Delanie Duran
Tuesday Lab
10/25/23

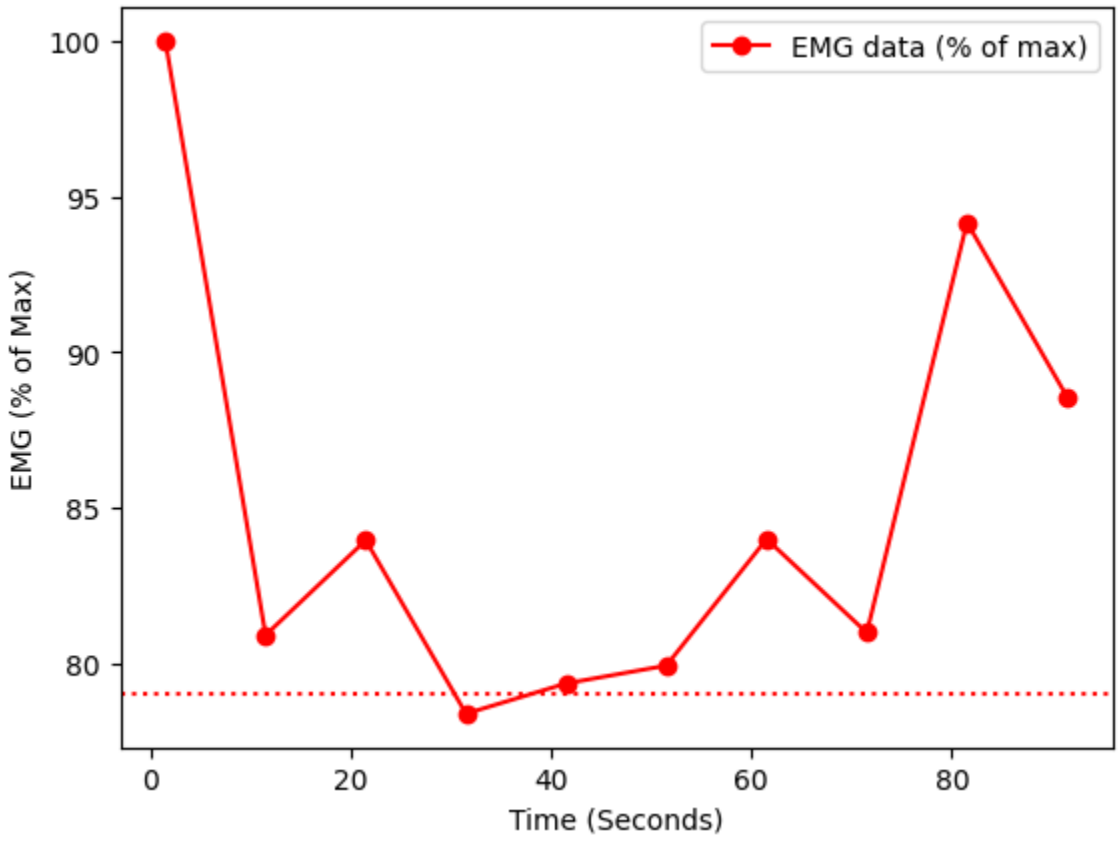
Laboratory 9-D: Demonstration of the Electromyograph (EMG)

Purpose: The purpose of this lab is to demonstrate the concepts of agonist, antagonist and synergist muscles. An antagonist muscle will work in opposition to the agonist while a synergist will aid the agonist and help refine a given moment. An EMG test can help diagnose several injuries or diseases that affect your motor nerves and muscles. It can help determine the presence, location and extent of these injuries and diseases. Providers may also use EMG tests to rule out conditions.

Procedure: Before you turn anything on, be sure the IWX/214 unit is plugged in, and that the IWX/214 unit is connected to the laptop by USB cable. Be sure that the C-AAMI-504 EEG cable is inserted into the isolated inputs of Channels 1 and 2 of the IWX/214. Be sure that the color-coded lead wires are correctly inserted in the lead pedestal of the C-AAMI-504 EEG cable. Insert the connectors on the electrode lead wires into the color-coded matching sockets on the lead pedestal of the ECG cable. Once everything is connected, FIRST turn on the laptop and allow it to fully boot up before you turn on the IWX/214 unit. Once the Iworx unit is on, the red indicator on the Iworx unit should light up and you may hear the USB chime from the laptop if the laptop does not default to mute (many are set to default to mute). Open the Labscribe 3 Program by clicking on the Labscribe 3 Icon On the desktop. As soon as the program opens, you should see a window pop-up that says “Hardware found IWX214:2008-1-24,” click “OK.” In the second from the top row (the row that says “File Edit View Tools SettingsAdvanced External Devices Help”), click on the “Settings" tab. About halfway down the drop-down window should be a tab called “Human Muscle.” Click on that tab and that should lead you to another drop-down list with the second tab from the top called “AntagonisticMuscle,” click on that tab and close the pdf file that appears, you don't need it. Instruct the subject to remove all jewelry from his/her arm and wrist. Use an alcohol swab to clean the regions of skin on the forearm you are going to use (Fig. 9-1.). Let the area dry. Remove a disposable electrode from its plastic shield, and apply the electrode to the six locations. Place the electrodes from proximal to distal on the forearm in the following order:+2,-2on the posterior and +1,-1 and ground on the anterior.(Fig.9-1.). Snap the lead wires onto the electrodes as follows: the red“+1” lead is attached to the proximal electrode on the anterior surface. The black“-1” lead is attached to the distal electrode on the anterior forearm. The green “C” lead (the ground) is attached to the remaining electrode on the anterior surface. The white “+2”lead is attached to the proximal electrode on the posterior forearm. The brown “-2”lead is attached to the distal electrode on the posterior surface. Record an EMG of the muscles of the forearm illustrating agonistic and antagonistic muscle activity for each of the exercises described below. Type the student’s name and the appropriate letter for the activity (A, B, C, D–see below) in the Mark box to the right of the Mark button. Click the red “Rec”button to begin the recording; then, press theEnterkey on the keyboard to mark the beginning of each activity. The recording for exercise “A” should look like Fig. 9-3. If you do not see anything, try clicking on theAutoScale tab and/or checking the electrode contacts. Repeat these procedures for each of the remaining activities. Gently flex the

wrist with the palm open and hold for four seconds. Return the wrist to a neutral position. Extend the wrist, again with the palm open, andhold for four seconds. Repeat several times. Forcefully flex the wrist with the hand closed into a fist, hold for four seconds. Return to neutral position. Extend the wrist maintaining the fist and hold for four seconds. Repeat several times. Attempt to flex the wrist against resistance applied by another student for 10 seconds. Place the hand in mid-supination and make a fist. Attempt to move the hand upwards against resistance applied by another student. Hold for 10 seconds.

Results:



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Discussion: This experiment was interesting to test our EMGs. Being an athlete growing up and currently still being active in exercising, it's important to test these in case of any undiagnosed symptoms that one may have. Muscular dystrophy was a topic that was covered in lecture that is typically seen in males and progresses as one ages. It's a very disheartening diagnosis and made me realize how fortunate I am and how active we use our muscles on an everyday basis.

Conclusion: In conclusion, this lab is to demonstrate the concepts of agonist, antagonist and synergist muscles. An EMG test can help diagnose several injuries or diseases that affect your motor nerves and muscles. It can help determine the presence, location and extent of these injuries and diseases. Providers may also use EMG tests to rule out conditions.