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Human Anatomy and Physiology II

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Designing Information Assignments for Literacy

Name: Professor Jhonny Ordonez

Course Name: Human Anatomy and Physiology II

Activity Duration: One Lab Class (3 hours)

Activity Learning Objectives:

- a. Explain the function of each component of a reflex arc.
- b. Explain the importance of reflex testing in a physical examination.
- c. Understand how the nerve signal travel through the nerves
- d. Describe how you would test for the following reflex responses: pupillary, patellar, Achilles, plantar and ciliospinal reflexes.

Description:

The students will learn and understand the importance of reflexes in human body, understand how the nerve impulse travels through the nerves and how to test a reflex.

Materials and Resources

- Handouts are provided in class
- Video is projected in class
- PowerPoints provided on blackboard
- Textbook: Anatomy and Physiology in laboratory by Erin Amerman, 2013
- Additional tools provided in class: reflex hammer and flashlight.
- Lab discussion
- Internet resources

Biology Topic: Human Reflexes

Activity Learning Objectives: At the end of this exercise the student should be able to:

1. Identify and name each component of a reflex arc.
2. Explain the components of a reflex arc.
3. Explain the importance of reflex testing in a physical examination.
4. Describe how you would test for the following reflex responses: pupillary, patellar, Achilles, plantar and ciliospinal reflexes.
5. Distinguish between a reflex and a learned response.
6. Explain the difference between ipsilateral and contralateral
7. Explain the difference between somatic and autonomic reflex
8. Explain the difference between the spinal and cranial reflex

Autonomic Reflexes

Activity 1- Patellar reflex

The patellar tendon reflex or knee-jerk reflex is a monosynaptic stretch reflex that assesses the nervous tissue between (and including) the L2 and L4 segments. It can be done by tapping the patellar ligament (just below the knee) with a reflex hammer.

What are the components of the patellar reflex?

What muscles are involved in produce the movement of the leg?

What happens if you have an abnormal reflex response?

Activity 2 - Achilles reflex

The Achilles or ankle-jerk reflex is a stretch reflex that assesses the nervous tissue between the first two sacral segments. It can be tested by tapping the calcaneal tendon (just above the ankle) with the base of a reflex hammer.

What movement was observed?

What are the components of the patellar reflex?

What happens if you have an abnormal reflex response?

Activity 3 - Plantar reflex

The plantar reflex is a superficial spinal reflex that depends both on functional upper-level motor pathways and on the cord-level reflex arc.

In adults, stimulation of cutaneous receptors in the sole of the foot (as when testing the plantar reflex) usually causes the toes to flex and move together.

What are the components of the patellar reflex?

What is the response?

Is it normal?

Activity 4 - Pupillary Light Reflex

a) In a dimly lit room, the subject should look out toward a wall until his/her eyes dilate. Observe for any irregularities or asymmetry. Measure the approximate pupillary size with a metric ruler. Be very careful near the subject's eyes.

Right pupil _____

Left pupil _____

The experimenter should place an index card or edge of hand on the bridge of the subject's nose to separate each eye's field of vision. Then the experimenter should bring a flashlight from the side to within 5 to 10 cm of the subject's face. Shine the light from the penlight flashlight into the left eye. As soon as the pupil responds remove the light. The response of both eyes should be observed.

What is the pupillary response?

What division of the autonomic nervous system was active during the pupillary reflex?

What cranial nerves were involved in the afferent and efferent limb of this reflex?

Activity 5 - Ciliospinal Reflex

- a) While observing the subject's eyes the skin on the left side of the back of the subject's neck. What is the reaction of the left pupil?
- b) What is the reaction of the right pupil?
- c) If you see no reaction, ask the instructor for additional ways to perform the test.
- d) What observations were observed in each eye?
- e) Right Eye _____
- f) Left Eye _____
- g) How did the ciliospinal reflex differ from the pupillary reflex?