# 6-Minute Walk Test (6MWT)

## Assessment Overview

### Assessment Area

**ICF Domain:**
Activity
**Subcategory:**
Mobility

### You Will Need

**Length:**
6 minutes
**Equipment:**

- Countdown timer
- Tape measure
- Mechanical lap counter
- Cones to mark the turnaround
- Chair that can be easily moved along the walking course.

**Scoring:**
Total distance walked (rounding to the nearest meter) and the number and duration of rests during the test is reported.

### Summary

The 6-Minute Walk Test (6MWT) is a self-paced test that measures the distance a patient can walk on a flat, hard surface in 6 minutes.

It assesses the sub-maximal level of functional capacity. The test evaluates the integrated response of pulmonary, cardiovascular, and circulatory systems, in addition to level of motor control, functional neuromuscular units, and muscle.

The 6MWT is used in many populations. In SCI, it is primarily used in people with incomplete injuries.

### Availability

**Worksheet:** Can be found here.

## Assessment Interpretability

### Minimal Clinically Important Difference

0.10 m/s

(Forrest et al. 2014; n=249; 190 males, 59 females; mean (SD) age: 42 (16) years; 20 ASIA C, 179 ASIA D; and median time since injury: 0.7 years)

### Statistical Error

**Standard Error of Measurement:**

12.3 m; 0.0342 m/s

(Musselman and Yang 2013; n=20; 14 males, 6 females; incomplete SCI; and mean (SD) time since injury: 5.4 (8.8) years)

**Minimal Detectable Change:**

0.086 m/s

(Tester et al. 2016; n=72, 57 males, 15 females; 17 ASIA A, 10 ASIA B, 20 ASIA C, and 25 ASIA D; 44 cervical, 28 thoracic; and median (range) time since SCI: 0.7 (0.1-14.7) years)

37.1 m; 0.103 m/s

(Duffell et al. 2015; n=83; 57 males, 26 females; incomplete SCI; and >12 months post-injury)

### Typical Values

**Mean (SD) Scores:**

Within 1st month = 314 m (137.0)
After 3 months = 473 m (110.1)
After 6 months = 502 m (132.6)
After 12 months = 495 m (125.1)

(van Hedel et al. 2006; n=22; 18 males, 4 females; incomplete SCI, tests performed between 1 month and 12 months post-injury)

## Measurement Properties

### Validity – Low to High

**High correlation with 10 Meter Walk Test:**

r = 0.94

(Forrest et al. 2014; n=249; 190 males, 59 females; mean (SD) age: 42 (16) years; 20 ASIA C, 179 ASIA D; and median time since injury: 0.7 years)

**High correlation with Walking Index for SCI:**

At 3 months: r = 0.76

At 6 months: r = 0.68

At 12 months: r = 0.69

**High correlation with Functional Independence Measure-Locomotor Score:**

At 3 months: r = 0.78

At 6 months: r = 0.69

At 12 months: r = 0.62

(Ditunno et al. 2007; n=146; 114 males, 32 females; mean age: 32 years; incomplete SCI; and inpatient)

**Low to High correlation with ASIA Motor Scales:**

Upper Extremity Motor Score: r = 0.24

Lower Extremity Motor Score: r = 0.70

ASIA Motor Score: r = 0.64

(Harkema et al. 2016; n=156; 123 males, 29 females; mean (SD) age: 36 (15) years; 110 cervical, 42 thoracic; 43 ASIA A, 21 ASIA B, 39 ASIA C, and 49 ASIA D; and median (range) time since injury: 0.9 (0.1-45.2) years)

**Moderate to High correlation with WISCI-II:**

r=0.36-0.69

**Moderate correlation with LEMS**

r=0.49-0.55

(Perez-Sanpablo et al. 2017; n=23, 15 males, 8 females; mean (SD) age: 45.6 (12.6) years, ASIA D; and chronic and subacute injury types)

**High correlation with 2-Minute Walk Test**

r=0.992

(Willi et al. 2023; n=50; mean (SD) age: 52.6 (16.2) years; 24 tetraplegic, 26 paraplegic; 2 ASIA A, 7 ASIA C, and 41 ASIA D; and mean (SD) time since injury: 6.11 (9.8) years)

**Moderate correlation with Standing and Walking Assessment Tool**

r=0.521; p<0.001

(Musselman et al. 2022; N= 618; 141 females; mean age: 48.7 years; 164 ASIA A, 66 ASIA B, 104 ASIA C, 283 ASIA D, 1 ASIA E; 383 cervical, 156 thoracic, 72 lumbar, 7 sacral)

**Number of studies reporting validity data:** 11

### Reliability – High

**High Test-retest Reliability:**

ICC = 0.989

(Musselman and Yang 2013; n=20; 14 males, 6 females; mean (SD) age: 46.0 (13.6) years; incomplete SCI; and mean (SD) time since injury: 5.4 (8.8) years)

**High Inter-rater Reliability:**

ICC = 0.970

**High Intra-rater Reliability:**

ICC = 0.981, P<.001

(Van Hedel et al. 2005; n=22; 14 males; AIS A-D; paraplegia; and no information on chronicity)

**Number of studies reporting reliability data:** 3

Responsiveness

**Floor/Ceiling Effect:**
Not established in SCI

**Effect Size:**

23+ sessions of locomotor training:
SRM = 0.48

(Harkema et al. 2016; n=156; 123 males, 29 females; mean (SD) age: 36 (15) years; 110 cervical, 42 thoracic; 43 ASIA A, 21 ASIA B, 39 ASIA C, and 49 ASIA D; and median (range) time since injury: 0.9 (0.1-45.2) years)

2-month endurance training:
SRM = 0.88

(Musselman and Yang 2013; n=20; 14 males, 6 females; mean (SD) age: 46.0 (13.6) years; incomplete SCI; and mean (SD) time since injury: 5.4 (8.8) years)

**Number of studies reporting responsiveness data:** 3