

In this investigation, you will design an experiment to determine how your heart rate and your blood pressure change after exposure to different factors, such as physical activity.

**Question**

How can you isolate factors that affect blood pressure and heart rate?

**Hypothesis**

Make a hypothesis about the effects of increased activity on blood pressure (1 Mark)

**Safety Precautions**

Do not over-inflate the blood pressure cuff. Students with circulatory or blood pressure problems should not be test subjects.

**Materials**

- blood pressure cuff
- watch with a second hand or a digital display of seconds

**Experimental Plan**

Working in a group, you will examine blood pressure before and after exercise.

Blood pressure is the force that blood exerts against the wall of a blood vessel. Pressure is highest in arteries when the ventricles contract (**systole**). The blood pressure drops in arteries when the ventricles relax (**diastole**). Blood pressure is measured in millimeters of mercury with an instrument called a sphygmomanometer.

**Using auto-inflation**

- One person in your group should sit down and place the cuff around their arm as shown



- Once the cuff has been correctly positioned and the proper inflation pressure set, press START. As the cuff is inflating, you will experience a feeling of tightness of the cuff on your arm.
- As the cuff deflates, you will see a blinking symbol that tells you the measurement of blood pressure is in progress. Once measurement is complete, a long beep will be heard or the blinking symbol will stop flashing.
- Read and record your systolic pressure, diastolic pressure and pulse as displayed on the monitor.
- Repeat the above procedure for immediately after exercise and three minutes after exercise.

**Data and Observations**

Conduct your experiment, and record your results. (9 Marks)

Activity	Systolic Pressure	Diastolic pressure	Pulse
Sitting			
Immediately after exercise			
Three minutes after exercise			

What is considered the normal blood pressure? (1 Mark)

## Analysis

How did the blood pressure change as a result of the factor you were testing? How did the heart rate change as a result of the variable you were testing? (2 Marks)

---

---

## Conclusions

What is the adaptive advantage of a temporary increase in blood pressure? (2 Marks)

---

---

What is the adaptive advantage of a temporary increase in heart rate? (2 Marks)

---

---

The body needs a small amount of sodium to function. High sodium consumption can raise blood pressure, and high blood pressure is a major risk factor for heart disease and stroke. Most of the sodium we consume is in the form of salt.

### What foods are high in sodium?

- Processed foods such as lunch meats, sausage, bacon, and ham.
- Canned soups, bouillon, dried soup mixes.
- Deli meats.
- Condiments (ketchup, soy sauce, salad dressings).
- Frozen and boxed mixes for potatoes, rice, and pasta.
- Snack foods (pretzels, popcorn, peanuts, chips).
- Pickled or marinated food in brine. (Vinegar- and lemon juice-based marinades are ok.)

Why do you think that Newfoundlanders have a higher rate of blood pressure than the rest of Canada? (2 Marks)

---

---

---

---

**Yoga:** Results of small studies suggest that yoga may modestly reduce high blood pressure. This can help to lower the risk of heart problems, chronic kidney disease, and strokes. Share on Pinterest People say that yoga and meditation help them to reduce stress and anxiety.

**Massage Therapy:** Massage therapy is known for having many benefits, including reducing symptoms of high blood pressure. Studies have shown that it can positively affect your sympathetic nervous system, which is responsible for raising blood pressure when you are stressed.

**Neuropathy:** Licensed naturopathic doctors (NDs) are trained to evaluate and treat the whole person. They help patients identify the well-known causes and modifiable risk factors of high blood pressure, as well as less-examined causes including nutritional and mineral deficiencies and inflammation.

Which of the above treatments would you prefer to lower blood pressure if you were diagnosed with high blood pressure and why? (1 Mark)

---

---