ECG & PULSE

- *Mechanical Action of the Heart, Peripheral Pressure Pulse, and Plethysmography*

**DATA REPORT**

Student’s Name: ________________________________
Lab Section: ________________________________
Date: ________________________________

I. **Data and Calculations**

**Subject Profile**

Name: ________________________________  Height: __________
Age: __________  Gender: Male / Female  Weight: __________

A. **Comparison of ECG with Pulse Plethysmogram**

Complete Table 7.1 with data from three cycles from each acquired recording and calculate the Means.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Selected Area</th>
<th>Measurement</th>
<th>Cycle 1</th>
<th>Cycle 2</th>
<th>Cycle 3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Relaxed</td>
<td>R-R Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heart Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. Change</td>
<td>R-R Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heart Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arm Up</td>
<td>R-R Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heart Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Interval</td>
<td>DeltaT</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse Rate</td>
<td>BPM</td>
<td>CH 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. **Relative Volume Changes**

Complete Table 7.2 with data from each acquired recording.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Arm Resting</th>
<th>Temperature</th>
<th>Arm Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>QRS Amplitude CH1 P-P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Pulse Amplitude (mV) CH 40 P-P</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C. Calculation of Pulse Speed

Distance between Subject’s sternum and shoulder? ___________________ cm
Distance between Subject’s shoulder and fingertip? ___________________ cm
Total distance? __________________ cm

Data from ‘Arm relaxed’ recording of the recording (measure with I-Beam)
Time between R-wave and Pulse peak? ___________________ secs

Speed? __________________ cm/sec

Data from ‘Arm up’ recording of the recording (measure with I-Beam)
Time between R-wave and Pulse peak? ___________________ secs

Speed? __________________ cm/sec

II. Questions

D. Referring to data in table 7.1, are the values of heart rate and pulse rate similar for each condition? Yes / No
Explain why the values might differ or be similar.

E. Referring to Table 7.2 data, how much did the amplitude of the QRS complex change between conditions?
   Extreme temp – Arm Resting? __________ mV
   Arm up – Arm Resting? __________ mV

F. Referring to Table 7.2 data, how much did the pulse amplitude change between arm positions?
   Extreme temp – Arm Resting? __________ mV
   Arm up – Arm Resting? __________ mV

G. Referring to Table 7.2 data, does the amplitude of the QRS complex change with the pulse amplitudes? Why or why not?

H. Describe one mechanism that causes changes in blood volume to your fingertip.

I. Referring to data from section C of this report, how would you explain the difference in speed, if any?

J. Which components of the cardiac cycle (atrial systole and diastole, ventricular systole and diastole) are discernible in the pulse tracing?
K. Would you expect the calculated pulse wave velocities of other students to be very close if not the same as yours? Why or why not?

________________________________________________________________________

________________________________________________________________________

L. Explain any amplitude or frequency changes that occurred with arm position.

________________________________________________________________________

________________________________________________________________________

III. OPTIONAL Active Learning Portion

A. Hypothesis

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B. Materials

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________________________________________________________________________

C. Method

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________________________________________________________________________

D. Set Up

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E. Experimental Results

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