

Timed Up and Go is a Valid and Valuable Performance Test to Evaluate Outcomes Following Total Knee Arthroplasty

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Abstract

INTRODUCTION: Over 800,000 total knee arthroplasties (TKAs) are performed annually in the United States, primarily to improve pain and mobility in end-stage osteoarthritis patients. Objective outcomes measurement is crucial for assessing TKA recovery and prognosis. The Timed Up-and-Go Test (TUG) is classically used to determine fall risk yet remains under-utilized in post-TKA examination. As TUG is accessible, reliable, and easy-to-administer, it may allow expanded assessment of TKA functional outcomes in patients. Our systematic review summarizes literature evaluating TUG as an outcomes measure in TKA.

METHODS: A Pubmed literature search retrieved 271 studies that address the use of TUG as a functional outcomes measure for TKA. Twenty-one studies met selection criteria, which included relevance to the topic, after thorough review of full-text articles.

RESULTS: TUG demonstrates excellent test-retest reliability ($ICC \geq 0.97$) across multiple studies and allows comparison of pre-operative and post-operative functional status. A study comparing TUG to the two-meter walk test identified that TUG changes greater than 2.27 seconds denote clinically important functional progress. Another group found that pre-operative TUGs less than 11.2 seconds ($P = 0.015$) are significant in predicting improved TKA recovery. Comparisons to walking and stair-climbing tests found that TUG was more time-, space- and equipment-efficient to administer. Lastly, others revealed TUG as the best predictor of quality of life-associated patient-reported outcomes (PROs) ($P \leq 0.0005$) out of all health indicators studied.

DISCUSSION: Our review confirms that TUG is a valuable outcome measure in TKA. TUG has high reliability, correlates with other performance-based tests and PROs, and can be administered rapidly in multiple clinical settings. Additionally, TUG can identify clinically important functional improvements, though further studies are needed to determine the absolute TUG value or post-operative TUG improvement that correlates with improved outcomes and patient satisfaction.

SIGNIFICANCE: While TUG has been validated widely in various clinical settings, including physical therapy, the limited understanding of its utility in TKA evaluation and recovery tracking causes TUG to remain under-utilized by orthopedic surgeons in recovery assessment. The prevalence of both osteoarthritis and TKA procedures are expected to increase with the aging population of the U.S. while the average age of patients undergoing TKA continues to decrease, underscoring the necessity for increased implementation of accurate predictive outcomes measurements that are efficiently administered and accessible to physicians and patients alike.

CONCLUSIONS: TUG is an accurate and accessible test that is simple to use and allows assessment of outcomes in TKA patients. Expanding TUG utilization can assist functional outcomes prediction pre-operatively and enable reliable post-operative assessment.