Risk Assessment Tools

Timed up and go test and risk of falls in older adults: a systematic review.
Of the 92 selected studies, 11 met the selection criteria and were included in the final analysis. Fall rate ranged from 7.5 to 60.0% in the selected studies. The cut-off time separating non-fallers and fallers varied from 10 to 32.6 seconds. All retrospective studies showed a significant positive association between the time taken to perform the TUG and a history of falls with the highest odds ratio calculated at 42.3 [5.1 - 346.9]. In contrast, only one prospective study found a significant association with the occurrence of future falls. This association with incident falls was lower than in retrospective studies.
Conclusions: Although retrospective studies found that the TUG time performance is associated with a past history of falls, its predictive ability for future falls remains limited. In addition, standardization of testing conditions combined with a control of the significant potential confounders (age, female gender and comorbidities) would provide better information about the TUG predictive value for future falls in older adults.

The FARE: A new way to express falls risk among older persons including physical activity as a measure of Exposure.
Community dwelling older persons (n = 771) between 71 and 96 years completed questionnaires on age, gender, physical activity participation, as well as balance control difficulty through questions like independently using the toilet, bending and picking up objects, and getting up from a chair. For the next ten months following the questionnaire, subjects were called monthly and asked about fall occurrences. Falls risk was expressed as falls per 1000 person-years and as the FARE (Falls Risk by Exposure (number of fallers per 1000 person-days with at least 30 min of physical activity)). The two falls risks expressions were compared and each had their own pattern. The falls risk, per 1000 person-years, increased linearly with reported balance control difficulty whereas the FARE increased exponentially. The exponential increase pattern of the FARE was due to the strongly reduced physical activity among subjects who reported increased difficulty controlling balance. Authors recommend the FARE for use in public health policy and research on falls prevention because it takes into account reduced physical activity of older persons who experience increased difficulty controlling their balance.

Correlation of accelerometry with clinical balance tests in older fallers and non-fallers.
Clinical assessment of balance is complicated by the lack of reliable, objective, inexpensive, simple and time efficient tests. Accelerometers have been proposed as a quantitative measure of balance and offer a practical and low cost alternative to force plates. Older patients (n = 21) with a mean age of 78 years who attended a day hospital were recruited for this study and identified as fallers or non-fallers based on a comprehensive falls history. Accelerometer data when standing on a compliant foam mat
with eyes open correlated significantly with both the Berg Balance Scale and the Timed Up and Go. As with other studies, accelerometry data in this study were able to distinguish between responses to different test conditions and between fallers and non-fallers.

The CAREFALL Triage instrument identifying risk factors for recurrent falls in elderly patients.
This study shows that the CAREFALL Triage Instrument (CTI) is an adequately valid and reliable self-assessment instrument for determining modifiable risk factors (medication, balance and mobility, fear of falling, orthostatic hypotension, mood, high risk of osteoporosis, impaired vision, and urinary incontinence) in elderly patients after a fall. The authors recommend its application to identify high-risk patients for a fall prevention outpatient clinic from elderly patients who visit an ER department after a fall.

Nursing homes (n = 58) were recruited to compare the number of fallers, falls, fall-related injuries, medical attention, and newly administered fall preventive measures between an intervention group which used a standard fall risk assessment tool (Downton Index) with nurses’ clinical judgement to a control group which used nurses’ clinical judgement alone. Both groups were provided with a 60-90 minute presentation which covered frequency of falls and fall-related injuries in older people, proven fall risk factors, fall-related morbidity and best evidence strategies to prevent falls and fractures. The intervention group was trained to use the assessment tool. The monthly administration of the fall risk assessment tool in the intervention group did not result in a reduction of fallers and fall-related consequences. Authors conclude that “the use of a fall risk assessment tool by nurses should be avoided since it has no clinical consequences other than a waste of scarce nursing resources.”

This study measured the relationship between fall hazards in the home using the Home Falls and Accidents Screening Tool (HOME FAST) and the outcome of falls for a community based sample of 727 people aged 70 years and older. The highest HOME FAST score reported in this study was 14 hazards. Authors found a 1–2% increase in the odds of having a fall for every increased point score on the HOME FAST and a 1–2% reduction in the odds of having a fall for every point reduced on the HOME FAST score. They conclude that HOME FAST can be used as an outcome measure for interventions that address falls hazards in home environments.

Authors surveyed 834 single, community-living, seniors (75-89 years) to test the hypotheses that an assessment of person-environment fit (frailty of the individual, the extent to which the home environment supports performance of activities, etc.) provides a more accurate prediction of indoor falls than an assessment of environmental hazards only. The surveys were followed up with self-reports about falls one year later. Results showed that the number of environmental hazards found in homes was similar for fallers and non-fallers; however, the magnitude of person-environment fit problems was higher among fallers. Authors point out that the person-environment fit approach also results in individually tailored interventions.
A classification and regression tree for predicting recurrent falling among community-dwelling seniors using home-care services.
Community-living older persons aged ≥65 years who use home-care services (n = 868) participated in a prospective, observational study for the identification of risk profiles for recurrent falls. The incidence of recurrent fallers was 11.4%. Authors found that a history of falls in the three months prior to the initial interview emerged as a predictor of recurrent falling. Also at a high risk of becoming recurrent fallers were participants with ≥2 prior falls and a score of ≤30 on the Berg balance scale – particularly those who drank alcohol in the six months preceding their examination – as well as participants with ≥2 prior falls but with a score higher than 30 on the Berg scale, who lived in a private residential facility verses a single-family home (i.e. house).

Screening the risk of falls: a general or a specific instrument?
In a geriatric German hospital, 560 newly admitted patients were assessed using a general health assessment tool, Care Dependency Scale (CDS) and a falls risk assessment tool, Hendrich Fall Risk Model (HFRM), and then patients’ falls within the hospital were recorded. It was found that the CDS bared similar results (sensitivity and specificity) to those of the HFRM. Authors conclude that this study supports the use of one tool in order to limit workloads.

The Dynamic Gait Index in healthy older adults: The role of stair climbing, fear of falling and gender.
Authors present findings from this first large-scale study on the Dynamic Gait Index (DGI) and associated factors among healthy older adults. Authors indicate that findings suggest that the DGI, although susceptible to ceiling effects, appears to be an appropriate tool for assessing function in healthy older adults.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2709498/

Lateral balance factors predict future falls in community-living older adults.
This study showed that laboratory tests of mediolateral stepping performance and associated neuromusculoskeletal factors were significant predictors of the prospective falls among community-living older people. The findings also showed that any 2-variable models combining the use of 100% multiple steps, FAR physical axial rotation, and peak isokinetic hip abductor torque improved prediction of fall risk compared with the most optimal single variable model, 100% multiple steps. The assessment of lateral balance factors is useful not only for identifying fall risk, but also for specifying target areas for clinical interventions to prevent falls.
Five times sit to stand test is a predictor of recurrent falls in healthy community-living subjects aged 65 and older.


This population-based study which included 2,735 consecutive voluntary subjects aged 65 and older in an apparently good state of health consulting for a medical examination showed that the threshold of 15 seconds for the Five Times Sit to Stand (FTSS) test was useful for the detection of elderly subjects at higher risk of recurrent falls independent of the other main risk factors for falls. The slower FTSS test time observed in recurrent fallers could reflect postural balance disorders or muscular weakness of the lower limbs in these individuals. This study did not find a significant predictive value for recurrent falls for the One-Leg Balance and Timed ‘‘Up & Go’’ tests.

Controversial issues: Opinion piece – Falls risk assessment tools. False friends?

Oliver D. ProFaNE Community Online 2008 February 29 [cited 2008 April 3]; Circulation: 2547: [6 screens]

Dr. David Oliver questions the use of falls risk assessment tools such as risk factor checklists, falls risk modeling tools, and risk prediction or stratification tools as many of them have only been tested on limited populations in certain settings. He argues further that many professionals address falls by simply doing a falls assessment neglecting to prescribe and facilitate appropriate interventions. Or they prescribe interventions which are based on inaccurate information derived from limited risk factors addressed in the utilized tools. He believes that professionals’ energy should be directed towards correctly identifying and facilitating interventions rather than assessing the risk of falls.

The reliability and predictive accuracy of the falls risk for older people in the community assessment (FROP-Com) tool.


Community-dwelling older people (n=344) presenting to an emergency department after a fall and being discharged directly home were monitored for falls for 12 months after a home-based assessment, including the FROP-Com, Timed Up and Go (TUG) and functional Reach (FR). The FROP-Com demonstrated good reliability and a moderate capacity to predict falls.

http://ageing.oxfordjournals.org/content/37/6/634.short

Prognostic validity of the Timed Up-and-Go test, a modified Get-Up-and-Go test, staff’s global judgement and fall history in evaluating fall risk in residential care facilities.


In this cohort study, 183 frail persons living in residential care facilities in Sweden were assessed for falls using Timed Up-and-Go test (TUG), a modified Get-Up-and-Go test (GUG-m), staff’s judgment of global rating of fall risk (GLORF) and fall history among frail older people. These assessment tools were evaluated using sensitivity, specificity and positive and negative likelihood ratios. Results indicated that staff’s judgment of
their residents’ fall risk as well as previous falls both appear superior to the performance-based measures TUG and GUG-m in ruling in a high fall risk.

http://ageing.oxfordjournals.org/content/37/4/442.abstract

Recurrent Falls and Dual Task-Related Decrease in Walking Speed: Is There a Relationship?
In randomized order, 213 participants were asked to perform straight walking 10 meters at their usual self-selected walking speed first as a single task and then while counting backward aloud (counting down by 1) starting from 50. It was found that slower walking speed while counting backward was associated with recurrent falls, suggesting that changes in gait performance while dual tasking might be an inexpensive way of identifying frail older adults prone to falling.

This prospective cohort study examined the comparative ability and clinical utility of eight mobility tests to predict multiple falls in older community-dwelling people.
Subjects aged 74-98 years (n = 362) were assessed using the sit-to-stand test (STS) with one and five repetitions, the pick-up-weight test, the half-turn test, the alternate-step test (AST), the six-metre-walk test (SMWT) and stair ascent and descent tasks. Falls were monitored for 1 year with fall calendars. Based on feasibility and predictive validity, the AST, STS-5 and SMWTs were the best tests.

A multifactorial approach to senior’s falls prevention can reduce the risk of falls by 30 – 40 %. The researchers suggest that a clinical examination should reserve prevention techniques for high risk patients. Clinically identifiable risk factors were identified: orthostatic hypotension, visual impairment, impairment of gait or balance, medication use, limitations in basic or instrumental activities of daily living, and cognitive impairment. To determine high-risk patients for falls, the authors suggest that clinicians should assess whether the patient has fallen in the last year, concluding that patients who have fallen within this time frame are at a higher risk of future falls.

The Falls Efficacy Scale-International (FES-I) with its 16 items has proved to be reliable and valid; however, this article suggests the need for a shortened version. The authors attempt to create and verify a shortened version of the FES-I by testing it against the larger original through random sampling. The results showed that the shortened FES-I
was a first-rate adaptation to the original which allowed for an accurate and reliable assessment of seniors falls, with very little difference shown in the two models. The article did highlight, however, that not all specific fall-related injuries were included in the shortened version; therefore, it may be necessary to use the FES-I version.