6-Minute Push Test (6-MPT)

Assessment Overview

Assessment Area

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

You Will Need

Length:
6 minutes
Equipment:

- Stopwatch
- Marking tape for set a fixed distance (30 m is recommended)

Instructions:
The 6-MPT is a self-paced test where participants may slow down and take breaks to rest as needed and resume propelling for whatever time remains.
Scoring:
The assessor will count the number of laps completed to calculate the total distance covered in 6 minutes. Clinicians should record heart rate before and after the VO_{2max}

Summary

The 6-Minute Push Test (6-MPT) assesses cardiovascular fitness in people who are not ambulatory as a clinic-friendly approach. The 6-MPT is a field-based assessment of VO_2 functional change, derived from the 6-MWT (Cowan et al. 2012).

Following the American Thoracic Society's 6-MWT guidelines and instructions (Cowan et al. 2012), it involves the individual pushing a manual wheelchair, over a flat surface, as far and hard as they can in 6 min (van der Westhuizen et al. 2017).

Availability

Worksheet: Can be found here.

Assessment Interpretability

Minimal Clinically Important Difference

Not established in SCI

Statistical Error

Standard Error of Measurement:
Heart rate = 8.5 bpm
Total distance = 21.9 m
6 min of work = 1.41 kg/km

Minimal Detectable Change:
Heart rate = 23.5 bpm
Total distance = 60.7 m
6 min of work = 7.45 kg/km

(Damen et al. 2020; n=53 youth with spina bifida; 32 males, 11 females; mean age 13.7 years; injury level: 11 thoracic, 4 lumbar, 1 sacral)

Typical Values

Mean Distance (meters):
Tetraplegia: 380.86
Paraplegia: 692.92

(Van der Westhuizen, 2017; N = 60; mean age = 38.4 years; 81.66% of sample classified as ASIA A [complete injury])

Measurement Properties

Validity – High

High correlation with VO_{2peak}:
r = 0.58

High correlation with respiratory exchange ratio:
r = 0.70

High correlation with peak exercise time:
r = 0.70

High correlation with peak workload:
r = 0.66

(Baattaiah et al. 2017; n=15, mean age 34.5 years; 12 paraplegia, 3 tetraplegia; ASIA A-D)

High correlation with RNLI:
r = 0.637

(van der Westhuizen et al. 2017; n=60; 50 males, 10 females; mean age 38.4 years, ASIA A-D; 39 paraplegia, 21 tetraplegia)

High correlation with heart rate recovery:
r = 0.87

(Solanki et al. 2016; n=47; 38 males, 9 females; mean age 38.4 years; 35 paraplegia, 12 tetraplegia)

Number of studies reporting validity data: 3

Reliability – High

High Test-retest Reliability:

Peak Heart Rate: ICC = 0.81

Total distance: ICC = 0.95

6 minutes of work: ICC = 0.97

(Damen et al. 2020; n=53 youth with spina bifida; 32 males, 11 females; mean age 13.7 years; injury level: 11 thoracic, 4 lumbar, 1 sacral)

High Reliability:

Whole sample: ICC = 0.97 (95% CI, 0.94–0.98)

Participants with tetraplegia: ICC = 0.93 (95% CI, 0.80–0.98)

Participants with paraplegia: ICC = 0.97 (95% CI, 0.93–0.99).

(Cowan et al. 2012; n=40; mean age 34 years; 63% paraplegia, 37% tetraplegia)

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: 1