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| The Effect of 45 Seconds of Jumping on Blood Pressure |
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| The purpose of the experiment was to determine the effects of moderate exercise on short- term blood pressure. To test this, we took our blood pressure using Logger Pro three times at resting. We then jumped up and down for 45 seconds and took our blood pressure, doing this three times. It was found that jumping for 45 seconds increased blood pressure from an average of 108/65.3 at rest to 160/68 while jumping. Jumping raises short- term blood pressure. |

**Background:**

During exercise, the muscles need more oxygen to perform. This means that an increased amount of blood is necessary to get that oxygen to the muscle tissue. Veins and arteries do not expand to accommodate the extra blood, so blood pressure increases. Blood pressure consists of two numbers, systolic and diastolic pressure, and is measured in millimeters of mercury (mm Hg). Systolic pressure, the top number, is the pressure exerted on blood vessels during the heart’s pump. Diastolic pressure, the bottom number, is the pressure exerted on blood vessels while the heart is relaxed. Normal blood pressure, according to the American Heart Association, is 120/80.

While hypertension (high blood pressure) is unhealthy, this temporary rise in blood pressure due to exercise should not negatively affect health, and the cardiovascular system reaps many benefits from exercise. Blood pressure should fall back to normal shortly after exercise, and exercise may even lower resting blood pressure. Plus, the more in shape a person is, the less his or her blood pressure should rise because of exercise. However, systolic blood pressure should never rise much more than 180 mm Hg.

The purpose of this experiment is to investigate further and more specifically the effects of exercise on the short- term blood pressure.

**Hypothesis:** 45 seconds of jumping in place will raise both systolic and diastolic blood pressure.

**Materials and Methods:**

* Computer with Vernier Logger *Pro*® software
* Vernier LabQuest Mini® with USB cable
* Vernier Blood Pressure Sensor
* Logger Pro resource sheet

Set up the Vernier Logger Pro software and the LabQuest Mini with the Vernier Blood Pressure Sensor. Use the sensor to measure a person’s blood pressure while they are sitting upright in a chair, keeping their arm muscles relaxed. The software will measure systolic and diastolic pressure. Repeat two more times, waiting at least three minutes between each measure. Have the subject jump up and down in place for 45 seconds. Measure blood pressure again. Repeat two more times, waiting three minutes in between trials.

**Results:**

Resting blood pressure was on average 180/65. Average jumping blood pressure was 160/68. This is a fifty- two point rise in systolic pressure and a 3 point rise in diastolic pressure.

 Resting Blood Pressure

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| --- | --- | --- | --- | --- |
| (mm Hg) | Trial 1 | Trial 2 | Trial 3 | Mean |
| Systolic Pressure  | 94 | 109 | 121 | 108 |
| Diastolic Pressure  | 61 | 66 | 69 | 65.3 |

Jumping Blood Pressure

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| --- | --- | --- | --- | --- |
| mm Hg | Trial 1  | Trial 2 | Trial 3 | Mean |
| Systolic Pressure | 160 | 159 | 161 | 160 |
| Diastolic Pressure | 65 | 72 | 67 | 68 |

**Discussion:** The results show that jumping up and down increases systolic pressure by about fifty- two points and diastolic pressure by about three points. This backs up the research that when the heart rate increases due to exercise, more blood is being force through veins and arteries and blood pressure increases. There could have been machine error from the Logger Pro equipment reading the blood pressure incorrectly. There could have been human error if the blood pressure cuff was incorrectly placed. To eliminate error, we could have taken less time to put the blood pressure cuff on and therefore measure blood pressure immediately after exertion instead of giving it several seconds to be reduced. We also could have been more precise with our measurement of how much time we jumped. To further investigate how exercise affects short term blood pressure, we could test other forms of exercise such as running or pushups, and also test these variables at different durations.

**Conclusion:** Jumping up and down for 45 seconds increases systolic pressure by an average of 52 points and diastolic pressure by an average of three points.

**Works Cited:**

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