Spinal Cord Ability Ruler (SCAR)

Assessment Overview

Assessment Area

ICF Domain:

Body Function

Subcategory:

Performance

You Will Need

Length:

24 items

Scoring:

Volitional SCAR items were rated on a scale of 0 (complete dependence on assistance from others) to 3 (independence without devices), C5-C8 muscle contractions were scored from 0 (no muscle activity) to 2 (functional muscle activity)

Summary

The Spinal Cord Ability Ruler provides clinician-administered interval scale to measure volitional performance after SCI. The SCAR uses a combination of existent spinal cord injury measures and is administered by a clinician. Items were selected and adjusted from the ISNCSCI and SCIM, allowing for good measurement properties and a validated linear interval-level measure with repeatable precision across a broad range of SCI levels and severities.

The SCAR changes the scoring options for the various SCIM items so that there are less scale numbers, making it easier for the patient to differentiate from the various scoring options.

Availability

Worksheet: Can be found in the following article: https://www.nature.com/articles/sc20171?proof=true, on page 734.

Assessment Interpretability

Minimal Clinically Important Difference

The range of MCID value of each subgroup was:

- Approx. 4 with a range of 0.4 to 4.45 for individuals with C5–C8 AIS A, B and C.
- Approx. 4 with a range of 0.39 to 4.35 for individuals with C1-C4 AIS A, B and C.
- Approx. 4 with a range of 0.37 to 4.15 for individuals with AIS D at any injury level.
- Approx. 2 with a range of 0.2 to 2.2 for individuals with T1-S3 AIS A, B and C.

Statistical Error

Not established in SCI

Typical Values

Not established in SCI

MDC95 value of each subgroup was:

- 1.10 for individuals with C5-8 AIS A, B and C.
- 1.08 for individuals with C1–4 AIS A, B and C.
- 1.03 for individuals with AIS D at any level.
- 0.55 for individuals with T1–S3 AIS A, B and C.

(Chaidaroon et al. 2023, n=311; 224 males, 87 females; mean age: 47.7 age; 98 ASIA A, 46 ASIA B, 69 ASIA C, 98 ASIA D; 137 tetraplegia, 174 paraplegia; and median (IQR) time since injury: 84.4 (19-87) days)

Measurement Properties

Validity – No relevant data

Number of studies reporting validity data: 0

Reliability – **High**

High Internal Consistency

α= 0.97

(Reed et al. 2017; n=2777; 79% male; age range at injury: 13-94, 45% tetraplegia, 55% paraplegia)

High Test-retest Reliability

ICC = 0.998

(Chaidaroon et al. 2023, n=311; 224 males, 87 females; mean age: 47.7 age; 98 ASIA A, 46 ASIA B, 69 ASIA C, 98 ASIA D; 137 tetraplegia, 174 paraplegia; and median (IQR) time since injury: 84.4 (19-87) days)

Number of studies reporting reliability data: 2

Responsiveness

Floor/Ceiling Effect:

Ceiling effects of 3%

Floor effects of 2.4% observed in the data set.

(Reed et al. 2017; n=2777; 79% male; age range at injury: 13-94, 45% tetraplegia, 55% paraplegia)

Effect Size:

Not established in SCI

Number of studies reporting responsiveness data:

Not established in SCI