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Mobility Assessment: Sensitivity and Specificity of Measurement Sets in Older Adults

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Objective: To identify quantitative measurement variables that characterize mobility in older adults, meet reliability and validity criteria, distinguish fall risk, and predict future falls.

Design: Observational study with 1-year weekly falls follow-up.

Setting: Mobility laboratory.

Participants: Community-dwelling volunteers (N74; age 65–94y) categorized at entry as 27 nonfallers or 47 fallers by using Medicare criteria (1 injury fall or >1 non-injury fall in the previous year).

Interventions: None.

Main Outcome Measures: Test-retest and within-subject reliability, criterion and concurrent validity; predictive ability indicated by observed sensitivity and specificity to entry fallrisk group (falls status), Tinetti Performance Oriented Mobility Assessment (POMA), computerized dynamic posturography Sensory Organization Test (SOT), and subsequent falls reported weekly.

Results: Measurement variables were selected that met reliability (intraclass coefficient of correlation .6) and/or discrimination (*P*.01) criteria (clinical variables: turn steps and time, gait velocity, step-in-tub time, downstairs time; forceplate variables: quiet standing Romberg ratio sway area, maximal lean anterior-posterior excursion, sit-to-stand mediallateral excursion, sway area). Sets were created (3 clinical, 2 forceplate) using combinations of variables appropriate for older adults with different functional activity levels, and composite scores were calculated. Scores identified entry falls status and concurred with POMA and SOT scores. The full clinical set (5 measurement variables) produced sensitivity of 80% and specificity of 74% to falls status. Composite scores were more sensitive and specific overall in predicting subsequent injury falls and multiple falls compared with falls status and POMA or SOT score.

Conclusions: Sets of quantitative measurement variables obtained with this mobility battery provided sensitive prediction of future injury falls and screening for multiple subsequent falls by using tasks that should be appropriate to diverse participants.