Exercise 5: Cardiovascular Dynamics: Activity 4: Studying the Effect of Blood Pressure on Blood Flow Rate Lab Report

Pre-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. Pressure changes in the cardiovascular system primarily result from
You correctly answered: b. changes in the force of contraction of the heart.

2. What is the driving force for blood flow?
You correctly answered: d. pressure gradient

3. Which of the following is directly proportional to blood flow?
You correctly answered: e. blood vessel radius and pressure gradient

4. Arteries close to the heart need to be able to compensate for
You correctly answered: c. pressure changes.
Experiment Results

Predict Question:
Predict Question 1: What effect do you think increasing the pressure will have on the fluid flow rate?
Your answer: b. The fluid flow rate will increase.

Predict Question 2: Do you think a graph plotted with pressure on the X-axis and flow rate on the Y-axis will be linear (a straight line)?
Your answer: a. yes

Stop & Think Questions:
This experiment uses pressure changes to model
You correctly answered: c. changes in the force of contraction of the heart.

Experiment Data:

<table>
<thead>
<tr>
<th>Flow (ml/min)</th>
<th>Radius (mm)</th>
<th>Viscosity</th>
<th>Length (mm)</th>
<th>Pressure (mm Hg)</th>
</tr>
</thead>
<tbody>
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<td>35.0</td>
<td>5.0</td>
<td>3.5</td>
<td>50</td>
<td>25</td>
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<td>3.5</td>
<td>50</td>
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<td>3.5</td>
<td>50</td>
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</table>
Post-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. The effect of increasing pressure was to
   You correctly answered: b. increase flow rate.

2. Blood pressure is measured in
   You correctly answered: c. mm Hg.

3. Which of the following variables has the greatest effect on blood flow?
   You correctly answered: d. vessel radius

4. Blood flow is measured in
   You correctly answered: a. ml/min.
Review Sheet Results

1. Explain the effect that pressure changes had on flow rate. How well did the results compare with your prediction?
   Your answer:
   The increase in pressure resulted in a corresponding increase in flow rate. A decrease in pressure would result in a decrease in flow rate. I was correct in my prediction as evident by my results.

2. How does the plot differ from the plots for tube radius, viscosity, and tube length? How well did the results compare with your prediction?
   Your answer:
   The other plot was curve while this one is a straight line. I predicted the right outcome as evident by my result.

3. Explain why pressure changes are not the best way to control blood flow.
   Your answer:
   Increasing the pressure increases fluid flow. The pressure versus flow rate plot is linear, whereas the plots for radius, viscosity, and length are all exponential. Changing pressure would not be a reasonable method of flow control because a large change in pressure is needed to significantly change flow rate.

4. Use your data to calculate the increase in flow rate in ml/min/mm Hg.
   Your answer:
   ~1.4 ml/min/mm Hg