

## Safety Literature 5<sup>th</sup> April 2020

### **Blood pressure drop rate after standing up is associated with frailty and number of falls in geriatric outpatients**

Mol A, Slangen LRN, Trappenburg MC, Reijnierse EM, van Wezel RJA, Meskers CGM, Maier AB. *J. Am. Heart Assoc.* 2020; 9(7): e014688.

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#### **Abstract**

**Background** The relationship between orthostatic hypotension and clinical outcome in older adults is poorly understood. Blood pressure drop rate (ie, speed of blood pressure drop) may particularly reflect the imposed challenge to the baroreflex and the associated clinical outcome (ie, frailty and number of falls). This study aimed to compare orthostatic blood pressure drop rate and drop magnitude with regard to their association with frailty and number of falls.

**METHODS and Results** Blood pressure was measured continuously during a standardized active stand task in 168 patients (mean age 81.4±7.0; 55.4% female) who visited a geriatric outpatient clinic for cognitive or mobility problems. The association of orthostatic blood pressure drop rate, blood pressure drop magnitude, and baroreflex sensitivity (ie, increase in heart rate divided by systolic blood pressure drop magnitude) with frailty (Fried criteria and 4 frailty markers) and self-reported number of falls was assessed using linear regression models, adjusting for age and sex. Systolic blood pressure drop rate had the strongest association with frailty according to the 4 frailty markers ( $\beta$  0.30; 95% CI, 0.11-0.49;  $P=0.003$ ) and number of falls ( $\beta$  1.09; 95% CI, 0.19-1.20;  $P=0.018$ ); diastolic blood pressure drop magnitude was most strongly associated with frailty according to the Fried criteria ( $\beta$  0.37; 95% CI, 0.15-0.60;  $P<0.001$ ). Baroreflex sensitivity was associated with neither frailty nor number of falls.

**CONCLUSIONS** Orthostatic blood pressure drop rate was associated with frailty and falls and may reflect the challenge to the baroreflex rather than drop magnitude.

Language: en

#### **Keywords**

baroreflex; blood pressure; blood pressure measurement/monitoring; falls; frailty; geriatrics; orthostatic hypotension

## Does 20-min rounding reduce falls in an aged-care setting? A pilot intervention study

Roberts B, Holloway-Kew K, Pretorius T, Hosking S, Kennedy A, Armstrong K. *Geriatr. Nurs.* 2020; ePub(ePub): ePub.

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### Abstract

**BACKGROUND:** This study investigated if implementation of a 20-min rounding intervention can reduce falls in aged care settings.

**METHODS:** Participants (aged 66-99 years) from five aged care facilities were randomly allocated to intervention (n = 20) or control groups (n = 21). The intervention consisted of 20-min rounding observations over a six month period. The number of falls for all residents of each aged care facility was also collected.

**RESULTS:** For participants of the intervention study, there were no differences for number of falls in the intervention compared to the control group (mean(95%CI) control:2.3(0.8-3.7), intervention:4.0(2.5-5.5), p = 0.108). There was a trend for a decreased average number of falls across all aged care sites (mean±SD, 60.4 ± 35.7 falls occurred prior vs. 53.4 ± 37.4 during the intervention, p = 0.056). There were no fall related fractures in the intervention group during the study.

**CONCLUSIONS:** This study suggests that 20-min rounding may decrease falls for all residents of aged care sites.

Language: en

### Keywords

Aged care; Falls; Falls risk; Intentional rounding

## Evaluation of fear of falling in patients with primary open-angle glaucoma and the importance of inferior visual field damage

Yuki K, Asaoka R, Ono T, Awano-Tanabe S, Murata H, Tsubota K. *Invest. Ophthalmol. Vis. Sci.* 2020; 61(3): e52.

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DOI 10.1167/iovs.61.3.52 PMID 32232347

### Abstract

**PURPOSE:** To evaluate fear of falling using the Fall Efficacy Scale-International (FES-I) in glaucoma patients and investigate its association with glaucomatous visual field loss.

**METHODS:** This study included 273 patients (160 men and 113 women, average age 64.2 years) with primary open-angle glaucoma. Participants were requested to answer the FES-I questionnaire, translated into Japanese, in a face-to-face interview. The relationship between total FES-I score and the following variables was analyzed using multivariable linear regression: age, sex, better and worse best corrected visual acuity, total deviation (TD) in four visual field areas, body mass index (BMI), minutes walked per day, history of diabetes mellitus, history of systemic hypertension, number of previous falls.

**RESULTS:** Univariate analysis suggested that total FES-I score increased with age and in woman, whereas other variables were not significantly associated with total FES-I score. However, age (coefficient, 0.23; standard error [SE], 0.04;  $P < 0.001$ ), sex (coefficient, 1.79 for women; SE, 0.84;  $P = 0.034$ ), mean TD in the inferior central area (coefficient, 0.92; SE, 0.22;  $P < 0.001$ ), and mean TD in the inferior peripheral area (coefficient, -0.86; SE, 0.21;  $P < 0.001$ ) were included in the optimal model for total FES-I score.

**CONCLUSIONS:** Inferior peripheral visual field damage and preserved inferior central visual field sensitivity were associated with increased fear of falling assessed with FES-I in glaucoma.

Language: en

**Falls: do we know anything more than we did 40 years ago?**

Resnick B. *Geriatr. Nurs.* 2020; ePub(ePub): ePub.

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**Abstract**

[Abstract unavailable]

Language: en

## **Prevalence and predictors of falls in a health-seeking older population: an outpatient-based study**

Subramanian MS, Singh V, Chatterjee P, Dwivedi SN, Dey AB. *Aging Med. (Milton)* 2020; 3(1): 25-31.

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### **Abstract**

**BACKGROUND:** Falls are one of the major causes of disability in older people. A wide range of risk factors for falls are described according to setting - inpatient, nursing homes and community. The aim of this study was to identify the risk factors for falls in an outpatient setting.

**METHODS:** In this cross-sectional observational study, 160 consenting subjects were enrolled randomly, from the Geriatric Medicine outpatient department, All India Institute of Medical Sciences, New Delhi, India. Non-ambulatory, seriously ill subjects were excluded. The subjects underwent brief evaluation including falls and geriatric assessment. They were grouped into fallers and non-fallers. A multivariable logistic regression analysis was used to identify the factors associated with falls.

**RESULTS:** The prevalence of falls was 23.75% (38/160). Women were proportionately higher (26.31%) in the fallers group vis-à-vis 19.67% in the non-fallers group. After multivariate analysis, opioids (odds ratio [OR] 5.24 [95% CI, 2.0 18-13.611]), vision impairment (OR 2.71 [95% CI, 1.050-07.011]), fear of falling (OR 3.17 [95% CI, 1.167-08.629]), instrumental activity of daily living (IADL) impairment (OR 3.41 [95% CI, 1.251-09.301]), anti-anginal medications (OR 8.90 [95% CI, 0.997-79.564]) and self-employment (OR 5.37 [95% CI, 1.058-27.329]) were associated with falls. Adequate nutrition (OR 0.82 [95% CI, 0.688-00.976]) and caregiver support (OR 0.46 [95% CI, 0.275-00.801]) were protective of falls.

**CONCLUSION:** We identified the multi-factorial etiology of falls. Patients having any of the above risk factors should undergo detailed fall risk assessment and preventive measures afterwards.

Language: en

### **Keywords**

fall risk; falls; falls screening; older people

## Assessing fall risk appraisal through combined physiological and perceived fall risk measures using innovative technology

Thiamwong L, Sole ML, Ng BP, Welch GF, Huang HJ, Stout JR. *J. Gerontol. Nurs.* 2020; 46(4): 41-47.

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DOI 10.3928/00989134-20200302-01 PMID 32219456

### Abstract

The current study aimed to categorize fall risk appraisal and quantify discrepancies between perceived fall risk measured subjectively using the short Fall Efficacy Scale-International and physiological fall risk measured objectively using the portable BTrackS™ Assess Balance System. One hundred two community-dwelling older adults were evaluated in this cross-sectional study. Approximately 40% of participants had maladaptive fall risk appraisals, which were either irrational (high perceived risk despite low physiological fall risk) or incongruent (low perceived risk but high physiological fall risk). The remaining 60% of participants had adaptive fall risk appraisals, which were either rational (low perceived risk aligned with low physiological fall risk) or congruent (high perceived risk aligned with high physiological fall risk). Among participants with rational, congruent, irrational, and incongruent appraisals, 21.7%, 66.7%, 28%, and 18.8%, respectively, reported having a history of falls ( $p < 0.01$ ). Using technology to identify discrepancies in perceived and physiological fall risks can potentially increase the success of fall risk screening and guide fall interventions to target perceived or physiological components of balance. [*Journal of Gerontological Nursing*, 46(4), 41-47.].

Language: en

## **Enhanced obstacle contrast to promote visual scanning in fallers with Parkinson's disease: role of executive function**

Alcock L, Galna B, Hausdorff JM, Lord S, Rochester L. *Neuroscience* 2020; ePub(ePub): ePub.

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### **Abstract**

The ability to perceive differences in environmental contrast is critical for navigating complex environments safely. People with Parkinson's disease (PD) report a multitude of visual and cognitive deficits which may impede safe obstacle negotiation and increase fall risk. Enhancing obstacle contrast may influence the content of visual information acquired within complex environments and thus target environmental fall risk factors. 17 PD with a history of falls and 18 controls walked over an obstacle covered in a high and low contrast material in separate trials whilst eye movements were recorded. Measures of visual function and cognition were obtained. Gaze location was extracted during the approach phase. PD spent longer looking at the obstacle compared to controls regardless of contrast ( $p < .05$ ), however group differences were largest for the low contrast obstacle. When accounting for group differences in approach time, PD spent longer looking at the obstacle and less time looking at the ground beyond the obstacle compared to controls ( $p < .05$ ). The response to obstacle contrast in PD (high-low) was significantly associated with executive function. Better executive function was associated with spending longer looking at the low contrast obstacle and at the ground beyond the high contrast obstacle. Enhancing the contrast of ground-based trip hazards may improve visual processing of environmental cues in PD, particularly for individuals with better executive function. Manipulating contrast to attract visual attention is already in use in the public domain, however its utility for reducing fall risk in PD is yet to be formally tested in habitual settings.

Language: en

### **Keywords**

Eye-tracking; contrast sensitivity; environmental modification; falls; obstacle appearance

## Prevalence of medication-related falls in 200 consecutive elderly patients with hip fractures: a cross-sectional study

Andersen CU, Lassen PO, Usman HQ, Albertsen N, Nielsen LP, Andersen S. *BMC Geriatr.* 2020; 20(1): e121.

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### Abstract

**BACKGROUND:** Hip fractures constitute a major health problem in elderly people and are often fall-related. Several factors can contribute to a fall episode leading to hip fracture, including fall-risk-increasing drugs (FRIDs), which are often used by elderly people. We aimed to investigate the prevalence of medication-related falls and to assess the role of FRIDs and potentially inappropriate medications (PIMs) in a population of elderly patients hospitalized for a hip fracture.

**METHODS:** We reviewed the patient records of 200 consecutive patients, aged  $\geq 65$  years, who were admitted for a hip fracture and evaluated whether medications were likely to have contributed to the fall episode. PIMs were identified using the Screening Tool of Older Persons' Prescriptions version 2 (STOPP) and by evaluating indications, contra-indications and interactions of the prescribed medications for each patient.

**RESULTS:** FRIDs were used by 175 patients (87.5%). Medications were considered a likely contributor to the fall in 82 patients (41%). These were most often psychotropic medications alone or in combination with antihypertensives and/or diuretics. The 82 patients with suspected medication-related falls used more medications, FRIDs and PIMs than the rest of the patients, and in 74 (90%) of the 82 patients, at least one medication considered to be a contributor to the fall was also a PIM.

**CONCLUSIONS:** The prevalence of suspected medication-related falls was 41%. It seems likely that a medication review could have reduced, though not eliminated, the risk of falling in this group of patients.

Language: en

### Keywords

Fall; Fall-risk-increasing drugs; Geriatrics; Polypharmacy; Potentially inappropriate medication



## **Risk of falls in postmenopausal women treated with romosozumab: preliminary indices from a meta-analysis of randomized, controlled trials**

Möckel L, Bartneck M, Möckel C. Osteoporos Sarcopenia 2020; 6(1): 20-26.

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### **Abstract**

**OBJECTIVES:** Falls are the well-known risk factor for osteoporotic fractures and some medications can increase the risk of falls. Therefore, the aim of our study is to evaluate the effect of romosozumab on risk of falls in postmenopausal women.

**METHODS:** Studies were searched on PubMed, Cochrane Central Register of Controlled Trials, and ClinicalTrials.gov using the search term "romosozumab." Randomized, clinical trials with romosozumab in postmenopausal women, which met the inclusion criteria and in particular reported on falls in safety or efficacy data, were included into the meta-analysis. Risk ratios (RRs) and corresponding 95% confidence intervals (CIs) were calculated using a binary effects model.

**RESULTS:** A total of four studies with overall 12,128 postmenopausal women with osteoporosis were included into the meta-analysis. Twelve-months treatment with romosozumab reduced the risk of falls nonsignificantly by 16% (RR, 0.84; 95% CI, 0.67-1.04;  $P = 0.10$ ;  $n = 11,829$ ). A subgroup analysis with double-blind studies indicated a statistically significant reduction in risk of falls by 20% (RR, 0.80; 95% CI, 0.71-0.92;  $P \leq 0.01$ ;  $n = 11,211$ ). A sequential treatment of romosozumab followed by an antiresorptive medication resulted in a 12% (RR, 0.88; 95% CI, 0.80-0.96;  $P \leq 0.01$ ;  $n = 11,211$ ) reduction of falls in the romosozumab group compared to the control group.

**CONCLUSIONS:** This analysis indicates that romosozumab has a tendency to reduce risk of falls in postmenopausal women with osteoporosis. Nevertheless, our findings are preliminary results with a low significance and to confirm these findings more data and analyses are needed.

Language: en

### **Keywords**

Falls; Frailty; Osteoporosis; Postmenopausal women; Romosozumab

## The association of balance, fear of falling, and daily activities with drug phases and severity of disease in patients with Parkinson

Mehdizadeh M, Martinez-Martin P, Habibi SA, Nikbakht N, Alvandi F, Bazipoor P, Panahi A, Taghizadeh G. *Basic Clin. Neurosci.* 2019; 10(4): 355-362.

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DOI 10.32598/bcn.9.10.295 PMID 32231772

### Abstract

**INTRODUCTION:** In the elderly, functional balance, fear of falling, and independence in daily living activities are interrelated; however, this relationship may change under the influence of drug phase and the severity of disease in individuals with idiopathic Parkinson disease. This study aimed to investigate the association of functional balance, fear of falling, and independence in the Activities of Daily Living (ADL) with the drug on- and drug off-phases.

**METHODS:** A total of 140 patients with Parkinson disease (age: Mean±SD; 60.51±12.32 y) were evaluated in terms of their functional balance, fear of falling, and independence in their daily activities by the Berg Balance Scale (BBS), Fall Efficacy Scale-International (FES-I), and Unified Parkinson Disease Rating Scale-ADL (UPDRS-ADL), respectively, in drug on- and drug off-phases. The Hoehn and Yahr scale recorded global disease rating. The Spearman coefficient, Kruskal-Wallis, and Mann-Whitney tests were used to find out whether the distribution of scale scores differs with regard to functional balance or disease severity.

**RESULTS:** A strong correlation was found between the functional balance, fear of falling, and independence in ADL with both drug phases. The results also showed the significant difference in the distribution of the FES-I and UPDRS-ADL scores with regard to functional balance (except independence in ADL in drug off-phase). Also, the distribution of the scores of BBS, FES-I, and UPDRS-ADL showed significant differences with regard to disease severity.

**CONCLUSION:** The study showed a strong correlation between functional balance, fear of falling, and independence in ADL that can be affected by the drug phase and severity of the disease. However, more studies are needed to understand this relationship precisely.

Language: en

### Keywords

Activities of daily living; Fear; Parkinson disease; Postural balance

## The relationship between self-rated economic status and falls among the elderly in Shandong Province, China

Hong Z, Xu L, Zhou J, Sun L, Li J, Zhang J, Hu F, Gao Z. *Int. J. Environ. Res. Public Health* 2020; 17(6): e2150.

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### Abstract

(1) Background: Older people are more vulnerable and likely to have falls and the consequences of these falls place a heavy burden on individuals, families and society. Many factors directly or indirectly affect the prevalence of falls. The aims of this study were to understand the prevalence and risk factors of falls among the elderly in Shandong, China; the relationship between economic level and falls was also preliminary explored. (2) Methods: Using a multi-stage stratified sampling method, 7070 elderly people aged 60 and over were selected in Shandong Province, China. General characteristics and a self-rated economic status were collected through face to face interviews. Chi-square tests, rank sum tests and two logistic regression models were performed as the main statistical methods. (3) Results: 8.59% of participants reported that they had experienced at least one fall in the past half year. There was a significant difference in experienced falls regarding gender, residence, marital status, educational level, smoking, drinking, hypertension, diabetes, coronary disease, and self-reported hearing. The worse the self-rated economic status, the higher the risk of falling, (poor and worried about livelihood, OR = 3.60, 95% CI = 1.76-7.35). (4) Conclusions: Women, hypertension, diabetes and self-reported hearing loss were identified as the risk factors of falls in the elderly. The difference of economic level affects the falls of the elderly in rural and urban areas. More fall prevention measures should be provided for the elderly in poverty.

Language: en

### Keywords

elderly; falls; risk factors; rural and urban; self-rated economic status