

Grip Strength and Electromyogram(EMG)

Saket Choudhary

September 21, 2016

BISC 104

Session 4

"Life is full of screwups. You're supposed to fail sometimes. It's a required part of the human existence."

– Sarah Dessen, *Along for the Ride*

Muscle contraction strength and EMG

- Strength of muscle contraction is related to number of motor units activated

Muscle contraction strength and EMG

- Strength of muscle contraction is related to number of motor units activated
- It is directly proportional to the potential generated

Muscle contraction strength and EMG

- Strength of muscle contraction is related to number of motor units activated
- It is directly proportional to the potential generated
- Difficult to quantify the amount of potential

Muscle contraction strength and EMG

- Strength of muscle contraction is related to number of motor units activated
- It is directly proportional to the potential generated
- Difficult to quantify the amount of potential
- Electromyogram(EMG) is used to measure muscular strength

Muscle contraction strength and EMG

- Strength of muscle contraction is related to number of motor units activated
- It is directly proportional to the potential generated
- Difficult to quantify the amount of potential
- Electromyogram(EMG) is used to measure muscular strength
- Why Study this? EMG is used for assessing muscular health

Today's experiment

- Please read the lab manual – step by step!

Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity

Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity
- Step 1: "EMG Cable and Hand Dynamometer Setup"

Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity
- Step 1: "EMG Cable and Hand Dynamometer Setup"
- Step 2: "Calibrating the Hand Dynamometer" – Method 2

Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity
- Step 1: "EMG Cable and Hand Dynamometer Setup"
- Step 2: "Calibrating the Hand Dynamometer" – Method 2
- Weigh textbooks in **kilograms**. $1\text{kg} = 2.2\text{lb}$

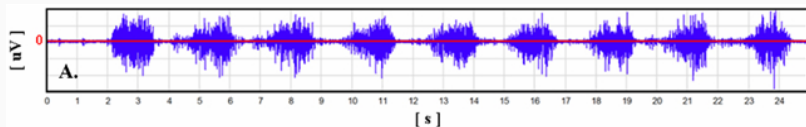
Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity
- Step 1: "EMG Cable and Hand Dynamometer Setup"
- Step 2: "Calibrating the Hand Dynamometer" – Method 2
- Weigh textbooks in kilograms. $1\text{kg} = 2.2\text{lb}$
- Step 3: Proceed to "Experiment HM-1"

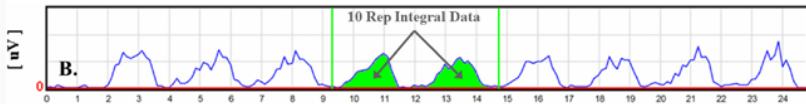
Today's experiment

- Please read the lab manual – step by step!
- 3 PDFs – Background, Setup/Calibrate, Experiment Activity
- Step 1: "EMG Cable and Hand Dynamometer Setup"
- Step 2: "Calibrating the Hand Dynamometer" – Method 2
- Weigh textbooks in kilograms. $1\text{kg} = 2.2\text{lb}$
- Step 3: Proceed to "Experiment HM-1"
- Exercise 1 and 2 are compulsory.

Analysis – Area Under Curve



Raw EMG Data (sample rate = 1024 Hz)



Electrodes



Dynamometer



Tuesday: 9-10AM

Thursday: 9-10AM

ZSH 372

Saket Choudhary

skchoudh@usc.edu