Purpose of this lab: To examine the pulse, determine the pulse rate, measure blood pressure, and investigate the effects of body position and exercise on pulse rate and blood pressure.

Materials:
1. Textbook/iPad
2. Clock or watch with second hand
3. Sphygmomanometer
4. Stethoscope

Procedure A—Pulse Rate.
1. Using your notes or your textbook, complete Part A of your answer sheet.
2. Examine your lab partner’s radial pulse. To do this, follow these steps:
   a. Have your partner sit quietly, remaining as relaxed as possible.
   b. Locate the pulse by placing your index and middle fingers over the radial artery on the anterior surface of the wrist. Do not use your thumb for sensing the pulse because you may feel a pulse coming from an artery in the thumb itself.
   c. Note the characteristics of the pulse. That is, could it be described as regular or irregular, strong or weak, hard or soft?
   d. To determine the pulse rate, count the number of pulses that occur in 1 minute. This can be accomplished by counting pulses in 15 seconds and multiplying that number by 4.
3. Repeat the procedure and determine the pulse rate in each of the following conditions:
   a. immediately after standing
   b. 3-5 minutes after standing quietly
   c. immediately after 3 minutes of exercise (omit if the person has health problems).
   d. 3-5 minutes after exercise has ended.
4. Switch partners and repeat steps 2 and 3 above.
5. Complete Part B of your answer sheet.

Procedure B—Blood Pressure.
1. Measure your lab partner’s arterial blood pressure. To do this, follow these steps:
   a. Obtain a sphygmomanometer and a stethoscope.
   b. Clean the earpieces and diaphragm of the stethoscope with an alcohol wipe.
   c. Have your partner sit quietly with a bare arm resting on a table at heart level. Have the person remain as relaxed as possible.
   d. Locate the brachial artery at the above the elbow. Wrap the cuff of the sphygmomanometer around the arm so that its lower border is about 2.5 cm above the end of the elbow. Center the tube of the cuff in line with the brachial pulse.
   e. Palpate the radial pulse. Close the valve on the neck of the rubber bulb connected to the cuff, and pump air from the bulb into the cuff. Inflate the cuff while watching the sphygmomanometer and note the pressure when the pulse disappears. (This is a rough estimate of the systolic pressure.) Immediately deflate the cuff.
   f. Position the stethoscope over the brachial artery. Reinflate the cuff to a level 30 mm Hg higher than the point where the pulse disappeared during palpation.
g. Slowly open the valve of the bulb until the pressure in the cuff drops at a rate of about 2 or 3 mm Hg per second.
h. Listen for sounds (Korotkoff sounds) from the brachial artery. When the first loud tapping sound is heard, record the reading as the systolic pressure. This indicates the pressure exerted against the arterial wall during systole.
i. Continue to listen to the sounds as the pressure drops, and note the level when the last sound is heard. Record this reading as the diastolic pressure, which means the constant arterial resistance.
j. Release all of the pressure from the cuff.
k. Repeat the procedure until you have **two blood pressure measurements from each arm**, allowing 2-3 minutes of rest between readings.
l. Average your readings and enter them in Table 1 of Part C of your answer sheet.

2. Measure your partner’s blood pressure in each of the following conditions (Record results in Table 2 of Part C of your answer sheet):
   a. 3-5 minutes after standing quietly.
   b. immediately after 3 minutes of exercise (omit if the person has health problems).
   c. 3-5 minutes after exercise has ended.

3. Complete Part C of your answer sheet.
Pulse Rate & Blood Pressure Lab
Anatomy & Physiology

HYPOTHESIS: How do you think pulse and blood pressure will be affected by body position (sitting vs. standing) and exercise?

Part A. Complete the following statements:

1. Blood pressure is the force exerted against the _________________________________.

2. The term blood pressure is most commonly used to refer to systemic ________________________________ pressure.

3. The maximum pressure achieved during ventricular contractions is called____________________________ pressure.

4. The lowest pressure that remains in the arterial system during ventricular relaxation is called____________________________ pressure.

5. Blood pressure rises and falls in a pattern corresponding to the phases of the _____________________.

6. A pulse is caused by the _________________________________.

Part B.

1. Enter your observations of pulse characteristics and pulse rates in the table.

<table>
<thead>
<tr>
<th>Test Subject</th>
<th>Pulse Characteristics</th>
<th>Pulse Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 min. after Standing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 min. after Exercise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Summarize the effects of body position and exercise on the characteristics and rates of the pulse.

3. The time needed to return to a resting pulse rate is called cardiac recovery time. Why is cardiac recovery time lower in a finely tuned athlete than in a physically unfit person?

4. Explain why an athlete must exercise harder or longer to achieve a maximum heart rate than a person who is not as physically fit.

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**Part C.**

**Table 1. Initial Blood Pressure Measurements.**

<table>
<thead>
<tr>
<th>Reading</th>
<th>Blood Pressure in Right Arm</th>
<th>Blood Pressure in Left Arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Blood Pressure Measurements**

<table>
<thead>
<tr>
<th>Test Subject</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td></td>
</tr>
<tr>
<td>3-5 min. after Standing</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>3-5 min. after Exercise</td>
<td></td>
</tr>
</tbody>
</table>
1. Summarize the effects of body position and exercise on blood pressure.

2. Summarize any correlations between pulse rate and blood pressure from any of the experimental conditions.

3. What are some dangers of high blood pressure?

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Once you have completed the entire lab and answer sheet, you will be writing a formal lab report. Much of the information will come right from this lab/answer sheet.

**Please see “Formal Lab Report Expectations” under Unit 8 on class webpage for layout and contents of lab report**