Timed Up and Go test

Clinical studies on patients with lumbar degenerative diseases increasingly employ objective measures of function, which offer high potential for improving the quality of outcome measurement in patient-care and research.

The Timed Up and Go test (TUG) is a simple test used to assess a person's mobility and requires both static and dynamic balance.

It has previously been described as a reliable tool to evaluate objective functional impairment in patients with lumbar degenerative disc disease.

It uses the time that a person takes to rise from a chair, walk three metres, turn around, walk back to the chair, and sit down. During the test, the person is expected to wear their regular footwear and use any mobility aids that they would normally require.

The TUG is used frequently in the elderly population, as it is easy to administer and can generally be completed by most older adults.

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/BA7Y_oLElGY" frameborder="0" allowfullscreen></iframe></html>

Of 2389 identified articles, 82 were included in the final analysis. There was a significant increase of 0.12 per year in the number of publications dealing with objective measures of function since 1989 (95% CI 0.08-0.16, p<0.001). Some publications studied multiple diagnoses and objective measures. The US was the leading nation in terms of scientific output for objective outcome measures (n=21; 25.6%), followed by Switzerland (n=17; 20.7%), Canada, Germany and the United Kingdom (each n=6; 7.3%).

The search revealed 21 different types of objective measures, predominantly applied to patients with lumbar spinal stenosis (n=67 publications; 81.7%), chronic/unspecific low back pain (n=28; 34.2%) and lumbar disc herniation (n=22; 26.8%). The Timed-Up-and-Go (TUG) test was the most frequently applied measure (n=26 publications; 31.7%; cumulative number of reported subjects: 5181), followed by the Motorized Treadmill Test (MTT; n=25 publications; 30.5%, 1499 subjects) and with each n=9 publications (11.0%) the Five Times Sit-to-Stand (5R-STS; 955 subjects), as well as accelerometry analyses (336 subjects). The reliability and validity of many of the less-applied objective measures was uncertain. There was profound heterogeneity in their application and interpretation of results. Risk of bias was not assessed. [1)].

Nikaido et al. investigated the differences in postural control disability between idiopathic normal pressure hydrocephalus (iNPH) and Parkinson's disease (PD).

Twenty-seven iNPH patients, 20 PD patients, and 20 healthy controls (HCs) were examined using the Timed Up and Go test (TUG) and a force platform for recording the center of pressure (COP) trajectory during quiescent standing and voluntary multidirectional leaning (forward, backward, right, and left for 10 s each).

In the leaning task, postural control in PD patients was impaired during forward and backward leaning, whereas postural control in iNPH patients was impaired in all directions. In particular, postural control during right and left leaning was significantly worse in iNPH patients than in PD patients. No significant difference was observed between iNPH and PD patients in TUG and postural sway during quiescent standing.

The results showed that the characteristics of impaired voluntary COP control in iNPH and PD patients might reflect pathophysiological differences in postural instability for each disease. In particular, postural instability during right and left leaning in iNPH patients may be responsible for wider steps and a higher risk of falling [2)].

One source suggests that scores of ten seconds or less indicate normal mobility, 11 – 20 seconds are within normal limits for frail elderly and disabled patients, and greater than 20 seconds means the person needs assistance outside and indicates further examination and intervention. A score of 30 seconds or more suggests that the person may be prone to falls.

Alternatively, a recommended practical cut-off value for the TUG to indicate normal versus below normal performance is 12 seconds.

A study by Bischoff et al. showed the 10th to 90th percentiles for TUG performance were 6.0 to 11.2 seconds for community-dwelling women between 65 and 85 years of age, and determined that this population should be able to perform the TUG in 12 seconds or less.

TUG performance has been found to decrease significantly with mobility impairments. Residential status and physical mobility status have been determined to be significant predictors of TUG performance.

The TUG was developed from a more comprehensive test, the Get-Up and Go Test.

Research has shown the Timed up and Go test has excellent interrater (intraclass correlation coefficient [ICC] = .99) and intrarater reliability (ICC = .99).[8] The test score also correlates well with gait speed (r = -.55), scores on the Berg Balance Scale (r = -.72), and the Barthel Index (r = -.51).

Many studies have shown good test-restest reliability in specific populations such as community-dwelling older adults and people with Parkinson’s disease.

The TUG Test (measured in seconds) was correlated with validated patient-reported outcome measures (PROs) of pain intensity (Visual Analog Scale for back and leg pain), functional impairment (Oswestry Disability Index, Roland Morris Disability Index), and health-related quality of life measures (Short Form-12 and EuroQol 5D). Three established methods were used to establish anchor-based MCID values using responders of the following PROs (Visual Analog Scale back and leg pain, Oswestry Disability Index, Roland Morris Disability Index, EuroQol 5D index, and Short Form-12 Physical Component Summary) as anchors: (1) average change, (2) minimum detectable change, and (3) change difference approach.

One hundred patients with a mean ± SD age of 56.2 ± 16.1 years, 57 (57%) male, 45 patients undergoing microdiscectomy, 35 undergoing lumbar decompression, and 20 undergoing fusion surgery were studied. The 3 MCID computation methods revealed a range of MCID values according

to the PRO used from 0.9 s (Oswestry Disability Index based on the change difference approach) to 6.0 s (EuroQol 5D index based on the minimum detectable change approach), with a mean MCID of 3.4 s for all measured PROs.

The MCID for the TUG Test time is highly variable depending on the computation technique used. The average TUG Test MCID was 3.4 s using all 3 methods and all anchors [3].

The TUG test is preferred over a battery of PROMs by 60-70% of patients with lumbar DDD not only in the preoperative, but also in the postoperative setting. High functional disability does not result in avoidance of the TUG test and repeated assessments lead to higher preference [4].

References

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