Investigation: Effects of Posture on blood Pressure and Pulse Rate

Blood pressure is different in different areas of the body. It is affected by factors such as exercise, drugs, and even posture.

Question:
What effect will posture have on your blood pressure and pulse rate?

Hypothesis/Prediction:
Using what you know about blood pressure, predict what will happen. Formulate a hypothesis to explain your prediction.

Materials:
Sphygmomanometer
Watch with a second hand

Procedure:

1. Ask your partner to sit quietly for 1 minute.
2. Expose the arm of your partner and place the cuff of the electronic blood pressure gauge just above the elbow,
3. Close the valve on the rubber bulb and inflate it by squeezing the rubber ball until a pressure of 180 mm Hg registers.
4. Release the pressure by opening the valve on the blood pressure gauge and watch the digital readout.
5. Completely deflate the cuff and take your partner’s pulse if the electronic blood pressure gauge does not provide it. Place your index and middle finger on the arm near the wrist. Count the number of pulses in 1 minute.
6. Record the systolic and diastolic pressures.
7. Record the pulse rate.
8. Repeat steps 2 – 7 while your partner is in a standing position and then in a lying position.
9. Record your results in a table similar to Table 1.

Analysis:

a) Compare the results with your predictions.
b) Which varied more with change in posture: systolic blood pressure or diastolic blood pressure? Explain.
c) What factors other than posture might have contributed to the change in blood pressure?

Table 1:

<table>
<thead>
<tr>
<th>Position</th>
<th>Systolic blood pressure (mm Hg)</th>
<th>Diastolic blood pressure (mm Hg)</th>
<th>Pulse Rate (beats/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lying</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Do not leave the pressure on for longer than 1 minute. If you are unsuccessful, release the pressure and try again.
Investigation: Effects of Exercise on Blood Pressure and Pulse Rate

In this investigation, you will design ways to test the effects of exercise on blood pressure and pulse rate.

Question:
How does exercise affect blood pressure and pulse rate?

Hypothesis/Prediction:
With a partner discuss how exercise might affect blood pressure and pulse rate. Make a prediction and formulate a hypothesis to explain your prediction.

Design:
Design a controlled experiment to test your hypothesis and prediction. Include the following in your design:

- description of the independent, dependent and controlled variables.
- a step by step description of the procedure.
- a list of safety precautions.
- a table to record observations.

Materials:
Make a list of materials and apparatus needed to carry out the procedure.

Procedure:

1. Submit the procedure, safety precautions, observation table, and list of materials and apparatus to your teacher for approval.
2. Carry out the procedure.
3. Write a report.

Analysis:

a) State how exercise affected blood pressure and pulse rate.

Evaluation:

b) Was your prediction correct? Was your hypothesis supported?

c) Describe any problems or difficulties in carrying out the procedure.

d) Include in your report ways to improve your current design.

e) If you were to repeat this experiment, what new factors would you investigate? Write a brief description of the new procedure.