

### **Acute effects of walking at moderate normobaric hypoxia on gait and balance performance in healthy community-dwelling seniors: A randomized controlled crossover study**

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#### **Abstract**

**BACKGROUND:** Hiking at moderate altitude is a popular outdoor activity in seniors. Acute exercise or altitude can diminish balance performance. Thus, the present study examined the combined effects of altitude and walking on static and dynamic balance.

**METHODS:** Thirty-six healthy seniors (age: 62 (SD: 4) y; BMI: 25 (5) kg/m<sup>2</sup>) were examined on three days. Firstly, walking velocity was determined at 85% of the first ventilatory threshold (VT1).

Therefore, a ramp walking test on a treadmill was completed. On day two or three, a 40-minute treadmill walk under sea level or normobaric hypoxia (2600m) was performed using a random, double-blind study design. Balance performance was assessed on a force-plate during single leg stance with eyes open (SLEO, 10s on a force-plate) immediately before and after walking. Spatio-temporal gait characteristics were collected during walking at 5 and 35min.

**RESULTS:** Condition × time interaction effects were not found for either parameter ( $0.13 < p < \eta^2(2)$ )

**CONCLUSION:** Alterations of cadence, stride time, and temporal gait variability might be attributed to fatigue-induced changes of temporal gait adjustments. Normobaric hypoxia did not acutely impair gait patterns. We assume that demanding postural standing tasks that require more central control may be affected to a greater extent by altitude exposure.

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### **An epidemiologic study of trauma in elderly diabetic patients: a preliminary report**

Zohrevandi B, Asadi P, Kasmaei VM, Ziabari SMZ, Tajik H, Marefati F.

*Iran. J. Emerg. Med.* 2015; 2(1): 39-44.

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#### **Abstract**

**INTRODUCTION:** Elderly diabetic patients are prone to trauma due to background illnesses or physical disabilities. In the present epidemiologic study, we aimed to evaluate pattern of trauma in elderly diabetic patients referred to the emergency department of Poorsina Hospital, Rasht, Iran, 2011.

**METHODS:** This cross-sectional study was performed on the diabetic patients over 60 years old. Demographic data, trauma characteristics, mortality, need for blood transfusion, and the time interval between admission and death, were gathered. Finally, the risk factors of the mortality were evaluated.  $P < 0.05$  was considered as the significance level.

**RESULTS:** 268 patients with mean age of  $69.94 \pm 7.18$  years were evaluated (58.6% female). Most common trauma mechanism was same level falling (40.3%); most common location for trauma was urban streets (35.8%); most common anatomic site were extremities (45.6%); and the season with

highest trauma occurrence was winter (28%). 14.2% of the patients needed blood transfusion and 6.3% of the patients finally died. Mean hospitalization duration in the department was  $3.72 \pm 5.14$  days (between 6 hours to 53 days). There was a significant correlation between mortality of the elderly diabetic patients and sex ( $p=0.012$ ), anatomic site of trauma ( $p=0.047$ ), number of injured site ( $p=0.030$ ), need for blood transfusion ( $p<0.001$ ), systolic blood pressure  $< 90$  mmHg ( $p=0.017$ ) and heart rate  $>100$ /minute ( $p<0.001$ ).

**CONCLUSION:** The results of this study, show that the most common trauma mechanism was same level falling, the most common site of trauma was streets and other places in the city, most common anatomic site for trauma were extremities; the season with highest trauma occurrence was winter. There was a significant correlation between mortality of patients and sex, anatomic site of trauma, number of injured site, need for blood transfusion, systolic blood pressure  $< 90$  mmHg and heart rate  $>100$ /minute.

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### **Anxiety disorders and falls among older adults**

Holloway KL, Williams LJ, Brennan-Olsen SL, Morse AG, Kotowicz MA, Nicholson GC, Pasco JA.

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#### **Abstract**

**BACKGROUND:** Falls are common among older adults and can lead to serious injuries, including fractures. We aimed to determine associations between anxiety disorders and falls in older adults.

**METHODS:** Participants were 487 men and 376 women aged  $\geq 60$  years enrolled in the Geelong Osteoporosis Study, Australia. Using the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Non-patient edition (SCID-I/NP), lifetime history of anxiety disorders was determined. Falls were determined by self-report. In men, a falls-risk score (Elderly Falls Screening Test (EFST)) was also calculated.

**RESULTS:** Among fallers, 24 of 299 (8.0%) had a lifetime history of anxiety disorder compared to 36 of 634 (5.7%) non-fallers ( $p=0.014$ ). Examination of the association between anxiety and falls suggested differential relationships for men and women. In men, following adjustment for psychotropic medications, mobility and blood pressure, lifetime anxiety disorder was associated with falling (OR 2.96; 95%CI 1.07-8.21) and with EFST score (OR 3.46; 95%CI 1.13-10.6). In women, an association between lifetime anxiety disorder and falls was explained by psychotropic medication use, poor mobility and socioeconomic status.

**LIMITATIONS:** Sub-group analyses involving types of anxiety and anxiety disorders over the past 12-months were not performed due to power limitations.

**CONCLUSION:** Although anxiety disorders were independently associated with a 3-fold increase in likelihood of reported falls and high falls risk among men, an independent association was not detected among women. These results may aid in prevention of falls through specific interventions aimed at reducing anxiety, particularly in men.

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### **Association between gait abnormality and malnutrition in a community-dwelling elderly population**

Misu S, Asai T, Doi T, Sawa R, Ueda Y, Saito T, Nakamura R, Murata S, Sugimoto T, Yamada M, Ono R. *Geriatr. Gerontol. Int.* 2016; ePub(ePub): ePub.

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#### **Abstract**

**AIM:** Malnutrition is common in older adults, and contributes to the risk of falls and functional impairment. Gait performance also contributes to falls and functional impairment; however, the association between malnutrition and gait performance remains unclear. The purpose of the present study was to investigate the association between malnutrition risk and gait performance.

**METHODS:** The study participants included 204 community-dwelling older adults with a mean age of  $73.4 \pm 4.3$  years. Nutritional status was evaluated using the short version of the Mini-Nutritional Assessment. A score of 11 points was used as the cut-off, and the participants were categorized into two groups:  $\leq 11$ , malnutrition-risk group; and  $\geq 12$ , well-nourished group. Gait performance was assessed by gait speed and walking smoothness. Walking smoothness was quantified by harmonic ratios (HR), which were derived from vertical (VT), mediolateral (ML) and anteroposterior trunk accelerations, recorded during over-ground walking. Skeletal muscle mass index, handgrip strength and physical functions were also measured.

**RESULTS:** HR in the ML direction was significantly lower in the malnutrition-risk group than the well-nourished group ( $P = 0.002$ ); however, no differences between the two groups were observed in gait speed or HR in the VT and anteroposterior directions. The relationship between malnutrition and HR in the ML direction was independent of skeletal muscle mass index, handgrip strength, physical function, gait speed, and other confounders ( $P < 0.05$ ).

**CONCLUSIONS:** In community-dwelling older adults, malnutrition is related to decreased walking smoothness in the ML direction, suggesting that nutritional status affects lateral trunk control during walking.

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### **Benzodiazepines and geriatrics: what clinical practice strategies can be used to reduce the inappropriate prescribing?**

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

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#### **Abstract**

In the elderly, Potentially Inappropriate Prescriptions (PIPs) are quite common and connected with adverse drug events (ADEs), hospital stays, increased medical acuities, and inefficient healthcare. Benzodiazepines as a class have been identified as an independent risk factor for ADE's and shown to be associated with sedation and impairments in cognition, memory, and balance, leading to an increased risk for falls. Clinically inappropriate medications continue to be prescribed and preferred by many clinicians over non-pharmacological strategies despite continued evidence demonstrating

poor outcomes in older adults. Due to the increasing evidence in positive elderly outcomes through the reduction in use of inappropriate drugs, medication reduction strategies are now required policy components in the Centers for Medicare and Medicaid Services regulations along with Medicare Part D. Quality measures now focus on extensive drug reviews with reduction strategies that incorporate use of: the Beers Criteria; multidisciplinary approaches; involving patients and caregivers; and de-prescribing strategies.

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#### **Cause and outcome of preventable accidents in the elderly; an epidemiologic study**

Aghaei MA, Norouzi S, Vakilzadeh AK, Abedi F.

*Iran. J. Emerg. Med.* 2016; 3(1): 28-33.

(Copyright © 2016, CC BY-NC 3.0. Copyright © 2016 Iranian Journal of Emergency Medicine, Publisher Shahid Beheshti University of Medical Sciences; Treata Medical Publishing)

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#### **Abstract**

**INTRODUCTION:** With the growing population of the elderly in societies, the medical problems of this age range also increases. Preventable accidents are among these problems. More than 5 million people die as the result of these injuries each year. Therefore, the present study was done aiming to evaluate the causes and outcomes of preventable accidents in the elderly.

**METHODS:** The present study is a retrospective cross-sectional one, performed on elderly patients admitted to a hospital during 2 years. Required data were gathered using census method via a checklist consisting of demographic data, cause of the accident, length of hospital stay, number of times revisiting the hospital, and final outcome. Data were then descriptively analyzed using SPSS 16 statistical software.

**RESULTS:** 2336 patients with the mean age of  $72.24 \pm 9.02$  years were evaluated (50.7% female). The most common causes of accidents were falling with 1033 (44.2%) cases, intentional poisoning with 382 (16.4%) cases, and unintentional poisoning with 360 (15.4%) cases, respectively. Mean length of hospital stay was  $5 \pm 7.7$  days. 144 (6.2%) elderly patients died during the study period. Type of accident ( $p < 0.001$ ) and final outcome ( $p < 0.001$ ) were significantly different between the sexes.

**CONCLUSION:** Based on the findings of the present study, falling, intentional poisoning and unintentional poisoning, respectively, were the most common causes of preventable accidents in the studied elderly population. Most cases were discharged after partial recovery and the 3 aforementioned causes had higher prevalence in women. The most frequent outcomes were complete recovery in poisoning, partial recovery in falling, and death in poisoning and burn.

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#### **Daily-life gait quality as predictor of falls in older people: a 1-year prospective cohort study**

van Schooten KS, Pijnappels M, Rispens SM, Elders PJ, Lips P, Daffertshofer A, Beek PJ, van Dieen JH.

*PLoS One* 2016; 11(7): e0158623.

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## Abstract

Falls can have devastating consequences for older people. We determined the relationship between the likelihood of fall incidents and daily-life behavior. We used wearable sensors to assess habitual physical activity and daily-life gait quality (in terms of e.g. stability, variability, smoothness and symmetry), and determined their predictive ability for time-to-first-and-second-falls. 319 older people wore a trunk accelerometer (Dynaport MoveMonitor, McRoberts) during one week. Participants further completed questionnaires and performed grip strength and trail making tests to identify risk factors for falls. Their prospective fall incidence was followed up for six to twelve months. We determined interrelations between commonly used gait characteristics to gain insight in their interpretation and determined their association with time-to-falls. For all data -including questionnaires and tests- we determined the corresponding principal components and studied their predictive ability for falls. We showed that gait characteristics of walking speed, stride length, stride frequency, intensity, variability, smoothness, symmetry and complexity were often moderately to highly correlated ( $r > 0.4$ ). We further showed that these characteristics were predictive of falls. Principal components dominated by history of falls, alcohol consumption, gait quality and muscle strength proved predictive for time-to-fall. The cross-validated prediction models had adequate to high accuracy (time dependent AUC of 0.66-0.72 for time-to-first-fall and 0.69-0.76 for -second-fall). Daily-life gait quality obtained from a single accelerometer on the trunk is predictive for falls. These findings confirm that ambulant measurements of daily behavior contribute substantially to the identification of elderly at (high) risk of falling.

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### Differing trends in fall-related fracture and non-fracture injuries in older people with and without dementia

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*Arch. Gerontol. Geriatr.* 2016; 67: 61-67.

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## Abstract

**OBJECTIVES:** To explore the impact of dementia on the trends in fall-related fracture and non-fracture injuries for older people.

**METHODS:** Individuals aged  $\geq 65$  years who were admitted to a NSW hospital for at least an over-night stay for a fall-related injury from 2003 to 2012 were identified. Age-standardised hospitalisation rates, length of stay, access to in-hospital rehabilitation, 30-day and 1-year mortality were examined. Annual percentage change (PAC) over time was calculated using negative binomial regression.

**RESULTS:** Of the 228,628 fall-related injury hospitalisations, 20.6% were for people with dementia. People with dementia were more likely to be admitted with a hip fracture, and less likely to be admitted with a fracture of the forearm/wrist, and received less in-hospital rehabilitation than people without dementia. Fall-related hip-fracture rates for people with dementia decreased by 4.2% (95%CI -5.6 to -2.7,  $p < 0.001$ ) per annum; there was no change over time for people without dementia (PAC-0.2%; 95%CI -0.8 to 0.5,  $p = 0.643$ ). Rates for other fractures decreased by 1.2%

(95%CI -1.9 to -0.5,  $p < 0.001$ ) per annum in people with dementia, while rates increased by 2.2% (95%CI 1.9-2.5,  $p < 0.001$ ) for people without dementia. By contrast, non-fracture injuries including traumatic brain injury increased significantly for both people with and without dementia.

**CONCLUSION:** Rates of fall-related fracture and non-fracture hospitalisations for people with dementia remain higher than for those without dementia. However, fall-related fracture hospitalisation rates have decreased for people with dementia, while there has not been a corresponding decrease in people without dementia.

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#### **Do subjective memory complaints predict falls, fractures and healthcare utilization? A two-year prospective study based on a cohort of older women recruited from primary care**

Al-Sari UA, Tobias JH, Archer H, Clark EM.

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

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#### **Abstract**

**OBJECTIVE:** A proportion of older individuals report subjective memory complaints (SMCs), which can predict the development of cognitive impairment and dementia. Previous studies based on secondary care suggest that SMC is also associated with other adverse health consequences, including falls, fractures and increased healthcare utilization. In this study, we aimed to establish whether similar findings are observed in the wider population.

**METHODS:** Prospective analysis of the Cohort for Skeletal Health in Bristol and Avon, a population-based cohort recruited from primary care, was carried out. Data were collected by self-completion questionnaire at baseline and 2 years. SMC was assessed at baseline. Fractures, measures of falls, mobility and healthcare utilization were assessed 2 years later. A random 5% subsample of data was validated against electronic general practitioner records. Logistic regression was used to identify independent associations, following adjustment for a range of confounders assessed at baseline.

**RESULTS:** Data were available on 3184 women. Three hundred and fifty participants (11.0%) reported SMC. They were older ( $73.3 \pm 4.5$  vs  $72.0 \pm 4.2$  years) and less mobile compared with those not reporting SMC. SMCs at baseline were associated with an increased risk of upper limb fractures over the following 2 years (OR 1.72, 95% CI 1.02-2.90). SMCs were also associated with an increased risk of falls (OR 1.83, 95% CI 1.41-2.38) and increased healthcare utilization (OR for hospital appointments 2.20, 95% CI 1.26-3.86). No association was observed with bone mineral density at any site.

**CONCLUSIONS:** Subjective memory complaints are important markers of adverse health outcomes and should prompt interventions to reduce fractures such as physiotherapy-led fall reduction programmes.

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### **Effect of a dual task on quantitative timed up and go performance in community-dwelling older adults: a preliminary study**

Smith E, Walsh L, Doyle J, Greene B, Blake C.

*Geriatr. Gerontol. Int.* 2016; ePub(ePub): ePub.

**Affiliation:** University College Dublin, School of Public Health, Physiotherapy and Sports Science, Dublin, Ireland.

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#### **Abstract**

**AIM:** The Timed Up and Go test (TUG) is used as a measure of functional ability in older adults; however, the method of measurement does not allow us to determine which aspects of the test deficits occur in. The aim of the present study was to examine the ability of the quantitative TUG (QTUG) to measure performance during the TUG test under three different conditions - single task, motor task and cognitive dual task - and to compare performance between fallers and non-fallers in high-functioning community-dwelling older adults.

**METHODS:** A total of 37 community-dwelling older adults, 16 with a self-reported falls history in the previous year, were recruited. Participants underwent a falls risk assessment with a physiotherapist including the QTUG under three conditions (single task, motor task, cognitive dual-task). A total of 10 clinical parameters were chosen for analysis using mancova and a series of ancova, with age, sex and body mass index included as covariates.

**RESULTS:** The mancova analysis showed a significant difference across the three task conditions (Wilk's Lambda  $F_{20,186} = 3.37$ ,  $P < 0.001$ ). No overall significant difference between faller and non-faller groups (Wilk's Lambda  $F_{10,96} = 1.469$ ,  $P = 0.163$ ) or significant interaction between task and faller status (Wilk's Lambda  $F_{20,192} = 1.131$ ,  $P = 0.321$ ) was found. ancova results for each of the parameters showed overall differences between single, motor and cognitive tasks for all of the variables, except time in double support. When faller and non-faller differences were explored, cadence and stride velocity was greater, and stride time longer in those with a prior history of falls.

**CONCLUSIONS:** In community-dwelling older adults, these preliminary results show that a cognitive dual-task significantly ( $P < 0.025$ ) affects QTUG performance in almost all parameters, with a significant ( $P < 0.025$ ) reduction in time-to-stand observed with a motor task. Although no statistical difference was found between fallers and non-fallers for many of the parameters, cadence, stride time and stride velocity were statistically different ( $P < 0.05$ ). A larger sample size and more assessment points might lead to more definitive findings. These results highlight the need for further research to examine QTUG performance under dual-task conditions between fallers and non-fallers in this population, and to look at the ability of dual-task QTUG assessment to measure change longitudinally and the effectiveness of therapeutic interventions.

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### **Fall-risk prediction in older adults with cancer: an unmet need**

Wildes TM, Depp B, Colditz G, Stark S.

*Support. Care Cancer* 2016; ePub(ePub): ePub.

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(Copyright © 2016, Springer International)

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## Abstract

Falls in older adults with cancer are more common than in noncancer controls, yet no fall-risk screening tool has been validated in this population. We undertook a cross-sectional pilot study of the Falls Risk Questionnaire (FRQ) in 21 adults aged  $\geq 65$  receiving systemic cancer therapy. Participants completed the FRQ, geriatric assessment measures, and a measure of fear-of-falling. The recruitment rate was 87.5 %, with 95.2 % completion of the FRQ and additional geriatric assessment and quality of life measures. The FRQ correlated significantly with the Timed Up and Go test (Pearson  $r$  0.479,  $p$  = 0.028). In addition, the FRQ score correlated directly with fear-of-falling and inversely with QOL, particularly physical health and neurotoxicity subscales. In conclusion, the FRQ was feasible in older adults receiving cancer therapy and correlates with measures of physical performance, functional status, and fear-of-falling. The FRQ may prove to be a valuable fall-risk screening tool to implement fall-prevention interventions in this vulnerable population of older adults with cancer.

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### Functional status, age, and long-term survival after trauma

Peetz AB, Brat GA, Rydingsward J, Askari R, Olufajo OA, Elias KM, Mogensen KM, Lesage JL, Horkan CM, Salim A, Christopher KB.

*Surgery* 2016; ePub(ePub): ePub.

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## Abstract

**BACKGROUND:** The association between functional status in trauma survivors and long-term outcomes is unknown.

**METHODS:** We performed an observational cohort study on adult trauma patients ( $\geq 18$  years), who required admission to the intensive care unit and who survived hospitalization between 1997 and 2011. The exposure of interest was a functional status defined as bed mobility, transfers, and gait level assessed at the time of hospital discharge. Adjusted odds ratios were estimated by multivariable logistic regression models. The primary outcome was all-cause, postdischarge mortality.

**RESULTS:** We analyzed 3,565 patients with a mean (standard deviation) age of 55 (12.4) years; 60% were male, and 78% were white. The 720-day postdischarge mortality was 22.8%. In a logistic regression model, the lowest functional status category at hospital discharge was associated with 4-fold increased odds of 720-day postdischarge mortality (adjusted odds ratio 4.06 [95% confidence interval, 2.65-6.20,  $P$  < .001] compared with patients with independent functional status. We compared the odds of 720-day postdischarge mortality in patients with independent functional status and in patients in the lowest functional status category at hospital discharge. The odds of 720-day postdischarge mortality were stronger in older adults ( $\geq 65$  years: adjusted odds ratio 3.34 [95% confidence interval, 1.72-6.50,  $P$  < .001]) than in younger adults (<65 years: adjusted odds ratio 2.53 [95% confidence interval, 1.39-4.60,  $P$  = .002]). Finally, improvement of functional status prior to discharge was associated with a 52% decrease in the odds of 720-day postdischarge mortality (adjusted odds ratio 0.48; 95% confidence interval, 0.30-0.75;  $P$  < .001) compared with patients without a change in functional status prior to discharge.



CONCLUSION: In trauma intensive care unit survivors, functional status at hospital discharge is predictive of long-term mortality.

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### **Identifying home care clinicians' information needs for managing fall risks**

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*Appl. Clin. Inform.* 2016; 7(2): 211-226.

**Affiliation:** Department of Information Systems, University of Maryland , Baltimore County.

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#### **Abstract**

**OBJECTIVES:** To help manage the risk of falls in home care, this study aimed to (i) identify home care clinicians' information needs and how they manage missing or inaccurate data, (ii) identify problems that impact effectiveness and efficiency associated with retaining, exchanging, or processing information about fall risks in existing workflows and currently adopted health information technology (IT) solutions, and (iii) offer informatics-based recommendations to improve fall risk management interventions.

**METHODS:** A case study was carried out in a single not-for-profit suburban Medicare-certified home health agency with three branches. Qualitative data were collected over a six month period through observations, semi-structured interviews, and focus groups. The Framework method was used for analysis. Maximum variation sampling was adopted to recruit a diverse sample of clinicians.

**RESULTS:** Overall, the information needs for fall risk management were categorized into physiological, care delivery, educational, social, environmental, and administrative domains. Examples include a brief fall-related patient history, weight-bearing status, medications that affect balance, availability of caregivers at home, and the influence of patients' cultures on fall management interventions. The unavailability and inaccuracy of critical information related to fall risks can delay necessary therapeutic services aimed at reducing patients' risk for falling and thereby jeopardizing their safety. Currently adopted IT solutions did not adequately accommodate data related to fall risk management.

**CONCLUSION:** The results highlight the essential information for fall risk management in home care. Home care workflows and health IT solutions must effectively and efficiently retain, exchange, and process information necessary for fall risk management. Interoperability and integration of the various health IT solutions to make data sharing accessible to all clinicians is critical for fall risk management.

**FINDINGS** from this study can help home health agencies better understand their information needs to manage fall risks.

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### **Motoric cognitive risk syndrome and falls risk: a multi-center study**

Callisaya ML, Ayers E, Barzilai N, Ferrucci L, Guralnik JM, Lipton RB, Otahal P, Srikanth VK, Verghese J. *J. Alzheimers Dis.* 2016; ePub(ePub): ePub.

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## Abstract

**BACKGROUND:** The Motoric Cognitive Risk Syndrome (MCR) is characterized by slow gait speed and cognitive complaints.

**OBJECTIVES:** The objective of this study was to determine if the presence of MCR increases the risk of falls in older people.

**METHODS:** Individual participant data (n=6,204) from five longitudinal studies from three countries were used for this analysis. MCR diagnosis was defined as both the presence of objectively measured slow gait speed and subjective cognitive complaints in those without dementia or mobility disability. Falls were prospectively ascertained using phone calls or questionnaires. Log binomial regression was performed to determine if MCR increased the risk of falls separately in each cohort. Random effects meta-analysis was used to pool results from all cohorts.

**RESULTS:** The mean age of participants was 74.9 (SD 6.8) years and 44% (n=2728) were male. Overall 33.9% (n=2104) reported a fall over follow-up. Pooled relative risk of MCR with any falls was RR 1.44 95% CI 1.16, 1.79. The components of MCR, slow gait (RR 1.30 95% CI 1.14, 1.47) and cognitive complaint (RR 1.25, 95% CI 1.07, 1.46) were also associated with an increased risk of any falls. In sub-analyses MCR was associated with any fall independent of previous falls (RR 1.29 95% CI 1.09, 1.53) and with multiple falls (RR 1.77, 95% CI 1.25, 2.51).

**CONCLUSION:** MCR is associated with an increased risk of falls. The increase in risk was higher than for its individual components. The simplicity of the MCR makes it an attractive falls risk screening tool for the clinic.

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### The contributions of balance to gait capacity and motor function in chronic stroke

Lee KB, Lim SH, Kim YD, Yang BI, Kim KH, Lee KS, Kim EJ, Hwang BY.

*J. Phys. Ther. Sci.* 2016; 28(6): 1686-1690.

**Affiliation:** Department of Physical Therapy, Yongin University, Republic of Korea.

(Copyright © 2016, Society of Physical Therapy Science)

**DOI** 10.1589/jpts.28.1686 **PMID** 27390395

## Abstract

**PURPOSE:** The aim of this study was to identify the contributions of balance to gait and motor function in chronic stroke.

**SUBJECTS AND METHODS:** Twenty-three outpatients participated in a cross-sectional assessment. Gait ability was assessed using the functional ambulation category, self-paced 10-m walking speed, and fastest 10-m walking speed. Standing balance and trunk control measures included the Berg Balance Scale and the Trunk Impairment Scale. Univariate and multivariate regression analyses were performed.

**RESULTS:** Balance was the best predictor of the FAC, self-paced walking speed, and fastest walking speed, accounting for 57% to 61% of the variances. Additionally, the total score of TIS was the only predictor of the motor function of the lower limbs and the dynamic balance of TIS was a predictor of the motor function of the upper limbs, accounting for 41% and 29% of the variance, respectively.

**CONCLUSION:** This study demonstrated the relative contribution of standing balance and trunk balance to gait ability and motor function. They show that balance has a high power of explanation of gait ability and that trunk balance is a determinant of motor function rather than gait ability.

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### **The effect of tai chi on reducing the risk of falling: a systematic review and meta-analysis**

Del-Pino-Casado R, Obrero-Gaitán E, Lomas-Vega R.

*Am. J. Chin. Med.* 2016; ePub(ePub): ePub.

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#### **Abstract**

Tai Chi has frequently been used as a preventive measure against falling in at-risk populations. However, studies have yielded contradictory results, and literature reviews have considered only a small number of trials and have not addressed some key aspects, such as sources of heterogeneity and publication bias. This study includes 13 controlled trials published before June 2015 that analyzed the effectiveness of Tai Chi in fall prevention in populations of frail and at-risk adults. The effect measure used in this meta-analysis was absolute risk reduction (ARR) with a 95% confidence interval (CI). According to our findings, practice of Tai Chi significantly prevents the risk of falling (ARR, [Formula: see text]; 95% CI: [Formula: see text], [Formula: see text]). The heterogeneity of results across the trials was low, with a reduced risk of publication bias, and no significant effect differences were observed between studies comparing Tai Chi with other interventions or non-treatment. We therefore conclude that Tai Chi is more effective than other measures, or no intervention, for fall prevention in at-risk populations. Further research is warranted to analyze the consequences of falls and to study the episodes rather than the cases of falls.

**PDF N (Will get ILL) Endnote Y**

### **The impact of traumatic brain injury on the aging brain**

Young JS, Hobbs JG, Bailes JE.

*Curr. Psychiatry Rep.* 2016; 18(9): e81.

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(Copyright © 2016, Springer Science+Business Media)

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#### **Abstract**

Traumatic brain injury (TBI) has come to the forefront of both the scientific and popular culture. Specifically, sports-related concussions or mild TBI (mTBI) has become the center of scientific scrutiny with a large amount of research focusing on the long-term sequela of this type of injury. As the populace continues to age, the impact of TBI on the aging brain will become clearer. Currently, reports have come to light that link TBI to neurodegenerative disorders such as Alzheimer's and Parkinson's diseases, as well as certain psychiatric diseases. Whether these associations are causations, however, is yet to be determined. Other long-term sequelae, such as chronic traumatic encephalopathy (CTE), appear to be associated with repetitive injuries. Going forward, as we gain better understanding of the pathophysiological process involved in TBI and subclinical head traumas, and individual traits that influence susceptibility to neurocognitive diseases, a clearer, more comprehensive understanding of the connection between brain injury and resultant disease processes in the aging brain will become evident.

**PDF Y Endnote Y**

### **The influence of age, anxiety and concern about falling on postural sway when standing at an elevated level**

Sturnieks DL, Delbaere K, Brodie MA, Lord SR.

*Hum. Mov. Sci.* 2016; 49: 206-215.

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#### **Abstract**

Psychological processes may influence balance and contribute to the risk of falls in older people. While a self-reported fear of falling is associated with increased postural sway, inducing fear using an elevated platform can lead to reduced sway, suggesting different underlying mechanisms whereby fear may influence balance control. This study examined changes in postural sway, muscle activity and physiological measures of arousal while standing on a 65cm elevated platform, compared to floor level, in young and older adults. The older adults were classified as fall concerned or not fall concerned based on the Falls Efficacy Scale-International and anxious or not anxious based on the Goldberg Anxiety Scale. Fall concern did not affect the physiological and sway response to the elevated platform. In response to the postural threat, the anxious participants increased their sway frequency ( $p=0.001$ ) but did not reduce sway range ( $p=0.674$ ). Conversely, non-anxious participants showed an adaptive tightening of balance control, effectively reducing sway range in the elevated condition ( $p<0.001$ ). Generalised anxiety in older adults appears to differentially affect postural control strategies under threatening conditions.

**PDF Y Endnote Y**

### **The older they are the harder they fall: injury patterns and outcomes by age after ground level falls**

Bhattacharya B, Maung A, Schuster K, Davis KA.

*Injury* 2016; ePub(ePub): ePub.

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**DOI** 10.1016/j.injury.2016.06.019 **PMID** 27346422

#### **Abstract**

**BACKGROUND:** Trauma centers are seeing an increasing number of geriatric patients that are more susceptible to injuries even from relatively minor insults such as a ground level fall (GLF). As life expectancy increases, people are living in the geriatric age bracket for decades and often use anticoagulation agents for various comorbidities. We hypothesize that this patient population is not homogenous and we investigated the injury patterns and outcomes after GLF as a function of age and anticoagulation use. We also sought to identify injury patterns and patient characteristics of GLF patients.

**METHODS:** A retrospective review of a Level I trauma center's database identified all adult (age>18) trauma patients admitted after GLFs between 1/2003 and 12/2013. Demographics, injury patterns, antiplatelet use, anticoagulation use (including warfarin, enoxaparin, and rivaroxaban) and outcomes were abstracted.

**RESULTS:** The cohort included 5088 patients. 3990 patients were >60years and 38.2% were male. With each decade, although the mean ISS did not considerably change (range 7.0-8.6), mortality increased (0.9% at <60years vs. 5.5% at >90years), and the likelihood of home discharge decreased dramatically (73.7% at <60years vs. 18.2% at >90years). Abdominal solid organ injuries were rare (0.8%). Age was associated with an increased incidence of cervical spine ( $p=0.002$ ), rib ( $p=0.009$ ) and pelvic fractures ( $p<0.001$ ). Only aspirin use was significantly associated with intracranial bleed ( $p=0.001$ ). Aspirin ( $p=0.049$ ) or warfarin ( $p<0.001$ ) use was associated with increased overall mortality.

**CONCLUSION:** GLF patients are not homogenous as certain injury patterns change with increasing age. Aspirin use was associated with an increased incidence of intracranial bleeds, whereas other antiplatelet or anticoagulation agents were not. GLF is also associated with significant morbidity and mortality that increases dramatically with age. Both aspirin and warfarin are independently associated with increased mortality. These patient differences have implications for their evaluation and management. **LEVEL OF EVIDENCE:** Epidemiological/prognostic study level IV.

#### **PDF Y Endnote Y**

#### **A review of stairway falls and stair negotiation: lessons learned and future needs to reduce injury**

Jacobs JV.

*Gait Posture* 2016; 49: 159-167.

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**DOI** 10.1016/j.gaitpost.2016.06.030 **PMID** 27427833

#### **Abstract**

Stairways are a common location for falls, and they result in a disproportionate risk of death or severe injury. Stairway falls are a significant problem across the lifespan and are often coincident with risky behaviors during stair use. The mechanics of successful stair negotiation for healthy young and older adults have been well described. These studies imply that current stair design does not offer an optimal universal design to meet the needs of older adults or people with health conditions. In addition, impaired stair negotiation associates with more than impaired strength, including functional impairments of cognitive load, sensory function and central motor coordination. Identification of behavioral strategies or stairway environments that assist or hinder recovery from a loss of balance on stairs remains incomplete. Therefore, future studies should investigate the mechanisms of balance recovery on stairs as well as the effectiveness of environmental interventions to mitigate stairway falls and injuries. Potential areas for evaluation may include modifying stair dimensions, surfaces, handrails, visual cues, and removing distractors of attention. Studies should also evaluate combinatorial interventions on person-related factors, such as behavioral interventions to decrease risky behaviors during stair use as well as interventions on cognitive, sensory, and motor functions relevant to stair use. Moreover, future studies should take advantage of new technologies to record stair use outside the laboratory in order to identify people or locations at risk for stairway falls. Such studies would inform the potential for broad-spectrum programs that decrease the risk of stairway falls and injuries.

#### **PDF Y Endnote Y**

### **Adoption of a tai chi intervention, tai ji quan: moving for better balance, for fall prevention by rural faith-based organizations, 2013-2014**

Jones DL, Starcher RW, Eicher JL, Wilcox S.

*Prev. Chronic Dis.* 2016; 13: e92.

**Affiliation:** Sara Wilcox, University of South Carolina, Columbia, South Carolina.

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**DOI** 10.5888/pcd13.160083 **PMID** 27418214

#### **Abstract**

**BACKGROUND:** Translating evidence-based, community-delivered, fall-prevention exercise programs into new settings is a public health priority. **COMMUNITY CONTEXT:** Older adults (aged  $\geq 65$  y) are at high risk for falls. We conducted a community engagement project in West Virginia to evaluate the adoption of a tai chi exercise program, Tai Ji Quan: Moving for Better Balance, by rural faith-based organizations (FBOs) and exercise instructors by recruiting 20 FBOs and 20 or more exercise instructors and by obtaining input from key stakeholders (representatives of FBOs, community representatives, exercise instructors) regarding potential barriers and facilitators to program adoption.

**METHODS:** We used both multistage, purposeful random sampling and snowball sampling to recruit FBOs and exercise instructors in 7 West Virginia counties. Two forums were held with stakeholders to identify barriers and facilitators to program adoption. We calculated separate adoption rates for organizations and exercise instructors. **OUTCOME:** It took up to 3 months to recruit each FBO with an adoption rate of 94%. We made 289 telephone calls, sent 193 emails and 215 letters, distributed brochures and flyers to 69 FBOs, held 118 meetings, and made 20 trips over a period of 31 days (8,933 miles traveled). Nineteen of 22 trained exercise instructors started classes, an instructor adoption rate of 86%. Key issues regarding adoption were the age requirement for participants, trust, education, and competing priorities.

**INTERPRETATION:** Although we had recruitment challenges, our adoption rates were similar to or higher than those reported in other studies, and the objectives of the community engagement project were met. Clustering the FBOs and having them located closer geographically to our location may have reduced our resource use, and using a recruitment coordinator from the local community may have enabled us to gain the trust of congregants and clergy support.

#### **PDF Y Endnote Y**

### **Cellular telephone dialing influences kinematic and spatiotemporal gait parameters in healthy adults**

Seymour KM, Higginson CI, DeGoede KM, Bifano MK, Orr R, Higginson JS.

*J. Mot. Behav.* 2016; ePub(ePub): ePub.

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**DOI** 10.1080/00222895.2016.1152226 **PMID** 27340890

#### **Abstract**

Gait speed is typically reduced when individuals simultaneously perform other tasks. However, the impact of dual tasking on kinetic and kinematic gait parameters is unclear because these vary with gait speed. The objective of this study was to identify whether dual tasking impacts gait in healthy adults when speed is constant. Twenty-two healthy adults dialed a cell phone during treadmill walking at a self-selected speed while kinetic, kinematic, and spatial parameters were recorded.



RESULTS indicated that dual tasking did not impact phone dialing speed, but increased stride width, peak knee flexion during stance, and peak plantarflexion, and decreased knee and ankle range of motion. Dual tasking appears to influence kinematic gait variables in a manner consistent with promotion of stability.

**PDF Y Endnote Y**

### **Does the type of visual feedback information change the control of standing balance?**

Dos Anjos F, Lemos T, Imbiriba LA.

*Eur. J. Appl. Physiol.* 2016; ePub(ePub): ePub.

**Affiliation:** Núcleo de Estudos do Movimento Humano (NEMoH), Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.

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**DOI** 10.1007/s00421-016-3434-7 **PMID** 27431210

#### **Abstract**

**PURPOSE:** The aim of this study was to evaluate whether different types of visual feedback influence the control of standing balance.

**METHODS:** Twenty-six subjects performed three tasks on a force platform: (1) standing with eyes open; (2) maintaining the own center of pressure (COP) displacement (internal feedback) on a target; and (3) pointing with a handheld laser pointer (external feedback) on a target. The COP and ankle displacements were measured through a force platform and a biaxial electrogoniometer, respectively, during 60 s in each task. Global posturographic parameters were computed in the anterior-posterior and medial-lateral directions. In addition, the standard deviation and mean frequency of the ankle movements were also calculated in the sagittal plane.

**RESULTS:** The sway area and standard deviation of COP differed between conditions, wherein smaller and higher values were typically observed during the internal and external feedback, respectively. Conversely, both the mean frequency and the mean velocity of COP were greater during internal feedback compared with other tasks, while external feedback usually leads to smaller values. Additionally, smaller and higher values for the ankle standard deviation and the ankle mean frequency, respectively, were observed during internal feedback, with the external feedback condition showing an opposite behavior.

**CONCLUSIONS:** These results showed that the global postural sway and the postural adjustments at ankle during standing balance change depending on the type of visual feedback information.

**PDF Y Endnote Y**

### **Falls, fractures and bone density in Parkinson's disease: across-sectional study**

Tassorelli C, Berlangieri M, Buscone S, Bolla M, De Icco R, Baricich A, Pacchetti C, Cisari C, Sandrini G. *Int. J. Neurosci.* 2016; ePub(ePub): 1-18.

**Affiliation:** Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy.

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**DOI** 10.1080/00207454.2016.1206897 **PMID** 27356592

#### **Abstract**

**AIM:** Evidence suggests that falls and associated bone fractures are more frequent in patients suffering from Parkinson's disease (PD) than in the general population. In this cross-sectional study we evaluated the clinical and biochemical characteristics that are associated to falls, fractures and

bone health in a population of PD subjects.

**MATERIALS AND METHODS:** Forty-two consecutive subjects suffering from idiopathic PD (mild-to-moderate severity) with/without falls in the previous year were included. They were characterized as regards functional independence, balance, fear of falling, bone density (ultrasound densitometry) and plasma levels of vitamin D. Twenty-one age- and sex-matched healthy subjects were evaluated as controls.

**RESULTS:** We detected a greater degree of osteoporosis in PD subjects as compared to controls, more pronounced in males than in females (Z-Score: M  $-3.8 \pm 1.6$ , F  $-2.28 \pm 0.92$ ,  $p = 0.0006$ ). A positive correlation was found between independence levels and bone density or D vitamin levels. Twenty seven patients (64%) reported falls in the previous year. These were associated to post-traumatic fractures in 16 subjects (59% of fallers). Women fell more than males (fallers: 20F/7M; non fallers: 4F/11M,  $\chi(2)$  test  $p = 0.02$ ), although the occurrence of post-traumatic fractures among fallers did not differ between sexes (F 11/9, M 5/2,  $\chi(2)$  test  $p > 0.05$ ). Fallers with post-traumatic fractures showed higher degrees of motor impairment.

**CONCLUSIONS:** These findings confirm that falls and osteoporosis represent major health issues in PD, already in the middle stages of disease.

#### **PDF Y Endnote Y**

#### **The circumstances and characteristics of fatal falls in Victoria, Australia: a descriptive study**

Rowbotham SK, Blau S.

*Aust. J. Forensic Sci.* 2016; ePub(ePub): ePub.

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**DOI** 10.1080/00450618.2016.1194472 **PMID** unavailable

#### **Abstract**

Falls are the 18th major cause of death in Australia. The intention of this study was to provide a comprehensive understanding of fatal falls in an Australian context through documenting the circumstances of fall-related deaths and investigating the characteristics surrounding those falls. A retrospective review of fatal falls in the state of Victoria from 2005 to 2014 was undertaken using the National Coronial Information System online database. Details recorded for each fatal fall case comprised the circumstances of the fall (year and month of fall, fall type, and manner and cause of death) and characteristics of the deceased (sex, age, body mass index, pre-existing conditions and psychoactive drug use). There were 2743 fatal falls, encompassing falls from a bed, chair, height (>3 m), horse, ladder, low height ( $\leq 3$  m), motor vehicle, stair(s), standing, toilet, wheelchair and unspecified. The majority of falls were accidental (95.5%), indirectly contributed to the fatality (66.4%), were female (53.2%), elderly (61+years) (92.3%) and of a healthy weight (33.3%). Many had pre-existing conditions (86.8%) and several (19%) had psychoactive drug use.

**FINDINGS** are anticipated to contribute to prevention policy improvements and assist medico-legal death investigations. \ **PDF Endnote**

#### **The ethics of deprescribing in older adults**

Reeve E, Denig P, Hilmer SN, Ter Meulen R.

*J. Bioeth. Inq.* 2016; ePub(ePub): ePub.

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DOI 10.1007/s11673-016-9736-y PMID 27416980

### **Abstract**

Deprescribing is the term used to describe the process of withdrawal of an inappropriate medication supervised by a clinician. This article presents a discussion of how the Four Principles of biomedical ethics (beneficence, non-maleficence, autonomy, and justice) that may guide medical practitioners' prescribing practices apply to deprescribing medications in older adults. The view of deprescribing as an act creates stronger moral duties than if viewed as an omission. This may explain the fear of negative outcomes which has been reported by prescribers as a barrier to deprescribing. Respecting the autonomy of older adults is complex as they may not wish to be active in the decision-making process; they may also have reduced cognitive function and family members may therefore have to step in as surrogate decision-makers. Informed consent is intended as a process of information giving and reflection, where consent can be withdrawn at any time. However, people are rarely updated on the altered risks and benefits of their long-term medications as they age. Cessation of inappropriate medication use has a large financial benefit to the individual and the community. However, the principle of justice also dictates equal rights to treatment regardless of age.

### **PDF Y Endnote Y**