

## SafetyLit October 16 2016

### An Ai Chi-based aquatic group improves balance and reduces falls in community-dwelling adults: a pilot observational cohort study

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#### Abstract

**BACKGROUND:** Falls are associated with morbidity, loss of independence, and mortality. While land-based group exercise and Tai Chi programs reduce the risk of falls, aquatic therapy may allow patients to complete balance exercises with less pain and fear of falling; however, limited data exist. **OBJECTIVE:** The objective of the study was to pilot the implementation of an aquatic group based on Ai Chi principles (Aquabalance) and to evaluate the safety, intervention acceptability, and intervention effect sizes.

**DESIGN:** Pilot observational cohort study.

**METHODS:** Forty-two outpatients underwent a single 45-minute weekly group aquatic Ai Chi-based session for eight weeks (Aquabalance). Safety was monitored using organizational reporting systems. Patient attendance, satisfaction, and self-reported falls were also recorded. Balance measures included the Timed Up and Go (TUG) test, the Four Square Step Test (FSST), and the unilateral Step Tests.

**RESULTS:** Forty-two patients completed the program. It was feasible to deliver Aquabalance, as evidenced by the median (IQR) attendance rate of 8.0 (7.8, 8.0) out of 8. No adverse events occurred and participants reported high satisfaction levels. Improvements were noted on the TUG, 10-meter walk test, the Functional Reach Test, the FSST, and the unilateral step tests ( $p < 0.05$ ). The proportion of patients defined as high falls risk reduced from 38% to 21%. The study was limited by its small sample size, single-center nature, and the absence of a control group.

**CONCLUSIONS:** Aquabalance was safe, well-attended, and acceptable to participants. A randomized controlled assessor-blinded trial is required.

#### PDF Y Endnote Y

### Can augmented feedback facilitate learning a reactive balance task among older adults?

Mansfield A, Aqui A, Fraser JE, Rajachandrakumar R, Lakhani B, Patterson KK.

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**DOI** 10.1007/s00221-016-4790-6 **PMID** 27709269

#### Abstract

While concurrent augmented visual feedback of the center of pressure (COP) or center of gravity (COG) can improve quiet standing balance control, it is not known whether such feedback improves reactive balance control. Additionally, it is not known whether feedback of the COP or COG is superior. This study aimed to determine whether (1) concurrent augmented feedback can improve reactive balance control, and (2) feedback of the COP or COG is more effective. Forty-eight healthy

older adults (60-75 years old) were randomly allocated to one of three groups: feedback of the COP, feedback of the COG, or no feedback. The task was to maintain standing while experiencing 30 s of continuous pseudo-random perturbations delivered by a moving platform. Participants completed 25 trials with or without feedback (acquisition), immediately followed by 5 trials without feedback (immediate transfer); 5 trials without feedback were completed after a 24-h delay (delayed transfer). The root mean square error (RMSE) of COP-COG, electrodermal level, and co-contraction index were compared between the groups and over time. All three groups reduced RMSE and co-contraction index from the start of the acquisition to the transfer tests, and there were no significant between-group differences in RMSE or co-contraction on the transfer tests. Therefore, all three groups learned the task equally well, and improved balance was achieved with practice via a more efficient control strategy. The two feedback groups reduced electrodermal level with practice, but the no-feedback group did not, suggesting that feedback may help to reduce anxiety.

#### PDF Y Endnote Y

### **Cost-effectiveness of combined oral bisphosphonate therapy and falls prevention exercise for fracture prevention in the USA**

Mori T, Crandall CJ, Ganz DA.

*Osteoporos. Int.* 2016; ePub(ePub): ePub.

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#### **Abstract**

We developed a Markov microsimulation model among hypothetical cohorts of community-dwelling US white women without prior major osteoporotic fractures over a lifetime horizon. At ages 75 and 80, adding 1 year of exercise to 5 years of oral bisphosphonate therapy is cost-effective at a conventionally accepted threshold compared with bisphosphonates alone.

**INTRODUCTION:** The purpose of this study was to examine the cost-effectiveness of the combined strategy of oral bisphosphonate therapy for 5 years and falls prevention exercise for 1 year compared with either strategy in isolation.

**METHODS:** We calculated incremental cost-effectiveness ratios [ICERs] (2014 US dollars per quality-adjusted life year [QALY]), using a Markov microsimulation model among hypothetical cohorts of community-dwelling US white women with different starting ages (65, 70, 75, and 80) without prior history of hip, vertebral, or wrist fractures over a lifetime horizon from the societal perspective.

**RESULTS:** At ages 65, 70, 75, and 80, the combined strategy had ICERs of \$202,020, \$118,460, \$46,870, and \$17,640 per QALY, respectively, compared with oral bisphosphonate therapy alone. The combined strategy provided better health at lower cost than falls prevention exercise alone at ages 70, 75, and 80. In deterministic sensitivity analyses, results were particularly sensitive to the change in the opportunity cost of participants' time spent exercising. In probabilistic sensitivity analyses, the probabilities of the combined strategy being cost-effective compared with the next best alternative increased with age, ranging from 35 % at age 65 to 48 % at age 80 at a willingness-to-pay of \$100,000 per QALY.

**CONCLUSIONS:** Among community-dwelling US white women ages 75 and 80, adding 1 year of exercise to 5 years of oral bisphosphonate therapy is cost-effective at a willingness-to-pay of \$100,000 per QALY, compared with oral bisphosphonate therapy only.

This analysis will help clinicians and policymakers make better decisions about treatment options to reduce fracture risk.

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**Examining evidence based resistance plus balance training in community-dwelling older adults with complex health care needs: trial protocol for the Muscling Up Against Disability project**

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*Arch. Gerontol. Geriatr.* 2016; 68: 97-105.

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**Abstract**

Progressive resistance plus balance training (PRBT) has been demonstrated as effective in reducing later life physical disability, falls risk and poor health, even among those with complex health care needs. However, few studies have examined the influence of PRBT on health service utilisation, cognitive wellbeing and training modality acceptance or undertaken a cost benefit analysis. This project will investigate the broad scope benefits of PRBT participation among community-dwelling older Australians receiving Government supported aged care packages for their complex health care needs. Using a modified stepped-wedge design, 248 community-dwelling adults 65 years and older with some level of government support aged care have been randomised into the study. Those randomised to exercise undertake six months of twice weekly machine-based, moderate to high intensity, supervised PRBT, followed by a six month unsupervised, unsupported follow-up. Controls spend six months undertaking usual activities, before entering the PRBT and follow-up phases. Data are collected at baseline and after each of the six month phases. Measures include level of and change in health and care needs, body composition, muscle capacity, falls, sleep, quality of life, nutritional and mental health status. In addition, acceptance and engagement is determined through telephone and focus group interviews complementing a multi-model health cost benefit evaluation. It is hypothesised this study will demonstrate the feasibility and efficacy of PRBT in improving primary and secondary health outcomes for older adults with aged care needs, and will support the value of this modality of exercise as an integral evidence-based service model of care.

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**Exercise to prevent falls in older adults: an updated systematic review and meta-analysis**

Sherrington C, Michaleff ZA, Fairhall N, Paul SS, Tiedemann A, Whitney J, Cumming RG, Herbert RD, Close JC, Lord SR.

*Br. J. Sports Med.* 2016; ePub(ePub): ePub.

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**Abstract**

**OBJECTIVE:** Previous meta-analyses have found that exercise prevents falls in older people. This study aimed to test whether this effect is still present when new trials are added, and it explores

whether characteristics of the trial design, sample or intervention are associated with greater fall prevention effects.

DESIGN: Update of a systematic review with random effects meta-analysis and meta-regression.

DATA SOURCES: Cochrane Library, CINAHL, MEDLINE, EMBASE, PubMed, PEDro and SafetyLit were searched from January 2010 to January 2016.

STUDY ELIGIBILITY CRITERIA: We included randomised controlled trials that compared fall rates in older people randomised to receive exercise as a single intervention with fall rates in those randomised to a control group.

RESULTS: 99 comparisons from 88 trials with 19 478 participants were available for meta-analysis. Overall, exercise reduced the rate of falls in community-dwelling older people by 21% (pooled rate ratio 0.79, 95% CI 0.73 to 0.85,  $p < 0.001$ ,  $I(2)$  47%, 69 comparisons) with greater effects seen from exercise programmes that challenged balance and involved more than 3 hours/week of exercise. These variables explained 76% of the between-trial heterogeneity and in combination led to a 39% reduction in falls (incident rate ratio 0.61, 95% CI 0.53 to 0.72,  $p < 0.001$ ). Exercise also had a fall prevention effect in community-dwelling people with Parkinson's disease (pooled rate ratio 0.47, 95% CI 0.30 to 0.73,  $p = 0.001$ ,  $I(2)$  65%, 6 comparisons) or cognitive impairment (pooled rate ratio 0.55, 95% CI 0.37 to 0.83,  $p = 0.004$ ,  $I(2)$  21%, 3 comparisons). There was no evidence of a fall prevention effect of exercise in residential care settings or among stroke survivors or people recently discharged from hospital.

SUMMARY/CONCLUSIONS: Exercise as a single intervention can prevent falls in community-dwelling older people. Exercise programmes that challenge balance and are of a higher dose have larger effects. The impact of exercise as a single intervention in clinical groups and aged care facility residents requires further investigation, but promising results are evident for people with Parkinson's disease and cognitive impairment.

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#### Factors related to fear of falling among community-dwelling older adults

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*J. Clin. Nurs.* 2016; ePub(ePub): ePub.

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#### Abstract

**AIMS AND OBJECTIVES:** To investigate the relationship between age, gender, history of falls, balance and gait status, general health perception, activities of daily living and depression to fear of falling in community-dwelling older people in Danang, Vietnam.

**BACKGROUND:** Fear of falling is a common and consequential psychosocial problem for older people and can lead to decreased quality of life. There is only limited research on fear of falling in Vietnam.

**DESIGN:** This is a cross-sectional descriptive study.

**METHODS:** One hundred fifty-three community-dwelling older people were recruited from seven communities of different districts in Danang. Data were collected using six instruments: a demographic questionnaire, the Fall Efficacy Scale-International, the General Health Perception

questionnaire, the Barthel Activities of Daily Living, the Geriatric Depression Scale and the Timed Up and Go test. Data were analysed using descriptive and correlational statistics.

**RESULTS:** The mean Fall Efficacy Scale-International score was 35, indicating a high level of fear of falling. ADLs, general health perception and Timed Up and Go were significantly and negatively related to fear of falling ( $r_p = -0.80$ ,  $r_{sp} = -0.77$  and  $r_p = -0.75$ , respectively). Age, depression and history of falls were significantly and positively related to fear of falling ( $r_p = 0.54$ ,  $r_p = 0.45$  and  $r_s = 0.39$ , respectively). Women were significantly more likely than men to have higher fear of falling ( $r_{pb} = -0.28$ ).

**CONCLUSION:** Fear of falling is more common in older people who are female, have a history of falls, have poor balance and gait status, have poor health perception, have greater ADL dependency, are depressed and, within the older people population, are older. Further research could examine additional correlates of fear of falling and develop/evaluate factor-specific intervention strategies to reduce fear of falling among community-dwelling older people. **RELEVANCE TO CLINICAL PRACTICE:** Understanding correlates of fear of falling among older Vietnamese people contributes to healthcare professionals' ability to develop effective cross-cultural and culture-specific interventions to reduce older people's fear of falling and to improve quality of life.

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#### Fall risk as a function of time after admission to sub-acute geriatric hospital units

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#### Abstract

**BACKGROUND:** There is evidence about time-dependent fracture rates in different settings and situations. Lacking are data about underlying time-dependent fall risk patterns. The objective of the study was to analyse fall rates as a function of time after admission to sub-acute hospital units and to evaluate the time-dependent impact of clinical factors at baseline on fall risk.

**METHODS:** This retrospective cohort study used data of 5,255 patients admitted to sub-acute units in a geriatric rehabilitation clinic in Germany between 2010 and 2014. Falls, personal characteristics and functional status at admission were extracted from the hospital information system. The rehabilitation stay was divided in 3-day time-intervals. The fall rate was calculated for each time-interval in all patients combined and in subgroups of patients. To analyse the influence of covariates on fall risk over time multivariate negative binomial regression models were applied for each of 5 time-intervals.

**RESULTS:** The overall fall rate was 10.2 falls/1,000 person-days with highest fall risks during the first week and decreasing risks within the following weeks. A particularly pronounced risk pattern with high fall risks during the first days and decreasing risks thereafter was observed in men, disoriented people, and people with a low functional status or impaired cognition. In disoriented patients, for example, the fall rate decreased from 24.6 falls/1,000 person-days in day 2-4 to about 13 falls/1,000 person-days 2 weeks later. The incidence rate ratio of baseline characteristics changed also over time.

**CONCLUSIONS:** Fall risk differs considerably over time during sub-acute hospitalisation. The

strongest association between time and fall risk was observed in functionally limited patients with high risks during the first days after admission and declining risks thereafter. This should be considered in the planning and application of fall prevention measures.

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#### **Fear of falling after hip fracture: prevalence, course, and relationship with one-year functional recovery**

Bower ES, Wetherell JL, Petkus AJ, Rawson KS, Lenze EJ.

*Am. J. Geriatr. Psychiatry* 2016; ePub(ePub): ePub.

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#### **Abstract**

**OBJECTIVES:** The effect of fear of falling (FoF) on recovery 1 year after hip fracture is not well known. Furthermore, the potential influence of premorbid function has not been explored. We aimed to describe rates of FoF after hip fracture, to assess the association of FoF with functional recovery 1 year post-fracture, and to evaluate the potential moderating effect of premorbid function on the relationship between FoF and functional recovery.

**DESIGN:** Secondary analysis of data from a prospective, longitudinal observational study to assess genetic factors influencing functional and psychological outcomes after hip fracture over 52 weeks.

**SETTING:** Eight area hospitals in St. Louis, MO.

**PARTICIPANTS:** 241 cognitively intact individuals 60 years of age or older requiring surgical repair for hip fracture.

**MEASUREMENTS:** Fear of falling was measured by the short Falls Efficacy Scale-International 4 and 12 weeks post-fracture. The primary outcome was probability of full recovery 52 weeks post-fracture assessed with the Functional Recovery Score.

**RESULTS:** High rates of FoF were seen at 4 (60.5%) and 12 weeks (47.0%) post-fracture. Week 12 FoF was associated with lower odds of recovery for those with high function pre-fracture (odds ratio [OR]: 0.82, 95% confidence interval [CI]: 0.72, 0.93), but not for those with impaired activities of daily living performance (OR: 1.04, 95% CI: 0.91, 1.19).

**CONCLUSIONS:** Fear of falling is common after hip fracture and is associated with poorer functional recovery 1 year after fracture, particularly in patients with high premorbid function. Fear of falling is a modifiable problem that represents a potential target for interventions to improve functional outcomes after hip fracture.

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#### **Literature review and meta-analysis of risk factors for delayed post-traumatic stress disorder in older adults after a fall**

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### Abstract

**OBJECTIVE:** To test the hypothesis that post-traumatic stress disorder (PTSD) can appear after a fall and try to identify predictive factors for its development in older fallers.

**METHODS:** Systematic literature review and meta-analyses of studies on PTSD post fall in older subjects.

**RESULTS:** One hundred seventy-seven indexed articles were identified, of which three had complete data on PTSD post fall in older subjects. Only the odds ratio of the association between history of fall and occurrence of PTSD was significant (odds ratio = 2.79 (95% CI, 1.03-7.53).

**CONCLUSION:** The trend in our results, even though limited, reveals two groups of subjects: frail subjects that are at risk of developing PTSD and subjects who seem to be resistant to its development. A clear description of these two groups may help us identify the population at risk for delayed PTSD who could then benefit from dedicated treatment. Copyright © 2016 John Wiley & Sons, Ltd.

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### Measuring fear of falling among high-risk, urban, community-dwelling older adults

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*Geriatr. Nurs.* 2016; ePub(ePub): ePub.

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(Copyright © 2016, Elsevier Publishing)

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### Abstract

Fear of falling (FOF) creates a psychological barrier to performing activities for many older adults. The negative impact of fear of falling increases risk of curtailment of activities, future falls, and injury. The specific aim for this study was to investigate the relationship between two fear of falling measures used in clinical research, the FOF Likert scale and Falls Self Efficacy Scale-International (FES-I). The study included a convenience sample of 107 high-risk, community-dwelling, mostly Black (94%) members from one Program for All-Inclusive Care for the Elderly program. The FOF scale is one-item asking to rate overall concern about falling, while the FES-I is 16-items rating concern about falling during physical and social activities. One-way ANOVA and Kruskal-Wallis were highly significant (F-value = 22.25, R-squared = 0.39,  $p < 0.0001$ ). The Graded Response Model statistics demonstrated one underlying latent factor, fear of falling. This study supports the use of both tools for thorough FOF measurement.

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### Pilot study for implementing an osteoporosis education and exercise program in an assisted living facility and senior community

Nanduri AP, Fullman S, Morell L, Buyske S, Wagner ML.

*J. Appl. Gerontol.* 2016; ePub(ePub): ePub.

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#### Abstract

**BACKGROUND:** Project Healthy Bones (PHB) is a 24-week, peer-led exercise and education program for older adults at risk of osteoporosis.

**METHOD:** Residents from an assisted living and senior community program were enrolled after medical clearance. Participant demographics, geriatric fitness assessments, exercise logs, quizzes, and surveys were collected at baseline and 24 weeks. Data were analyzed using paired t tests and ANOVA of change scores for the pooled data within the R statistical environment.

**RESULTS:** Forty of the 53 enrolled participants completed the program. Participants improved their strength, balance, posture, and flexibility, resulting in a reduced risk of falls and fractures. In addition, their knowledge of bone health, nutrition, and fall prevention increased.

**CONCLUSION:** Offering low-cost disease-specific programs such as PHB helps minimize the complications of osteoporosis and improve the overall health of participants. Implementing disease-specific public health programs in assisted living centers can increase access to programs.

**PDF Y Endnote Y**

#### Recent trial on Vitamin D: higher dose increases fall?

Hajra A, Bandyopadhyay D.

*Indian J. Endocrinol. Metab.* 2016; 20(5): 737-738.

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#### Abstract

Several postulations are there to explain the interrelationship of Vitamin D and muscle strength. The Vitamin D receptors are found to be expressed in human muscle tissue. ] Studies among older individuals suggested that Vitamin D receptor activation in muscle induces de novo protein synthesis. This effect is particularly seen in type II fast twitch muscle fibers. This finding proposed an association between muscle strengthening the effect of Vitamin D and prevention of fall.

Several studies have found the beneficiary impact of this vitamin on muscle strength. However, reversed results are also there. A meta-analyses of double-blind, randomized control trial (RCT) support a benefit of Vitamin D supplementation in the prevention of falls and hip fractures among patients of 65 years and older at high risk of Vitamin D deficiency. However, questionable outcomes are also there in meta-analyses where this age restriction is not maintained.

Currently, we have come to know about another study (NCT01017354). It is a 1-year, double-blind, randomized clinical trial conducted in Zurich, Switzerland. Analysis of data was done from June 15, 2012, to October 10, 2015.

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#### The association between physical activity and social isolation in community-dwelling older adults

Robins LM, Hill KD, Finch CF, Clemson L, Haines T.

*Ageing Ment. Health* 2016; ePub(ePub): 1-8.

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#### **Abstract**

**OBJECTIVES:** Social isolation is an increasing concern in older community-dwelling adults. There is growing need to determine effective interventions addressing social isolation. This study aimed to determine whether a relationship exists between physical activity (recreational and/or household-based) and social isolation. An examination was conducted for whether group- or home-based falls prevention exercise was associated with social isolation.

**METHODS:** Cross-sectional analysis of telephone survey data was used to investigate relationships between physical activity, health, age, gender, living arrangements, ethnicity and participation in group- or home-based falls prevention exercise on social isolation. Univariable and multivariable ordered logistic regression analyses were conducted.

**RESULTS:** Factors found to be significantly associated with reduced social isolation in multivariable analysis included living with a partner/spouse, reporting better general health, higher levels of household-based physical activity (OR = 1.03, CI = 1.01-1.05) and feeling less downhearted/depressed. Being more socially isolated was associated with symptoms of depression and a diagnosis of congestive heart failure (pseudo  $R^2$ ) = 0.104).

**DISCUSSION:** Findings suggest that household-based physical activity is related to social isolation in community-dwelling older adults. Further research is required to determine the nature of this relationship and to investigate the impact of group physical activity interventions on social isolation.

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#### **Traumatic brain injury (TBI) in older adults: aging with a TBI versus incident TBI in the aged**

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*Int. Psychogeriatr.* 2016; ePub(ePub): epub.

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#### **Abstract**

Approximately 39 million older adults (age >65) were evaluated for traumatic brain injury (TBI) in United States emergency departments during the 2-year period from 2009 to 2010, representing a 61% increase in estimates from prior years (Albrecht et al., 2015a). Across the lifespan, an estimated 5.3 million Americans are living with a TBI-related disability (Centers for Disease Control and Prevention (CDC), 2003). With improved recognition and management, more individuals experiencing TBI are surviving to die of other causes later in life (Flanagan et al., 2005). Taken together, these statistics highlight two important populations: those who are "aging with a TBI" and "incident TBI in the aged."

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#### **Adding self-management of chronic conditions to fall prevention: a feasibility study**

Wurzer BM, Waters DL, Robertson L, Hale B, Hale LA.

*Australas. J. Ageing* 2016; ePub(ePub): ePub.

**Affiliation:** School of Physiotherapy, University of Otago, Dunedin, New Zealand.

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### Abstract

**OBJECTIVE:** Assess feasibility and impact of adding a long-term condition self-management program (Living a Healthy Life, LHL) into Steady as You Go (SAYGO) fall prevention exercise classes.

**METHOD:** Four-day LHL leader training workshop to deliver six weekly program. Focus groups explored feasibility and acceptability. Chronic disease self-efficacy, balance confidence, health behaviours and status were measured at 6 weeks, 3, 6 and 12 months.

**RESULTS:** Four leaders and 17 participants volunteered. Focus groups revealed that becoming a leader was considered stressful. Participants valued discussions about managing health, strategies for better communication with doctors, keeping track of medications, action plans and nutrition labels. Between 6-week and 12-month follow-up, self-rated health increased.

**CONCLUSION:** Although participants valued LHL information, the low participation rates, time commitment and stress of becoming a leader and leading classes suggest that adding LHL to other fall prevention programs will need further consideration around integration of the programs.

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### **Association of Osteoporosis Self-Assessment Tool for Asians (OSTA) score with clinical presentation and expenditure in hospitalized trauma patients with femoral fractures**

Chen CC, Rau CS, Wu SC, Kuo PJ, Chen YC, Hsieh HY, Hsieh CH.

*Int. J. Environ. Res. Public Health* 2016; 13(10): e13100995.

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### Abstract

**BACKGROUND:** A cross-sectional study to investigate the association of Osteoporosis Self-Assessment Tool for Asians (OSTA) score with clinical presentation and expenditure of hospitalized adult trauma patients with femoral fractures.

**METHODS:** According to the data retrieved from the Trauma Registry System between 1 January 2009 and 31 December 2015, a total of 2086 patients aged  $\geq 40$  years and hospitalized for treatment of traumatic femoral bone fracture were categorized as high-risk patients ( $OSTA < -4$ ,  $n = 814$ ), medium-risk patients ( $-1 \geq OSTA \geq -4$ ,  $n = 634$ ), and low-risk patients ( $OSTA > -1$ ,  $n = 638$ ). Two-sided Pearson's, chi-squared, or Fisher's exact tests were used to compare categorical data. Unpaired Student's t-test and Mann-Whitney U-test were used to analyze normally and non-normally distributed continuous data, respectively. Propensity-score matching in a 1:1 ratio was performed using Number Crunching Statistical Software (NCSS) software (NCSS 10; NCSS Statistical Software, Kaysville, UT, USA), with adjusted covariates including mechanism and Glasgow Coma Scale (GCS); injuries were assessed based on the Abbreviated Injury Scale (AIS), and Injury Severity Score (ISS) was used to evaluate the effect of OSTA-related grouping on a patient's outcome.

**RESULTS:** High-risk and medium-risk patients were predominantly female, presented with significantly older age and higher incidences of co-morbidity, and were injured in a fall accident more frequently than low-risk patients. High-risk patients and medium-risk patients had a different pattern of femoral fracture and a significantly lower ISS. Although high-risk and medium-risk patients had significantly shorter lengths hospital of stay (LOS) and less total expenditure than low-risk patients did, similar results were not found in the selected propensity score-matched patients,

implying that the difference may be attributed to the associated injury severity of the patients with femoral fracture. However, the charge of surgery is significantly lower in high-risk and medium-risk patients than in low-risk patients, regardless of the total population or the selected propensity score-matched patients. This lower charge of surgery may be attributed to a less aggressive surgery applied for older patients with high or medium risk of osteoporosis.

**CONCLUSIONS:** This study of hospitalized trauma patients with femoral fracture according to OSTA risk classification revealed that high-risk and medium-risk patients had significantly higher odds of sustaining injury in a fall accident than low-risk patients; they also present a different pattern of femoral bone fracture as well as a significantly lower ISS, shorter hospital LOS, and less total expenditure. In addition, the significantly lower charge of surgery in high-risk and medium-risk patients than in low-risk patients may be because of the preference of orthopedists for less aggressive surgery in dealing with older patients with osteoporotic femoral bone fracture.

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### **Associations between bipedal stance stability and locomotor stability following a trip in unilateral vestibulopathy**

McCrum C, Eysel-Gosepath K, Epro G, Meijer K, Savelberg HH, Brüggemann GP, Karamanidis K. *J. Appl. Biomech.* 2016; ePub(ePub): ePub.

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#### **Abstract**

Posturography is used to assess balance in clinical settings, but its relationship to gait stability is unclear. We assessed if dynamic gait stability is associated with standing balance in 12 patients with unilateral vestibulopathy. Participants were unexpectedly tripped during treadmill walking and the change in the margin of stability (MoSChange) and base of support (BoSChange) relative to non-perturbed walking was calculated for the perturbed and first recovery steps. The centre of pressure (COP) path during 30s stance with eyes open and closed, and the distance between the most anterior point of the COP and the anterior BoS boundary during forward leaning (ADist) were assessed using a force plate. Pearson correlations were conducted between the static and dynamic variables. The perturbation caused a large decrease in the BoS, leading to a decrease in MoS. One of 12 correlations was significant (MoSChange at the perturbed step and ADist;  $r = -.595$ ,  $P = .041$ ; non-significant correlations:  $.068 \leq P \leq .995$ ). The results suggest that different control mechanisms may be involved in stance and gait stability, as a consistent relationship was not found. Therefore, posturography may be of limited use in predicting stability in dynamic situations.

**PDF Y Endnote Y**

### **Chronic low quality sleep impairs postural control in healthy adults**

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## Abstract

The lack of sleep, both in quality and quantity, is an increasing problem in modern society, often related to workload and stress. A number of studies have addressed the effects of acute (total) sleep deprivation on postural control. However, up to date, the effects of chronic sleep deficits, either in quantity or quality, have not been analyzed. Thirty healthy adults participated in the study that consisted of registering activity with a wrist actigraph for more than a week before performing a series of postural control tests. Sleep and circadian rhythm variables were correlated and the sum of activity of the least active 5-h period, L5, a rhythm variable, obtained the greater coefficient value with sleep quality variables (wake after sleep onset WASO and efficiency sleep). Cluster analysis was performed to classify subjects into two groups based on L5 (low and high). The balance tests scores used to assess postural control were measured using Biodex Balance System and were compared between the two groups with different sleep quality. The postural tests were divided into dynamic (platform tilt with eyes open, closed and cursor) and static (clinical test of sensory integration). The results showed that during the tests with eyes closed, the group with worse sleep quality had also worse postural control performance. Lack of vision impairs postural balance more deeply in subjects with chronic sleep inefficiency. Chronic poor sleep quality impairs postural control similarly to total sleep deprivation.

## PDF Y Endnote Y

### Development of an evidence-based fall risk assessment tool and evaluation of interrater reliability and nurses' perceptions of the tool's clarity and usability

Higaonna M, Enobi M, Nakamura S.

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(Copyright © 2016, John Wiley and Sons)

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## Abstract

**AIM:** To develop and test interrater reliability of an evidence-based fall risk assessment tool for nurses and to investigate how nurses perceived the clarity and usability of the tool.

**METHODS:** In phase 1, an evidence-based fall risk assessment tool was developed based on a literature review and expert discussion. The finalized tool assessed 11 risk factors and comprised 23 items. In phase 2, reliability testing was done. Two nurses out of a possible 125 participating nurses independently assessed each participating patient on admission with the assessment tool. The nurses then provided feedback on the clarity and usability of the tool. The interrater reliability was estimated by the percentage agreement, Cohen's kappa, and prevalence- and bias-adjusted kappa. **RESULTS:** Of the 164 patients who were recruited, 114 patients participated. After adjustment for prevalence and bias, only "frequent urination" and "night-time toileting" showed a less-than-substantial interrater agreement. Assessment of the items "cognitive impairment" and "night-time toileting" were most frequently reported to be problematic.

**CONCLUSION:** The evidence-based fall risk assessment tool requires further modification and re-examination of interrater reliability is warranted. In particular, the cognitive impairment items need to be reconsidered in order to enable nurses to better assess patient cognition on the admission day.

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## PDF Y Endnote Y

### **Recurrent falls associated with lower limb deep vein thrombosis**

Joo JJ, Ahn BJ, Kwon KY.

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**Abstract** [Abstract unavailable]

**PDF Y Endnote Y**

### **Use of the Nintendo Wii balance board for studying standing static balance control: technical considerations, force-plate congruency, and the effect of battery life**

Weaver TB, Ma C, Laing AC.

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**Abstract**

The Nintendo Wii Balance Board (WBB) has become popular as a low-cost alternative to research-grade force plates. The purposes of this study were to characterize a series of technical specifications for the WBB, to compare balance control metrics derived from time-varying center of pressure (COP) signals collected simultaneously from a WBB and a research-grade force plate, and to investigate the effects of battery life. Drift, linearity, hysteresis, mass accuracy, uniformity of response and COP accuracy were assessed from a WBB. Additionally, six participants completed an eyes-closed quiet standing task on the WBB (at three battery life levels) mounted on a force plate while sway was simultaneously measured by both systems. Characterization results were all associated with less than 1% error.  $R(2)$  values reflecting WBB sensor linearity were  $>0.99$ . Known and measured COP differences were lowest at the center of the WBB and greatest at the corners. Between-device differences in quiet stance COP summary metrics were of limited clinical significance. Lastly, battery life did not affect WBB COP accuracy, but did influence 2 of 8 quiet stance WBB parameters. This study provides general support for the WBB as a low-cost alternative to research-grade force plates for quantifying COP movement during standing.

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