

Lab 7 Heart rate and blood pressure

Name _____

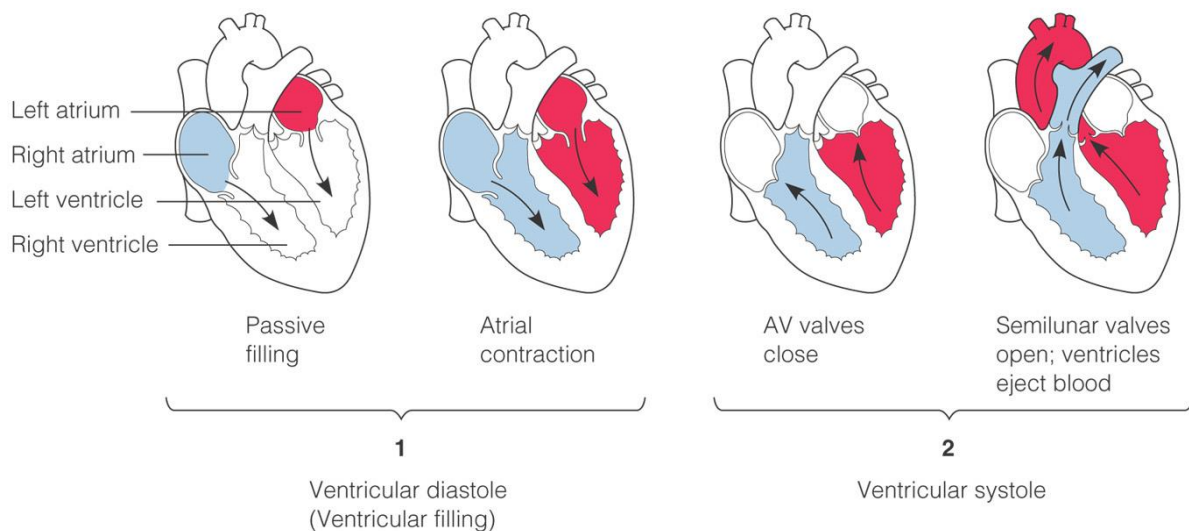
Seat number ____

Objectives:

- A. Background on heart beats
- B. Heart rate measurement by stethoscope
- C. Heart rate measurement by hand
- D. Heart rate after exercise
- E. Measuring blood pressure
- F. Questions

A. Background on heart beats

During the cardiac cycle, first the atria contract and then the ventricles contract.



There are usually two heart sounds with each heartbeat. The first sound, LUB, is low, dull and lasts longer than the second sound. The LUB sound is caused by the closing of the AV valves following ventricular contraction. The second sound, DUP, follows the first sound after a brief pause. The sound has a snapping quality of higher pitch that is louder and of shorter duration. The DUP sound is caused by the semilunar valves following ventricular contraction.

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B. Heart rate measurement by stethoscope

1. Obtain a stethoscope and properly position the earpieces to POINT FORWARD. Place the bell of the stethoscope on the left side of your partner's chest between the fourth and fifth ribs.
2. Count the heartbeats for 15 seconds and then multiply by 4
_____ × 4 = _____ bpm (beats per minute)
3. Have your partner measure your heart rate in the same manner
4. Record the heart rates in the table below.

Heart Rate BPM

Method	Partner	Self
Stethoscope		
Pulse rate		

C. Heart rate measurement by hand

1. Position the fingers (not thumb) of one hand over the radial artery (thumb side) of your partner to measure the pulse rate.
2. Count the pulse for 15 seconds and multiply by 4.
3. Do this for yourself and your partner and add it to the table above.

D. Heart rate measurement after exercise

Use the pulse method to determine the heart rate after exercise. Jump on one foot 30 times and then the other for 30 times and then measure your heart rate. Or you can run up and down the stairs. Please do this OUTSIDE for noise purposes. Take a 15 second pulse and then multiply by 4 to get BPM.

Comparison of Heart Rate Before and After

	partner	self
Before exercise		
After exercise		

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E. Measuring blood pressure

Obtain a partner, a sphygmomanometer and a stethoscope. Try and choose a partner whose arm is not too small or too large. The cuff of the sphygmomanometer will allow you to shut off the blood flow of the brachial artery. At this point, you will not hear any flow of blood in the artery. When you slowly release the pressure of the cuff, the first sound you hear will be due to the blood rushing through the artery during systole. This is the systolic pressure. Then as you continue to let air escape from the cuff, no more sounds will be heard. This is the diastolic pressure.

Follow these directions to get the BP of your partner

1. Wrap the cuff around the right upper arm. Allow the subject's arm to rest.
2. Close the valve on the rubber bulb.
3. Position the bell of the stethoscope just below the cuff. This is the lowest extremity of the brachial artery.
4. Pump air into the cuff by squeezing the bulb. Watch the pressure gauge. Allow the pressure to rise to 180 (mm Hg). PLEASE TAKE CARE here to leave the cuff on high pressure for the MINIMUM amount of time. Students should find the valve and work it and get familiar with it before inflating the cuff on their partner.
5. Turn the valve so that the pressure is released slowly. Listen carefully as you watch the pressure fall. Note the pressure of this first sound will be the systolic pressure.
6. Continue listening as the pressure falls. When you hear no more sounds, note the pressure on the gauge; this will be the diastolic pressure.
7. Record these pressures in the table below.

Blood pressure

	partner	self
Systolic		
Diastolic		

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F. Questions:

- 1) Which of the two sounds, LUB or DUP is louder? _____
- 2) Are the heart rates the same, regardless of the method used to determine the heart rate? _____
Explain.
- 3) What is a typical heart rate for a healthy adult at rest? _____
- 4) Elite endurance athletes can have heart rates of 32-34 at rest. Why so low?
- 5) What is a heart murmur?
- 6) Have you ever noticed the automatic external defibrillators in public places? Should they only be used by a paramedic?
- 7) Name 2 reasons why your heart rate changes due to exercise.
- 8) Blood pressure is highest just after ventricle systole (contraction) and is lowest during ventricle diastole (relaxation and filling). Why? _____
- 9) What is a healthy adult BP? _____
- 10) What is the problem with hypertension?
- 11) Are there any problems with hypotension? (Google it)