

Laboratory II: Measurement of Grip and Pinch Strengths with and without Arm Rest

Goal: The goal of this laboratory is to familiarize the students with the procedures of strength and range of motion measurements for the purpose of equipment design and redesign.

Equipment: Handgrip Dynamometer and Pinch Gauge

Procedure: Class members will be divided into appropriate number of groups, and data collection on the handgrip dynamometer and pinch gauge will be performed. Grip and pinch strengths will be collected with the wrist at neutral and elbow at 90 deg in seated positions with and without the use of armrest and in standing position. Data will be collected on both the hands using Caldwell Protocol. At least three trials are to be performed for each hand (at least two measurements should be within 10% of each other). Anthropometric and physical data such as hand length, handbreadth, stature, and age of the subjects are collected and reported in a tabular form.

Tables: Report the collected data in tabular formats as given below:

Table 1. Grip strengths at different postures

Wrist Posture	Elbow Posture	Body Posture	RH Trials (lbs.)			LH Trials (lbs.)		
			1	2	3	1	2	3
Neutral	90° Fl	Standing						
		Seated (W/AR)						
		Seated (W/O-AR)						

Table 2. Pinch Strengths

Wrist Position	Trials on Right Hand (Dominant hand)								
	Key Pinch			Tip Pinch			Chuck Pinch		
	1	2	3	1	2	3	1	2	3
Neutral									

Table 3. Physical and Anthropometric Data

Age	Stature	Hand Length	Hand Breadth

Results: compare your mean maximum grip, pinch strengths at neutral wrist posture with the corresponding values given in Table 3-5 of the textbook, and state the percentile that your values fall in.

Report: Standard format as per the instructions given in the class