconds. Double this value to determine pulses per minute.

_____ pulses/30sec translates to _____ pulses/minute

- How does the pulse rate compare with the heart rate recorded earlier?
- Identify the pulse points you palpated.

Blood pressure determinations

Utilizing a sphygmomanometer and a stethoscope, measure your partner's blood pressure via the auscultatory method

- Subject should sit comfortably with one arm at roughly heart level
- Wrap the cuff snugly around the upper arm
- Inflate the cuff to stop blood flow to the forearm
 - Inflate the cuff to about 180 mmHg
- Gradually release the cuff pressure using the release valve
- Examiner listens with a stethoscope over the brachial artery for characteristic sounds of Korotkoff, which indicate a resumption of blood flow into the forearm
- Pressure at which the first soft tapping sounds are heard is recorded as the systolic pressure
- As the pressure is reduced further, blood flow becomes more turbulent and louder
- Below the diastolic pressure, when the artery is no longer compressed, blood flows freely and the sounds of Korotkoff can no longer be heard.
 - Diastolic pressure is recorded as the point where the sounds disappear
- Record your blood pressure reading
 - Systolic pressure/Diastolic pressure _____/_____

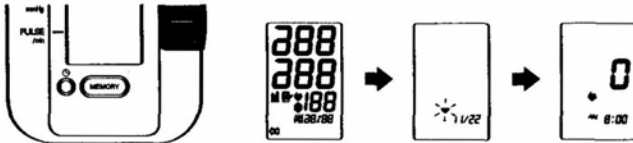
Verification of Blood Pressure and Pulse Readings

AFTER measuring your pulse rate by palpation and your blood pressure with a sphygmomanometer and stethoscope, double check both readings using the *Omron HEM 432CN Manual Blood Pressure Monitor* at a location to be designated by the instructor.

TAKING A MEASUREMENT

1. Press the ON/OFF button

All display symbols appear on the screen.



NOTE: When the monitor completes the necessary preparations before measurement, the Heartbeat Symbol (♥) appears next to the zero. Wait for the Heartbeat Symbol (♥) before taking a measurement.

2. Begin inflating the cuff by rapidly squeezing the inflation bulb until you have reached approximately 30-40 mmHg higher than your normal systolic reading. If your normal systolic blood pressure is unknown, inflate the cuff to 180 mmHg.

NOTES:

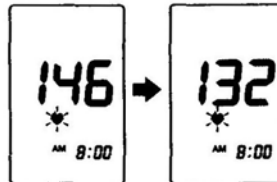
- Do not inflate the arm cuff more than necessary. The current time continues to be displayed while the cuff is being inflated.
- Do not inflate higher than 299 mmHg.

3. When the desired pressure has been achieved, release the inflation bulb.

4. Inflation stops and the measurement is started.

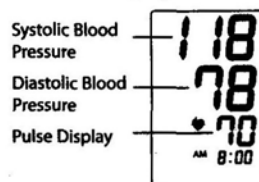
As the cuff deflates, decreasing numbers appear on the display. The Heartbeat Symbol (♥) flashes at every heartbeat.

NOTE: If the re-inflation symbol (▲) appears, squeeze the inflation bulb to re-inflate the arm cuff.



5. When the Deflation Symbol (♥) appears on the display, press the Air Release Button to release the air left in the cuff.

6. The measurement is complete, the Heartbeat Symbol (♥) stops flashing and your blood pressure and pulse rate are displayed.



7. Press the ON/OFF button to turn the monitor off.

NOTE: The monitor will automatically turn off after five minutes.

Systolic/Diastolic _____ / _____




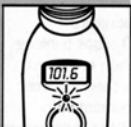



Body Temperature

At a location to be designated by the instructor, measure your core body temperature with the *Philips SensorTouch HF370 Temple Thermometer*.

The measurement of the blood temperature in a main artery accurately reflects the true body temperature. This instrument is designed to measure temperature directly via the skin surface over the temporal artery. The temporal artery, a branch of the carotid artery, is the only artery with constant blood flow positioned very close to the skin surface. This thermometer has been clinically tested in major university hospitals, with readings proven to be as accurate as rectal measurements.

“Normal temperature” varies between individuals, the time of day, activity before measurement and room temperature. A temperature between 97.5F and 99.5F is considered normal with this instrument.

NOTE: Wait 5 minutes before taking the temperature of a person who has been out in the cold or subject to physical exertion to allow the skin to equilibrate. Sweating causes extra cooling of the skin and results in a low reading.

HOW TO TAKE A TEMPERATURE	
	1 Remove protective cap before use. Place the thermometer in your hand as shown with your thumb on the Soft Touch button. ▶ Do not press the button yet.
	2 Gently position the sensor flush on center of the forehead, midway between eyebrow and hairline. Press and release the ON/OFF button. ▶ Wait until the sensor is flush against the forehead before pressing the button, if not, the thermometer will beep and display “—”.
	3 Slowly slide the thermometer across the forehead, keeping the sensor flat and in contact with the skin until you have reached the area at the top of the ear. ▶ You will hear beeping and the LEDs will blink to indicate a measurement is taking place. ▶ Be careful not to keep the sensor on one spot for too long, the thermometer will indicate that the measurement has been completed before you have reached the temporal artery.
	4 After the long beep when the red LED remains on, the measurement is complete and the thermometer may be removed from the head.
	5 Read the temperature on the display, then press the button lightly to turn the thermometer off. ▶ The thermometer will automatically turn off after 30 seconds if you forget to do so. ▶ To take another temperature at any time, simply press the button and repeat the process.
	6 The thermometer does not require cleaning after every reading, but like a camera lens, it should always be kept clean. To clean, point the sensor downwards, and gently wipe with a cotton swab or soft cloth moistened with rubbing alcohol or water. ▶ Do not use a paper towel or abrasive cleaners.
	7 Place the protective cap on thermometer to protect the sensor when not in use.

- Record your average core body temperature _____