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Title: Fall risk assessment: prediction and prevention from a 60 second test.

*Background.* Each year, 28.7% of older Americans fall, resulting in \$50 billion in medical costs and numerous deaths. To reduce falls, the CDC recommend “screening for fall risk and intervening on modifiable risk factors”. Yet, there is no gold standard assessment, and the current best fall predictor is fall history. The objective of this study was to determine if a stability score calculated during a 60 second eyes-open Romberg test(60sRT), can be used for fall prediction and thus, facilitate fall prevention.

*Methods.* A stability score was measured with a force plate (Zibrio SmartScale) during a 60sRT in 461 participants recruited from community dwellers, eight senior-living facilities(SLF), two physical therapy clinics, two outpatient clinics and a hospital surgical ward. Twelve month fall history, prospective falls, Timed Get Up and Go (TUG), Johns Hopkins Fall Risk Assessment Tool (JHFRAT), and/or Sit to Stand (STT) were also measured. No participants received their score, except a subset of SLF. Receiver operating curves, survival, and regression analyses were performed for comparisons.

*Results.* The stability score provides good fall prediction, greater sensitivity than fall history or TUG, and good agreement with JHFRAT and SST. Each fall risk category had progressively increasing fall probabilities ( $p<0.05$ ), and different fall types and risk factors associated ( $p<0.05$ ). Residing in Senior Living altered the probability of falling ( $p<0.05$ ). When a stability score was received, a 50% reduction in falls was observed.

*Conclusions.* The stability score is a valid, reliable, 60s fall risk assessment. For fall prevention, the specific risk factors associated with defined risk categories creates actionable information, and the score may also motivate the patient.

*Public Health Implications.* This study indicates personalized fall prevention care is possible from a quick, low burden test.

*Data Source Utilized.* 461 participants from 15 sites, measuring stability score, fall history, fall tracking, TUG, SST, and/or JHFRAT.