Five Time Sit To Stand

Introduction

The *Five Time Sit to Stand Test* (FTSST) is used to measure a patient's functional mobility and muscle strength of their lower extremities. The patient is instructed to go from a sitting position to a standing position five times as fast as they can without assistance. If the patient is unable to go from the sitting position to standing position five times without assistance results in a failure of the test[1].

Establishing Author: Cuska, et al[2] **Data Type:** Time Interval/Percentage

Measurement Type: Performance- Based Outcome Measure **Assessment Type:** Observer

Patient Populations[1]

-Cerebral Palsy
-Chronic Obstructive Pulmonary Disease
-Elderly
-Knee Osteoarthritis
-Low Back Pain
-Multiple Sclerosis
-Parkinson's Disease
-Patients With Mobility Impairments
-Peripheral Arterial Disease
-Renal Transplant
-Rheumatoid Arthritis
-Stroke
-Total Knee Arthroplasty
-Vestibular Disorders

Required Resources

Time: 5 min or less[1]
Personnel: 2 (Patient and Clinician)
Equipment: Stopwatch, Normal Sitting Chair (standard arms and seat height (usually 43-45cm))[4]
Space: Safe environment where chair does not roll or slide[1]. Patient must also have adequate space to sit and stand without restraint.
Cost: Free[1]

Test Administration

1. Patient is instructed to sit all the way back against the chair with arms folded across chest[1].
2. Clinician ensures that the chair is not stabilized in anyway against a wall or object[1].
3. Patient is instructed to sit down without touching the back of the chair and stand fully for five repetitions as fast as they can when they hear the clinician say "GO"[1].
4. Clinician starts the stopwatch when he/she say "GO"[1].
5. Clinician stops the stopwatch after the patient has completed five full repetitions[1].
6. Document time and assist level[1] (Using hands/arms to push on legs or chair arm).

Test Considerations

Allow for one trial run in order for the patient to become acclimated to the test. If the clinician is concerned about the patient fatiguing during the trial run, the clinician is allowed to demonstrate

the test to allow for patient understanding. Administrator must not talk to patient during test due to a possible decreasing of patient concentration and speed[1].

Interpretation

This outcome measure test is used to assess the functional muscle strength of lower limbs[1]. This test is also useful to measure of a patient's ability to maintain balance as well as a patient's risk of falling[4]. If the patient cannot complete this test without assistance or with minimal assistance the subject is considered to have failed[1].

Minimal Detectable Change Studies / Reliability

Subject Population	Change
Geriatric (n= 40)[6]	$MDC_{95\%}$: 19.2-34.4%
Geriatric Females (n = 29)[7]	MDC_{95} : 2.5 sec
Vestibular Disorders (n = 117)[1]	MCID : ≥ 2.3 sec

Psychometric Properties

The Five Times Sit to Stand test (FTSST) is a physical performance test that is most commonly used within clinical geriatric studies, yet this test can still be applied to various patient populations such as lower extremity amputees and geriatrics. A main goal of the Five Times Sit to Stand test is to act as a measure of dynamic balance for those whom are being tested. [7]

Reliability: An "excellent" relative and absolute reliability for the FTSST was found within a study regarding geriatric females. The high ICC and low SEM and SEM% suggest excellent relative and absolute reliability and reproducibility of the FTSST in older adults.[7] The FTSTS test showed excellent intra-rater reliability intra-class correlation coefficient and moderate intra-rater reliability in healthy older and young subject groups respectively.[8] The Inter-rater reliability between assessors yielded an ICC of 0.990, therefore the test-retest reliability was deemed excellent.[8]

Validity: The Pearson's correlation coefficient between FTSST and TUG ($r=0.64$, $p<0.001$) indicates that FTSST is a valid measure of dynamic balance and functional mobility in older adults.[7]

Responsiveness: Change in FTSTS performance should exceed 2.5 seconds in order to be considered an appreciable change beyond measurement error. [7]

Limitations

If a trial run is performed and fatigue is not evaluated, results will possibly be skewed[1]. If one trial is performed, a second trial may be helpful to gain more conclusive results (take the mean of the two trials)[3].

Documentation in Clinical Notes

Example: When assessed with the FTSST the patient recorded a time that was X.XX seconds faster/slower than previously recorded. This represents a decrease/increase in time since last recorded (99/99/9999), and therefore represents an improvement/decrease in the patient's functional mobility and lower extremity strength. This improvement was greater/less than the Minimal Detectable Change (MDC) established for this population.

Disclaimer: The Authors, the Outcomes Research Committee, and the American Academy of Orthotitsts and Prosthetists does not endorse the use of any single outcome measure over any other single outcome measure and declares no conflict of interest in the presentation of the measure. There may be multiple versions of the instructions published in the research literature. This reference guide has attempted to remain consistent with the instructions form the original developers of the outcome measure whenever possible, however in some instances specific versions of the instructions are chosen for ease of use in the clinic.

References

1. http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=1015
2. Simple method for measurement of lower extremity muscle strength. Csuka, Maryellen et al. The *American Journal of Medicine*, Volume 78 , Issue 1 , 77 - 81
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3250986/
4. http://alliedhealth.ceconnection.com/files/AComparativeStudyoftheFiveTimesSittoStand-1404240171643.pdf
5. http://www.thompsonhealth.com/Portals/0/_RehabilitationServices/PT%20Mgmt%20of%20Knee/5XSST_handout.pdf
6. http://iopscience.iop.org/article/10.1088/0967-3334/33/11/1931/meta
7. https://www.ncbi.nlm.nih.gov/pubmed/23238309
8. http://www.magonlinelibrary.com/doi/abs/10.12968/ijtr.2013.20.3.