

PRODUCT

Smart phone application as a self-administered comprehensive tool for the assessment and quantification of overall mobility function

INDICATIONS

Mobility assessment in patients with neurological disorders, validated in a Parkinson's disease patient population

VALUE PROPOSITION

- First of its kind smart phone enabled mobility assessment tool that can be self-administered to analyze task-based mobility
- Features an advanced algorithm that separates multiple mobility tasks into specific sequential movements such as in the Timed Up and Go (TUG) test
- Untethers the utilization of TUG and other movement assessments from purely in-office / clinician facilitated use

DEVELOPMENT STAGE

Algorithm validation complete, app interface in development

PUBLICATIONS

Miller Koop M, Ozinga SJ, Rosenfeldt AB, Alberts JL. Quantifying turning behavior and gait in Parkinson's disease using mobile technology. [IBRO Rep.](#) 2018 Jun 21;5:10-16.

Miller Koop M, Rosenfeldt AB, Alberts JL. Mobility improves after high intensity aerobic exercise in individuals with Parkinson's disease. [J Neurol Sci.](#) 2019 Apr 15;399:187-193.

CONTACT INFORMATION

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Smart Phone Enabled Assessment of Timed Up and Go (TUG) Test

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OPPORTUNITY

Neurological conditions such Parkinson's disease, multiple sclerosis, Alzheimer's, and stroke typically feature clinical care and assessment pathways that are often time and resource intensive for all levels of healthcare providers. These conditions feature hallmark symptom progression and dynamic patient statuses that must be regularly assessed to ensure that optimal resources and clinical care are consistently provided. The administration of widely used mobility assessments such as the Timed Up and Go (TUG) test has historically been restricted to in-office and clinician facilitated use only. Additionally, this assessment's value has been limited due to its outcome metric being collapsed into a single measurement as opposed to expanded. In an expanded form, biomechanical data obtained from the TUG test (in-real time) could be used to determine patient performance related to its specific individual components (sit-to-stand, gait, turn, and turn-to-sit).

At present, there is a severe unmet need in available medical technologies that are capable of efficiently extrapolating comprehensive biomechanical data from the TUG test and other commonly used mobility assessments in patients affected by neurological disorders.

SOLUTION

We have developed a novel smart phone enabled assessment tool for the commonly implemented Timed Up and Go (TUG) test that features an internal advanced algorithm capable of analyzing intermediary data related to each of the individual components of this assessment. The algorithm intelligently assesses mobility function during maneuvers such as walking, turning, and weight transfer movements using a native inertial monitoring unit (IMU). This platform, coupled with commercially available mobile smart phones, creates a functional, all-inclusive system for biomechanical data collection, storage, processing and external reporting. The algorithm used in this system was validated within a population of patients with Parkinson's disease.

The development of this system offers a first-in-class opportunity to provide patients with neurological disorders with a tool that can be used to self-assess their overall functional mobility. Additionally, this system has the potential to greatly improve clinical decision making and patient outcomes by quickly, yet comprehensively analyzing mobility measurements while seamlessly integrating this data into an electronic medical record (EMR) system.

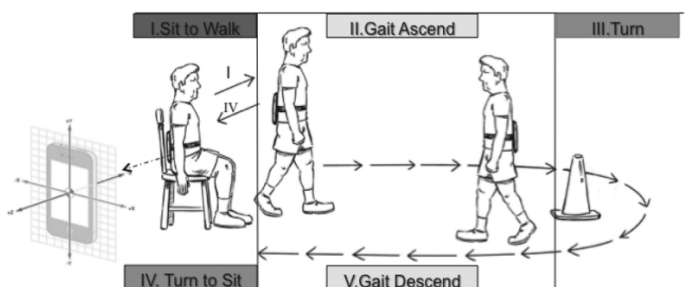


Figure: Sequential movement breakdown for the Timed Up and Go (TUG) Test, the most widely utilized clinical assessment of functional mobility in neurological and geriatric populations.