Learning Goals and Outcomes for REACH-DL Physiology Exercises

MUSCLE

General Goals and Outcomes per HAPS (http://www.hapsweb.org)

1. Interpret a myogram of a twitch contraction with respect to the duration of the latent, contraction and relaxation periods and describe the events that occur in each period.

2. Define the terms tension and contraction, with respect to muscles.

3. Define the term motor unit.

4. Interpret a myogram or graph of tension vs. stimulus intensity and explain the physiological basis for the phenomenon of recruitment.

5. Interpret a graph of the length-tension relationship and discuss the anatomical basis for that relationship.

6. Demonstrate isotonic and isometric contraction and interpret graphs of tension vs. time and muscle length vs. time for each type of contraction.

7. Differentiate among the three classes of levers in terms of the relative position of fulcrum, effort and load, as well as in terms of the relative power and range of motion.

8. Give examples in the human body of muscles and their associated joints to illustrate each type of lever system.

Muscles in Opposition

Learning Goals:

1. Students will successfully record electromyograms (EMGs) from antagonistic muscle groups in both the forearm.

2. Students will gain an understanding of the muscle groups involved in flexion and extension.

3. Students will use weights to put load on muscles groups while examining changes in the EMG.

4. Students will gain an understanding of the relationship between the electric current from the nerves and the response of the muscle or muscle group being innervated.

5. Students should be able to measure the EMG produced and corresponding muscle force.

6. Students will continue to be successful at using the LabScribe software to move cursors, analyze data, record data to the Journal, and add functions to the Analysis window.

Outcomes: Students who have successfully completed this exercise will:

1. understand and be able to record an EMG.

2. understand how nerves send electrical signals to muscles to cause a response.

3. be able to determine the relationship between antagonistic muscles during movement.

4. have gained understanding of the relationship between load and muscle activity.

5. have measured the EMG force difference between muscle groups without and without lifting a weight.

6. feel comfortable transferring data to the Journal and interpreting that data to answer questions about their recordings.

7. have used the functions available in the Analysis window to determine values necessary for this exercise.