

**Safety Literature 3<sup>rd</sup> November 2019**

**A TUG value longer than 11 s predicts fall risk at 6-month in individuals with COPD**

Reynaud V, Muti D, Pereira B, Greil A, Caillaud D, Richard R, Coudeyre E, Costes F. J. Clin. Med. 2019; 8(10): e8101752.

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31652506

**Abstract**

Risk of a fall is increased in individuals with chronic obstructive pulmonary disease (COPD), and is usually evaluated using the Berg Balance Scale (BBS), but this is difficult to perform in everyday clinical practice. We aimed to prospectively predict short-term fall recurrence in COPD patients using a predetermined cut-off value of the Timed Up and Go test (TUG). In stable COPD patients, we collected self-reported records of the number of falls in the previous year, and measured TUG and BBS scores for each individual. Records of fall recurrence were obtained prospectively at 6-months after the initial evaluation. Among the 50 patients recruited, 23 (46%) had at least one fall during the past year. The optimal diagnosis value for the TUG to detect a fall was 10.9 s with a sensitivity of 100% and a specificity of 97%. A cut-off of 11 s predicted fall recurrence with high sensitivity and specificity (93% and 74%, respectively). The TUG as well as the BBS score detected fallers, and a cut-off value of 11 s predicted fall recurrence. TUG could be easily incorporated into the scheduled functional evaluations of COPD patients, could predict the risk of a fall and when appropriate, could guide specific balance training exercises to prevent fall.

Language: en

**Keywords**

Chronic obstructive pulmonary disease; Fall; Hypoxia; Postural balance; Risk factor; Timed Up and Go test

## **An intervention to improve outcomes of falls in dementia: the DIFRID mixed-methods feasibility study**

Allan LM, Wheatley A, Smith A, Flynn E, Homer T, Robalino S, Beyer FR, Fox C, Howel D, Barber R, Connolly JA, Robinson L, Parry SW, Rochester L, Corner L, Bamford C. *Health Technol. Assess.* 2019; 23(59): 1-208.

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(Copyright © 2019, National Co-ordinating Centre for Health Technology Assessment (UK))

### **DOI**

10.3310/hta23590

### **PMID**

31661058

### **Abstract**

**BACKGROUND:** Fall-related injuries are a significant cause of morbidity and mortality in people with dementia. There is presently little evidence to guide the management of such injuries, and yet there are potentially substantial benefits to be gained if the outcomes of these injuries could be improved. This study aimed to design an appropriate new health-care intervention for people with dementia following a fall and to assess the feasibility of its delivery in the UK NHS.

**OBJECTIVES:** To determine whether or not it is possible to design an intervention to improve outcomes of falls in dementia, to investigate the feasibility and acceptability of the DIFRID (Developing an Intervention for Fall related Injuries in Dementia) intervention and to investigate the feasibility of a future randomised controlled trial and the data collection tools needed to evaluate both the effectiveness and the cost-effectiveness of the DIFRID intervention.

**DESIGN:** This was a mixed-methods feasibility study. A systematic review (using Cochrane methodology) and realist review [using Realist And Meta-narrative Evidence Syntheses: Evolving Standards (RAMESES) methodology] explored the existing evidence base and developed programme theories. Searches were carried out in November 2015 (updated in January 2018) for effectiveness studies and in August 2016 for economic studies. A prospective observational study identified service use via participant diary completion. Qualitative methods (semistructured interviews, focus groups and observation) were used to explore current practice, stakeholder perspectives of the health and social care needs of people with dementia following a fall, ideas for intervention and barriers to and facilitators of change. Each of the resulting data sets informed intervention development via Delphi consensus methods. Finally, a single-arm feasibility study with embedded process evaluation was conducted. **SETTING:** This study was set in the community. **PARTICIPANTS:** The

participants were (1) people with dementia presenting with falls necessitating health-care attention in each setting (primary care, the community and secondary care) at three sites and their carers, (2) professionals delivering the intervention, who were responsible for training and supervision and who were members of the intervention team, (3) professionals responsible for approaching and recruiting participants and (4) carers of participants with dementia. **INTERVENTIONS:** This was a complex multidisciplinary therapy intervention. Physiotherapists, occupational therapists and support workers delivered up to 22 sessions of tailored activities in the home or local area of the person with dementia over a period of 12 weeks. **MAIN OUTCOME MEASURES:** (1) Assessment of feasibility of study procedures; (2) assessment of the acceptability, feasibility and fidelity of intervention components; and (3) assessment of the suitability and acceptability of outcome measures for people with dementia and their carers (number of falls, quality of life, fear of falling, activities of daily living, goal-setting, health-care utilisation and carer burden).

**RESULTS:** A multidisciplinary intervention delivered in the homes of people with dementia was designed based on qualitative work, realist review and recommendations of the consensus panel. The intervention was delivered to 11 people with dementia. The study suggested that the intervention is both feasible and acceptable to stakeholders. A number of modifications were recommended to address some of the issues arising during feasibility testing. The measurement of outcome measures was successful.

**CONCLUSIONS:** The study has highlighted the feasibility of delivering a creative, tailored, individual approach to intervention for people with dementia following a fall. Although the intervention required greater investment of time than usual practice, many staff valued the opportunity to work more closely with people with dementia and their carers. We conclude that further research is now needed to refine this intervention in the context of a pilot randomised controlled trial. **TRIAL REGISTRATION:** Current Controlled Trials ISRCTN41760734 and PROSPERO CRD42016029565. **FUNDING:** This project was funded by the National Institute for Health Research (NIHR) Health Technology Assessment programme and will be published in full in Health Technology Assessment; Vol. 23, No. 59. See the NIHR Journals Library website for further project information.

Language: en

### Keywords

Accidental Falls; Dementia; Health Services Needs and Demand; Interventions; Pilots; Prospective Studies

## Case report on fear of falling syndrome: a debilitating but curable gait disorder

Ghaffari-Rafi A, Horak RD, Miles DT, Eum KS, Jahanmir J. Am. J. Case Rep. 2019; 20: 1587-1591.

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### DOI

10.12659/AJCR.918879

### PMID

31659147

### Abstract

**BACKGROUND** Fear of falling syndrome is a rare and often-missed disorder among patients with new-onset gait abnormality. The disorder is often mistaken for an organic neurologic problem, with some considering it to be a medical emergency. **CASE REPORT** This case report presents a 70-year-old man who presented to the Emergency Department due to inability to rise from a chair or ambulate independently. Onset of his chief complaint occurred subsequent to a traumatic fall in a public location. He underwent extensive workup, and an organic neurologic cause was ruled out. He was subsequently diagnosed with fear of falling syndrome after obtaining a detailed fall history, as well as utilizing a verified survey (the Falls Efficacy Scale-International). After extensive inpatient treatment, the patient improved significantly. However, upon discharge to a skilled nursing facility, he was not offered the recommended treatment. When he was readmitted for an unrelated reason 3 months later, he had regressed to the state he was in at the time of prior admission.

**CONCLUSIONS** This case presents a rare debilitating but reversible gait disorder, and highlights the importance of assessing "fall history" and fear of falling in older adults. Uniquely, this case presents the rapid fluctuation in outcomes dependent on treatment, and what happens when a patient fails to complete treatment regimens. The report also provides an overview of fear of falling with the corresponding gait disorder.

Language: en

## Development and evaluation of fall impact protection pads using additive manufacturing

Park JH, Jung HK, Lee JR. *Materials (Basel)* 2019; 12(20): e12203440.

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### DOI

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31640163

### Abstract

This paper presents the development and evaluation of fall-impact protection pants for elderly women using additive manufacturing. The protective pants were designed incorporating a protective pad in the hip area to reduce the impact of falls on the human body. The protective pad is a 3D mesh structure with a curved surface to fit the human body. Pads printed with flexible thermoplastic polyurethane were combined with foam to create the final pad. The impact-absorbing performance of the pad was verified through physical impact experiments. When dropping a bowling ball onto the protective pad from heights of 15, 20, and 25 cm, the protective pad was found to reduce the impact force by more than 82% in all cases. The impact force was less than the average fracture threshold of 3472 N. A subject group and an expert group evaluated the appearance, pad characteristics, motion functionality, and the wearability of the protection pants. Despite the insertion of a pad, the pants appeared natural and had a good fit. The pads were evaluated as being well-designed in terms of their position, shape, area, thickness, weight, flexibility, ease of insertion, and ease of use. Users were comfortable performing various motions when wearing the designed protective clothing. Therefore, this work can be considered to have developed protective clothing that provides satisfactory impact-protection performance and comfort thereby advancing the possibility of applying additive manufacturing to the creation of functional garments.

Language: en

### Keywords

additive manufacturing; design; fall-impact protection; protection pad; protective pants

## **Fall-related efficacy is a useful and independent index to detect fall risk in Japanese community-dwelling older people: a 1-year longitudinal study**

Kamide N, Shiba Y, Sakamoto M, Sato H, Kawamura A. *BMC Geriatr.* 2019; 19(1): e293.

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**DOI** 10.1186/s12877-019-1318-5 **PMID** 31664911

### **Abstract**

**BACKGROUND:** Fall-related efficacy has been found to be associated with both falls and fall risk factors such as physical performance. The aim of the present study was to clarify whether fall-related efficacy is, independent of physical performance and other potential risk factors, associated with future falls in community-dwelling older people.

**METHODS:** The study participants were 237 Japanese older people aged 65 years and over who were living independently in their community. Fall-related efficacy and physical performance were assessed at baseline using the short version of the Falls Efficacy Scale-International (short FES-I) and 5-m walking time, the Timed Up and Go Test, the 5 Times Sit to Stand Test, and grip strength. Physical performance was then again assessed at 1-year follow-up. The number of falls was obtained every 6 months for 1 year after the baseline survey. Instrumental activities of daily living (IADL), depression, fall history, current medications, medical history, and pain were also investigated as potential confounding factors that have possible associations with falls. The associations between the short FES-I, physical performance, and number of falls were analyzed using Poisson regression analysis adjusted for physical performance and potential confounding factors.

**RESULTS:** The mean age of the participants (75.9% women) was  $71.1 \pm 4.6$  years, and 92.8% could perform IADL independently. The total numbers of falls and fallers during the 1-year follow-up period were 70 and 42, respectively. On Poisson regression analysis adjusted for walking time and potential confounding factors, independent of physical performance, the short FES-I was found to be significantly associated with number of falls (relative risk = 1.09,  $p < 0.05$ ). On the other hand, physical performance was not significantly associated with the number of falls.

**CONCLUSIONS:** The findings of the present study suggest that the short FES-I, independent of physical performance and other potential risk factors, is a useful index to detect fall risk in community-dwelling older people, and that fall-related efficacy is an important factor in terms of fall prevention.

Language: en

**Keywords** Accidental falls; Aged; Fall-related efficacy; Japanese; Physical performance

## **Fear of falling in community-dwelling older adults diagnosed with cancer: a report from the International Mobility in Aging Study (IMIAS)**

Aburub AS, P Phillips S, Curcio CL, Guerra RO, Auais M. J. Geriatr. Oncol. 2019; ePub(ePub): ePub.

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### **DOI**

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### **PMID**

31653454

### **Abstract**

**BACKGROUND:** The incidence of fear of falling (FOF) is high among people with cancer. However, factors that are associated with FOF in people with cancer has not yet been investigated. Therefore, the objective of this study was to identify the associated factors with FOF in people with cancer.

**METHOD:** This is a secondary analysis of the International Mobility in Aging Study (IMIAS) study. A total of 175 people self-identified as patients with cancer (mean age: 69.3 years, women: 50.2%) and 177 healthy age-matched group. FOF measured using the Falls Efficacy Scale-International (FES-I) was the primary outcome. Potential variables/factors for consistency known to be associated with FOF (cognitive status, depression, physical performance, the number of falls in the last year, visual acuity and grip strength) were assessed. Simple linear regression was used to identify factors associated with FOF. Variables with p-value <0.05 were then included in a multiple linear regression adjusted for the study confounders (study site, sex, and age).

**RESULTS:** For people with cancer, FES-I was significantly associated with the Leganes Cognitive Test, The Short Physical Performance Battery (SPPB) total scores and the number of falls reported in the past 12 months (P-value <0.05). For the healthy group, FOF was only associated with depression and SPPEB.

**CONCLUSION:** FOF is multifactorial in people with cancer and it is associated with cognitive status, physical performance and number of falls in the last year. Healthcare providers for patients with cancer should evaluate all potential factors associated with FOF and manage it.

Language: en

### **Keywords**

Fear of falling; People with cancer

## **Frailty, falls and osteoporosis: learning in elderly patients using a theatrical performance in the classroom**

Robles MJ, Esperanza A, Arnau-Barrés I, Garrigós MT, Miralles R. J. Nutr. Health Aging 2019; 23(9): 870-875.

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### **Abstract**

**OBJECTIVE:** To ascertain the usefulness of a simulated clinical scene with actors in the classroom (theatrical performance) as a teaching tool for the management of falls and their related injuries.

**DESIGN:** Experimental design of two related groups. **SETTING:** Spain. **PARTICIPANTS:** A group of 12 students attended a seminar in which the approach to a clinical case was made using a simulated scene with actors in the classroom (scene group); a non-scene group of 34 students attended the seminar, without a theatrical performance (the same clinical case was read and presented in a traditional manner, oral presentation). **MEASUREMENTS:** Before and after the seminar, students answered a questionnaire [five questions on theoretical knowledge of falls and osteoporosis (score 0-10) and two on subjective learning perception (linear scale: 0-10) (score 0-20)]. In the scene group were two further questions included at the end on their opinion of the scene and on the seminar overall.

**RESULTS:** Both groups significantly improved in all questionnaire scores after the seminar ( $p=0.001$ ). The scene group had a greater rise in mean points of the questionnaire before and after the seminar than the non-scene group: theoretical knowledge [ $3.81\pm 1.69$  versus  $2.75\pm 1.33$  ( $p=0.033$ )], subjective questions [ $6.08\pm 4.10$  versus  $4.97\pm 2.24$  ( $p=0.247$ )], and the questionnaire overall [ $9.89\pm 4.98$  versus  $7.72\pm 2.66$  ( $p=0.060$ )]. The scene group had a very good opinion of the usefulness of the scene and of the overall opinion of the seminar:  $9.08\pm 0.95$  and  $9.41\pm 0.79$ .

**CONCLUSIONS:** Theatrical performance in the classroom seems to promote better learning than classic oral presentation, providing qualitative value by adding creativity and different approaches to the teaching of medicine.

Language: en

Keywords

Theatrical performance; education; falls; frailty; geriatrics; osteoporosis



## High prevalence of fall-related medication use in older veterans at risk for falls

Elias AM, Ogunwale AN, Pepin MJ, Bailey JC, Adams AD, Colón-Emeric CS, Vognsen JD, Schmader KE, Pavon JM. *J. Am. Geriatr. Soc.* 2019; ePub(ePub): ePub.

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### PMID

31657005

### Abstract

Falls are a common and costly medication-related safety event in older adults.<sup>1</sup> Suboptimal medication use is a major modifiable risk factor for falls,<sup>2</sup> and polypharmacy is an independent risk factor for falls among older adults.<sup>3, 4</sup> Therefore, deprescribing fall-related medications, defined as a systematic approach to discontinuing or reducing high-risk medications to avoid adverse health outcomes,<sup>5</sup> is a critical step in fall prevention.

To inform the development of pragmatic deprescribing interventions for this high-risk population, the goal of this study is to determine the proportion of veterans, aged 65 years and older, at high risk of falls using the electronic health record (EHR) and to quantify the prevalence of high-risk medication use in this population ...

Language: en

## **Multimodal training reduces fall frequency as physical activity increases in individuals with Parkinson's disease**

Penko AL, Barkley JE, Rosenfeldt AB, Alberts JL. J. Phys. Act. Health 2019; ePub(ePub): ePub.

(Copyright © 2019, Human Kinetics Publishers)

### **DOI**

10.1123/jpah.2018-0595

### **PMID**

31648204

### **Abstract**

**BACKGROUND:** Parkinson's disease (PD) results in a global decrease in information processing, ultimately resulting in dysfunction executing motor-cognitive tasks. Motor-cognitive impairments contribute to postural instability, often leading to falls and decreased physical activity. The aim of this study was to determine the effects of a multimodal training (MMT) versus single-modal (SMT) training on motor symptoms, fall frequency, and physical activity in patients with PD classified as fallers.

**METHODS:** Individuals with PD were randomized into SMT (n = 11) or MMT (n = 10) and completed training 3 times per week for 8 weeks. The SMT completed gait and cognitive training separately, whereas MMT completed gait and cognitive training simultaneously during each 45-minute session. Physical activity, 30-day fall frequency, and PD motor symptoms were assessed at baseline, posttreatment, and during a 4-week follow-up.

**RESULTS:** Both groups exhibited significant ( $P < .05$ ) improvements in clinical ratings of motor function, as symptoms improved by 8% and 15% for SMT and MMT, respectively. Physical activity significantly increased ( $P < .05$ ) for both groups from baseline (mean steps 4942 [4415]) to posttreatment (mean steps 5914 [5425]). The MMT resulted in a significant 60% reduction in falls.

**CONCLUSIONS:** Although SMT and MMT approaches are both effective in improving physical activity and motor symptoms of PD, only MMT reduced fall frequency after the intervention.

Language: en

### **Keywords**

dual task; exercise; gait; neurology

## Proinflammatory diet increases circulating inflammatory biomarkers and falls risk in community-dwelling older men

Cervo MMC, Scott D, Seibel MJ, Cumming RG, Naganathan V, Blyth FM, Le Couteur DG, Handelsman DJ, Ribeiro RV, Waite LM, Shivappa N, Hébert JR, Hirani V. *J. Nutr.* 2019; ePub(ePub): ePub.

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(Copyright © 2019, American Society of Nutritional Sciences)

DOI 10.1093/jn/nxz256 PMID 31665502

### Abstract

**BACKGROUND:** The relations between diet, chronic inflammation, and musculoskeletal health are unclear, especially among older men.

**OBJECTIVE:** This study aimed to determine associations of the Dietary Inflammatory Index (DII) with inflammatory biomarkers, musculoskeletal health, and falls risk in community-dwelling older men.

**METHODS:** The cross-sectional analysis included 794 community-dwelling men, mean age  $81.1 \pm 4.5$  y, who participated in the 5-y follow-up of the Concord Health and Aging in Men Project. Of these, 616 were seen again 3 y later for the longitudinal analysis. Energy-adjusted DII (E-DII) was calculated from a validated diet history questionnaire. Bone mineral density (BMD) was measured using DXA. Twenty-four inflammatory biomarkers were analyzed. Incident falls over 3 y were determined through telephone interviews every 4 mo. Multiple regression, linear mixed effects models, negative binomial regression, and mediation analysis were utilized in this study.

**RESULTS:** A higher E-DII score (indicating a more proinflammatory diet) was associated with higher concentrations of IL-6 ( $\beta$ : 0.028 pg/mL; 95% CI: 0.003, 0.053), IL-7 ( $\beta$ : 0.020 pg/mL; 95% CI: 0.002, 0.037), and TNF- $\alpha$  ( $\beta$ : 0.027 pg/mL; 95% CI: 0.003, 0.051). A higher E-DII score was also associated with lower appendicular lean mass adjusted for BMI (ALMBMI) ( $\beta$ : -0.006 kg/m<sup>2</sup>; 95% CI: -0.010, -0.001). For every unit increase in E-DII (range: -4.91 to +3.66 units), incident falls rates increased by 13% (incidence rate ratio: 1.13; 95% CI: 1.05, 1.21) over 3 y. Mediation analysis showed that the association between E-DII and 3-y incident falls was influenced by the concentrations of IL-7 by 24%. There was no association between E-DII and BMD.

**CONCLUSIONS:** Consumption of a proinflammatory diet was associated with increased concentrations of IL-6, IL-7, and TNF- $\alpha$ ; increased falls risk; and lower ALMBMI in community-dwelling older men. The association between incident falls and E-DII was partly mediated by concentrations of IL-7.

Language: en **Keywords** bone mineral density; chronic inflammation; community-dwelling older men; dietary inflammatory index; falls; inflammatory biomarkers

## **Risk of falls and injuries requiring hospitalisation after first-eye cataract surgery in elderly Australians**

Gadzhanova S, Gillam M, Roughead E. Acta ophthalmol. 2019; ePub(ePub): ePub.

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(Copyright © 2019, John Wiley and Sons)

### **DOI**

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### **PMID**

31654472

### **Abstract**

**PURPOSE:** To investigate the impact of the type of the intraocular lenses (IOLs) in first-eye cataract surgery in elderly people on the risk of hospitalisation due to falls and injuries.

**METHODS:** A retrospective cohort study was conducted using the Australian Government Department Veterans' Affairs claims data. All people aged 65 years and above who had first cataract surgery between January 2007 and July 2017 were identified. Two cohorts were established depending on the type of IOL-monofocal and multifocal. The risk of injuries and falls requiring hospitalisation in the first 3 months post the surgery was assessed using Cox proportional hazard models with age at entry as primary time scale and adjusting for gender, comorbidities and prior history of falls.

**RESULTS:** There were 45 728 people across the two cohorts with the majority receiving monofocal lenses (97%), followed by multifocal lenses (3%) at the time of first cataract surgery. The risk of injury and falls was lower (but not significant) in the multifocal cohort compared to monofocal cohort (adjusted hazard ratio (aHR) 0.56, 95% CI 0.26-1.17). The risk was also lower (but not significant) when stratifying by age group at the time of the surgery.

**CONCLUSIONS:** Regardless of age, multifocal lenses did not appear to be associated with the higher risk of serious injuries and falls after first-eye cataract surgery compared to monofocal lenses.

Language: en

### **Keywords**

Australia; cataract surgery; elderly people; risk of falls

## **The reliability and validity of the Turkish version of the Modified Falls Efficacy Scale: the reliability and validity from the viewpoint of balance**

Çetişli Korkmaz N, Duray M, Doğru Hüzmele E, Şenol H. Turk. J. Med. Sci. 2019; ePub(ePub): ePub.

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### **DOI**

10.3906/sag-1903-212

### **PMID**

31655523

### **Abstract**

**BACKGROUND/AIM:** Factors associated with fall-related self-efficacy should be addressed, especially in elders. The Modified Falls Efficacy Scale (MFES) is simple instrument with good scaling properties and reliability. The aim of present study was to determine the reliability and validity of the Turkish version of the MFES from the viewpoint of balance.

**MATERIALS AND METHODS:** In the study, 164 participants aged > 65 years were included. Use of walking aids and assistive devices, history and frequency of falls in previous year, living environment, and exercise habits were noted. Balance and fall risk were assessed with Berg Balance Scale (BBS). A forward?backward translation procedure was used for MFES?s Turkish version.

**RESULTS:** None of 14 items in the MFES were modified. The Turkish version of the MFES has excellent internal consistency (Cronbach?s alpha, 0.978) and reliability (interclass correlation coefficient, 0.928?0.982), and its construct validity was supported by its ability to distinguish between groups with respect to fall-risk factors and balance. According to the BBS scores, high fall risk group had lower MFES scores than moderate and low fall risk groups (?2=34.153, p=0.001).

**CONCLUSION:** The Turkish version of the MFES is a sensitive instrument for evaluation of fall-related confidence while carrying out indoor/outdoor activities. It also predicts falls, reduced physical activity, balance and mobility problems, and restricted social participation and daily living activities.

Language: en

### **Keywords**

Berg Balance Scale; Modified Falls Efficacy Scale; elderly; falls; fear of falling; older people

## **A detailed analysis of serious personal injuries suffered by full time and part time soldiers of the Australian Army**

Schram B, Pope R, Norman A, Orr R. *Mil. Med.* 2019; ePub(ePub): ePub.

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**DOI** 10.1093/milmed/usz370 **PMID** 31665412

### **Abstract**

**INTRODUCTION:** The intense training and occupational demands of military personnel place the individual at risk of serious injury. When they do occur, serious personal injuries (SPIs) can lead to medical discharge, mission compromise, and ongoing recurrence of problems. Prior to the implementation of any minimization strategies, an understanding of the causes of SPIs requires development. The aim of this study was to analyze the incidence rates and patterns of SPIs within the Australian Regular Army (ARA) and Australian Army Reserve (ARES).

**METHODS:** Data for a 2-year period were obtained through the Work Health, Safety, Compensation, and Reporting database of the Australian Department of Defence. Records of SPIs were extracted, with details including: (a) the activity being performed when the injury was suffered; (b) the body location of injury; (c) the nature of injury; and (d) the mechanism of injury.

**RESULTS** were reported as number of SPIs and converted to SPIs/100 full-time equivalent (FTE) years of service.

**RESULTS:** In total, 507 SPIs were reported over the two-year period (ARA = 466; ARES = 41). SPIs most commonly: occurred during combat training (n = 80; 0.13 SPIs/100 FTE years) and physical training (n = 66; 0.10 SPIs/100 FTE years); affected the head (n = 63; 0.10 SPIs/100 FTE years) and shoulders (n = 57; 0.09 SPIs/100 FTE years); and comprised fractures (n = 199; 0.19 SPIs/100 FTE years) and soft-tissue injuries (n = 103; 0.16 SPIs/100 FTE years). The most common mechanism of injury was falls (n = 132; 0.21 SPIs/100 FTE years) or contact with objects (n = 114; 0.18 SPIs/100 FTE years). When adjusted for service time, ARES personnel were found to report SPIs more frequently than ARA personnel (0.87 vs. 0.79/100 FTE years, respectively) giving an injury risk ratio (ARA:ARES) of 0.91 [95% CI = 0.66-1.25].

**CONCLUSIONS:** Despite higher absolute numbers of SPIs occurring in ARA, ARES in fact report similar rates of SPIs when adjusted for service time. The natures and mechanisms of SPIs are also similar for both service types and therefore should be the focus of targeted programs to reduce such injuries.

Language: en

**Accidental adult deaths involving ladders: a forensic perspective**

Froneczek J, Byard RW. *Med. Sci. Law* 2019; ePub(ePub): ePub.

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**DOI**

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31645184

**Abstract**

A retrospective study was undertaken of autopsy cases at the Forensic Science South Australia state mortuary over a 20-year period from January 1999 to December 2018 for all cases aged  $\geq 18$  years where a ladder was mentioned in the death scene description and/or police reports. Twelve cases were identified, all of whom were male, with an average age of 56 years (range 21–83 years). The most frequent cause of death was a fall from a ladder ( $n = 8$ ; 66%), followed by electrocution ( $n = 4$ ; 33%). The falls were associated with deaths from blunt injuries, impalement and laceration. The age range of those who fell was 47–83 years (average 66 years). The three of the four deaths associated with electrocutions involved contact with power lines or live electrical wires; the remaining case involved a sharp metal ladder base cutting through a live power lead. The age range of those who were electrocuted was 21–43 years (average 35 years) – significantly younger than those who had died from falls ( $p < 0.05$ ). The increase in mean age of the population with increasing popularity of home maintenance activities may result in more cases of lethal falls involving ladders presenting for forensic assessment.

Language: en

**Keywords**

Ladder; deaths; electrocution; falls; forensic; injury

## **Construct validity of the early clinical assessment of balance in toddlers with cerebral palsy: brief report**

Pierce SR, Kornafel T, Skorup J, Paremski AC, Prosser LA. Dev. Neurorehabil. 2019; ePub(ePub): ePub.

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### **DOI**

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### **PMID**

31661347

### **Abstract**

**Purpose:** The purpose of this research was to investigate differences in Early Clinical Assessment of Balance (ECAB) scores within children with cerebral palsy (CP) with different Gross Motor Function Classification System (GMFCS) levels and between children with CP and typical development (TD) who are under three years of age. **Methods:** The ECAB was administered to fifty children (13 with TD, 16 with GMFCS level II, 11 with GMFCS level III, 10 with GMFCS level III). **Results:** The group of children of TD had significantly higher scores than all groups of children with CP. There were significant differences in ECAB within the groups of children with CP with different GMFCS levels. **Conclusion:** The results of this study support the construct validity of the ECAB as a measure of postural control in children under three years of age with CP.

Language: en

### **Keywords**

Cerebral palsy; balance; motor development; postural control; toddlers



## Effects of fall training program on automatization of safe motor responses during backwards falls in school-age children

DelCastillo-Andrés Ó, Toronjo-Hornillo L, Toronjo-Urquiza L. *Int. J. Environ. Res. Public Health* 2019; 16(21): e16214078.

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### DOI

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31652771

### Abstract

A significant number of children suffer injuries from falls. The current measures of prevention and education regarding falls are not sufficient, as falling is still the main cause of injury at this age. This study aimed to evaluate the risk of injury during a backward fall and assess the effect of the Safe Fall training program on this risk. 457 primary school children between the ages of 6 and 12 (mean age of 9) were enrolled in a 6-week randomized intervention. The program was carried out during physical education classes and consisted of an intervention group that followed the Safe Fall training program and a control group that was given equilibrium exercises. The risk of injury was assessed before and after the implementation using the Information Scale on Safe Ways of Falling observation scale, evaluating the responses of five different body parts (head, hip, knees, upper limbs and back). Students' natural response to falls was associated with a high risk of injury in more than 90% of the cases. The implementation of the Safe Fall program resulted in a considerable decrease in this risk, with percentages lowered to levels between 8.7% and 18.3%.

Language: en

### Keywords

childhood injuries; health promotion; protective factors; public health

## **Falls during inpatient rehabilitation in spinal cord injury, acquired brain injury, and neurologmusculoskeletal disease programs**

Wilson A, Kurban D, Noonan VK, Krassioukov A. *Spinal Cord* 2019; ePub(ePub): ePub.

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### **DOI**

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### **PMID**

31641202

### **Abstract**

**STUDY DESIGN:** Retrospective chart review.

**OBJECTIVES:** To compare the proportion of fallers and the patient level and fall characteristics among inpatients who had experienced at least one fall in a spinal cord injury (SCI), an acquired brain injury (ABI), and a neuromusculoskeletal disease (NMS) rehabilitation program. **SETTING:** Tertiary rehabilitation hospital. **SUBJECTS:** Inpatients who had experienced at least one fall during rehabilitation.

**METHODS:** Patient and fall level variables were extracted from electronic medical records over a 5-year period (January 1, 2011 to January 1, 2016): hospital program, age, sex, Functional Independence Measure (FIM) scores, length of stay, number of medications, as well as fall date, time, location, cause, harm, fall risk assessment data, and whether the fall was witnessed. The impact of hospital program on fall was examined using bivariate and multivariable analysis.

**RESULTS:** Two hundred and thirty-seven (16%) inpatients experienced at least one fall during the study period. Inpatients with SCI had the highest proportion of fallers (20%) and fell later after admission than inpatients in the other programs. Patients with ABI were more likely to sustain moderate-to-severe physical harm from falls. Taking >5 medications at time of fall and being earlier in one's rehabilitation course were associated with increased fall rate among fallers.

**CONCLUSIONS:** Although the type of program was not a significant predictor of fall rate in the multivariable analysis, there were some important differences among the rehabilitation programs on patient and fall level characteristics. These results may be useful when developing and timing fall prevention interventions for inpatient rehabilitation.

Language: en

## **Influence of physical performance on elderly mortality, functionality and life satisfaction: FIBRA's study data**

Soares VN, Fattori A, Neri AL, Fernandes PT. Cien. Saude Colet. 2019; 24(11): 4181-4190.

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### **DOI**

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### **PMID**

31664391

### **Abstract**

**OBJECTIVE:** To verify the influence of physical performance on elderly mortality, functionality and life satisfaction.

**MATERIALS AND METHODS:** A follow-up was performed on 900 Brazilian non-hospitalized elderly in the period 2008-2016, in which 154 deaths from natural causes were included in the survival analysis.

**RESULTS:** the worst grip strength (RR = 1.60; CI 95% = 1.15-2.23, p = 0.005) and gait speed (RR = 1.82; CI 95% = 1.30-2.55, p < 0.001) performances were associated with increased mortality risk. Age was a confounding factor for strength (RR = 1.06; CI 95% = 1.03-1.09, p < 0.001) and rheumatoid arthritis was a confounding factor for speed (RR = 2.02; CI 95% = 1.36-3.01, p < 0.001). The elderly with good physical performance realized more instrumental and advanced activities of daily living, and good gait performance had a significant effect on life satisfaction (F = 6.87, p = 0.009).

**CONCLUSIONS:** good physical performance seems to be fundamental for longevity and for accomplishing daily tasks. Furthermore, good mobility can affect life satisfaction-related mechanisms.

Language: en

## Development and validation of an algorithm to assess risk of first-time falling among home care clients

Kuspinar A, Hirdes JP, Berg K, McArthur C, Morris JN. Development and validation of an algorithm to assess risk of first-time falling among home care clients. *BMC geriatrics*. 2019 Dec 1;19(1):264.

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### DOI

10.1186/s12877-019-1300-2

### Abstract

**Background:** The falls literature focuses on individuals with previous falls, so little is known about individuals who have not experienced a fall in the past. Predicting falls in those without a prior event is critical for primary prevention of injuries. Identifying and intervening before the first fall may be an effective strategy for reducing the high personal and economic costs of falls among older adults. The purpose of this study was to derive and validate a prediction algorithm for first-time falls (1stFall) among home care clients who had not fallen in the past 90days.

**Methods:** Decision tree analysis was used to develop a prediction algorithm for the occurrence of a first fall from a cohort of home care clients who had not fallen in the last 90days, and who were prospectively followed over 6 months. Ontario home care clients who were assessed with the Resident Assessment Instrument-Home Care (RAIHC) between 2002 and 2014 (n=88,690) were included in the analysis. The dependent variable was falls in the past 90days in follow-up assessments. The independent variables were taken from the RAI-HC. The validity of the 1stFall algorithm was tested among home care clients in 4 Canadian provinces: Ontario (n=38,013), Manitoba (n=2738), Alberta (n=1226) and British Columbia (n=9566).

**Results:** The 1stFall algorithm includes the utilization of assistive devices, unsteady gait, age, cognition, pain and incontinence to identify 6 categories from low to high risk. In the validation samples, fall rates and odds ratios increased with risk levels in the algorithm in all provinces examined.

**Conclusions:** The 1stFall algorithm predicts future falls in persons who had not fallen in the past 90days. Six distinct risk categories demonstrated predictive validity in 4 independent samples.

**Keywords:** Falls, Home care, Older adults, Machine learning, interRAI