

NAME _____ PERIOD _____

Reflex Lab
Anatomy and Physiology

You have probably touched a hot stove or sharp object and pulled your hand away before realizing what had happened. This fast and automatic reaction to a stimulus is a reflex action. Some reflexes prevent injury to the body. Reflexes also control automatic activities in the body such as the beating of the heart, breathing, gagging, and stomach movement.

In a simple reflex pathway a sensory neuron carries impulses from a receptor to the spinal cord where it synapses with an integrative neuron. This neuron synapses with a motor neuron. Impulses carried by the motor neuron stimulate the appropriate muscles or glands (effectors) to respond. All of this happens in a fraction of a second. A person's reaction time is a measure of how quickly he or she can perceive a stimulus and react to it. Reaction time is important in operating vehicles and machinery, in sports, and in many everyday activities. Reaction times may increase with fatigue, drugs, and distraction. In today's lab you will be testing reflexes and responses in the human nervous system.

Stretch Reflexes

Patellar Reflex (Knee Jerk)

1. Have the subject sit on a table so that the legs hang free. The weight of the leg puts the quadriceps muscles under tension. Let another student strike the patellar ligament, just below the knee, with a rubber hammer. This may require some practice, and it is best for the subject to divert his or her attention. Describe what occurs. With your knowledge of leg muscles and reflexes, explain why this occurs.

2. Repeat this procedure but have the subject clasp his/her hands behind the back and pull just prior to and during the striking of the ligament. How does this affect the reflex?

3. Give the subject a column of numbers to add. While he/she is adding the numbers, strike the patellar ligament. How does this affect the reflex?

Achilles Reflex (Ankle Jerk)

The subject should kneel on a chair, his/her feet hanging free over the edge of the chair. Bend the foot so as to increase the tension of the gastrocnemius muscle. Tap the Achilles tendon with a rubber hammer. Describe what occurs. Does the foot flex or extend? With your knowledge of leg muscles and reflexes explain why this occurs.

Biceps Reflex

The subject's forearm should be flexed 90 degrees and supported by the examiner's arm. The examiner should use the thumb of the arm supporting the subject to palpate for the subject's biceps tendon. After the tendon is located, keep the thumb over the tendon and strike it lightly with the rubber hammer. Describe what happens.

Triceps Reflex

This reflex is elicited with the subject's arm supported in a similar manner. Palpate the triceps tendon just above its insertion near the elbow. Strike the tendon with the rubber hammer. Describe what happens.

Autonomic Reflexes

Cilio-Spinal Reflex

1. The subject should be seated and looking straight ahead. Using a pin or a dissecting needle, lightly scratch one side of the nape of the neck while watching the subject's pupils. Describe what occurs.
2. Repeat this test using the opposite side of the neck. Describe what occurs.
3. Pinch the nape of the neck. Describe what occurs.

Photo-Pupil Reflex

Ask the subject to close and shield his/her eyes for two to three minutes. Simultaneously shine a bright light into the subject's eyes and have the subject open his/her eyes. Describe what happens to the subject's pupils.

Straining Reflex

Observe the subject's pupil. Ask the subject to clasp his/her hands and then try to pull them apart with all of his/her strength. Describe the effect on the pupil.

Blinking Reflex

Without warning, wave your hand near a classmate's eyes. Describe what happened.

Swallowing Reflex

Swallow the saliva in your mouth. And immediately attempt to swallow again. Repeat this procedure with a glass of water. Compare what occurred in each situation.

Babinski Reflex

Have your partner remove a shoe and look away while the shoeless foot is propped up in a chair. Quickly draw the handle of the reflex hammer across the sole of the foot. Describe what occurs.

Lab Summary: Use the following terms to write a short paragraph that explains what reflexes are and how they work.

Afferent	Nervous impulse
Efferent	Neurotransmitter
Motor nerve	Synapse
Sensory nerve	Peripheral nervous system
Mixed nerve	Central nervous system
Neuron	

Please underline each term.