

Mechanical Testing of Muscle Properties

Minster

I. Abstract

II. Introduction

Skeletal muscles are biological motors or actuators that enable human movement, have certain intrinsic mechanical properties. Students are going to learn skeletal muscle behavior (flexion and extension) in the horizontal plane with isometric and isokinetic that performed by the Biodex system. The axis is the joint and the moment is respect to the joint. The sample rate is 100Hz using the LabView program and lab software. Isometric testing is performed under zero velocity and isokinetic testing is performed under constant velocity that both situations have various angular position, such as 30, 60, 90, and 120 degrees. Students are going to focus on muscles behavior of flexion & extension, and concentric & eccentric.

To understand skeletal muscle's behavior, angular position and joint moment are important. Patients, who have stroke history or currently have stroke, cannot control their skeletal muscles. Therefore, biomedical engineers analyze stoke patients with isometric and isokinetic testing data to improve their mobility and what skeletal muscles they have difficulties for movement.

III. Methods

**In the laboratory, the Biodex is used to collect human performance data for a joint of interest.

A volunteer is placed appropriately in the laboratory apparatus for elbow flexion-extension testing. The proper position would be the arm is positioned about 20 degrees below from horizontal line of shoulder and about 30 degrees forward from the horizontal line of shoulder. The distance between the seat of volunteer and apparatus should be comfortable for the volunteer and the axis of apparatus and the elbow joint should be aligned. Then padding a forearm of volunteer with foams and tighten it up with straps. With a goniometer, make the range of motion from 30 degrees to 120 degrees.

IV. Result

V. Discussion

VI. Conclusion

Reference