

# FALLS LINKS

Volume 8, Issue 2, 2013

Newsletter of the NSW Falls Prevention Network

## Welcome

This year the NSW Falls Prevention Network celebrates 20 years as a network promoting falls prevention and injury minimising harm from falls to a wide network of health professionals, community service and residential aged care providers.

This issue includes:

- The role of Vitamin D in falls prevention: an overview
- A short report on the Rural Falls Forums in Dubbo and Broken Hill

[fallsnetwork.neura.edu.au](http://fallsnetwork.neura.edu.au)



Presenters at the Rural Forums  
Lorraine Lovitt, Prof Stephen Lord  
A/Prof Jacqueline Close, Shelley Moor,  
Anthea Temple and Esther Vance

## Inside this Issue

*Vitamin D in falls prevention* 2

*Rural Forums - Dubbo & Broken Hill* 8

*New Resources and Conferences* 10  
New resources, websites and upcoming meetings.

*Abstracts* 12  
Recent abstracts from the research literature.

*Network Information* 24  
How to join and communicate through the network.

**"Falls Prevention is  
Everyone's Business®"**



This mini review has been undertaken as part of the workplan of the NSW Falls Prevention Network and provides the evidence base for vitamin D supplementation for falls prevention in people over 65 years in the community and residential aged care facilities.

## The Role of Vitamin D in Falls Prevention: an Overview

Esther Vance<sup>1</sup>, Jacqueline Close<sup>2</sup> and Stephen Lord<sup>1</sup>, <sup>1</sup>Falls and Balance Research Group, <sup>2</sup>Falls and Injury Prevention Group, Neuroscience Research Australia

### Introduction

Falls are a major health issue with one in three community dwelling people aged 65+ yrs and one in every two people living in residential aged care facilities falling annually [1, 2]. Vitamin D deficiency is an identified risk factor for falls in older people and this review summarises the evidence around vitamin D supplementation and fall prevention for this group.

Vitamin D is a steroid hormone and most cells in the body including those within muscle and nervous tissues have receptors for vitamin D [3]. Vitamin D plays a role in calcium and phosphate metabolism and is important for bone and muscle function [4]. The main source of vitamin D is from exposure to sunlight. Vitamin D is synthesised from 7-dehydrocholesterol in the skin following exposure to the ultraviolet B radiation of the sun. This is metabolised in the liver to 25-hydroxy vitamin D, the metabolite most commonly measured in blood tests for vitamin D [5]. However, 25-hydroxy vitamin D is further metabolized by the kidney to produce the active form of vitamin D (1,25 dihydroxy vitamin D<sub>3</sub> or calcitriol) as shown in Figure 1.

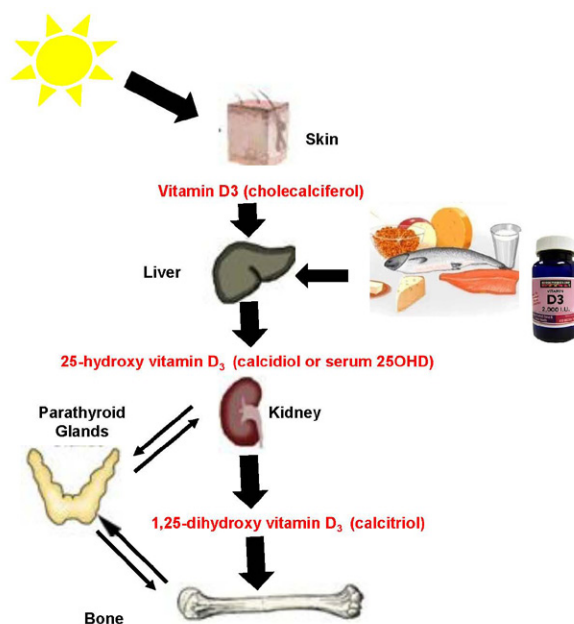


Figure 1 Vitamin D synthesis (adapted from <http://rickets.stanford.edu/>)

The Institute of Medicine (IOM), the health arm of the National Academy of Sciences (USA), has defined a serum level of 25 hydroxyvitamin D of 50nmol/L (20ng/ml) or above as adequate with levels below 25nmol/L (10ng/ml) considered as deficient. However, there is some debate about the minimum level of serum vitamin D required for bone health with minimal levels recommended between 50 and 75nmol/L [6, 7].

Studies in Australia have found vitamin D insufficiency (levels below 50nmol/L) to be around 46% in women and 22% in men over 65 years, increasing to 57% for women and 28% for men over 75 years [8]. There is seasonal variation in vitamin D levels with the highest levels found in summer and the lowest levels found following winter, i.e. September [9].

## Vitamin D and falls reviews and meta-analyses

Several systematic reviews and meta-analyses, including gold standard Cochrane reviews, have been undertaken to determine the effects of vitamin D supplementation on falls and some of these have included fracture data. Primary findings of these reviews are presented in Table 1 (see pages 6-7).

The most recent Cochrane review on interventions for preventing falls in the community [10], concluded that vitamin D supplementation did not reduce the rate of falls in this group as a whole. However, a subgroup analysis undertaken on participants who had low vitamin D levels at enrolment demonstrated a 43% reduction in the rate of falls (RaR 0.57; 95%CI 0.37 to 0.89) in these participants (see Table 1 on page 6).

The recently updated Cochrane review [11] on interventions for preventing falls in care facilities and hospitals reported that average vitamin D levels in these settings were low or very low. The review concluded that in care facilities, vitamin D supplementation reduced the rate of falls by 37% (RaR 0.63, 95% CI 0.46 to 0.86). One study on vitamin D supplementation conducted in an acute geriatric unit was also included in this review. In this setting, there was no effect of vitamin D supplementation on the risk of falling; a finding undoubtedly influenced by the relatively short intervention period (median length of stay 30 days) for this type of intervention.

A third Cochrane review of vitamin D supplementation [12] in older women living in institutional care found a significant reduction in hip fractures (RR =0.84, 95% CI 0.73 to 0.96). The authors, concluded, however, that it is not possible to determine whether vitamin D on its own can prevent hip fractures as most of the studies also included calcium supplementation.

Further systematic reviews have addressed other important aspects of vitamin D supplementation. Two systematic reviews have found that a reduction in falls and/or fractures is dose dependent, i.e. doses of at least 800 IU per day are required to prevent falls and fractures [13, 14]. Other reviews have pointed out that the efficacy of interventions might depend on the type of supplementation provided. For example, it has been shown that vitamin D3 cholecalciferol (the most commonly prescribed form of vitamin D in Australia) is more potent than vitamin D2 ergocalciferol in both raising and maintaining serum 25 Hydroxyvitamin D and produces 2-3 fold greater storage [15]. To complement most reviews that have used "intention to treat" data, Bischoff Ferrari et al [16] conducted an "as treated" analysis in their systematic review and concluded that adherence to the supplementation (i.e. actually taking the vitamin D tablets) was also crucial for a reduction in falls.

With regard to mechanisms as to why vitamin D may prevent falls, studies have shown that vitamin D supplementation improves neuromuscular and psychomotor performance in older people living in both the community ([17-19] and residential aged care facilities [18, 20].

Finally it is worth noting that a well conducted Australian study found very high single annual doses of vitamin D (500,000 IU D3 administered orally in autumn or winter) provided over 3-5 years increased the risk of both falls and fractures [21]. The mechanisms underlying this unexpected finding are

### Key Points

**46% of women and 22% of men over 65 years in Australia have vitamin D insufficiency.**

**Vitamin D supplementation can reduce falls by up to 43% in older people who have vitamin D insufficiency.**

**Vitamin D supplementation improves neuromuscular function and psychomotor performance in older people living in the community and residential aged care facilities.**

**Osteoporosis Australia recommends supplementation of:**

- at least 800IU per day for people over the age of 70 years and
- 1,000 IU daily for the prevention of fractures and for those who are housebound or in residential aged care facilities.

**It is not recommended to administer annual single high doses (500,000 IU) of Vitamin D.**

unclear but suggest that high single annual dose supplementation should be avoided.

## Discussion

One of the main limitations of the meta-analyses undertaken is the heterogeneity of the trials included. This is reflected in the inclusion of both high and low quality trials, variability in dose prescribed (ranging from 200 to 1200 IU per day or high doses given monthly or yearly), the form of vitamin D (D2 versus D3) provided and the variable addition of calcium as part of the intervention. Some studies have also had poor definitions of falls and inconsistent collection of falls data. There is also variation in adherence to treatment (68-100%) with lower rates of adherence reported when calcium is included [22]. Another issue relates to the proportion of participants in included studies that are actually vitamin D deficient. As could be expected, the beneficial effect in relation to fall prevention has primarily been evident in those with lower levels of vitamin D. It has been shown that there is a correlation between the initial severity of vitamin D insufficiency and its effect on physical performance improvement [4].

Despite these methodological limitations, a number of key findings emerge. First, vitamin D supplementation is particularly beneficial for people living in residential aged care facilities where fall risk is high and vitamin D deficiency is widespread. Second, vitamin D supplementation also prevents falls in frail or primarily house bound older people living in the community who are vitamin D deficient. Third, vitamin D supplementation has very few side effects. Therefore, unless contraindicated, vitamin D should be routinely prescribed for the above groups. It is also worth noting that for people with significant renal impairment, it may be necessary to administer the active form of vitamin D – calcitriol.

A recent position statement by Osteoporosis Australia (OA) recommends that vitamin D supplementation be offered to older or disabled people in residential care and community dwelling older people admitted to hospital as these groups are likely to be at high risk of vitamin D deficiency [5, 23]. OA recommends a daily dose of vitamin D supplementation of 600 IU (15µg) for those ≤ 70 years, 800 IU (20 µg) for those >70 years and 1,000 IU (25 µg) for older people who are housebound or reside in residential aged care facilities along with adequate calcium (1,000-1,300mg/day) preferably from their diet. The recommendation for reducing fracture risk in older people is 1,000 IU (25 µg) per day [5, 23].

Osteoporosis Australia has produced a range of publications on vitamin D for professionals and consumers including information on sun exposure for bone health. These can be accessed at: <http://www.osteoporosis.org.au/about/about-osteoporosis/information-to-download/>

Many older people are on a number of medications and are reluctant to take multiple pills. This barrier can be overcome by the administration of inexpensive vitamin D drops in weekly or monthly doses. Alternatively, compounding pharmacists are able to produce 50,000 IU tablets for monthly prescription.

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Table 1 Summary of Reviews and Meta-analysis of Vitamin D and falls prevention studies

Author and year	No of studies included	No of participants (mean age, % female)	Vitamin D (dose, formulation and duration of treatment)	Outcomes of Study
Gillespie et al 2012 [10] (Cochrane Review)	14 RCT (8 included calcium)	28,135 (76 years, 79% female)	Vitamin D <sub>3</sub> (200-2,000 IU daily, to 100,000 IU every 4 months  Treatment duration varied from 8 weeks to 5 years Vitamin D <sub>2</sub> (1,000 IU daily to 500,000 IU yearly)  Some studies included Calcium daily up to 1,000mg	No statistical difference in rate of falls RaR 1.00 (95% CI 0.90 – 1.11), 9324 participants in 7 trials. Risk of falling RR 0.96 (95% CI 0.89 – 1.03), 26,747 participants, 13 trials.  In a subgroup analysis of trials with participants with lower Vitamin D levels there was a reduction in rate of falls and risk of falling. RaR 0.57 (95%CI 0.37 to 0.89), 260 participants, 2 trials RR 0.70 (95%CI 0.56 to 0.87), 804 participants, 4 trials.
Cameron et al 2012 [11] (Cochrane Review)	5 RCT (Care Facilities)  1 RCT (Acute Aged Care Ward)	4603 (85.6 years, 83 % female)  205 (83 years, 59% female)	Vitamin D <sub>3</sub> (400-800 IU daily, with or without calcium 1200mg) Vitamin D <sub>2</sub> (1000 -1100 IU daily) 3-24 months treatment duration  800IU Vitamin D3 + 1200 mg calcium daily until discharge (median length of stay 30 days)	Significant reduction in the rate of falls RaR 0.63, 95% CI 0.46 to 0.86 (5 trials, 4603 participants. No significant reduction in the risk of falling RR 0.99, 95% CI 0.90 -1.08, 5 trials, 4603 participants.  No significant effect on risk of falling RR 0.82, (5% CI 0.59 – 1.14.

Author and year	No of studies included	No of participants (mean age, % female)	Vitamin D (dose, formulation and duration of treatment)	Outcomes of Study
Bischoff-Ferrari et al 2009 [16]	8 RCT (7 included calcium)	2426 (80 years, 81% female)	Vitamin D <sub>3</sub> (5 studies) Vitamin D <sub>2</sub> (3 studies)  Daily Dose range 200IU to 1,000 IU  2-36 months treatment duration	Reduction in falls of 19% (pooled RR 0.81 (95% CI 0.71- 0.92) Non-vertebral fractures reduced by 20% Falls reduction was dependant on :  Vitamin D Dose (>700 IU Vitamin D daily)25 OHD levels required >60nmol (24 ng/mL) for falls reduction >75nmol/L (30ng/mL) for fracture reduction
Kalyani et al 2010 [13]	10 studies (7 included calcium 600-1200mg daily) + 7 studies included for post hoc analysis	2,932 (79 years, mostly female)	Vitamin D <sub>3</sub> (6 studies) Vitamin D <sub>2</sub> (3 studies) Alfacalcidol (1 study)  Daily dosage 200- 800IU  1-36 months treatment duration	Reduction of falls of 14% (RR = 0.86, 95% CI 0.79-0.93) Falls reduction was dependent on: > 800 IU Vitamin D daily  > 6 months treatment  Use of Vitamin D <sub>3</sub>
Murad et al 2011 [24]	26 RCT (14 included calcium 500-1200mg daily)	45,782 (76 years, 78% female)	Vitamin D <sub>3</sub> (11 studies) Vitamin D <sub>2</sub> (8 studies) Daily dosage 400 -1,000 IU Also included dosages up to 500,000 IU orally annually. 3-62 months treatment duration	Reduction in risk of falls (OR for the risk of suffering at least 1 fall) OR 0.86 (95%CI 0.77-0.96)

OR – Odds Ratio, RaR – Rate Ratio, RR- Relative Risk, Vitamin D<sub>2</sub> – ergocalciferol, Vitamin D<sub>3</sub> – cholecalciferol

## NSW FALLS PREVENTION NETWORK RURAL FORUMS, DUBBO AND BROKEN HILL

These sessions were a collaborative between the NSW Falls Prevention Network, NSW Falls Prevention Program, Clinical Excellence Commission (CEC) and the Aged Health Network, Agency for Clinical Innovation (ACI). The Falls Prevention Coordinator for Western NSW and Far West Local Health Districts was involved in planning these sessions as well as our NSW Falls Prevention Network Advisory Group member from Broken Hill. These sessions brought world renowned falls prevention experts and clinicians working on statewide falls prevention programs to the rural venues. The Chief Executives of Western NSW LHD (Scott McLachlan) and Far West (Stuart Riley) supported the attendance of their staff at these forums.

### FORUM STRUCTURE

Afternoon forums were held on Thursday May 2 in Dubbo and Friday May 3 in Broken Hill. A total of 140 participants took part in these forums.

Presentations included:

Ms Lorraine Lovitt, Leader NSW Falls Prevention Program, Clinical Excellence Commission, *Update on NSW Falls Prevention Program*

Professor Stephen Lord, Senior Principal Research Fellow, Falls and Balance Research Group, Neuroscience Research Australia, *Falls Prevention Research Update*

A/Professor Jacqueline Close, Senior Staff Specialist in Geriatric Medicine, Prince of Wales Hospital and Director, Falls and Injury Prevention Group, Neuroscience Research Australia, *The challenge of preventing falls in people with dementia*

Ms Anthea Temple, Project Officer, Aged Health Network, Agency for Clinical Innovation, *Care of the Confused Hospitalised Older Person Study (CHOPS)*

Dr Esther Vance, Project Officer, NSW Falls Prevention Network and Active and Healthy website, Neuroscience Research Australia, *Falls Prevention Resources*

The PDFs of the presentations are available on the NSW Falls Prevention Network website at:

<http://fallsnetwork.neura.edu.au/events/index.php#past>

### ATTENDANCE



Dubbo Forum audience

### Western NSW LHD



The Dubbo Forum was attended by 81 participants from hospital, community and residential care sectors and from 22 locations other than Dubbo including Canowindra, Coonamble, Coonabarabran, Cowra, Dunedoo, Forbes, Gilgandra, Grenfell, Gulgong, Junee, Molong, Mudgee, Narramine, Nyngan, Orange, Parkes, Walgett, and Wellington.



The Broken Hill forum was attended by 49 Participants from hospital community and residential care and participants were mostly from Broken Hill however there were participants from Balranald and Dareton.

## EVALUATION

Evaluations were completed by 49% of participants in Dubbo and 70% in Broken Hill. Over 90 % of respondents rated the overall forums were  $\geq 4$  (1 is poor and 5 is excellent) and over 70% of respondents rated the presentations by the presenters as  $\geq 4$ . The main expectations participants had of the forums were an update on the research evidence on falls prevention and evidence based best-practice tools and strategies for falls prevention. Most participants indicated that their expectations were met or exceeded.

Feedback from the participants was they wanted to be kept regularly informed on evidence based research and tools and the provision of practical information and strategies for implementing falls prevention in their work setting. They suggested that the main mechanism for the delivery of this information could be through educational DVDs or regular in-services.

The main issues identified by participants that prevented them from implementing falls prevention strategies was the need for more staff education particularly around managing falls risk in patient/clients with delirium and/or dementia, also competing priorities and lack of resources.

The forums were well publicised through local LHD email lists and notice boards and by the Falls Prevention Coordinator and the Falls Network Advisory Group member providing information to other health service providers.

The main overall comments on the forums were that they were excellent, very informative and well presented and the information was found to be very useful for their work setting.

### Comments on the forums by participants:

- 'Wonderful to have experts come west of the mountains'
- 'Learnt a lot, motivated to get back hope and put measures in place to prevent falls'
- 'It was worth the 4 hour (one way) drive'
- 'Thanks it was all great, not long enough but food for thought'
- 'Excellent more of these forums each year would be great'
- 'Thank you great information shared and meeting key people from CEC/ACI etc'
- 'Great to refresh knowledge and think about ways to prevent falls'
- 'Have learnt that there are a lot more things that affect balance'
- 'Was beneficial and encouraging for what we are doing in RAC'



**Kirsty Stapylton, NSW Falls Prevention Network Advisory Group member for Far West LHD and Shelley Moor, Falls Prevention Coordinator**



**Anthea Temple, Agency for Clinical Innovation**



**Prof Stephen Lord, Neuroscience Research Australia**

# New Resources and Websites

## Falls Prevention Program, Clinical Excellence Commission (CEC)

The following CEC Falls Prevention flyers are now available in Arabic, Simplified Chinese, Traditional Chinese, Vietnamese, Greek and Italian at: <http://www.cec.health.nsw.gov.au/programs/falls-prevention/falls-one-page-flyers>

How to fall proof yourself

Falls Prevention - In hospital

Information for those at risk of a fall

Falls Prevention - Medications

Falls Prevention - Foot care and safe footwear

Falls Prevention - Home exercises

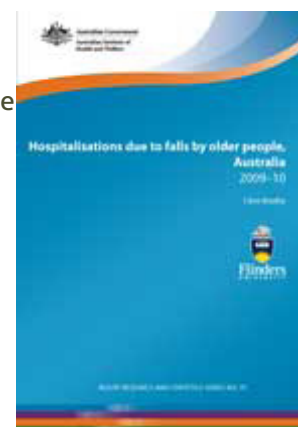
How to get up if you have a fall



## AIHW New Reports

### Hospitalisations due to falls by older people, Australia: 2009-10

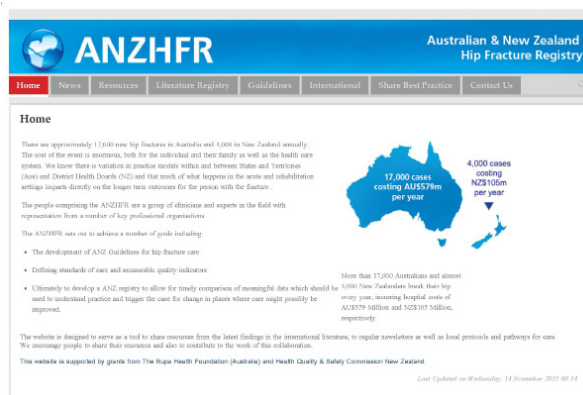
This report is the sixth in a series on hospitalisations due to falls by Australians aged 65 and over, and focuses on 2009-10. The estimated number of hospitalised injury cases due to falls in older people was 83,800 - more than 5,100 extra cases than in 2008-09 - and about 70% of these falls happened in either the home or an aged care facility. One in every 10 days spent in hospital by a person aged 65 and older in 2009-10 was directly attributable to an injurious fall (1.3 million patient days over the year), and the average total length of stay per fall injury case was estimated to be 15.5 days.



## NEW WEBSITE

### Australian and New Zealand Hip Fracture Registry

<http://www.anzhfr.org/>



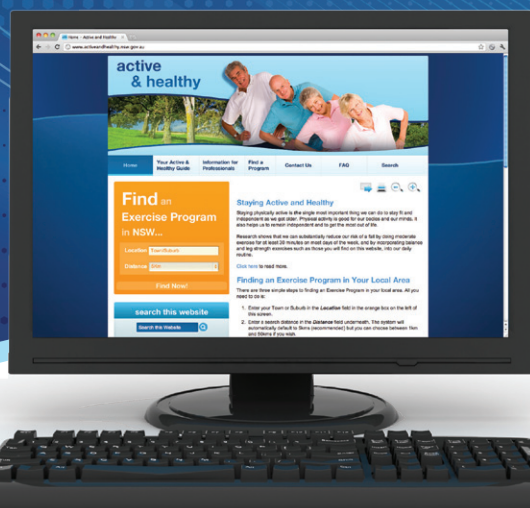
This website has a range of information relevant to hip fracture and hip fracture prevention including a *literature registry* section which contains the latest scientific papers in the field.

The website has also been designed to encourage sharing of resources such as policies, protocols, models of care and clinical pathways. If you have a resource you are willing and able to share please send an email to [clinical@anzhfr.org](mailto:clinical@anzhfr.org).

New  
Website

[www.activeandhealthy.nsw.gov.au](http://www.activeandhealthy.nsw.gov.au)

Find a falls prevention exercise program in your local community.



## Designed for

- General Practitioners
- Health & Community Services staff
- Community members (older people, family, friends and carers)

### Search by suburb

To find a falls prevention exercise program in your local area.

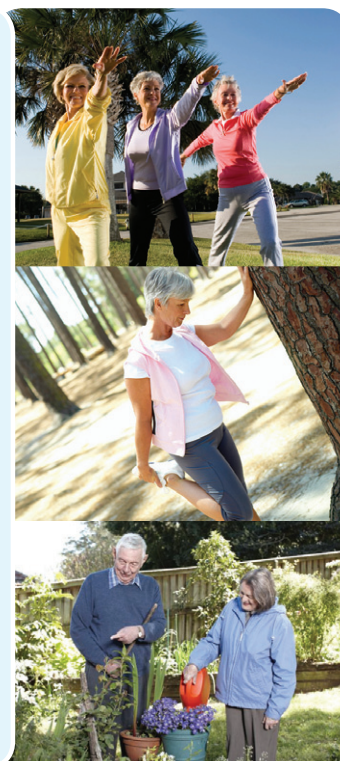
### Exercise programs

Have been approved for registration on this website.

**Programs include:** Tai Chi, Stepping On, Gentle Exercise and more.

### Other highlights

- The *Staying Active and On Your Feet* booklet with exercises to do at home, and lifestyle and home safety checklists.
- Information for health professionals - falls prevention best-practice.



View the website at: [www.activeandhealthy.nsw.gov.au](http://www.activeandhealthy.nsw.gov.au)

Please promote this website and provide feedback at:  
[www.activeandhealthy.nsw.gov.au/feedback](http://www.activeandhealthy.nsw.gov.au/feedback)





# Abstracts

## Recent abstracts from the research literature

### Reviews

#### **Vision and falls: A multidisciplinary review of the contributions of visual impairment to falls among older adults**

Reed-Jones RJ, Solis GR, Lawson KA, Loya AM, Cude-Islas D, Berger CS.

*Maturitas* 2013; ePub(ePub): ePub.

Affiliation: Department of Kinesiology, College of Health Sciences, The University of Texas at El Paso, United States; Physical Therapy Program, Department of Rehabilitation Sciences, College of Health Sciences, The University of Texas at El Paso, United States. Electronic address: rreedjones@utep.edu.

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### Abstract

Falls are a leading cause of mortality among older adults worldwide. With the increasing aging population, falls are rapidly becoming a public health concern. Numerous internal and external factors have been associated with an older adult's increased risk of falling. Most notably visual impairments are gaining recognition for their critical role in fall events, particularly related to trips, slips and falls due to environmental hazards. This review presents the issue of vision and falls from a multidisciplinary health professional perspective. Discussions include the influence of visual impairment on mobility and activities of daily living, the effects of medications on vision, visual cognitive factors on falls risk and visual training interventions. Finally, implications for multidisciplinary health professional practice and suggestions for future research are offered.

#### **The effectiveness of physical therapist-administered group-based exercise on fall prevention: a systematic review of randomized controlled trials**

Martin JT, Wolf A, Moore JL, Rolenz E, Dininno A, Reneker JC.

*J. Geriatr. Phys. Ther.* 2013; ePub(ePub): ePub.

Affiliation: Walsh University, North Canton, Ohio.

(Copyright © 2013, American Physical Therapy Association) DOI 10.1519/JPT.0b013e3182816045 PMID 23449007

### Abstract

**BACKGROUND:** Falls are a verified cause of morbidity and mortality in adults older than 65 years. Exercise under the direction of a physical therapist has been shown to reduce the risk of falls in older adults; however, it is not clear whether physical therapist-directed group-based exercise could produce similar results.

**PURPOSE:** The purpose of this systematic review was to summarize the evidence on the effectiveness of physical therapist-administered group-based exercise when compared with various controls for falls prevention and improvement of quality of life.

**METHODS:** A computerized search of PubMed and CINAHL was performed. An exhaustive hand search was also performed of the references of all full-text articles. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed for this review. Studies were included if they met the following criteria: (1) comparison of group-based exercise led by a physical therapist to a control group; (2) ambulatory elderly men or women, aged 65 years or older; (3) subjects in the community or institutional setting; (4) the use of 1 or more outcome measures related to functional balance and/or quality of life; (5) randomized controlled or clinical trials; and (6) published in English, between December 1, 2001, and June 7, 2012. The PEDro scale was used to assess the quality of each study included in this review.

**RESULTS:** The computerized search strategy and hand search revealed 213 potential articles, 10 of which met the inclusion criteria. After assessment with the PEDro scale, 8 of these were considered high-quality studies (score > 6/10). Seven studies compared group-based exercise to a nonexercise control group, while 3 studies compared group-based exercise with a physical therapist-prescribed home exercise program. Outcomes measured include fall rate, balance, physical performance, health-related quality of life, and fear of falling.

**DISCUSSION:** When group-based exercise was compared with no intervention, group-based exercise was found to be more effective in decreasing fall frequency, increase balance, and improve quality of life. When compared with



a physical therapist-prescribed home exercise program, the group-based exercise results were not statistically different but showed improvements in some quality of life and physical functioning measures. There is also some evidence to suggest that group-based exercise promotes greater patient satisfaction and exercise adherence.

**CONCLUSION:** There is preliminary evidence to suggest that the group-based exercise is effective for falls prevention, quality-of-life enhancement, and balance improvements in the older adults comparable with traditional home exercise programs.

### **A meta-analysis of functional outcome among older adults with traumatic brain injury**

McIntyre A, Mehta S, Janzen S, Aubut J, Teasell RW.

*NeuroRehabilitation* 2013; 32(2): 409-414.

Affiliation: Lawson Health Research Institute, St. Joseph's Parkwood Hospital, London, ON, Canada.

(Copyright © 2013, IOS Press) DOI 10.3233/NRE-130862 PMID 23535806

#### **Abstract**

**OBJECTIVE:** The objective of this study was to determine rates of functional outcomes, based on Glasgow Outcome Scale scores, among older adults (>60 years) after a traumatic brain injury. **METHODS:** An extensive database search was conducted. To be included all articles were published in English, included individuals 60 years or older, explicitly stated in-hospital GCS scores and GOS scores within one year post-TBI. Data was pooled on patient characteristics, mortality rates, time to death, and study design.

**RESULTS:** A total of 11 studies were included in this review. Among individuals with severe TBI, favourable, unfavourable, and fatal outcomes were observed in 7.9% (CI 5.3%-11.8%), 13.8% (CI 10.0%-18.8%) and 79.3% (CI 73.2%-84.4%), respectively. Among those with moderate TBI, favourable, unfavourable, and fatal outcomes were observed in 32.2% (CI 18.0%-50.7%), 29.5% (CI 16.5%-47.0%), and 42.5% (CI 26.1%-60.7%), respectively. Among those with mild TBI, favourable, unfavourable, and fatal outcomes were observed in 80.5% (CI 53.2%-93.7%), 7.0% (CI 1.9%-22.7%), and 10.7% (CI 3.1%-30.9%), respectively.

**CONCLUSION:** This study has demonstrated the significant interaction between GCS and GOS among older adults. Although older adults may require aggressive and comprehensive treatment to achieve these favourable outcomes, high rates of unfavourable outcome should not justify the use of conservative treatment.

### **Risk factors for falls among older adults: A review of the literature**

Ambrose AF, Paul G, Hausdorff J.

*Maturitas* 2013; ePub(ePub): ePub.

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(Copyright © 2013, Elsevier Publishing) DOI 10.1016/j.maturitas.2013.02.009 PMID 23523272

#### **Abstract**

Falls are one of the major causes of mortality and morbidity in older adults. Every year, an estimated 30-40% of patients over the age of 65 will fall at least once. Falls lead to moderate to severe injuries, fear of falling, loss of independence and death in a third of those patients. The direct costs alone from fall related injuries are a staggering 0.1% of all healthcare expenditures in the United States and up to 1.5% of healthcare costs in European countries. This figure does not include the indirect costs of loss of income both to the patient and caregiver, the intangible losses of mobility, confidence, and functional independence. Numerous studies have attempted to define the risk factors for falls in older adults. The present review provides a brief summary and update of the relevant literature, summarizing demographic and modifiable risk factors. The major risk factors identified are impaired balance and gait, polypharmacy, and history of previous falls. Other risk factors include advancing age, female gender, visual impairments, cognitive decline especially attention and executive dysfunction, and environmental factors. Recommendations for the clinician to manage falls in older patients are also summarized.

# Abstracts Continued

## Recent abstracts from the research literature

### **Recurrent falls in Parkinson's disease: a systematic review**

Allen NE, Schwarzel AK, Canning CG.

*Parkinsons Dis.* 2013; 2013(online): 906274.

Affiliation: Clinical and Rehabilitation Sciences Research Group, Faculty of Health Sciences, The University of Sydney, P.O. Box 170, Lidcombe, NSW 1825, Australia.

(Copyright © 2013, Sage Publications) DOI 10.1155/2013/906274 PMID 23533953

#### **Abstract**

Most people with Parkinson's disease (PD) fall and many experience recurrent falls. The aim of this review was to examine the scope of recurrent falls and to identify factors associated with recurrent fallers. A database search for journal articles which reported prospectively collected information concerning recurrent falls in people with PD identified 22 studies. In these studies, 60.5% (range 35 to 90%) of participants reported at least one fall, with 39% (range 18 to 65%) reporting recurrent falls. Recurrent fallers reported an average of 4.7 to 67.6 falls per person per year (overall average 20.8 falls). Factors associated with recurrent falls include: a positive fall history, increased disease severity and duration, increased motor impairment, treatment with dopamine agonists, increased levodopa dosage, cognitive impairment, fear of falling, freezing of gait, impaired mobility and reduced physical activity. The wide range in the frequency of recurrent falls experienced by people with PD suggests that it would be beneficial to classify recurrent fallers into sub-groups based on fall frequency. Given that there are several factors particularly associated with recurrent falls, fall management and prevention strategies specifically targeting recurrent fallers require urgent evaluation in order to inform clinical practice.

### **Epidemiology and risk factors**

#### **Changing patterns in the epidemiology of traumatic brain injury**

Roozenbeek B, Maas AI, Menon DK.

*Nat. Rev. Neurol.* 2013; ePub(ePub): ePub.

Affiliation: Department of Neurology, Erasmus MC, Rotterdam, PO Box 2040, 3000 CA, Rotterdam, The Netherlands.

(Copyright © 2013, Nature Publishing Group) DOI 10.1038/nrneurol.2013.22 PMID 23443846

#### **Abstract**

Traumatic brain injury (TBI) is a critical public health and socio-economic problem throughout the world. Reliable quantification of the burden caused by TBI is difficult owing to inadequate standardization and incomplete capture of data on the incidence and outcome of brain injury, with variability in the definition of TBI being partly to blame. Reports show changes in epidemiological patterns of TBI: the median age of individuals who experience TBI is increasing, and falls have now surpassed road traffic incidents as the leading cause of this injury. Despite claims to the contrary, no clear decrease in TBI-related mortality or improvement of overall outcome has been observed over the past two decades. In this Perspectives article, we discuss the strengths and limitations of epidemiological studies, address the variability in its definition, and highlight changing epidemiological patterns. Taken together, these analyses identify a great need for standardized epidemiological monitoring in TBI.

#### **Risk factors for falls in adults with rheumatoid arthritis: A prospective study**

Stanmore EK, Oldham J, Skelton DA, O'Neill T, Pilling M, Campbell AJ, Todd C.

*Arthritis Care Res.* (2010) 2013; ePub(ePub): ePub.

Affiliation: 1School of Nursing, Midwifery and Social Work and MAHSC (Manchester Academic Health Science Centre), Jean McFarlane Building, University Place, U.K. M13 9LP. Emma.K.Stanmore@manchester.ac.uk.

(Copyright © 2013, John Wiley and Sons) DOI 10.1002/acr.21987 PMID 23436687

#### **Abstract**

**OBJECTIVES:** To investigate the association between potential risk factors and falls in community dwelling adults with rheumatoid arthritis (RA).

**METHODS:** 1 year follow-up in a prospective cohort study with monthly falls calendars and telephone calls. Lower limb muscle strength, postural stability, number of swollen and tender joints, functional status, history of falling, fear of falling, pain, fatigue, medication and use of steroids were assessed as risk factors for falls.

**RESULTS:** 386 women and 173 men with RA, aged 18-88 (n=559) completed baseline. 535 participants (96%) completed 1 year follow-up. Bivariate logistic regression showed that falls risk was not associated with age or gender. Multivariate logistic regression revealed that a history of multiple falls in the previous 12 months was the most significant predictive risk factor (OR=5.3, 95% CI 2.3 to 12.3). The most significant modifiable risk factors were swollen and tender lower limb joints (OR=1.7, 95% CI 1.1 to 2.7), psychotropic medication (OR=1.8, 95% CI 1.1 to 3.1) and fatigue (OR=1.13, 95% CI 1.02 to 1.2).

**CONCLUSIONS:** Adults with RA are at high risk of falls. In clinical practice high risk falls patients with RA can be identified by asking whether patients have fallen in the past year. Important risk factors highlighted in this study included: swollen and tender lower limb joints; fatigue and use of psychotropic medicines. © 2013 by the American College of Rheumatology.

### **Do older adults with cancer fall more often? A comparative analysis of falls in those with and without cancer**

Spoelstra SL, Given BA, Schutte DL, Sikorskii A, You M, Given CW.

*Oncol. Nurs. Forum* 2013; 40(2): E69-78.

Affiliation: College of Nursing, Michigan State University in East Lansing.

(Copyright © 2013, Oncology Nursing Society) DOI 10.1188/13.ONF.E69-E78 PMID 23448747

#### **Abstract**

**Purpose/Objectives:** To examine whether a history of cancer increased the likelihood of a fall in community-dwelling older adults, and if cancer type, stage, or time since diagnosis increased falls.

**Design:** A longitudinal, retrospective, cohort study.

**Setting:** A home- and community-based waiver program in Michigan.

**Sample:** 862 older adults aged 65 years or older with cancer compared to 8,617 older adults without cancer using data from the Minimum Data Set-Home Care and Michigan cancer registry.

**Methods:** Reports of falls were examined for 90-180 days. Generalized estimating equations were used to compare differences between the groups.

**Main Research Variables:** Cancer, falls, patient characteristics, comorbidities, medications, pain, weight loss, vision, memory recall, and activities, as well as cancer type, stage, and time since diagnosis.

**Findings:** A fall occurred at a rate of 33% in older adults with cancer compared to 29% without cancer ( $p < 0.00$ ). Those with a history of cancer were more likely to fall than those without cancer (adjusted odds ratio 1.16; 95% confidence interval [1.02, 1.33];  $p = 0.03$ ). No differences in fall rates were determined by cancer type or stage, and the odds of a fall did not increase when adding time since cancer diagnosis.

**Conclusions:** The fall rate was higher in older adults with cancer than in older adults without cancer.

**Implications for Nursing:** Nurses need to assess fall risk and initiate fall prevention measures for older adults at the time of cancer diagnosis.

**Knowledge Translation:** When caring for older adults with cancer, nurses should be aware of an increased risk for falls. Healthcare staff also should be aware of an increased risk for falls in that population during cancer treatment. Evidence-based fall prevention measures should be included in care plans for older adult cancer survivors.

### **Fall with and without fracture in elderly: what's different?**

Kantayaporn C.

*J. Med. Assoc. Thai.* 2012; 95(Suppl 10): S109-S112.

Affiliation: Orthopaedic Department, Lamphun General Hospital, Lamphun, Thailand. choo2510@hotmail.com

# Abstracts Continued

## Recent abstracts from the research literature

(Copyright © 2012, Medical Association of Thailand) DOI unavailable PMID 23451448

### Abstract

Falling fracture was one of the health problems in elderly. This presentation aimed to identify the factors of fall that caused fractures. The retrospective case-control study was designed. Samples were all who experienced fall within 1 year in Lamphun. Factors included age, gender underlying diseases, chronic drugs used, history of parent fragility fracture, age of menopause, steroid used, body mass index, visual acuity and time up and go test were studied. Multivariate regression analysis was used. 336 cases of fractures in 1,244 cases of fall were found. Significant factors of falling fracture group that were different from fall without fracture group included age, female gender, menopause before age of 45 and visual impairment. Visual impairment was the other key factor rather than osteoporosis that caused fall with fracture. The author suggested that falling fracture prevention programs should be included correction of visual impairment other than osteoporosis treatment.

### Greater number of narcotic analgesic prescriptions for osteoarthritis is associated with falls and fractures in elderly adults

Rolita L, Spegman A, Tang X, Cronstein BN.

*J. Am. Geriatr. Soc.* 2013; ePub(ePub): ePub.

Affiliation: Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, New York.

(Copyright © 2013, John Wiley and Sons) DOI 10.1111/jgs.12148 PMID 23452054

### Abstract

**OBJECTIVES:** To evaluate the changes in types of medications prescribed for pain before and after withdrawal of certain selective cyclooxygenase 2 (COX-2) inhibitors in 2004 and to determine whether there was an association with fall events in elderly adults with a diagnosis of osteoarthritis (OA).

**DESIGN:** A nested case-control design using electronic medical records compiled between 2001 and 2009.

**SETTING:** Electronic medical records for care provided in an integrated health system in rural Pennsylvania over a 9-year period (2001-09), the midpoint of which rofecoxib and valdecoxib were pulled from the market.

**PARTICIPANTS:** Thirteen thousand three hundred fifty-four individuals aged 65 to 89 with a diagnosis of OA.

**MEASUREMENTS:** The incidence of falls and fractures was examined in relation to analgesics prescribed: narcotics, COX-2 inhibitors, and nonsteroidal anti-inflammatory drugs (NSAIDs). The comparison sample of individuals who did not fall was matched 3:1 with those who fell according to age, sex, and comorbidity.

**RESULTS:** Narcotic analgesic prescriptions were associated with a significantly greater risk of falls and fractures. The likelihood of experiencing a fall/fracture was higher in participants prescribed narcotic analgesics than those prescribed a COX-2 inhibitor (odds ratio (OR) = 3.3, 95% confidence interval (CI) = 2.5-4.3) or NSAID (OR = 4.1, 95% CI = 3.7-4.5).

**CONCLUSION:** Use of narcotic analgesics is associated with risk of falls and fractures in elderly adults with OA, an observation that suggests that the current guidelines for the treatment of pain, which include first-line prescription of narcotics, should be reevaluated.

### Malnutrition and falls risk in community-dwelling older adults

Isenring E, Baker J, Kerr G.

*J. Nutr. Health Aging* 2013; 17(3): 277-279.

Affiliation: E. Isenring, School of Human Movements Studies, University of Queensland, St Lucia 4072, Email: e.isenring@uq.edu.au; Ph: +61 3 07 3365 6982.

(Copyright © 2013, Springer Science+Business Media) DOI 10.1007/s12603-012-0408-2 PMID 23459982

### Abstract

**Background and Aims:** Falls and fall-related injuries result in reduced functioning, loss of independence, premature nursing home admissions and mortality. Malnutrition is associated with falls in the acute setting, but little is



known about malnutrition and falls risk in the community. The aim of this study was to assess the association between malnutrition risk, falls risk and falls over a one-year period in community-dwelling older adults.

**Methods:** Two hundred and fifty four subjects >65 years of age were recruited to participate in a study in order to identify risk factors for falls. Malnutrition risk was determined using the Mini Nutritional Assessment-Short Form. **Results:** 28.6% had experienced a fall and according to the Mini Nutritional Assessment-Short Form 3.9% (n=10) of subjects were at risk of malnutrition. There were no associations between malnutrition risk, the risk of falls, nor actual falls in healthy older adults in the community setting.

**Conclusions:** There was a low prevalence of malnutrition risk in this sample of community-dwelling older adults and no association between nutritional risk and falls. Screening as part of a falls prevention program should focus on the risk of developing malnutrition as this is associated with falls.

### **A growing troubling triad: diabetes, aging, and falls**

Crews RT, Yalla SV, Fleischer AE, Wu SC.

*J. Aging Res.* 2013; 2013(online): 342650.

**Affiliation:** Center for Lower Extremity Ambulatory Research (CLEAR), Dr. William M. Scholl College of Podiatric Medicine, Rosalind Franklin University of Medicine and Science, 3333 Green Bay Road, North Chicago, IL 60064, USA.

(Copyright © 2013, Sage Hindawi) DOI 10.1155/2013/342650 PMID 23476773

### **Abstract**

There is a significant and troubling link between diabetes (DM) and falls in the elderly. Individuals with DM are prone to fall for reasons such as decreased sensorimotor function, musculoskeletal/neuromuscular deficits, foot and body pain, pharmacological complications, and specialty (offloading) footwear devices. Additionally, there is some concern that DM patients are prone to have more severe problems with falls than non-DM individuals. Fractures, poorer rehabilitation, and increased number of falls are all concerns. Fortunately, efforts to mitigate falls by DM patients show promise. A number of studies have shown that balance, strength, and gait training may be utilized to successfully reduce fall risk in this population. Furthermore, new technologies such as virtual reality proprioceptive training may be able to provide this reduced risk within a safe training environment.

### **Performance of adults with cerebral palsy related to falls, balance and function: A preliminary report**

Morgan P, McGinley

*J. Dev. Neurorehabil.* 2013; 16(2): 113-120.

**Affiliation:** Physiotherapy Department, School of Primary Health Care, Monash University, Frankston, Australia.

(Copyright © 2013, Informa - Taylor and Francis Group) DOI 10.3109/17518423.2012.725107

PMID 23477464

### **Abstract**

**Aim:** To describe performance on standardised measures of functional mobility and identify relationships between gait decline, falls history and risk scores, and Gross Motor Function Classification System (GMFCS) level.

**Method:** Adults with cerebral palsy (CP) aged 30-65 years, GMFCS Levels I-III underwent a single assessment to complete performance and questionnaire measures of balance, mobility and falls.

**Results:** Twenty-five ambulant community dwelling adults with CP participated (mean 41 years) in this study. Fifteen participants (60%) reported gait decline (>age 18). The most frequent self-reported cause of decline was reduced balance (n = 12). Seventeen participants (68%) reported prior falls. Group differences were found between GMFCS levels and falls risk (falls risk for older people-community,  $p = 0.025$ ), balance (Berg Balance Scale,  $p = 0.005$ ) and mobility (6 min walk test  $p = 0.004$ ; timed up and go,  $p = 0.011$ ).

**Conclusion:** Adults with CP experience mobility decline in early to middle adulthood, with reduced balance performance and elevated falls risk evident. There is urgent need for further research into falls risk factors using prospective falls data.

# Abstracts Continued

## Recent abstracts from the research literature

### Domestic environmental risk factors associated with falling in elderly

Lök N, Akin B.

*Iran. J. Public Health* 2013; 42(2): 120-128.

Affiliation: Dept. of Public Health Nursing, Faculty of Health Sciences, Selçuk University Selçuklu-Konya 42100, Turkey.

(Copyright © 2013, Tehran University of Medical Sciences) DOI unavailable PMID 23515204

#### Abstract

**BACKGROUND:** This is a cross-sectional study aiming at analyzing the relation between falling and domestic environmental -risk factors in community-dwelling elderly.

**METHODS:** The study consisted of 243 randomly chosen community-dwelling elderly over 65 years of age living around a health care center in Central Selcuklu, Konya. Data were collected with a questionnaire form including socio-demographic and other characteristics, with the Rivermead Mobility Index for evaluating mobility condition and an Evaluation Form of Domestic Environmental Risk Factors of Falling (EFDERF), which is developed by the researcher to assess domestic environmental risk factors of falling.

**RESULTS:** Based on (EFDERF) high number of problems lived in bathroom/restroom, kitchen, bedroom, sitting room/saloon and in all other areas was a risk factor in terms of domestic falling characteristics while the number of problems lived in hall and stairs was not a significant risk factor.

**CONCLUSION:** EFDERF may be used by the nurses and health professionals to evaluate risk of falling and collecting data after visits in primary-care of elderly.

### Trends in serious fall-related injury: Where we are and where to from here?

Bradley CE, Pointer SC, Harrison JE.

*Australas. epidemiol.* 2012; 19(2): 13.

(Copyright © 2012, Australasian Epidemiological Association) DOI unavailable PMID unavailable

#### Abstract

Serious falls have a significant impact on the health and welfare of our older population and incur substantial costs. However, despite the design of demonstrably effective fall-prevention interventions and the dedicated efforts of health professionals, researchers and policy makers, there has been little improvement in the rate of fall-related injuries requiring hospitalisation over the last decade or so. This paper presents an overview of recent analyses of trends in serious falls incidence in Australia and starts discussion as to where fall injury surveillance, research, intervention design, and fall prevention policy should head in coming years.

### Unexplained falls are frequent in patients with fall-related injury admitted to orthopaedic wards: the UFO Study (unexplained falls in older patients)

Chiara M, Gianluigi G, Pasquale A, Alessandro M, Alice M, Gabriele N, Paolo C, Loredana G, Giovanni T, Franco R, Giulio M, Gianfranco S, Niccolò M, Andrea U.

*Curr. Gerontol. Geriatr. Res.* 2013; 2013(online): 928603.

Affiliation: Geriatric and Gerontology Institute, University of Modena and Reggio Emilia, Modena 41121, Italy.

(Copyright © 2013, Hindawi Publishing) DOI 10.1155/2013/928603 PMID 23533394

#### Abstract

To evaluate the incidence of unexplained falls in elderly patients affected by fall-related fractures admitted to orthopaedic wards, we recruited 246 consecutive patients older than 65 (mean age  $82 \pm 7$  years, range 65-101). Falls were defined "accidental" (fall explained by a definite accidental cause), "medical" (fall caused directly by a specific medical disease), "dementia-related" (fall in patients affected by moderate-severe dementia), and "unexplained" (nonaccidental falls, not related to a clear medical or drug-induced cause or with no apparent cause). According to the anamnestic features of the event, older patients had a lower tendency to remember

the fall. Patients with accidental fall remember more often the event. Unexplained falls were frequent in both groups of age. Accidental falls were more frequent in younger patients, while dementia-related falls were more common in the older ones. Patients with unexplained falls showed a higher number of depressive symptoms. In a multivariate analysis a higher GDS and syncopal spells were independent predictors of unexplained falls. In conclusion, more than one third of all falls in patients hospitalized in orthopaedic wards were unexplained, particularly in patients with depressive symptoms and syncopal spells. The identification of fall causes must be evaluated in older patients with a fall-related injury.

### **Elderly outpatient profile and predictors of falls**

Gomes GA, Cintra FA, Batista FS, Neri AL, Guariento ME, Sousa Mda L, D'Elboux MJ.

*Sao Paulo Med. J.* 2013; 131(1): 13-18.

(Copyright © 2013, Associacao Paulista de Medicina) DOI unavailable PMID 23538590

### **Abstract**

**CONTEXT AND OBJECTIVES** Falls are a serious public health problem and are one of the biggest reasons for hospitalization, morbidity and mortality among elderly people. Moreover, few studies on predictors of falls have been conducted in low and middle income countries. The aim here was to identify elderly outpatient profiles according to sociodemographic, clinical, physical and functional variables and correlate them with occurrences of falls among these subjects.

**DESIGN AND SETTING** Cross-sectional descriptive study forming part of the project "Quality of Life of Frail Elderly People", carried out in Campinas, Brazil.

**METHODS** The subjects were 145 elderly individuals ( $76.3 \pm 7.8$  years old), of whom 65% were women, who were living in the city of Campinas or nearby and were attended at the geriatric outpatient clinic of a University Hospital. Sociodemographic, clinical, physical and functional data, as well as fall occurrence data, were gathered. Cluster analyses and comparisons between groups were carried out.

**RESULTS** Cluster analysis identified two distinct groups related to the study variables, and the determinants for this distinction were: gender, marital status, physical performance, handgrip strength and functional independence. These groups were compared according to occurrences of falls over the last year, and significant differences between them were found.

**CONCLUSIONS** The results showed that greater occurrences of falls were associated with a profile of elderly people comprising female gender, single status, lower muscle strength and physical performance regarding balance and gait, and lower independence in motor tasks for activities of daily living.

## **Fear of Falling**

### **Feasibility of a nurse-led in-home cognitive behavioral program to manage concerns about falls in frail older people: A process evaluation**

Dorresteyn TA, Rixt Zijlstra GA, van Haastregt JC, Vlaeyen JW, Kempen GI.

*Res. Nurs. Health* 2013; ePub(ePub): ePub.

Affiliation: CAPHRI School for Public Health and Primary Care and Department of Health Services Research, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands.

(Copyright © 2013, John Wiley and Sons) DOI 10.1002/nur.21534 PMID 23533013

### **Abstract**

Concerns about falls and related avoidance of activities are common problems among older people living in the community. In this study we examined the feasibility and acceptability of AMB-Home (the Dutch in-home version of A Matter of Balance), a nurse-led in-home cognitive behavioral program developed for frail community-living older people with concerns about falls and related activity avoidance. The multicomponent program consisted of seven individual sessions, including three home visits and four telephone contacts. Data were collected from eight nurses and 194 participants. Generally, the program was considered acceptable and feasible by both the nurses

## Abstracts Continued

### Recent abstracts from the research literature

and the participants. When AMB-Home turns out to be effective, the implementation of a fine-tuned version of this in-home program in regular health care, would be a natural next step.

#### **Older community-dwelling people's comparative optimism about falling: A population-based telephone survey**

Dollard J, Barton C, Newbury J, Turnbull D.

*Australas. J. Ageing* 2013; 32(1): 34-40.

Affiliation: Discipline of General Practice, University of Adelaide, Adelaide, South Australia, Australia School of Population Health and Clinical Practice, University of Adelaide, Adelaide, South Australia, Australia Spencer Gulf Rural Health School, University of Adelaide and University of South Australia, Port Lincoln, South Australia, Australia School of Psychology, University of Adelaide, Adelaide, South Australia, Australia.

(Copyright © 2013, Australian Council on the Ageing, Publisher John Wiley and Sons) DOI 10.1111/j.1741-6612.2012.00597.x PMID 23521732

#### **Abstract**

**Aim:** To determine whether older community-dwelling people underestimate their own perceived chance of falling compared with that of other older people (comparative optimism), and whether a history of falls is associated with comparative optimism.

**Method:** A sample of community-dwelling South Australians aged  $\geq 65$  years ( $n = 389$ ) completed a computer-assisted telephone interview about their 12-month fall history, their perceived chance of falling and their rating of other older people's chance of falling.

**Results:** Respondents were comparatively optimistic about their chance of falling ( $Z = -8.1$ ,  $P < 0.001$ ). Those who had fallen in the last 12 months had a lower comparative optimism score ( $Z = -3.0$ ,  $P < 0.003$ ).

**Conclusion:** As older people were comparatively optimistic about their likelihood of falling, they might not find fall prevention messages relevant. When older people present with a fall, clinicians could provide fall prevention information consistent with how older people present themselves.

#### **Risk Assessment**

#### **Three simple clinical tests to accurately predict falls in people with Parkinson's disease**

Paul SS, Canning CG, Sherrington C, Lord SR, Close JC, Fung VS.

*Mov. Disord.* 2013; ePub(ePub): ePub.

Affiliation: Clinical and Rehabilitation Sciences Research Group, Faculty of Health Sciences, The University of Sydney, Sydney, New South Wales, Australia.

(Copyright © 2013, Movement Disorders Society, Publisher John Wiley and Sons) DOI 10.1002/mds.25404 PMID 23450694

#### **Abstract**

Falls are a major cause of morbidity in Parkinson's disease (PD). The objective of this study was to identify predictors of falls in PD and develop a simple prediction tool that would be useful in routine patient care. Potential predictor variables (falls history, disease severity, cognition, leg muscle strength, balance, mobility, freezing of gait [FOG], and fear of falling) were collected for 205 community-dwelling people with PD. Falls were monitored prospectively for 6 months using monthly falls diaries. In total, 125 participants (59%) fell during follow-up. A model that included a history of falls, FOG, impaired postural sway, gait speed, sit-to-stand, standing balance with narrow base of support, and coordinated stability had high discrimination in identifying fallers (area under the receiver-operating characteristic curve [AUC], 0.83; 95% confidence interval [CI], 0.77-0.88). A clinical tool that incorporated 3 predictors easily determined in a clinical setting (falling in the previous year: odds ratio [OR], 5.80; 95% CI, 3.00-11.22; FOG in the past month: OR, 2.39; 95% CI, 1.19-4.80; and self-selected gait speed  $< 1.1$  meters per second: OR, 1.86; 95% CI, 0.96-3.58) had similar discrimination (AUC, 0.80; 95% CI, 0.73-0.86) to the more complex model ( $P = 0.14$  for comparison of AUCs). The absolute probability of falling in the next 6 months for people with low, medium, and high risk using the simple, 3-test tool was 17%, 51%, and 85%, respectively. In people who have PD without significant cognitive impairment, falls can be predicted with a high degree of accuracy using a simple, 3-test clinical tool. This tool enables individualized quantification of the risk of



falling. © 2013 Movement Disorder Society.

### **Using the timed up and go test in a clinical setting to predict falling in Parkinson's disease**

Nocera J, Stegemöller EL, Malaty I, Okun M, Marsiske M, Hass C.

*Arch. Phys. Med. Rehabil.* 2013; ePub(ePub): ePub.

Affiliation: VA Rehabilitation R&D Center of Excellence, Atlanta VAMC; Emory University, Department of Neurology.  
Electronic address: joenocera@emory.edu.

(Copyright © 2013, Elsevier Publishing) DOI 10.1016/j.apmr.2013.02.020 PMID 23473700

#### **Abstract**

**OBJECTIVE:** To investigate the ability of the Timed Up and Go test to identify patients with Parkinson's disease at risk for a fall. This study hypothesized that the Timed Up and Go test may be a reliable clinical tool to predict fall risk in Parkinson's disease.

**DESIGN:** Cross-sectional cohort study.

**SETTING:** Sixteen participating National Parkinson's Foundation Centers of Excellence. **PARTICIPANTS:** A query yielded a total of 2,985 records (1828 men and 1157 women). From these, 884 were excluded because of a lack of crucial information (age, diagnosis, the presence of deep brain stimulation, disease duration, inability of performing the timed up and go without assistance) at the time of testing leaving 2,097 patients included in the analysis.

**INTERVENTION:** Not applicable.

**MAIN OUTCOME MEASURES:** The primary outcome measure for this study was falls. The chief independent variable was the Timed Up and Go.

**RESULTS:** The initial model examined the prediction of falls from Timed Up and Go, adjusting for all study covariates. The estimated models in the imputed data sets represented a significant improvement above chance ( 2 range (df=17): 531.29 to 542.39,  $p < .001$ ) suggesting that 74% of participants were accurately classified as a faller or non-faller. The secondary model in which the question of whether the effect of Timed Up and Go was invariant across disease severity demonstrated 75% of participants were accurately classified as a faller or non-faller. Additional analysis revealed a proposed cut score of 11.5 seconds for discrimination of those who did or did not fall.

**CONCLUSIONS:** The findings suggest that the Timed Up and Go test may be an accurate assessments tool to identify those at risk for a fall.

### **Intervention Studies**

#### **Engaging home health care providers in a fall prevention best practice initiative**

Shaw J, Sidhu K, Kearney C, Keeber M, McKay S.

*Home Health Care Serv. Q.* 2013; 32(1): 1-16.

Affiliation: Toronto Rehabilitation Institute , Toronto.

(Copyright © 2013, Informa - Taylor and Francis Group) DOI 10.1080/01621424.2013.757177 PMID 23438506

#### **Abstract**

This article reports key findings regarding the engagement of home health care providers in the implementation of a fall prevention best practice initiative. Participants were 29 home health care providers from physiotherapy, occupational therapy, and nursing. Each participant completed a self-efficacy for evidence-based practice survey, and a smaller subgroup of volunteers participated in focus groups for each discipline individually. Findings suggest home health care providers value the implementation of best practice in everyday care, but may need to be highly involved in the development of best practice initiatives and implementation strategies to foster engagement with the initiative in everyday practice.

# Abstracts Continued

## Recent abstracts from the research literature

### **A randomized controlled pilot study of home-based step training in older people using videogame technology**

Schoene D, Lord SR, Delbaere K, Severino C, Davies TA, Smith ST.

*PLoS ONE* 2013; 8(3): e57734.

Affiliation: Falls and Balance Research Group, Neuroscience Research Australia, Sydney, New South Wales, Australia ; School of Public Health and Community Medicine, University of New South Wales, Sydney, New South Wales, Australia.

(Copyright © 2013, Public Library of Science) DOI 10.1371/journal.pone.0057734 PMID 23472104

#### **Abstract**

**BACKGROUND:** Stepping impairments are associated with physical and cognitive decline in older adults and increased fall risk. Exercise interventions can reduce fall risk, but adherence is often low. A new exergame involving step training may provide an enjoyable exercise alternative for preventing falls in older people.

**PURPOSE:** To assess the feasibility and safety of unsupervised, home-based step pad training and determine the effectiveness of this intervention on stepping performance and associated fall risk in older people.

**DESIGN:** Single-blinded two-arm randomized controlled trial comparing step pad training with control (no-intervention).

**SETTINGPARTICIPANTS:** Thirty-seven older adults residing in independent-living units of a retirement village in Sydney, Australia.

**INTERVENTION:** Intervention group (IG) participants were provided with a computerized step pad system connected to their TVs and played a step game as often as they liked (with a recommended dose of 2-3 sessions per week for 15-20 minutes each) for eight weeks. In addition, IG participants were asked to complete a choice stepping reaction time (CSRT) task once each week. **MAIN OUTCOME MEASURES:** CSRT, the Physiological Profile Assessment (PPA), neuropsychological and functional mobility measures were assessed at baseline and eight week follow-up.

**RESULTS:** Thirty-two participants completed the study (86.5%). IG participants played a median 2.75 sessions/week and no adverse events were reported. Compared to the control group, the IG significantly improved their CSRT ( $F=18.203$ ,  $p<.001$ ), PPA composite scores ( $F=12.706$ ,  $p=0.001$ ), as well as the postural sway ( $F=4.226$ ,  $p=0.049$ ) and contrast sensitivity ( $F=4.415$ ,  $p=0.044$ ) PPA sub-component scores. In addition, the IG improved significantly in their dual-task ability as assessed by a timed up and go test/verbal fluency task ( $F=4.226$ ,  $p=0.049$ ).

**CONCLUSIONS:** Step pad training can be safely undertaken at home to improve physical and cognitive parameters of fall risk in older people without major cognitive and physical impairments. **TRIAL REGISTRATION:** Australian New Zealand Clinical Trials Registry ACTRN12611001081909.

### **Effective fall-prevention demands a community approach**

Beattie BL.

*J. Geriatr. Phys. Ther.* 2013; ePub(ePub): ePub.

Affiliation: Falls Free Initiative, National Council on Aging, Washington, District of Columbia.

(Copyright © 2013, American Physical Therapy Association) DOI 10.1519/JPT.0b013e31828835f4 PMID 23478394

#### **Abstract**

Given the rapid aging of the population, we can expect the number of older adult falls and fall-related injuries and deaths to increase exponentially unless we make a serious commitment to providing evidence-based, fall risk screening and assessments, and appropriate interventions to those increasingly at risk. National, state, and local partners are coming together to address this growing public health issue through evidence-based interventions that promote collaboration between public health, health care, and aging service providers. Physical therapists are uniquely positioned to make a significant contribution to this effort and to promote older adult participation in programs and services that can augment or supplement the plan of treatment. The purpose of this special interest

paper is to describe the efforts of the National Council on Aging's Falls Free Initiative and the role that physical therapists and other rehabilitation professionals can play in community-based programs aimed at reducing risk and occurrence of falls in later life.

### **Meeting physical activity guidelines through community-based group exercise: "better bones and balance"**

McNamara AJ, Pavol MJ, Gunter KB.

*J. Aging Phys. Act.* 2013; 21(2): 155-166.

Affiliation: School of Biological and Population Health Sciences, Oregon State University, Corvallis, OR.

(Copyright © 2013, Human Kinetics Publishers) DOI unavailable PMID 23531505

#### **Abstract**

**Objective:** Community-based exercise programs are popular for achieving physical activity among older adults, but the amount of physical activity obtained through such programs is unknown. This study quantified the bone-loading forces and levels of cardiovascular activity associated with participation in "Better Bones and Balance" (BBB), a community-based fall- and fracture-prevention program for older adults.

**Methods:** Thirty-six postmenopausal women age  $73.2 \pm 7.6$  yr engages in BBB participated in this study. Ground-reaction forces (GRFs) associated with BBB exercises were evaluated using a force platform. Session and weekly totals of minutes of moderate to vigorous physical activity (MVPA) and total time spent above 55% maximum heart rate (HR) were measured using accelerometers and HR monitors, respectively.

**Results:** BBB exercises produced mean 1-leg GRFs of 1.4-2.2 units body weight. Weekly BBB participation was associated with  $126 \pm 31$  min of MVPA.

**Conclusion:** Activity obtained by BBB participation meets recommended guidelines for skeletal and cardiovascular health.

### **Slow down and concentrate: time for a paradigm shift in fall prevention among people with Parkinson's disease?**

Stack EL, Roberts HC.

*Parkinsons Dis.* 2013; 2013(online): 704237.

Affiliation: Academic Geriatric Medicine, Faculty of Medicine, University of Southampton, Mailpoint 807, University Hospital Southampton, Tremona Road, Southampton SO16 6YD, UK.

(Copyright © 2013, Sage Publications) DOI 10.1155/2013/704237 PMID 23533952

#### **Abstract**

**Introduction:** We know little about how environmental challenges beyond home exacerbate difficulty moving, leading to falls among people with Parkinson's (PwP).

**Aims:** To survey falls beyond home, identifying challenges amenable to behaviour change. **Methods.** We distributed 380 questionnaires to PwP in Southern England, asking participants to count and describe falls beyond home in the previous 12 months.

**Results:** Among 255 responses, 136 PwP (diagnosed a median 8 years) reported falling beyond home. They described 249 falls in detail, commonly falling forward after tripping in streets. Single fallers (one fall in 12 months) commonly missed their footing, walking, or changing position and recovered to standing alone or with unfamiliar help. Repeat fallers (median falls, two) commonly felt shaken or embarrassed and sought medical advice. Very frequent fallers (falling at least monthly; median falls beyond home, six) commonly fell backward, in shops and after collapse but often recovered to standing alone.

**Conclusion:** Even independently active PwP who do not fall at home may fall beyond home, often after tripping. Falling beyond home may result in psychological and/or physical trauma (embarrassment if observed by strangers and/or injury if falling backwards onto a hard surface). Prevention requires vigilance and preparedness: slowing down and concentrating on a single task might effectively prevent falling.

# Falls Network Information

[fallsnetwork.neura.edu.au](http://fallsnetwork.neura.edu.au)

## Joining the Network

To join the NSW Falls Prevention Network listserv, send an email to:

[majordomo@lists.health.nsw.gov.au](mailto:majordomo@lists.health.nsw.gov.au)

In the body of the message type

*subscribe nsw-falls-network*

on the next line type *end*

Do not put anything in the subject line. You will receive an e-mail to confirm you have been added to the listserv.

To unsubscribe send an e-mail to the above address and in the body of the message type

*unsubscribe nsw-falls-network*

on the next line type *end*

If you have any problems, contact Esther Vance at [e.vance@neura.edu.au](mailto:e.vance@neura.edu.au).

## Share your news and information/ideas

Do you have any news on Falls Prevention you want to share with others on the network, or do you want to report on a project that is happening in your area.

Please email Esther with your information. We also welcome suggestions for articles and information you would like to see in this newsletter.

Send your information to:

[e.vance@neura.edu.au](mailto:e.vance@neura.edu.au)

## The Network Listserv

It is great to see the increased activity on the listserv and we want to continue to promote this. To send an item to the listserv where all members of the network can see it, send an email to:

[nsw-falls-network@lists.health.nsw.gov.au](mailto:nsw-falls-network@lists.health.nsw.gov.au)

You need to be a subscriber to the listserv to send an email that will be distributed to all members of the listserv. Remember to put a short description in the subject line.

Recently some posts to the listserv have bounced due to email address changes, you need to re-subscribe with your new e-mail address and unsubscribe from your old address following the Join the Network instructions as shown on this page.

## NSW Falls Prevention Network Background

The NSW Falls Prevention Network was established in 1993. The role of this network has grown since its inception and now includes:

- Meetings for discussion of falls related issues;
- Dissemination of research findings both local and international;
- Sharing resources developed and exploration of opportunities to combine resources in joint initiatives;
- Encouragement of collaborative projects and research;
- To act as a group to influence policy;
- To liaise with NSW Ministry of Health to provide information on current State/Commonwealth issues in relation to falls and
- Maintenance of resources pertinent to the field.

The main purpose of the network is to share knowledge, expertise and resources on falls prevention for older people.

The NSW Falls Prevention Network activities are part of the implementation of the NSW Falls Prevention Policy funded by the NSW Ministry of Health.



**“Falls Prevention is Everyone’s Business®”**

