

## SafetyLit December 11 2016

### Benefits of a novel concept of home-based exercise with the aim of preventing aspiration pneumonia and falls in frail older women: a pragmatic controlled trial

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*BMJ Open Sport Exerc. Med.* 2016; 2(1): e000127.

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#### Abstract

**AIM:** To investigate whether home-based exercise with the aim of preventing aspiration pneumonia and accidental falls improves swallowing-related and physical functions in community-dwelling frail older women.

**METHODS:** Participants were 266 community-dwelling frail older women in a long-term care prevention class (mean (SD): age 75 (5) years). Participants were allocated to either an intervention group or a control group. In the intervention group, participants were asked to perform, at least three times a week for 6 months, a home-based exercise programme that was specifically developed to prevent aspiration pneumonia and accidental falls. Control group participants were instructed to perform general stretching exercises only. Voluntary peak cough flow and lip closure force were measured as swallowing-related functions. Static and dynamic balance function, lower limb strength and flexibility were measured as secondary outcomes. Intervention effects were determined using *t* tests; effect sizes were calculated using Cohen's *d*.

**RESULTS:** Voluntary peak cough flow in the intervention group was significantly greater than in the control group ( $p < 0.01$ ,  $d = 0.5$ ). However, lip closure force did not differ between groups. Regarding physical function, results of the Timed Up and Go Test ( $p < 0.05$ ,  $d = 0.4$ ), Chair Stand Test ( $p < 0.01$ ,  $d = 0.4$ ), maximal knee extension strength ( $p < 0.05$ ,  $d = 0.4$ ), and Sit and Reach Test ( $p < 0.05$ ,  $d = 0.3$ ) showed greater improvement in the intervention group.

**CONCLUSIONS:** Specifically developed home-based exercise as described in this study is simple and can be performed briefly. Improvements in voluntary peak cough flow and physical function indicate the possible usefulness of such exercise in preventing falls and aspiration pneumonia in community-dwelling frail older adults. **TRIAL REGISTRATION NUMBER:** UMIN Clinical Trials Registry (UMIN-CTR): UMIN000014880.

#### PDF Y Endnote Y

### Can the Otago falls prevention program be delivered by video? A feasibility study

Davis JC, Hsu CL, Cheung W, Brasher PM, Li LC, Khan KM, Sykes J, Skelton DA, Liu-Ambrose T.

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### Abstract

**OBJECTIVES:** We assessed the feasibility of delivering the Otago Exercise Programme (OEP) via an interactive DVD (ie, OEP-DVD) in combination with monthly physical therapist phone calls to older adults.

**DESIGN:** This pre-post (baseline and 6-month follow-up) study included an intervention group (n=61) based in a rural location and a control group (n=21) based in a city.

**SETTING:** Sechelt and Vancouver, British Columbia.

**PARTICIPANTS:** 82 community-dwelling adults  $\geq 75$  years.

**INTERVENTION:** Individuals in the intervention group received the OEP-DVD and were instructed to do the exercises 3 times a week after their initial home physical therapist visit for 6 months.

**PRIMARY AND SECONDARY OUTCOMES:** Feasibility was ascertained by withdrawal rate and compliance to the OEP-DVD. The number of participants and the frequency (ie, number of times weekly) they performed the OEP exercises and walking were used to estimate compliance. The potential benefit of the OEP-DVD on falls risk profile (Physiological Profile Assessment (PPA)) and mobility were examined by comparing the change in the intervention group compared with the control group. Self-reported compliance to the exercise programme was assessed by monthly returned diary.

**RESULTS:** Of the 82 participants, 2 withdrew from the OEP-DVD group and none withdrew from the control group. We obtained compliance data on 72% of participants in the intervention group. The mean OEP-DVD compliance was 87% and the mean walking compliance was 166%. After adjusting for baseline PPA, baseline age, sex, baseline comorbidities, baseline cognitive status and baseline falls-related self-efficacy, there was a significant between-group improvement in the overall PPA score (OEP group pre-PPA to post-PPA score:  $0.79 \pm 1.2$  to  $0.7 \pm 0.9$ ;  $p < 0.05$ ) at study completion.

**CONCLUSIONS:** Although the OEP-DVD resulted in significant reductions in falls risk among community-dwelling older adults, there was a notable loss to follow-up limiting the feasibility of this approach.

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#### **Commentary: Public health system perspective on implementation of evidence-based fall-prevention strategies for older adults**

Shubert TE, Smith ML, Schneider EC, Wilson AD, Ory MG.

*Front. Public Health* 2016; 4: e252.

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**Comment On:** *Front Public Health* 2015;2:191.

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**Abstract** [Abstract unavailable]

### PDF Y Endnote Y

#### **Comparison of self-reported and performance-based measures of functional ability in elderly patients in an emergency department: implications for selection of clinical outcome measures**

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*BMC Geriatr.* 2016; 16(1): e199.

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**DOI** 10.1186/s12877-016-0376-1 **PMID** 27899065

#### **Abstract**

**BACKGROUND:** Assessment of functional ability in elderly patients is often based on self-reported rather than performance-based measures. This study aims to compare self-reported and performance-based measures of functional ability in a population of elderly patients at an emergency department (ED).

**METHODS:** Participants were 61 patients aged 65 years and above admitted to an ED. The self-reported measure used was the Barthel-20; the performance-based measures were Timed Up and Go (TUG); 30s-Chair Stand Test (30s-CST) and Assessment of Motor and Process Skills (AMPS) with the two scales; motor and process. Correlation analyses were conducted to examine the relationships between the self-reported and performance-based measures of functional ability.

**RESULTS:** The correlation between the Barthel-20 and the TUG was moderate ( $r = -0.64$ ). The correlation between the Barthel-20 and the AMPS motor was also moderate ( $r = 0.53$ ). The correlation between the Barthel-20 and the 30s-CST was fair ( $r = 0.45$ ). The correlation between Barthel-20 and the AMPS process was non-significant. The results were affected by high ceiling effect (Barthel-20).

**CONCLUSION:** Self-reported and performance-based measures seem to assess different aspects of functional ability. Thus, the two methods provide different information, and this highlight the importance of supplementing self-reported measures with performance-based measures when assessing functional ability in elderly patients.

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

#### **Deaths among elderly patients in the emergency department: a needs assessment for end-of-life care**

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*Singapore Med. J.* 2016; ePub(ePub): ePub.

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#### **Abstract**

**INTRODUCTION:** Elderly patients with serious chronic diseases often present to the emergency department (ED) in the last moments of their life, many with identifiable trajectories of dying: organ failure; advanced cancer; and chronic frailty. These patients and their families may benefit more from good end-of-life (EOL) care provision than the standard resuscitative approach. This study aimed to determine the incidence and nature of death among patients aged 65 years and above in an ED, and characterise their trajectories of dying.

**METHODS:** This was a retrospective study carried out over a one-year period in a tertiary ED. All deaths in patients aged 65 years and above over this period were included. Information on the patients' demographics, comorbidities and details of death were extracted from the hospital's electronic medical records database. Based on available information, their Karnofsky Performance Status (KPS) scores and trajectories of dying were ascertained.

**RESULTS:** In one year, 197 patients aged 65 years and above died in the ED, 51.3% of whom suffered from serious chronic illnesses, with identifiable trajectories of dying. Of these patients, 46.5% had pre-morbid functional limitation with KPS scores of 0-40. However, only 14.9% of patients had a pre-existing resuscitation status and 74.3% received aggressive resuscitative measures.

**CONCLUSION:** There is a significant burden of EOL care needs among elderly patients in the ED, many of whom have chronic illness trajectories of dying. This study underscores the need for improvement in EOL care provision for dying patients and their families in the ED.

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### **Ethnic differences in fall risk among community-dwelling older people in the Netherlands**

El Fakiri F, Kegel AA, Schouten GM, Berns MP.

*J. Aging Health* 2016; ePub(ePub): ePub.

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#### **Abstract**

**OBJECTIVE:** This study measures the prevalence of falls and fear of falling among a population sample aged  $\geq 65$  years from different ethnic minorities living in the Netherlands, and examines whether ethnicity contributed to the differences in fall risk.

**METHOD:** We analyzed data from 8,892 Dutch, Moroccan, Turkish, and Surinamese participants. Descriptive statistics and multiple regression analyses were conducted with falls and fear of falling as the dependent variable and ethnicity as the independent variable.

**RESULTS:** Moroccan, Turkish, and Surinamese older adults had a significantly higher odds ratio (OR) for fear of falling than their Dutch counterparts (OR = 2.13, 95% confidence interval [CI] = [1.05, 4.31]; OR = 2.09, 95% CI = [1.07, 4.09]; and OR = 2.49, 95% CI = [1.53, 4.03], respectively). The association between ethnicity and falling disappeared after controlling for socio-demographic and health characteristics.

**DISCUSSION:** Dutch minority older adults were at higher risk for fear of falling than their Dutch counterparts. The study underlines the need for targeting culture-sensitive interventions.

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### **Falls, cognitive impairment, and gait performance: results from the GOOD Initiative**

Allali G, Launay CP, Blumen HM, Callisaya ML, De Cock AM, Kressig RW, Srikanth V, Steinmetz JP, Verghese J, Beauchet O.

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#### **Abstract**

**OBJECTIVES:** Falls are highly prevalent in individuals with cognitive decline. The complex relationship between falls and cognitive decline (including both subtype and severity of dementia) and the influence of gait disorders have not been studied. This study aimed to examine the association between the subtype (Alzheimer disease [AD] versus non-AD) and the severity (from preclinical to

moderate dementia) of cognitive impairment and falls, and to establish an association between falls and gait parameters during the course of dementia.

DESIGN: Multicenter cross-sectional study.

SETTING: "Gait, cOgnitiOn & Decline" (GOOD) initiative.

PARTICIPANTS: A total of 2496 older adults ( $76.6 \pm 7.6$  years; 55.0% women) were included in this study (1161 cognitively healthy individuals [CHI], 529 patients with mild cognitive impairment [MCI], 456 patients with mild dementia, and 350 with moderate dementia) from 7 countries.

MEASUREMENTS: Falls history was collected retrospectively at baseline in each study. Gait speed and stride time variability were recorded at usual walking pace with the GAITRite system.

RESULTS: The prevalence of individuals who fall was 50% in AD and 64% in non-AD; whereas it was 25% in CHIs. Only mild and moderate non-AD dementia were associated with an increased risk for falls in comparison with CHI. Higher stride time variability was associated with falls in older adults without dementia (CHI and each MCI subgroup) and mild non-AD dementia, whereas lower gait speed was associated with falls in all participant groups, except in mild AD dementia. When gait speed was adjusted for, higher stride time variability was associated with falls only in CHIs (odds ratio 1.14;  $P = .012$ ), but not in MCI or in patients with dementia.

CONCLUSIONS: These findings suggest that non-AD, but not AD dementia, is associated with increased falls in comparison with CHIs. The association between gait parameters and falls also differs across cognitive status, suggesting different mechanisms leading to falls in older individuals with dementia in comparison with CHIs who fall.

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#### **Fear of falling and physical function in older adults with cataract: exploring the role of vision as a moderator**

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

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#### **Abstract**

**AIM:** To examine fear of falling and associated factors in a cohort of older adults with cataract, and investigate the interplay of vision and physical function with respect to fear of falling.

**METHODS:** We analyzed baseline data from a longitudinal study of adults aged  $\geq 65$  years referred for cataract surgery. Fear of falling was assessed by the Short Falls Efficacy Scale-International. Physical function was determined by the Short Physical Performance Battery. Participants underwent assessment of visual acuity, contrast sensitivity, visual disability, quality of life, depressive symptoms, exercise frequency, comorbidity and falls history. Factors associated with fear of falling were assessed using linear regression. Planned stepwise regression investigated vision as a potential moderator of the relationship between physical function and fear of falling.

**RESULTS:** Among 322 participants, 32.9 % ( $n = 106$ ) showed high fear of falling. Poorer physical function, more comorbidities and greater visual disability were independently associated with a higher fear of falling (all  $P < 0.001$ ). Visual disability moderated the relationship between physical

function and fear of falling ( $\beta = -0.10$ ,  $P = 0.04$ ). The impact of physical function on fear of falling was strongest in participants with higher (+1 standard deviation above the mean) visual disability ( $b = -0.21$ ,  $P < 0.001$ ).

**CONCLUSIONS:** Fear of falling in older adults with cataract is greatest in those with poorer physical function and higher levels of visual disability. Perceived visual ability has a moderating role in the relationship between physical function and fear of falling; physical function alone might not adequately predict falls concern.

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### **Home-based interventions improve trained, but not novel, dual-task balance performance in older adults: a randomized controlled trial**

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*Gait Posture* 2016; 52: 147-152.

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#### **Abstract**

The purpose of this study was to compare the efficacy of four different home-based interventions on dual-task balance performance and to determine the generalizability of the four trainings to untrained tasks. Sixty older adults, aged 65 and older, were randomly assigned to one of four home-based interventions: single-task motor training, single-task cognitive training, dual-task motor-cognitive training, and dual-task cognitive-cognitive training. Participants received 60-min individualized training sessions, 3 times a week for 4 weeks. Prior to and following the training program, participants were asked to walk under two single-task conditions (i.e. narrow walking and obstacle crossing) and two dual-task conditions (i.e. a trained narrow walking while performing verbal fluency task and an untrained obstacle crossing while counting backward by 3s task). A nine-camera motion capture system was used to collect the trajectories of 32 reflective markers placed on bony landmarks of participants. Three-dimensional kinematics of the whole body center of mass and base of support were computed.

**RESULTS** from the extrapolated center of mass displacement indicated that motor-cognitive training was more effective than the single-task motor training to improve dual-task balance performance ( $p=0.04$ ,  $ES=0.11$ ). Interestingly, balance performance under both single-task and dual-task conditions can also be improved through a non-motor, single-task cognitive training program ( $p=0.01$ ,  $ES=0.13$ , and  $p=0.01$ ,  $ES=0.11$ , respectively). However, improved dual-task processing skills during training were not transferred to the novel dual task ( $p=0.15$ ,  $ES=0.09$ ). This is the first study demonstrating that home-based dual-task training can be effectively implemented to improve balance performance during gait in older adults.

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### **Staircase climbing is not solely a visual compensation strategy to alleviate freezing of gait in Parkinson's disease**

Gilat M, Hall JM, Ehgoetz Martens KA, Shine JM, Walton CC, MacDougall HG, Moore ST, Lewis SJ.



*J. Neurol.* 2016; ePub(ePub): ePub.

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**Abstract** [Abstract unavailable]

**PDF Y Endnote Y**

### **Technology-based measurements for screening, monitoring and preventing frailty**

Dasenbrock L, Heinks A, Schwenk M, Bauer JM.

*Z. Gerontol.* 2016; 49(7): 581-595.

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**DOI** 10.1007/s00391-016-1129-7 **PMID** 27637581

#### **Abstract**

**BACKGROUND AND OBJECTIVE:** Sensor technology, in particular wearable inertial sensors, has the potential to help researchers objectively assess the functionality of older adults. The following review provides an overview about the possible use of sensor technology to detect and prevent pre-frailty and frailty.

**METHOD:** A systematic literature search in PubMed and the Cochrane Library was conducted. Articles were selected according to the following criteria: frail and/or pre-frail population, use of wearable and non-wearable sensor technology to measure or enhance human movements or activities of daily living and a focus on frailty assessment.

**RESULTS:** A total of 28 publications were found. Sensor-derived parameters obtained during assessment of gait, functional performances and physical activity were reported to be relevant for screening and monitoring pre-frailty and frailty; however, current findings are limited to cross-sectional studies, which do not allow establishment of a causal relationship between motor performance, physical activity and specific frailty states. No study monitored specific activities of daily living.

**DISCUSSION:** Outcome variables from technology-based assessment seem to provide valuable information for frailty assessment. Strenuous testing conditions as well as increased variability in gait, functional performance and physical activity may be useful in identifying frailty. Outcome variables derived from gait, motor assessment and physical activity must still be validated in large cohorts and under daily living conditions in order to develop robust screening tools for pre-frailty and frailty. Further research should focus on specific activities of daily living in pre-frail or frail older adults and technology-based approaches for intervention and prevention.

**PDF Y Endnote Y**

### **Walking aids moderate exercise effects on gait speed in people with dementia: a randomized controlled trial-**

Toots A, Littbrand H, Holmberg H, Nordström P, Lundin-Olsson L, Gustafson Y, Rosendahl E.

*J. Am. Med. Dir. Assoc.* 2016; ePub(ePub): ePub.

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### **Abstract**

**OBJECTIVES:** To investigate the effects of exercise on gait speed, when tested using walking aids and without, and whether effects differed according to amount of support in the test.

**DESIGN:** A cluster-randomized controlled trial.

**SETTING:** The Umeå Dementia and Exercise (UMDEX) study was set in 16 nursing homes in Umeå, Sweden.

**PARTICIPANTS:** One hundred forty-one women and 45 men (mean age 85 years) with dementia, of whom 145 (78%) habitually used walking aids.

**INTERVENTION:** Participants were randomized to the high-intensity functional exercise program or a seated attention control activity.

**MEASUREMENTS:** Blinded assessors measured 4-m usual gait speed with walking aids if any gait speed (GS), and without walking aids and with minimum amount of support, at baseline, 4 months (on intervention completion), and 7 months.

**RESULTS:** Linear mixed models showed no between-group effect in either gait speed test at 4 or 7 months. In interaction analyses exercise effects differed significantly between participants who walked unsupported compared with when walking aids or minimum support was used. Positive between-group exercise effects on gait speed (m/s) were found in subgroups that walked unsupported at 4 and 7 months (GS: 0.07,  $P = .009$  and 0.13,  $P < .001$ ; and GS test without walking aids: 0.05,  $P = .011$  and 0.07,  $P = .029$ , respectively).

**CONCLUSIONS:** In people with dementia living in nursing homes exercise had positive effects on gait when tested unsupported compared with when walking aids or minimum support was used. The study suggests that the use of walking aids in gait speed tests may conceal exercise effects.

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### **PDF Y Endnote Y**

### **A novel approach to falls classification in Parkinson's disease: development of the Fall-Related Activity Classification (FRAC)**

Ross A, Yarnall AJ, Rochester L, Lord S.

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

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**DOI** 10.1016/j.physio.2016.08.002 **PMID** 27913063

### **Abstract**

**BACKGROUND:** Falls are a major problem for people with Parkinson's disease (PD). Despite years of focused research knowledge of falls aetiology is poor. This may be partly due to classification approaches which conventionally report fall frequency. This nosology is blunt, and does not take into account causality or the circumstances in which the fall occurred. For example, it is likely that people who fall from a postural transition are phenotypically different to those who fall during high level



activities. Recent evidence supports the use of a novel falls classification based on fall related activity, however its clinimetric properties have not yet been tested.

**OBJECTIVE:** This study describes further development of the Fall-Related Activity Classification (FRAC) and reports on its inter-rater reliability (IRR).

**METHOD:** Descriptors of the FRAC were refined through an iterative process with a multidisciplinary team. Three categories based on the activity preceding the fall were identified. PD fallers were categorised as: (1) advanced (2) combined or (3) transitional. Fifty-five fall scenarios were rated by 23 raters using a standardised process. Raters comprised 3 clinical subgroups: (1) physiotherapists, (2) physicians, (3) non-medical researchers. IRR analysis was performed using weighted kappa coefficients and included sub group analysis based on clinical speciality.

**RESULTS:** Excellent agreement was reached for all clinicians,  $\kappa=0.807$  (95% CI 0.732 to 0.870). Clinical subgroups performed similarly well (range of  $\kappa=0.780$  to 0.822).

**CONCLUSION:** The FRAC can be reliably used to classify falls. This may discriminate between phenotypically different fallers and subsequently strengthen falls predictors in future studies.

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

#### **A self-powered insole for human motion recognition**

Han Y, Cao Y, Zhao J, Yin Y, Ye L, Wang X, You Z.

*Sensors (Basel)* 2016; 16(9): s16091502.

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**DOI** 10.3390/s16091502 **PMID** 27649188

#### **Abstract**

Biomechanical energy harvesting is a feasible solution for powering wearable sensors by directly driving electronics or acting as wearable self-powered sensors. A wearable insole that not only can harvest energy from foot pressure during walking but also can serve as a self-powered human motion recognition sensor is reported. The insole is designed as a sandwich structure consisting of two wavy silica gel film separated by a flexible piezoelectric foil stave, which has higher performance compared with conventional piezoelectric harvesters with cantilever structure. The energy harvesting insole is capable of driving some common electronics by scavenging energy from human walking. Moreover, it can be used to recognize human motion as the waveforms it generates change when people are in different locomotion modes. It is demonstrated that different types of human motion such as walking and running are clearly classified by the insole without any external power source. This work not only expands the applications of piezoelectric energy harvesters for wearable power supplies and self-powered sensors, but also provides possible approaches for wearable self-powered human motion monitoring that is of great importance in many fields such as rehabilitation and sports science.

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

#### **Body sway adaptation to addition, but not withdrawal of stabilizing visual information is delayed by a concurrent cognitive task**

Honeine JL, Crisafulli O, Schieppati M.

*J. Neurophysiol.* 2016; ePub(ePub): ePub.

**Affiliation:** University of Pavia.

(Copyright © 2016, American Physiological Society)

**DOI** 10.1152/jn.00725.2016 **PMID** 27903641

#### **Abstract**

Aim of this study was to test the effects of a concurrent cognitive task on the promptness of the sensorimotor integration and reweighting processes following addition and withdrawal of vision. Fourteen subjects stood in tandem while vision was passively added and removed. Subjects performed a cognitive task, consisting of counting backwards in steps of three, or were 'mentally idle'. We estimated the time interval, following addition and following withdrawal of vision, at which body sway began to change. We also estimated the time constant of the exponential change in body oscillation until the new level of sway was reached, consistent with the current visual state. Under the mentally-idle condition, mean latency was 0.67 s and 0.46 s, and mean time constant was 1.27 s and 0.59 s, for vision addition and withdrawal, respectively. Following addition of vision, counting backward delayed the latency by about 300 ms, without affecting the time constant. Following withdrawal, counting-backward had no significant effect on either latency or time-constant. The extension by counting backwards of the time-interval to stabilization onset on addition of vision suggests a competition for cortical resources allocation. Conversely, the absence of cognitive-task effect on the rapid onset of destabilization on vision withdrawal, and on the relevant reweighting time-course, advocates the intervention of a subcortical process. Diverting attention from a challenging standing task discloses a cortical supervision on the process of sensorimotor integration of new balance-stabilizing information. A subcortical process would instead organize the response to removal of the stabilizing sensory input.

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

### **Changes in physical functioning among men and women aged 50-79 years in Germany: an analysis of National Health Interview and Examination Surveys, 1997-1999 and 2008-2011**

Buttery AK, Du Y, Busch MA, Fuchs J, Gaertner B, Knopf H, Scheidt-Nave C.

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#### **Abstract**

**BACKGROUND:** This study examines changes in physical functioning among adults aged 50-79 years in Germany based on data from two German National Health Interview and Examination Surveys conducted in 1997-1999 (GNHIES98) and 2008-2011 (DEGS1).

**METHODS:** Using cross-sectional data from the two surveys (GNHIES98, n = 2884 and DEGS1, n = 3732), we examined changes in self-reported physical functioning scores (Short Form-36 physical functioning subscale (SF-36 PF)) by sex and age groups (50-64 and 65-79 years). Covariables included educational level, living alone, nine chronic diseases, polypharmacy ( $\geq 5$  prescribed medicines), body mass index, sports activity, smoking and alcohol consumption. Multimorbidity was defined as  $\geq 2$  chronic diseases. Multivariable models were fitted to examine consistency of changes in physical functioning among certain subgroups and to assess changes in mean SF-36 PF scores, adjusting for changes in covariables between surveys.

**RESULTS:** Mean physical functioning increased among adults aged 50-79 years between surveys in unadjusted analyses, but this change was not as marked among men aged 65-79 years who experienced rising obesity (20.6 to 31.5%,  $p = 0.004$ ) and diabetes (13.0 to 20.0%,  $p = 0.014$ ). Prevalence of multimorbidity and polypharmacy use increased among men and women aged 65-79 years. In sex and age specific multivariable analyses, changes in physical functioning over time were consistent across subgroups. Gains in physical functioning were explained by improved education, lower body mass index and improved health-related behaviours (smoking, alcohol consumption, sports activity) in women, but less so among men.

**CONCLUSIONS:** Physical functioning improved in Germany among adults aged 50-79 years. Improvements in the population 65-79 years were less evident among men than women, despite increases in multimorbidity prevalence among both sexes. Changes in health behaviours over time differed between sexes and help explain variations in physical functioning. Targeted health behaviour interventions are indicated from this study.

**PDF Y Endnote Y**

### **Relationship between visual status and functional status and the risk of falls in women. The RAC-OST-POL study**

Rokicki W, Drozdowska B, Czekajło A, Grzeszczak W, Wiktor K, Majewski W, Pluskiewicz W.  
*Arch. Med. Sci.* 2016; 12(6): 1232-1238.

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#### **Abstract**

**INTRODUCTION:** Falls in elderly women producing fractures are a public health problem that could be largely preventable. The aim of this study was to determine the effect of visual impairment on functional status, falls and fractures in women.

**MATERIAL AND METHODS:** We examined 623 women aged  $\geq 55$  years in order to assess the association between visual status and functional status and the risk of falls and fractures. Distance, near visual acuity, and depth perception were examined. Functional status was assessed using the Instrumental Activities of Daily Living (IADL) and Timed Up and Go (TUG) tests. The history of falls in the last 12 months and prior osteoporotic fractures were recorded.

**RESULTS:** The mean age of participants was  $66.01 \pm 7.76$  years. Distance visual acuity was correlated ( $r = -0.13$ ,  $p < 0.0001$ ) with an increased number of falls. The most prognostic fall factor was IADL ( $Z = 3.19$ ,  $p < 0.05$ ), which showed a significant association with distance acuity ( $r = 0.27$ ,  $p < 0.0001$ ). The TUG test time significantly increased with diminishing visual acuity:  $10.6 \pm 3.1$  s for good,  $12.8 \pm 6.1$  s for moderate and  $15.3 \pm 8.8$  s for poor visual acuity ( $p < 0.0001$ , ANOVA 24.4). The IADL also differs significantly ( $p < 0.0001$ ) in subgroups divided according to visual acuity ( $23.6 \pm 1.5$ ,  $22.6 \pm 2.9$ ,  $21.2 \pm 4.8$  points, respectively). In multivariate logistic regression on probability of falls including IADL, TUG and visual acuity, IADL was found to be an independent prognostic factor ( $p = 0.025$ ). The data revealed no association of refractive correction, depth perception, or near visual acuity with fall incidence or history of fractures.

**CONCLUSIONS:** Visual acuity influences functional status and number of falls in women aged over 55 years.

## PDF Y Endnote Y

### **Social-aware event handling within the FallRisk project**

De Backere F, Van den Bergh J, Coppers S, Elprama S, Nelis J, Verstichel S, Jacobs A, Coninx K, Ongenaë F, De Turck F.

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### **Abstract**

**OBJECTIVES:** With the uprise of the Internet of Things, wearables and smartphones are moving to the foreground. Ambient Assisted Living solutions are, for example, created to facilitate ageing in place. One example of such systems are fall detection systems. Currently, there exists a wide variety of fall detection systems using different methodologies and technologies. However, these systems often do not take into account the fall handling process, which starts after a fall is identified or this process only consists of sending a notification. The FallRisk system delivers an accurate analysis of incidents occurring in the home of the older adults using several sensors and smart devices.

Moreover, the input from these devices can be used to create a social-aware event handling process, which leads to assisting the older adult as soon as possible and in the best possible way.

**METHODS:** The FallRisk system consists of several components, located in different places. When an incident is identified by the FallRisk system, the event handling process will be followed to assess the fall incident and select the most appropriate caregiver, based on the input of the smartphones of the caregivers. In this process, availability and location are automatically taken into account.

**RESULTS:** The event handling process was evaluated during a decision tree workshop to verify if the current day practices reflect the requirements of all the stakeholders. Other knowledge, which is uncovered during this workshop can be taken into account to further improve the process.

**CONCLUSIONS:** The FallRisk offers a way to detect fall incidents in an accurate way and uses context information to assign the incident to the most appropriate caregiver. This way, the consequences of the fall are minimized and help is at location as fast as possible. It could be concluded that the current guidelines on fall handling reflect the needs of the stakeholders. However, current technology evolutions, such as the uptake of wearables and smartphones, enables the improvement of these guidelines, such as the automatic ordering of the caregivers based on their location and availability.

## PDF N Endnote Y

### **Spinal fractures in older adult patients admitted after low-level falls: 10-year incidence and outcomes**

Jawa RS, Singer AJ, Rutigliano DN, McCormack JE, Huang EC, Shapiro MJ, Fields SD, Morelli BN, Vosswinkel JA.

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### Abstract

**OBJECTIVES:** To evaluate the incidence of spinal fractures and their outcomes in the elderly who fall from low-levels in a suburban county.

**DESIGN:** Retrospective county-wide trauma registry review from 2004 to 2013. **SETTING:** Suburban county with regionalized trauma care consisting of 11 hospitals. **PARTICIPANTS:** Adult trauma patients aged  $\geq 65$  years who were admitted after falling from  $< 3$  feet. **MEASUREMENTS:** Demographic characteristics, comorbidities, and outcomes.

**RESULTS:** Spinal fractures occurred in 18% of 4,202 older adult patients admitted following trauma over this 10-year time period, in the following distribution: 43% cervical spine, 5.7% thoracic, 4.9% lumbar spine, 36% sacrococcygeal, and 9.6% multiple spinal regions. As compared to non-spinal fracture patients, more spinal fracture patients went to acute/subacute rehabilitation (47% vs 34%,  $P < .001$ ) and fewer were discharged home (21% vs 35%,  $P < .001$ ). In-hospital mortality rate in spinal and non-spinal fracture patients was similar (8.5% vs 9.3%,  $P = .5$ ).

**CONCLUSION:** Low-level falls often resulted in a spinal fracture at a variety of levels. Vigilance in evaluation of the entire spine in this population is suggested.

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### System issues leading to "found-on-floor" incidents: a multi-incident analysis

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### Abstract

**BACKGROUND:** Although attention to patient safety issues in the home care setting is growing, few studies have highlighted health system-level concerns that contribute to patient safety incidents in the home. Found-on-floor (FOF) incidents are a key patient safety issue that is unique to the home care setting and highlights a number of opportunities for system-level improvements to drive enhanced patient safety.

**METHODS:** We completed a multi-incident analysis of FOF incidents documented in the electronic record system of a home health care agency in Toronto, Canada, for the course of 1 year between January 2012 and February 2013.

**RESULTS:** Length of stay (LOS) was identified as the cross-cutting theme, illustrating the following 3 key issues: (1) in the short LOS group, a lack of information continuity led to missed fall risk information by home care professionals; (2) in the medium LOS group, a lack of personal support worker/carer training in fall prevention led to inadequate fall prevention activity; and (3) in the long LOS group, a lack of accountability policy at a system level led to a lack of fall risk assessment follow-up.

**CONCLUSIONS:** Our study suggests that considering LOS in the home care sector helps expose key system-level issues enabling safety incidents such as FOF to occur. Our multi-incident analysis identified a number of opportunities for system-level changes that might improve fall prevention

practice and reduce the likelihood of FOF incidents in the home. Specifically, investment in electronic health records that are functional across the continuum of care, further research and understanding of the training and skills of personal support workers, and enhanced incentives or more punitive approaches (depending on the circumstances) to ensure accountability in home safety will strengthen the home care sector and help prevent FOF incidents among older people.

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