Hand-Held Myometer

Assessment Overview

Assessment Area

ICF Domain:
Body Function & Structures
Subcategory:
Neuromusculoskeletal and Movement-Related Functions & Structures

You Will Need

Length:
30 minutes
Equipment:
A myometer
Scoring:
The recommended unit of measurement is kg in order avoid interpretation issues. Measurements are generally rounded to the nearest kg.
Training:
No formal training required, but examiners should be familiar with the techniques, appropriate body positioning for patient and tester, and proper administration.

Summary

The Hand-Held Myometer is a portable device used as a quantitative method of measuring muscle contraction (primarily for upper limb). Testing is performed using one of two techniques, 1) make or 2) break. The 'make' technique requires the examiner to resist a maximal voluntary contraction by the patient, thereby producing an isometric contraction.
In the 'break' technique, the examiner applies adequate force to overcome the patient, thereby producing an eccentric contraction.

Availability

Can be found here.

Assessment Interpretability

Minimal Clinically Important Difference

Not established in SCI

Statistical Error

Standard Error of Measurement (lbs) – Tester 1, Tester 2:
Left biceps = 5.05, 1.84
Right biceps = 2.94, 2.96
Left triceps = 2.91, 2.17
Right triceps = 3.26, 2.44
Left wrist extensors = 2.71, 1.73
Right wrist extensors= 2.94, 0.26
Minimal Detectable Change (lbs) – Tester 1, Tester 2:
Left biceps = 14.01, 5.10
Right biceps = 8.15, 8.21
Left triceps = 8.08, 6.01
Right triceps = 9.04, 6.76
Left wrist extensors = 7.51, 4.80
Right wrist extensors= 8.14, 0.73

Typical Values

Mean (SD) Scores (lbs) – Tester 1, Tester 2:
Left biceps = 46.79 (11.91), 37.92 (8.23)
Right biceps = 46.20 (14.70), 34.97 (9.37)
Left triceps = 26.28 (11.90), 26.33 (12.51)
Right triceps = 30.74 (9.41, 27.21 (14.09)
Left wrist extensors = 23.80 (13.55), 23.26 (10.00)
Right wrist extensors= 31.39 (11.99), 23.05 (10.52)

(Aufsesser et al. 2003; n=25, chronic SCI, mean time since injury (SD)=13 (10), mixed injury types, 2 testers)

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Measurement Properties

Validity – Low to High

Low **to** ***High*** **correlation with Manual Muscle Testing:**
Paraplegics = 0.26-0.67

(Noreau & Vachon 1998; n=38, 31 males, mixed injury type, mean time since injury (SD) at admission=1.6 (0.7) months, mean time since injury (SD) at discharge=2.1(2.1) months)

Tetraplegics = 0.59-0.94

(Schwartz et al. 1992; n=122, all male, quadriplegia, over 6 time points b/w 72 hours and 12 months post-injury)

Moderate **to** ***High*** **correlation with Isokinetic Dynamometry:**
Paraplegics = 0.70-0.90
Tetraplegics = 0.57-0.96

(Noreau & Vachon 1998; n=38, 31 males, mixed injury type, mean time since injury (SD) at admission=1.6 (0.7) months, mean time since injury (SD) at discharge=2.1(2.1) months)

Number of studies reporting validity data: 5

Reliability – High

High **Inter-rater Reliability:**
Make Technique: ICC = 0.94-0.97
Break Technique: ICC = 0.94-0.95

High **Intra-rater Reliability:**
Make Technique: ICC = 0.91-0.94
Break Technique: ICC = 0.93-0.94

(Burns et al. 2005; n=19, 19 males, mixed injury types, inpatient, 3 < 6 months post-injury, 16 >1 year post-injury, 2 testers)

Number of studies reporting reliability data: 7

Responsiveness

Floor/Ceiling Effect:
Not established in SCI

Effect Size:
Not established in SCI

Number of studies reporting responsiveness data: 0