

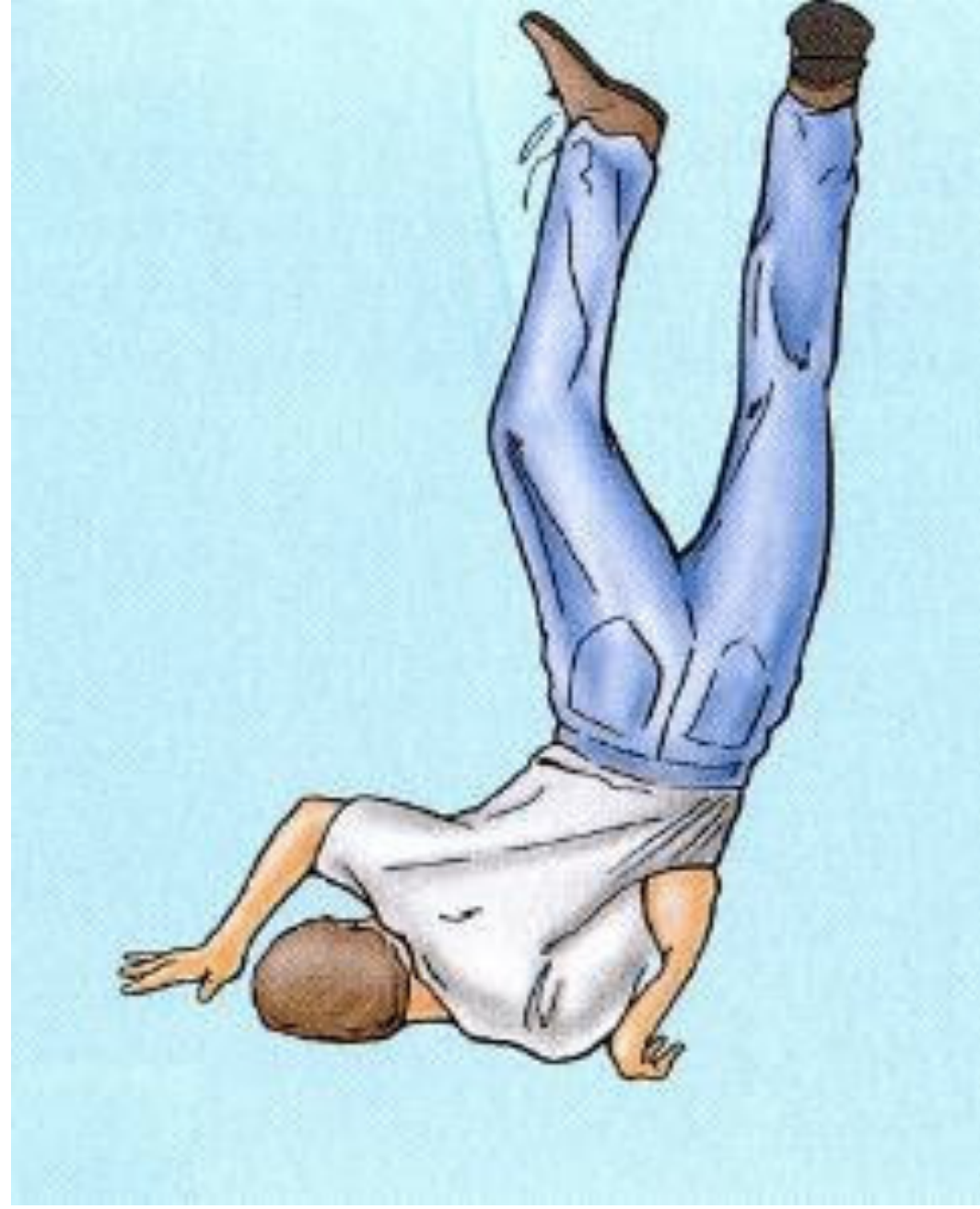
# How to Evaluate Patients with Brachial Plexus Injury ?

Experimental Protocols

Gabriel Freire Miranda Ft.

NeuroMat





# OBJECTIVE

“ Develop a reliable evaluation protocol that permit us to understand the complex changes in motor control after BPI. ”



Experimental Models



Muscle  
Strength



Kinematic  
Parameters



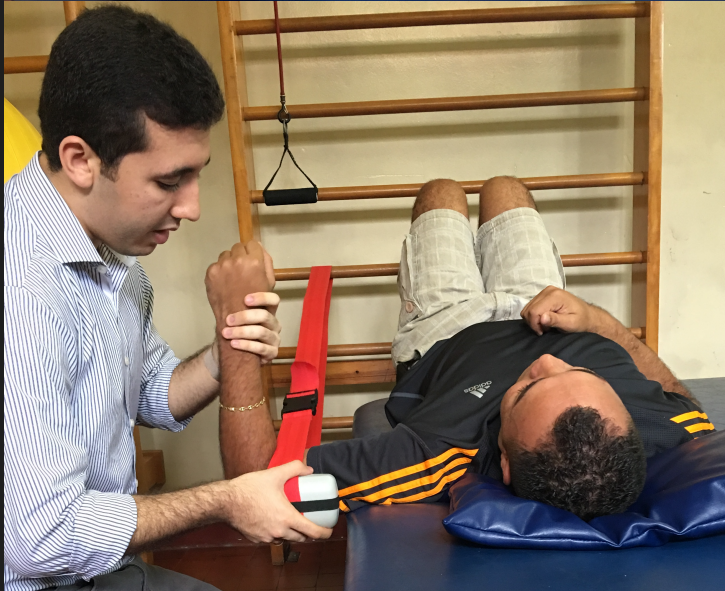
Functional  
Scales



# Muscle Strength

- Clinical parameters most used to evaluate the function of a patient.
- With adequate technological support it is possible to carry out such measurement in a precise and objective way.

# Muscle Strength





Journal of Shoulder and Elbow Surgery

Volume 19, Issue 8, December 2010, Pages 1175–1183





Basic science

Hand-held dynamometer testing of the internal and external rotator musculature based on selected positions to establish normative data and unilateral ratios

Bryan L. Riemann, PhD<sup>a, b</sup>,  , George J. Davies, DPT<sup>b, c</sup>, Lauren Ludwig, DPT<sup>b, c</sup>, Helen Gardenhour, DPT<sup>b, c</sup>

ORIGINAL ARTICLE

A practical posture for hand grip dynamometry in the clinical setting

T.E. Hillman<sup>a</sup>, Q.M. Nunes<sup>a</sup>, S.T. Hornby<sup>a</sup>, Z. Stanga<sup>b</sup>, K.R. Neal<sup>c</sup>, B.J. Rowlands<sup>a</sup>, S.P. Allison<sup>d</sup>, D.N. Lobo<sup>a</sup>,  



01165 - Manual Muscle Tester

Phone: 765-423-1505  
www.lafayetteinstrument.com

10:57 AM CLEAR

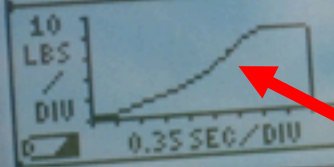
PEAK 39.2 LBS

REAL-TIME F 0.0 LBS

TOTAL TIME 3.0 SEC

TIME-PEAK 2.6 SEC

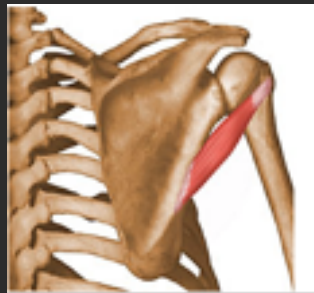
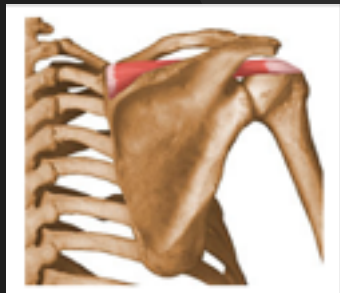
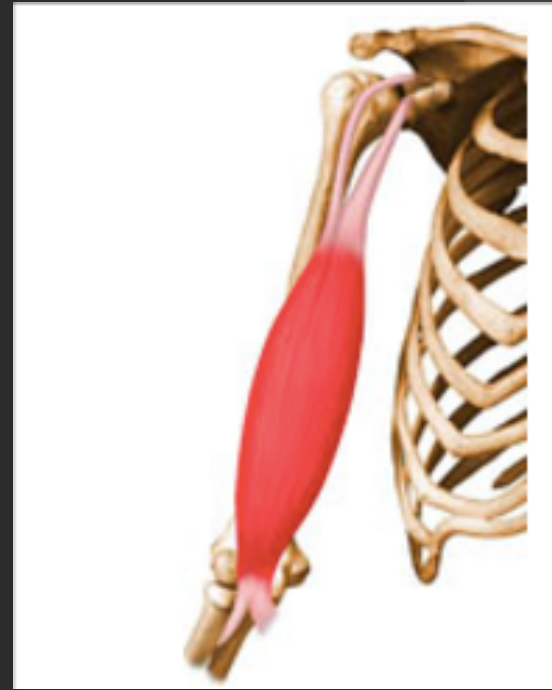
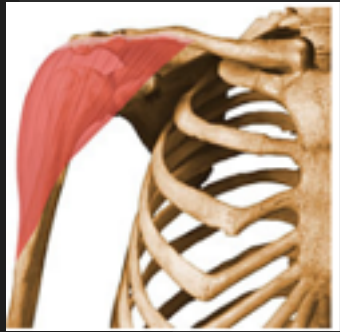
TEST 31



Menu/Select



# Key Muscles





# Kinematic Parameters

- High-tech and highly effective technique for extracting measures related to joint movement and displacements in the patient's center of mass





# Kinematic Parameters

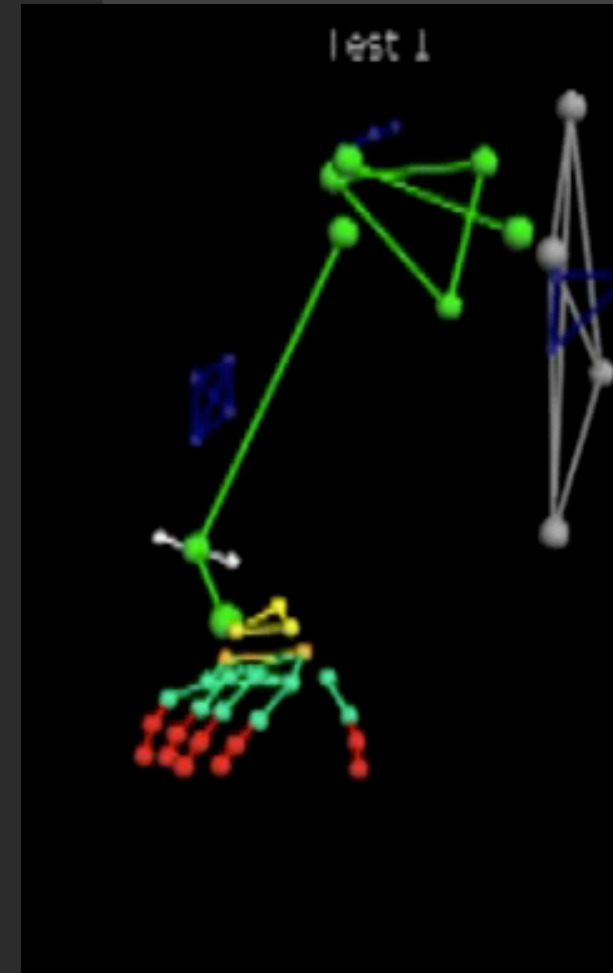
- The preparation of the subject consists of calibration of the system and the positioning of 26 reflective markers on the patient's body surface.





# Kinematic Parameters

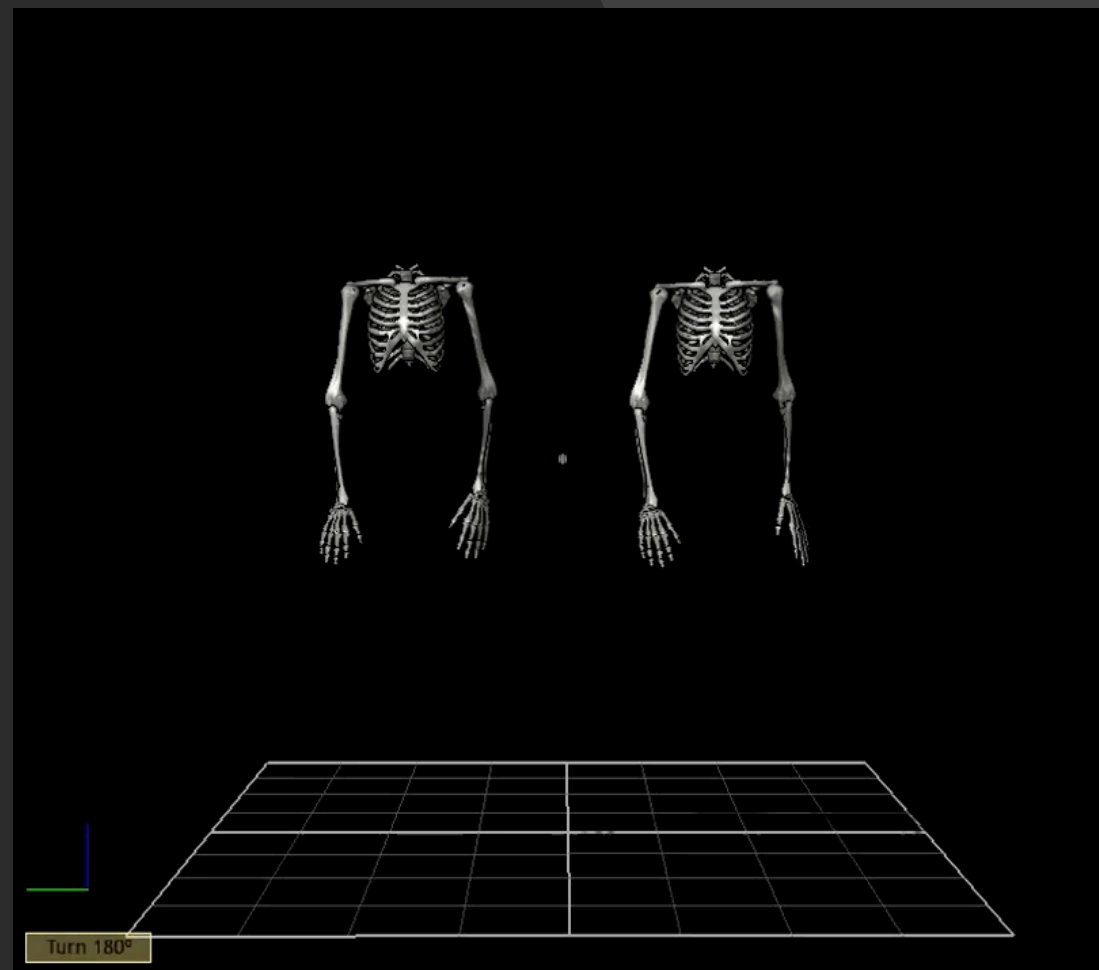
- Angular displacements of each body segment during the execution of a movement
- Angular speed
- Correlation between 2 or more body segments





# Kinematic Parameters

- Functional Tasks
- Structural Tasks





# Functional Tasks

- Bring a glass to the mouth
- Hold a waist-high cup
- Hold a suitcase of approximately 2Kg along the body



# Structural Tasks

- Shoulder flexion
- Flexion of the elbow
- Abduction of the shoulder



THE

# DASH

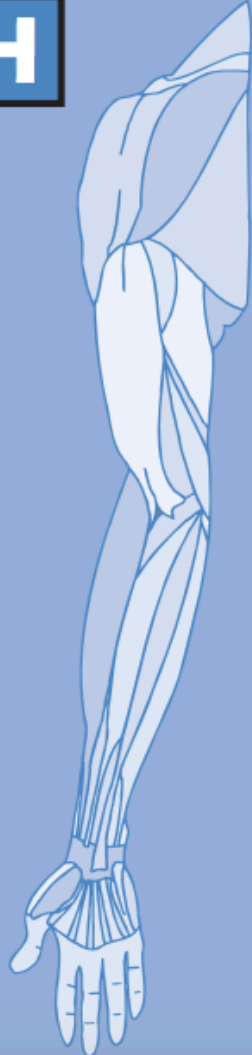
## INSTRUCTIONS

This questionnaire asks about your symptoms as well as your ability to perform certain activities.

Please answer *every question*, based on your condition in the last week, by circling the appropriate number.

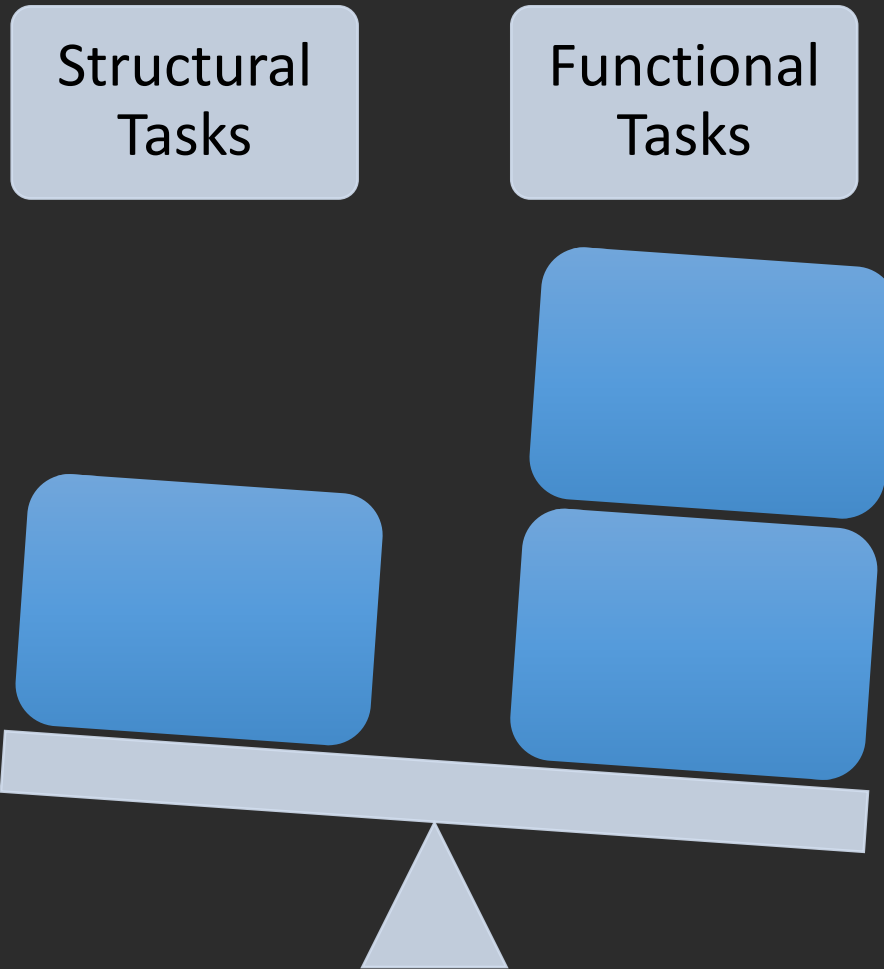
If you did not have the opportunity to perform an activity in the past week, please make your *best estimate* on which response would be the most accurate.

It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.



# Disabilities of The Arm, Sholder and Hand outcome Measure

# Piltot Study



# Main Questions

- Does the surgery of Reinervation of biceps can characterize patients as “More Functional Than Before?”
- Can functional movements express better results than the structural ones ?
- How does the learning of movement during the experiment influence the displacement of the center of mass in these patients?

Thank you