Wingate Anaerobic Test (WAnT)

Assessment Overview

Assessment Area

ICF Domain:
Body Functions
Subcategory:
Functions and Structures of the Cardiovascular, Haematological, Immunological and Respiratory Systems

You Will Need

Length:
10-20 min + warm-up (depending on number of tests administered)
Equipment:
Arm ergometer
Optional: computer and software
Scoring:
Peak power: highest average power for any 5s period
Mean power: average power over 30s
Relative peak power: peak power standardized by body mass
Anaerobic fatigue: percentage decline in power output time
Anaerobic capacity: total work done in 30s
Scoring can be computerized or manual.

Summary

The Wingate Anaerobic Test (WAnT) assesses muscle power by 30-second maximal effort trials on a leg or arm ergometer. Arm WAnT has been used in persons with paraplegia to compare to performance of upper limb anaerobic tasks such as transferring in and out of the car and 26m wheelchair sprints.

While not developed for use specifically in the SCI population, the WAnT is the only standardized test to monitor upper extremity strength and power. Most assessments look at aerobic function rather than anaerobic tasks. It is also a well-established protocol that has been used in many populations so comparisons are possible.

The test is relatively easy and inexpensive to administer with the appropriate equipment; however, the initial expenditure is significant.

Availability

Can be found here. Additional information can be found here.

Languages: English

Assessment Interpretability

Minimal Clinically Important Difference

Not established in SCI

Statistical Error

Not established in SCI

Typical Values

Mean (Peak/Mean) Scores:
C5 Group:
53.9-57.0W / 31.7-31.9W
C6 Group:
121.7-119.7W / 70.3-72.3W
C7 Group:
203.4-206.8W / 134.2-138.2W

(Jacobs et al. 2005; n=45, complete cervical SCI, mean time since injury: 8.2-10.6 years)

Measurement Properties

Validity

Not established in SCI

Reliability

Test-retest Reliability:

No significant differences between 2 trials in P_{peak}, P_{mean}, P_{min} and anaerobic fatigue.

Between trial r^2 for P_{peak} = 0.92

Between trial r^2 for P_{mean} = 0.94

(Jacobs et al. 2003; N=43; 33 males, 10 females; paraplegic; T2-T12 SCI; mean (SD) time since injury = 8.1 (7.1) years)

Between trial r^2 for P_{peak}:

C5 group = 0.95

C6 group = 0.98

C7 group = 0.93

Between trial r^2 for P_{mean}:

C5 group = 0.98

C6 group = 0.96

C7 group = 0.88

(Jacobs et al. 2005; n=45; motor-complete SCI; injury levels C5-C7; mean (SD) time since injury = C5 group: 8.1(7.1); C6 group: 10.0(7.2), C7 group: 10.6(7.4) years)

Number of studies reporting reliability data: 2

Responsiveness

Floor/Ceiling Effect:
Not established in SCI

Effect Size:
Not established in SCI

Number of studies reporting responsiveness data: 0