

Action Research Arm Test (ARAT)

Assessment Overview

Assessment Area

ICF Domain:

Activity

Subcategory:

Mobility

You Will Need

Length:

5-15 minutes

19 items, categorized into 4 subscales:

- Grasp (6 items).
- Grip (4 items).
- Pinch (6 items).
- Gross motor movement (3 items).

Equipment:

- Chair without armrests
- Table
- Wooden blocks of various sizes
- Cricket ball
- Sharpening stone
- Alloy tubes
- Washer and bolt
- Jug and glass or two glasses
- Marbles
- Ball bearings
- Tin lid
- Plank

Scoring:

Each limb is scored separately. Task performance is rated on a 4-point scale, ranging from 0 (no movement) to 3 (movement performed normally). Scores range from 0-57 points, with a score of 57 indicating better performance. Items are arranged in order of decreasing difficulty (the most difficult task is examined first). If the highest score is obtained for the first task, it is inferred that all

Summary

The Action Research Arm Test (ARAT) is a standardized observational performance measure that evaluates a person's ability to use their arm and hands to handle objects using grasp, grip, pinch and gross motor movements.

The ARAT is frequently used in clinical neurorehabilitation practice and research; mainly in people with stroke, brain injury or multiple sclerosis. It was originally described by Lyle in 1981 as a modified version of the Upper Extremity Function Test.

For the performance of the test, the participant is sitting in a chair with a firm back and no armrest:

- Grasp tasks require the participant to lift testing materials from the surface of the table to a shelf located 37 cm above the starting point.
- Grip related tasks require the individual to grip testing materials and move them from one side of the table to the other.
- Pinching tasks require the participant to perform similar movements to those in the grip subscale, but with the use of a fine motor pincer grip instead.
- Gross movement tasks require the individual to move their testing arm to different resting positions including on top of their head, behind their head, or to their mouth.

Availability

Worksheet: A manual that provides a detailed and standardized approach for assigning ARAT scores can be found in the following article: <https://pubmed.ncbi.nlm.nih.gov/17704352/> and instructional video can be found here <https://www.youtube.com/watch?v=bhkCB0qoZk>

Kits can be purchased at <http://www.aratkits.com/> or <http://www.saliarehab.com/arar.html>

Languages: English

tasks less difficult could be completed, and thus can move on to the next subtest (for faster test administration).

Training: None required.

Assessment Interpretability

Minimal Clinically Important Difference

Not established in SCI

Statistical Error

Not established in SCI

Typical Values

Not established in SCI

Measurement Properties

Validity – **Moderate** to **High**

Moderate correlation with SCIM-III subscales:

SCIM self-care: $r = 0.56$ ($p < 0.01$)

SCIM mobility: $r = 0.33$

SCIM total: 0.29

(Lili et al. 2023; $n=25$; 18 males, 7 females; mean (range) age: 58.4 (44.6-72.2) years; injury level: 17 cervical, 8 thoracic; ASIA A-D; mean (SD) time since injury: 17.5 (15.4) years)

Moderate to **High** correlation with kinematic end-point measures of:

Movement time:

Reaching: $r = -0.41$ ($p < 0.05$)

Forward transport: $r = -0.71$ ($p < 0.01$)

Backward transport: $r = -0.58$ ($p < 0.01$)

Total movement time: $r = -0.70$ ($p < 0.01$)

Smoothness:

Reaching and forward transport: $r = -0.89$ ($p < 0.01$)

Backward transport and returning: $r = -0.71$ ($p < 0.01$)

Total number of movement units: $r = -0.82$ ($p < 0.01$)

Movement pattern:

Elbow flexion (reaching): $r = 0.66$ ($p < 0.01$)

Wrist angle (reaching and forward transport): $r = -0.60$ ($p < 0.01$)

Trunk displacement: $r = -0.52$ ($p < 0.01$)

(Lili et al. 2021; $n=25$; 18 males, 7 females; mean (range) age: 58.4 (44.6-72.2) years; injury level: 17 cervical, 8 thoracic; ASIA A-D; mean (SD) time since injury: 17.5 (15.4) years)

Reliability – **Not established in SCI**

Not established in SCI

Number of studies reporting reliability data: 0

High correlation with the ReJoyce Hand Function
Test:

$r^2 = 0.88$

Moderate correlation with the Fugl-Meyer
Assessment:

$r^2 = 0.53$

(Kowalczewski et al. 2011; n=13; age between 24 and 56 years; injury level: C5-C6)

Number of studies reporting validity data: 3

Responsiveness

Floor/Ceiling Effect:
Not established in SCI

Effect Size:
Not established in SCI

**Number of studies reporting
responsiveness data: 0**