Cardiac Vital Measurement Lab

In this activity, you will learn and practice many of the techniques used in the health/medical profession for assessing a patient's cardiac health.
By now you should know the difference between heart rate, blood oxygen saturation level, and systolic blood pressure and diastolic blood pressure.

*Form hypotheses (4 total), using if-then statements, for each measurement predicting the percent increase or decrease from resting to right after aerobic exercise. You may write this as one if-then statement as long as you predict all 5 measurements. *Form another hypothesis predicting how many seconds it will take your body to return to a normal pulse rate after exercise.
1. Create a data table in a spreadsheet.

2. Record your values while at rest (sit quietly for 5 minutes before taking the measurements):
   - pulse/heart rate (beats per minute)
   - blood pressure (systolic/diastolic)
   - oxygen saturation level (record %)

3. Exercise vigorously for at least 1 minute.

4. Sit down, start a timer, then measure your vitals and record.

5. Record how long (in seconds) it takes for your heart rate to return to resting value.

6. In your data table, include all members of your group plus one additional person from the class (the additional person may not be used by anybody else in your group).

7. In your spreadsheet data table, calculate the % difference from rest after exercise for each measurement:
   - \( R \) = Resting value
   - \( E \) = Value right after exercise

   \[ \frac{(E-R)}{R} \times 100 \] 
   Example 25% means your rate increase 25% over resting. -10% means you decreased 10% from resting.
<table>
<thead>
<tr>
<th>Blood Pressure Category</th>
<th>Systolic mm Hg (upper #)</th>
<th>Diastolic mm Hg (lower #)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>less than 120</td>
<td>and</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120 – 139</td>
<td>or</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 1</td>
<td>140 – 159</td>
<td>or</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 2</td>
<td>160 or higher</td>
<td>or</td>
</tr>
<tr>
<td>Hypertensive Crisis (Emergency care needed)</td>
<td>Higher than 180</td>
<td>or</td>
</tr>
</tbody>
</table>

From the American Heart Association
Lab Report (all parts required to be typed and computer generated):
• Your original Hypotheses
• Data Tables
• Graphs
• *Lab Analysis (follow the format used in class)
• Work Cited/Bibliography

*In the analysis, address the results by compare the average student results (% difference) and data range (min-max values) to your hypothesis.
**Graphs:**

Create 4 bar graphs, each comparing the results (% difference) for the students in your group:

- Heart Rate
- O₂ Saturation Level
- Systolic Blood Pressure
- Diastolic Blood Pressure

Make a 5th bar graph comparing the student result for:
- Time in Seconds to return to resting heart rate
Additional Questions:

- Describe the difference between heart rate and pulse rate. What is each measuring? Be specific.

- What is hypertension? Research and describe three harmful effects of long term hypertension in a human. Then, describe three contributing factors that cause hypertension. **Cite your source(s) within your analysis** then include a bibliography.

How to cite a source within your analysis:

According to the American Heart Association (2016), *your info goes here*.

or

*Your info goes here* (American Heart Association, 2016).

Use quotation marks if using a direct quote.

Works Cited/Bibliography


Hint: Use the Add On "Easy Bib" from the Google Add Ons.
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