Lab Exercise (Joint flexibility)

Passive insufficiency

Choose a subject in your group and use a goniometer to measure maximum knee extension under two conditions. First, have the subject lie supine on the table, maximally extend his/her knee (should almost be fully extended to begin with), and take the measurement. Second, in the same supine position, have the subject flex his/her hip beyond 90 degrees then take the maximal knee extension measurement. Select another muscle or muscle group that is subject to passive insufficiency and do a similar procedure. Record the information into a table as data for your report. Also, in your own words, explain the concept of passive insufficiency and how it was demonstrated in this lab exercise.

Propioceptive Neuromuscular Facilitation (PNF)

Choose a different subject in your group and use PNF technique to improve joint flexibility. Use a goniometer to measure the subject’s initial maximum hip flexion (from supine position) through passive stretch. Next, measure the maximum hip flexion following the PNF stimulus. Record the information into a table as data for your report. Also, in your own words, explain the theory behind PNF and how it was demonstrated in this lab exercise.

Lab Exercise #2 (EMG / Muscle contraction)

Active insufficiency

Choose a subject in your group and prepare him/her for EMG analysis. Measure the EMG activity of their rectus femoris muscle under two conditions. First, have the subject sit with their lower legs hanging over the edge and their trunk slightly leaning backward for a typical knee extension exercise. Strap a dumbbell weight to their ankle for resistance. Have the subject isometrically contract in maximum extension for 5 seconds. Record the average voltage of muscle activity for this exercise from the EMG readout. For the second trial have the subject do the same procedure but have them lean their trunk forward instead of backward. Also, record the condition that the subject felt was most difficult. Record all this information into a table as data for your report. Also, in your own words, explain the concept of active insufficiency and how it was demonstrated in this lab exercise.