

Name _____ Date _____

Chapter 6 Lab Investigation: Nerve Impulse

Purpose

In this activity you will perform two demonstrations to learn more about nerve impulse transmission.

Background

When stretch receptors in a muscle detect stretch, they send a nerve impulse to the spinal cord, which causes the muscle to contract.

Materials

toothpick, ice cube, timer, and your body

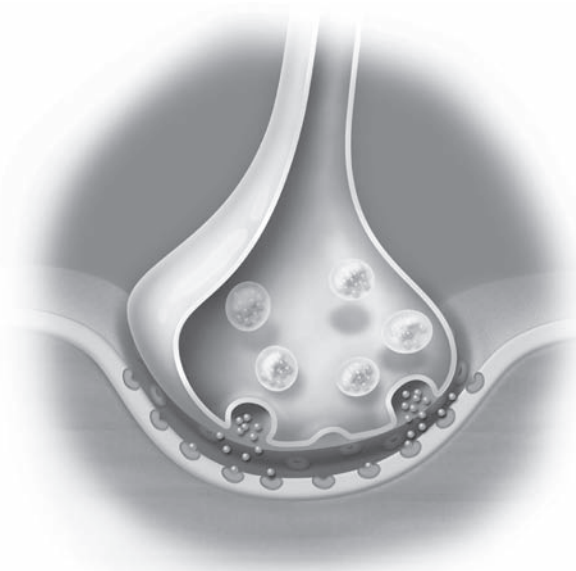
Procedure

Pressure

1. Gently push a toothpick against your skin on the ventral surface of the distal portion of your forearm. Push until the pressure becomes uncomfortable.
2. Note how much pressure and time is required for you to feel discomfort. _____
3. Place an ice cube on your skin in the same spot that you applied pressure with the toothpick. Leave the ice cube in place for one minute.
4. Remove the ice cube and again apply pressure with the toothpick.
5. Note how much pressure and time is required for you to feel discomfort. _____

Impulse Transmission

6. In the diagram below, draw arrows to and label the following: axon, axon terminal, sarcolemma, diffusing neurotransmitter, neurotransmitter receptor sites, muscle fiber, synaptic cleft, vesicle containing neurotransmitter.



Reflex

1. Sit in a chair and cross your legs, your right leg over your left leg.
2. Locate the area of your right patellar ligament just inferior to your right patella and superior to the condyles of your tibia.

3. Make a fist and use the edge of your right hand (little finger side) to sharply strike the identified area.
4. How does your lower leg respond? _____

Conclusions

Pressure

1. Which temperature, normal body temperature or cold, required the longest time to feel discomfort?

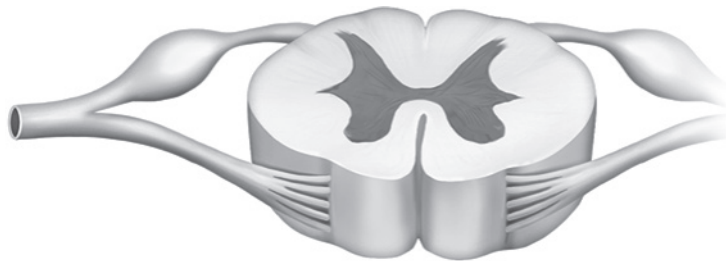
2. In which temperature, normal body temperature or cold, does a nerve impulse travel slower?

3. Explain why the nerve impulse travels slower at this temperature.

Reflex

1. In the experiment in which you struck your knee, how did you stimulate the stretch receptors in the muscle?

2. Is this reflex somatic or autonomic? _____
3. In the diagram below, draw the path of the nerve impulses that create this reflex.



Cross section of spine