Our Mission: Helping to prepare Iowa’s health practitioners to care for our growing population of elders. E-NEWS is one of our methods of teaching through technology.

Each month, E-NEWS delivers abstracts from current multidisciplinary healthcare journal articles related to a specific geriatric topic. This month’s E-NEWS focuses on FALL RISK ASSESSMENT AND BALANCE TOOLS.

FALL RISK ASSESSMENT AND BALANCE TOOLS

In this issue of the E-NEWS, you will find abstracts for:

- A study that measures the effectiveness of a multifactorial intervention with balance training as a core component among older adults at risk for falls.
- A study that examines the development of a protocol for improving the clinical utility of posturography as a fall-risk screening tool.
- A study that assesses concurrent validity and reliability of the Maximum Step Length test in older adults.
- A study that investigates the benefits of cognitive dual-task training on balance performance in healthy older adults.
- A review that discusses tai chi as a balance improvement exercise for older adults.
- A study that seeks to determine the ability of simple balance and mobility tests to assess falls risk in older adults when cognition is impaired.
- A study that evaluates balance impairment as a risk factor for falls in high-functioning community-dwelling older adults.
- An article that presents clinical tools for assessing balance disorders.

PURPOSE: The purpose of this randomized controlled trial was to measure the effectiveness of A Matter of Balance, a small-group based balance program, on muscle strength, gait, balance, and fall risk among older community-dwelling adults at risk for falls. A secondary aim was to measure the effects of the program on actual fall rates over the 3-month study. METHODS: Twenty-three older adults were randomly assigned to either an experimental group that participated in a 12-week small-group based balance program or a control group. Subjects were assessed at baseline and following an intervention using the following outcome measures: lower extremity manual muscle testing (MMT) and range of motion; gait analysis on the GAITRite system; balance parameters on the SMART EquiTest, the Timed Up and Go test, the Berg Balance Scale, and incidence of falls. RESULTS: A repeated measures ANOVA revealed that there was a significant interaction between groups over time in the Berg Balance Scale scores, P < or = .05. The experimental group improved over time (48.1 to 52.9/56, respectively), whereas the control group decreased in performance (49.1 to 47.8/56, respectively), P < or = .05. The mean number of falls was significantly less in the experimental group during the intervention compared with the control group (0.09 and 0.50, respectively), P < or = .05. CONCLUSIONS: A community-based multifactorial intervention including individualized fall risk assessment, exercise, and home assessment appears to safely and effectively reduce the number of falls, resulting in significant improvements in functional balance ability and decreased fall risk.


BACKGROUND: The usefulness of posturography in the clinical screening of older adults for fall risk has been limited by a lack of standardization in testing methodology and data reporting. This study determines which testing condition and postural sway measures best differentiate recurrent fallers and nonrecurrent fallers. METHODS: One hundred and fifty older adults were categorized based on their fall status in the past year. Participants performed four quiet-standing tasks, eyes open and eyes closed in both comfortable and narrow stance, for 60 seconds while standing on a force-measuring platform. Traditional and fractal measures were calculated from the center of pressure data. Logistic regression was performed to determine the model for each condition that best discriminated between recurrent fallers and nonrecurrent fallers. RESULTS: The eyes closed comfortable stance condition, with its associated model, best differentiated recurrent fallers and nonrecurrent fallers. Medial-lateral sway velocity, anterior-posterior short-term α-scaling exponent, medial-lateral short-term α-scaling exponent, mean frequency, body mass index, and age were included in this model. Sensitivity of the model was 75%, and specificity was 94%. CONCLUSIONS: This resulting model demonstrates potential to differentiate recurrent fallers and nonrecurrent fallers in an eyes closed comfortable stance condition. The inclusion of traditional sway parameters, fractal measures, and personal characteristics in this model demonstrates the importance of considering multiple descriptions of postural stability together rather than using only a single measure to establish fall risk.


PURPOSE: This study assessed concurrent validity of the Maximum Step Length (MSL) test as a measure of falls risk and balance-impairment for community-dwelling older adults. A secondary purpose was to determine intra- and interrater reliability and standard error of measurement of the MSL test. METHODS: Thirty-five community-dwelling adults aged 60 or older provided a 12-month falls history. Functional measures included the MSL test, Single Limb Stance Time, Functional Reach test, Timed Up and Go test, and a test of trunk position sense. Pearson correlation coefficient, intraclass correlation coefficient (a coefficient of relative reliability), and standard error of measurement (a measure of absolute reliability) were calculated as indices of concurrent validity and reliability of the MSL test. Minimal detectable change was also calculated; this represents actual change beyond that of measurement error or random variation in stepping performance. RESULTS: Correlations between MSL score and clinical balance measures and self-reported number of falls in the past 12 months ranged from fair to good. Same-day and 1-month intrarater test-retest reliability of the MSL test was excellent. Same-day interrater reliability between 2 raters was also excellent. Measurement error of the MSL test was low. Minimal detectable change for the MSL test at the 95% confidence level was 7.32 inches. CONCLUSION: The MSL test appears to be a valid and reliable measure of balance-impairment and falls risk in older adults. Clinicians should consider incorporating the MSL test into their battery of falls risk assessment tools. Use of this test as a screening measure may reduce the incidence of falls in community-dwelling older adults. Real change in performance requires a difference of more than 7.32 inches between

BACKGROUND: There is growing evidence of the involvement of executive control in the maintenance of balance in old age. We examined whether healthy older adults who completed five sessions of nonmotor cognitive dual-task training would show significant improvements on measures of dual-task standing balance and mobility, compared with an untrained control group. METHODS: Twenty healthy older adults were assigned to either training or control groups. In the pre- and post-training sessions, all participants performed tests of cognition, balance, and mobility (single-support balance, dynamic posturography, sit-to-stand, 40-foot walk) under single- and dual-task conditions. The training group completed five sessions of cognitive dual-task training spaced at least 2 days apart. The two tasks involved making two-choice decisions to visually presented stimuli. Participants completed multiple blocks of single-task (task A or B, blockwise) and mixed (A, B, or A + B) trials in each training session. RESULTS: The training group showed significant improvements in body sway during single-support balance and center of gravity alignment during double-support dynamic balance. The control group showed no appreciable improvements. CONCLUSIONS: This study is the first to demonstrate training-related benefits to gross motor performance stemming from cognitive dual-task training. The results support the view that motor control in aging is influenced by executive control and have implications for theories of cognitive training and transfer.


PURPOSE: The purpose of this systematic review was to identify exercise parameters and the most common outcome measures used in tai chi (TC) research. METHODS: Ovid Medline and PubMed were used to identify longitudinal studies published from January 2000 to July 2007 written in English with the key words tai chi, tai ji, tai chi quan, tai ji quan, balance, falls, and falling. Qualifying studies had subjects aged 60 years or older. RESULTS: In all 19 qualified prospective studies, older vigorous and likely transitional frail individuals seemed to benefit more from TC than did older frail individuals. The most commonly used TC parameters were Yang's style, with 12 or fewer forms, durations of 12 weeks or longer, frequencies of twice a week or more, and session lengths of at least 45 minutes. The most common outcome measures observed were a combination of 2 to 5 of the following 10 measures (from most to least common): fear of falling, single-leg stance, posturography, rate of falling, flexibility, walking velocity, Berg Balance Scale, Timed up and Go, Functional Reach, and ankle and knee joint strength and range of motion. Improvements were reported in almost all of these measures. CONCLUSIONS: This review indicates that TC may be an economic and effective exercise program for improving balance and balance confidence in older adults.


To examine the ability of the Romberg test and the original untimed version of the Get-Up-and-Go test (GUG) to elders at risk for falls. At baseline and two annual follow-up visits, nurses administered the Romberg and GUG tests to 358 primary care patients aged 65+ years. Logistic regression models examined cross-sectional and longitudinal associations between abnormal balance tests and self-reported falls over the preceding year. Models were adjusted for age, sex, education and self-rated health (and, in the longitudinal models, for baseline falls), and the Mini-Mental State Examination (MMSE) as a measure of cognitive status. In cross-sectional analyses, falls reported at baseline were significantly associated with concurrently abnormal Romberg and GUG tests, after adjustment for covariates. In longitudinal analyses, abnormal GUG remained significantly associated with future falls, adjusting for covariates. Among those with low MMSE, GUG remained a significant predictor of future falls. Both balance tests were associated with low MMSE among those reporting no falls. Simple balance tests can help assess falls risk, particularly in cognitively impaired elderly who have elevated falls risk and might not accurately recall previous falls.

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BACKGROUND: Screening should have simple and easy-to-administer methods that identify impairments associated with future fall risk, but there is a lack of literature supporting validation for their use. OBJECTIVE: The aim of this study was to evaluate the independent contribution of balance assessment on future fall risk, using 5 methods to quantify balance impairment, for the outcomes "any fall" and "any injurious fall" in community-dwelling older adults who are higher functioning. DESIGN: This was a prospective cohort study. METHODS: A sample of 210 community-dwelling older adults (70% male, 30% female; mean age=79.9 years, SD=4.7) received a comprehensive geriatric assessment at baseline, which included the Berg Balance Scale to measure balance. Information on daily falls was collected for 12 months by each participant's monthly submission of a falls log calendar. RESULTS: Seventy-eight people (43%) fell, of whom 54 (30%) sustained an injurious fall and 32 (18%) had recurrent falls (> or =2 falls). Different balance measurement methods identified different numbers of people as impaired. Adjusted relative risk (RR) estimates for an increased risk of any fall were 1.58 (95% confidence interval [CI]=1.06, 2.35) for self-report of balance problems, 1.58 (95% CI=1.03, 2.41) for one-leg stance, and 1.46 (95% CI=1.02, 2.09) for limits of stability. An adjusted RR estimate for an increased risk of an injurious fall of 1.95 (95% CI=1.15, 3.31) was found for self-report of balance problems. LIMITATIONS: The study was a secondary analysis of data. CONCLUSIONS: Not all methods of evaluating balance impairment are associated with falls. The number of people identified as having balance impairment varies with the measurement tool; therefore, the measurement tools are not interchangeable or equivalent in defining an at-risk population. The thresholds established in this study indicate individuals who should receive further comprehensive fall assessment and treatment to prevent falls.


Three main issues have to be addressed by the examination of a patient complaining from balance disorders: physiopathology and aetiology, severity and consequences, and evolution. A precise clinical analysis must be then conducted, including close anamnesis and clinical examination, with scale measurements depending on the objectives. Daily consequences can be assessed by the Dizziness Handicap Inventory, which considers a large field of daily activities. The International Classification of Functioning evaluates activities and participation, influence of environmental factors, and quality of life. Then, patient's examination aims at objectifying and measuring the balance disorder. Quantified measurement is possible even in a simple doctor's office. Clinical scales for balance assessment should be used for a standardized assessment and to allow comparison of different subjects. Although the Tinetti test is the most-widely used in older people, it is quite approximate. The Berg Balance Scale has also been first validated in older people, it is rather easy to use, but uncertainty between two close scores is frequent. The Timed Up-and-Go Test is the simplest one and probably the most reliable. The Unipodal Stance Testing is also a simple test and a good predictor of fall. The Functional Ambulation Classification focuses attention on the physical support needed by the patient during walking. The Postural Assessment Scale for Stroke Patients (PASS) is easy to use after a recent stroke. Instrumental analysis by means of static and dynamic platforms, often coupled together with accelerometers or video, can be used to complete the clinical examination. Its main interest is to contribute to give insight into physiologic and pathologic mechanisms underlying the postural trouble.
Next Month’s Issue:

Medications and Falls in Older Adults

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