5 Times Sit to Stand Test (5XSST)

Assessment Overview

Assessment Area

ICF Domain:
Activity
Subcategory:
Mobility

You Will Need

Length:
Less than 5 minutes
Equipment:

- Standard height chair (43-45 cm, 17-18 inches) with a backrest.
- Countdown timer.

Scoring:
The amount of time (to the nearest decimal in seconds) it takes the patient to transfer from a seated to a standing position and back to sitting five times.

Summary

The 5 Times Sit to Stand Test (5XSST) is a test that measures the amount of time a patient is able to transfer from a seated to a standing position and back to sitting five times.

It assesses the functional lower limbs strength, transitional movements, balance, and fall risk. The 5XSST is widely used in many populations including older adults and ambulatory individuals with SCI.

Availability

Worksheet: Can be found here.

Assessment Interpretability

Minimal Clinically Important Difference

>2.27 s with arms on a walking device
>2 s with arms on knees, arms by sides, and arms folded over the chest

(Amatachaya et al. 2023; n=109; 87 males, 14 females; ASIA C-D; 67 paraplegia, 42 tetraplegia; mean (SD) time since injury: 76.3 (72.1) months)

Statistical Error

Standard Error of Measurement:
1.09 s (arms on a walking device)
0.88 s (arms on knees)
0.55 s (arms by sides)
1.05 s (arms crossed over the chest)

Minimal Detectable Change:
3.01 s (arms on a walking device)
2.44 s (arms on knees)
1.53 s (arms by sides)
2.93 s (arms crossed over the chest)

(Khuna et al. 2020; n=82; 69 males, 13 females; ASIA C-D; 55 paraplegia, 26 tetraplegia; mean time since injury: 89.8 months)

Typical Values

Not established in SCI

Measurement Properties

Validity – Low to High

Moderate correlation of 5XSST (without hands) with knee extensor muscle strength:

r = -0.45

(Mato et al. 2022; n=44; 31 males, 13 females; incomplete SCI; injury level: 9 cervical, 12 thoracic, 18 lumbar, 5 sacral; mean time since injury: 73.14 months)

Low to Moderate correlation of 5XSST (without hands) with lower extremity motor strength:

ρ = –0.38 to –0.70

Low to Moderate correlations of 5XSST with 10-MWT:

- Without hands: Moderate ρ = –0.68
- With hands: Low ρ = –0.40

Moderate correlations of 5XSST with TUGT:

- Without hands - ρ = –0.69
- With hands - ρ = 0.52

Low to High correlations of 5XSST with 6-MWT:

- Without hands - High - ρ = –0.71
- With hands – Low ρ = –0.47

Moderate correlation of 5XSST (without hands) with WISCI II:

ρ = –0.58

(Khuna et al. 2022; n=56; 44 males, 12 females; incomplete SCI; level of injury: 12 C5-C8, 7 T1-T6, 4 T7-T12, and 33 L1-L5; and mean time since injury: 80.7 months)

Number of studies reporting validity data: 4

Reliability – High

High Test-retest Reliability:

ICC = 0.956-0.989

(Khuna et al. 2020; n=82; 69 males, 13 females; ASIA C-D; 55 paraplegia, 26 tetraplegia; mean time since injury: 89.8 months)

High Inter-rater Reliability:

ICC = 0.997-1.000

(Khuna et al. 2020; n=82; 69 males, 13 females; ASIA C-D; 55 paraplegia, 26 tetraplegia; mean time since injury: 89.8 months)

(Poncumhak et al. 2013; n=66, 46 male, incomplete SCI)

High Intra-rater Reliability:

ICC = 0.998-1.000

(Khuna et al. 2020; n=82; 69 males, 13 females; ASIA C-D; 55 paraplegia, 26 tetraplegia; mean time since injury: 89.8 months)

Number of studies reporting reliability data: 2

Responsiveness

Floor/Ceiling Effect:
Not established in SCI

Effect Size:
Arms on walking device:
0-1 month, SRM = 0.91
1-3 months, SRM = 1.03
3-6 months, SRM = 0.99

Arms on knees:
0-1 month, SRM = 1.13
1-3 months, SRM = 0.85
3-6 months, SRM = 1.12

Arms on by sides:
0-1 month, SRM = 1.04
1-3 months, SRM = 1.00
3-6 months, SRM = 1.22

Arms on walking device:
0-1 month, SRM = 0.95
1-3 months, SRM = 0.83
3-6 months, SRM = 1.09

(Amatachaya et al. 2023; n=109; 87 males, 14 females; ASIA C-D; 67 paraplegia, 42 tetraplegia; mean (SD) time since injury: 76.3 (72.1) months)

Number of studies reporting responsiveness data: 1