

**SafetyLit February 10, 2019**

**Associations between daily-living physical activity and laboratory-based assessments of motor severity in patients with falls and Parkinson's disease**

Galperin I, Hillel I, Del Din S, Bekkers EMJ, Nieuwboer A, Abbruzzese G, Avanzino L, Nieuwhof F, Bloem BR, Rochester L, Della Croce U, Cereatti A, Giladi N, Mirelman A, Hausdorff JM. [Parkinsonism Relat. Disord.](#) 2019; ePub(ePub): ePub.

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**Abstract** INTRODUCTION: Recent work suggests that wearables can augment conventional measures of Parkinson's disease (PD). We evaluated the relationship between conventional measures of disease and motor severity (e.g., MDS-UPDRS part III), laboratory-based measures of gait and balance, and daily-living physical activity measures in patients with PD.

**METHODS:** Data from 125 patients (age:  $71.7 \pm 6.5$  years, Hoehn and Yahr: 1-3, 60.5% men) were analyzed. The MDS-UPDRS-part III was used as the gold standard of motor symptom severity. Gait and balance were quantified in the laboratory. Daily-living gait and physical activity metrics were extracted from an accelerometer worn on the lower back for 7 days.

**RESULTS:** In multivariate analyses, daily-living physical activity and gait metrics, laboratory-based balance, demographics and subject characteristics together explained 46% of the variance in MDS-UPDRS-part III scores. Daily-living measures accounted for 62% of the explained variance, laboratory measures 30%, and demographics and subject characteristics 7% of the explained variance. Conversely, demographics and subject characteristics, laboratory-based measures of gait symmetry, and motor symptom severity together explained less than 30% of the variance in total daily-living physical activity. MDS-UPDRS-part III scores accounted for 13% of the explained variance, i.e., <4% of all the variance in total daily-living activity.

**CONCLUSIONS:** Our findings suggest that conventional measures of motor symptom severity do not strongly reflect daily-living activity and that daily-living measures apparently provide important information that is not captured in a conventional one-time, laboratory assessment of gait, balance or the MDS-UPDRS. To provide a more complete evaluation, wearable devices should be considered.

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**Keywords** Accelerometers; Daily-living activity; Digital health; Inertial measurement units; Parkinson's disease; Wearable device

**PDF Y, Endnote Y**

## Before evening falls: perspectives of a good old age and healthy ageing among oldest-old Swedish men

Carstensen G, Rosberg B, Mc Kee KJ, Aberg AC. [Arch. Gerontol. Geriatr.](#) 2019; 82: 35-44.

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### Abstract

The late life experiences of men in the oldest-old age group have been under-researched, and their perspectives on ageing successfully neglected. This study explored the perspectives of oldest-old Swedish men on what a 'good old age' and ageing successfully meant to them. A purposive sample of 17 men, aged 85-90 years, was drawn from the Uppsala Longitudinal Study of Adult Men. An interview guide explored participants' perspectives on their ageing experiences and how they viewed ageing successfully. Participants were interviewed twice, with 1-2 weeks between interviews, and both interviews were recorded and transcribed. Content analysis identified four themes: i) Adaptation, concerning the ability to adapt to growing old with increasing limitations; ii) Sustaining Independence, related to financial resources and good health as the foundation for independence; iii) Belongingness, representing close relationships, established friendships, and the significance of the spouse; and iv) Perspectives of Time, also a common thread in all themes, in which past life experiences create an existential link between the past, the present and the future, establishing continuity of the self and enhancing life satisfaction. The participants presented themselves as active agents involved in maintaining meaning and achieving life satisfaction; a process related to the ability to manage changes in life. Our findings have resonance with models of healthy or successful ageing, but also diverge in important ways, since such models do not consider the significance of an individual's life history for their present well-being, and primarily conceptualise health as an outcome, rather than as a resource.

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### Keywords

Adaptation; Belongingness; Continuity; Independence; Life satisfaction; Men; Older adults; Time; healthy aging

**PDF Y, Endnote Y**

### Changes in physical activity behavior and risk of falls over 8 years' follow-up: English Longitudinal Study of Aging

Smith L, Stubbs B, Hamer M. [Mayo Clin. Proc.](#) 2019; 94(2): 365-367.

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30711135

#### Abstract

[Abstract unavailable]

PDF N, Endnote Y

### Clinical and anatomical predictors for freezing of gait and falls after subthalamic deep brain stimulation in Parkinson's disease patients

Karachi C, Cormier-Dequaire F, Grabli D, Lau B, Belaid H, Navarro S, Vidailhet M, Bardin E, Fernandez-Vidal S, Welter ML. [Parkinsonism Relat. Disord.](#) 2019; ePub(ePub): ePub.

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30704853

#### Abstract

**INTRODUCTION:** Freezing of gait (FOG) and falls are the most disabling motor symptoms in Parkinson's disease (PD) patients. The effects of subthalamic deep-brain-stimulation (STN-DBS) on FOG and falls are still a matter of controversy, and factors contributing to their outcome have yet to be defined.

**METHODS:** We examined the relationship between FOG and falls after STN-DBS and preoperative clinical features, MRI voxel-based-morphometry (VBM) analysis and statistical mapping of electrode locations.

**RESULTS:** 331 patients (age at surgery =  $57.7 \pm 8.4$  years; disease duration =  $12.5 \pm 5$  years) were

included in the final analysis, with VBM analysis in 151 patients. After surgery, FOG was aggravated in 93 patients and falls in 75 patients. After surgery, FOG severity was related to its level before surgery without dopaminergic treatment, the dopaminergic treatment dosage and severity of motor fluctuations after surgery; and falls severity to lower postoperative cognitive performance. VBM analyses revealed that, relative to other patient groups, patients with FOG worsening had putamen grey matter density decrease, and fallers patients a left postcentral gyrus atrophy. The best effects of STN-DBS on FOG and falls were associated with the location of contacts within the STN, but no specific location related to aggravation.

**CONCLUSIONS:** FOG and falls are reduced after STN-DBS in about 1/3 of patients, with the best effects obtained for electrodes located within the STN. Clinicians should be aware that, after STN-DBS, FOG severity is related to preoperative FOG severity whatever its dopa-sensitivity; and falls to lower postoperative cognitive performance; and atrophy of cortico-subcortical brain areas.

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Language: en

### Keywords

Deep brain stimulation; Falls; Freezing of gait; Parkinson's disease; Subthalamic nucleus

**PDF Y, Endnote Y**

### Cognitive-behavioral therapy improves diverse profiles of depressive symptoms in Parkinson's disease

Dobkin RD, Mann SL, Interian A, Gara MA, Menza M. [Int. J. Geriatr. Psychiatry](#) 2019; ePub(ePub): ePub.

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30714202

### Abstract

**OBJECTIVE:** Depression is among the most common and debilitating non-motor complaints in Parkinson's disease (PD), yet there is a paucity of controlled research to guide treatment. Little research has focused on the extent to which specific depressive symptom profiles may dictate unique clinical recommendations to ultimately improve treatment outcomes. The current study examined the impact of Cognitive-Behavioral Therapy (CBT) on different types of depressive symptoms in PD. It was hypothesized that the cognitive (e.g., guilt, rumination, negative attitudes towards self) and behavioral (e.g., avoidance, procrastination) symptoms targeted most intensively by the treatment protocol would show the most robust response. The extent to which stabilized antidepressant use moderated specific symptom change was examined on an exploratory basis.

**METHOD:** Eighty depressed people with PD participated in a randomized controlled trial of CBT plus clinical management, versus clinical management only. Hamilton Depression Rating Scale (HAMD) and Beck Depression Inventory (BDI) subscale scores, reflecting depressive symptom heterogeneity in PD, were the focus of this investigation.

**RESULTS:** CBT response was associated with significant improvements in mood, sleep, anxiety, and somatic symptoms (HAMD), and negative attitudes toward self, performance impairment, and somatic symptoms (BDI). As hypothesized, the largest effect sizes were observed for cognitive and behavioral (vs. somatic) symptoms of depression. Stabilized antidepressant use moderated the effect of CBT on somatic complaints (HAMD, BDI).

**CONCLUSIONS:** CBT may improve a diverse array of depressive symptoms in PD. Cognitive and behavioral (vs. somatic) symptoms showed the greatest change. Combining CBT with antidepressants may help optimize the management of somatic complaints in dPD.

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Language: en

#### **Keywords**

Parkinson's disease; depression; personalized medicine

**PDF Y, Endnote Y**

#### **Cognitive-motor interference in walking after stroke: test-retest reliability and validity of dual-task walking assessments**

Tsang CSL, Chong DYK, Pang MYC. [Clin. Rehabil.](#) 2019; ePub(ePub): ePub.

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30722681

#### **Abstract**

**OBJECTIVE::** To explore the reliability and validity of a series of dual-task mobility assessments among individuals post-stroke.

**DESIGN::** Observational study with repeated measures. **SETTING::** University laboratory.

**PARTICIPANTS::** Thirty community-dwelling individuals with chronic stroke. **INTERVENTIONS::** Not applicable. **MAIN MEASURES::** Each of the two mobility tasks (1-minute level-ground walking with and without obstacle-negotiation) was performed concurrently with each of the eight cognitive tasks (auditory Stroop test, serial subtraction, shopping list recall and category naming at two difficulty levels). Walking distance and obstacle hitting rate (OHR) indicated dual-task mobility performance. Number of correct responses (NCR) indicated cognitive performance. Reaction time was additionally

measured for the auditory Stroop test. Construct validity was examined by correlations between the dual-task assessments. The dual-task assessments were repeated within 7-14 days for test-retest reliability.

**RESULTS:** Excellent test-retest reliability in walking distance and OHR was found (intraclass correlation coefficient, ICC(3,1) = 0.891-0.984,  $P < 0.05$ ). Moderate to excellent reliability was found in NCR and reaction time (ICC(3,1) = 0.480-0.911,  $P < 0.01$ ). Correlations between walking distance were excellent ( $r_s = 0.840-0.985$ ,  $P < 0.01$ ). Correlations of NCR and reaction time between low- and high-level cognitive tasks were mostly moderate to excellent ( $r_s = 0.515-0.793$ ,  $P < 0.01$ ). Generally no significant correlations were found in NCR between the dual-task assessments with different cognitive domains.

**CONCLUSION:** The dual-task walking assessments are reliable and valid for evaluating cognitive-motor interference in community-dwelling individuals post-stroke. The lack of correlations between the tasks of different cognitive domains indicates the need of using different cognitive domains in dual-task walking assessment post-stroke.

Language: en

#### Keywords

Dual-task interference; reliability; stroke; validity; walking

PDF Y, Endnote Y

### Drugs in fall versus non-fall accidents with major trauma - a population-based clinical and medico-legal autopsy study

#### Citation

Acosta S, Andersson L, Bagher A, Wingren CJ. [Forensic Sci. Int.](#) 2019; 296: 80-84.

#### Affiliation

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30710812

#### Abstract

**BACKGROUND:** The main aim of the present population-based study was to compare drugs in fall versus non-fall accidents causing major trauma, including both clinical and medico-legal autopsy data.

**METHODS:** All individuals with accidents resulting in major trauma, a new injury severity score (NISS) > 15 or lethal outcome was identified at hospital and/or the Department of Forensic Medicine between 2011 and 2013. Modified Downton Fall Risk Index ranged from 0 to 7, and was based on specific pharmaceuticals (max 5 points), previous fall (1 point) and cognitive impairment (1 point).

**RESULTS:** One hundred and four individuals with major traumatic accidents were identified, 38 (36.5%) died. The median modified Downton Fall Risk Index was 2 for fall accidents and 0 for non-fall accidents ( $p < 0.001$ ). Modified Downton Fall Risk Index was an age-independent factor associated with fall accident ( $p < 0.001$ ). The medico-legal autopsy rate for in-hospital patients was 50% (6/12) for fatal fall accidents in comparison with 92.3% (12/13) for fatal non-fall accidents ( $p = 0.03$ ). In individuals undergoing medico-legal autopsy, the proportion of individuals with any detected drug was 77% in fall accidents compared to 39% in non-fall accidents ( $p = 0.036$ ). The presence of sedatives ( $p = 0.002$ ) and benzodiazepines ( $p = 0.023$ ) were higher for fall accidents compared to non-fall accidents.

**CONCLUSION:** This population-based study on accidents with major trauma showed that drugs had high impact on fall accidents with major trauma. It seems warranted from a public health perspective to study if implementation of medication review guidelines at hospital managing polypharmacy issues may prevent fall accident recidivism.

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#### Keywords

Fall accident; Forensic toxicology; Major trauma; Medico-legal autopsy; New injury severity score

PDF Y, Endnote Y

#### Effectiveness of DementiAbility Methods: The Montessori Way™ on agitation in long term care home residents with dementia in Hong Kong

Yuen I, Kwok T. [Int. J. Geriatr. Psychiatry](#) 2019; ePub(ePub): ePub.

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30697810

#### Abstract

**OBJECTIVE:** To investigate the effect of the DementiAbility Methods: The Montessori Way™ (DMMW) on agitation in long term care home residents with dementia. The activities using the DMMW are hypothesized to reduce agitation in terms of its frequency and disruptiveness to greater extent than structured social activities as control.

**METHODS:** Forty-six long-term care home residents with dementia were randomly allocated to receive the DMMW ( $n=23$ ) or structured social activities as control ( $n=23$ ). Each participant received 6 intervention sessions of 45 minutes each within 2 weeks, at long-term care home. Agitation in terms of frequency and disruptiveness before and after the intervention were compared.

**RESULTS:** The results showed that the DMMW resulted in significant reduction in overall frequency and disruptiveness of agitation. The DMMW group had significant reduction in frequency and



disruptiveness of verbal aggressive, physical non-aggressive and physical aggressive behaviors after the intervention.

**CONCLUSIONS:** In summary, the present findings support the potential of the DMMW as a safe and efficacious therapeutic intervention for addressing agitation in long-term care home residents with dementia, relevant to Hong Kong culture.

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Language: en

#### Keywords

DementiAbility; Montessori Way™; agitation; dementia; long-term care

#### PDF Y, Endnote Y

### Effects of a fall prevention program in elderly: a pragmatic observational study in two orthopedic departments

#### Citation

Røyset B, Talseth-Palmer BA, Lydersen S, Farup PG. [Clin. Interv. Aging](#) 2019; 14: 145-154.

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#### Abstract

**PURPOSE:** Falls are a common adverse event experienced by elderly in hospitals. This study assessed the effects of a fall prevention program on the rate of fallers, the patient safety culture, and patient-perceived safety.

**MATERIALS AND METHODS:** Two orthopedic departments in different towns in Norway participated in the study. A comprehensive, multifactorial fall prevention program was implemented in one of the departments, the other one was used for control. The changes in the outcomes in the two departments from before to after the intervention were compared. All patients above 64 years of age admitted to the two departments in a 1-year period before and after the intervention were included. All employees at the two departments were invited to participate in surveys measuring the patient safety culture, and a selection of the patients reported patient-perceived safety. The primary outcome was the rate of fallers. Secondary outcomes were the employees' perceived patient safety culture (measured with the Safety Attitudes Questionnaire) and patient-perceived safety (measured



with Norwegian Patient Experience Questionnaire).

**RESULTS:** Falls were registered in 114 out of 3,143 patients (3.6%) with 17,006 days in the hospital. Ten patients had two falls, giving a fall rate of 7.3 falls/1,000 days in the hospital. The number of fallers before and after the intervention in the intervention department were 37/734 (5.04%) and 31/735 (4.22%),  $P=0.46$ , and in the control department, 25/811 (3.08%) and 21/863 (2.43%),  $P=0.46$ . The difference between the changes in the two departments was not statistically significant; 0.17% (95% CI: -2.49 to 2.84;  $P=0.90$ ). There were also no significant differences in the changes in patient safety culture and patient-perceived safety.

**CONCLUSION:** The fall prevention program revealed no significant effect on the rate of fallers, the patient safety culture, or patient-perceived safety.

Language: en

**Keywords:** accident prevention; accidental falls; adverse effects; patient safety; safety culture

**PDF Y, Endnote Y**

### **Effects of Nordic walking training on quality of life, balance and functional mobility in elderly: a randomized clinical trial**

Gomeñuka NA, Oliveira HB, Silva ES, Costa RR, Kanitz AC, Liedtke GV, Schuch FB, Peyré-Tartaruga LA. [PLoS One](#) 2019; 14(1): e0211472.

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#### **Abstract**

**PURPOSE:** There is physiological and biomechanical evidence suggesting a possible advantage of using poles in walking training programs. The purpose of this proof-of-concept study was to test the hypothesis that untrained elderly training Nordic walking for eight weeks will show higher improvements on the functional mobility, quality of life and postural balance than that training without poles; more likely to occur in self-selected walking speed (primary outcome), and the locomotor rehabilitation index than the quality of life, the static balance and the dynamic stability. It was a two-arm randomized sample- and load-controlled study.

**METHODS:** Thirty-three untrained older people were randomly assigned into Nordic walking (n = 16, age: 64.6±4.1 years old) and free walking (n = 17, age: 68.6±3.9 years old) training groups.

**RESULTS:** Improvements in the self-selected walking speed (primary outcome,  $p = 0.011$ , ES = 0.42 95%CI -0.31 to 1.16), locomotor rehabilitation index ( $p = 0.013$ , ES = 0.36; 95%CI -0.39 to 1.10), quality of life ( $p<0.05$ ), static balance ( $p<0.05$ ) and dynamic variability ( $p<0.05$ ) were found in both groups.

**CONCLUSIONS:** The hypothesis was not supported, our findings indicated that after 8 weeks, the Nordic walking training did not result in greater improvements than free walking training for the primary outcome (self-selected walking speed) and most of the secondary outcomes (including locomotor rehabilitation index, static balance, dynamic stability, and psychological and social participation domains of quality of life). TRIAL REGISTRATION: ClinicalTrials.gov NCT03096964.

**PDF Y, Endnote Y**

### **Fall worry restricts social engagement in older adults**

Choi NG, Bruce ML, Dinitto DM, Marti CN, Kunik ME. [J. Aging Health](#)2019; ePub(ePub): ePub.

#### **Affiliation**

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#### **Abstract**

**OBJECTIVE:** To examine cross-sectional and longitudinal associations between (a) activity-limiting fall worry (ALW) and (b) self-reported health-related restrictions and social engagement among older adults.

**METHOD:** The National Health and Aging Trends Study Waves 5 (T1) and 6 (T2) provided data ( n = 6,279). Binary and multinomial logistic regression models were used to examine association of T2 social engagement restrictions with T2 fall worry and association of T1-T2 changes in social engagement restrictions with T1-T2 changes in fall worry.

**RESULTS:** ALW was significantly associated with both informal and formal social engagement restriction at T2. Onset of ALW and continued ALW between T1 and T2 were also significantly associated with newly reported restrictions in both informal and formal social engagement at T2 even controlling for falls incidents and changes in health status and other covariates.

**DISCUSSION:** The findings underscore the importance of reducing fall worry and preventing social disengagement in late life.

Language: en

#### **Keywords**

activity participation; fall worry; falls; fear of falls; social engagement

**PDF Y, Endnote Y**

## Falls after hospital discharge: a randomized clinical trial of individualized multi-modal falls prevention education

Hill AM, McPhail SM, Haines TP, Morris ME, Etherton-Beer C, Shorr R, Flicker L, Bulsara M, Waldron N, Lee DA, Francis-Coad J, Boudville A. [J. Gerontol. A Biol. Sci. Med. Sci.](#) 2019; ePub(ePub): ePub.

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30721940

### Abstract

**BACKGROUND:** Older people are at high risk of falls after hospital discharge. The study aimed to evaluate the effect of providing individualized falls prevention education in addition to usual care on falls rates in older people after hospital discharge compared to providing a social intervention in addition to usual care.

**METHODS:** A randomized clinical trial at three hospitals in Western Australia: participants followed for six months after discharge. Baseline and outcomes measured by assessors masked to group allocation. Participants: aged 60 years and over, admitted for rehabilitation. Eligibility included: cognitively able to undertake education (Abbreviated mental test score >7/10). Intervention: tailored education comprising patient video and workbook, structured discussion and goal setting led by trained therapist. Main outcomes: falls in the six months after discharge; proportion of participants sustaining one or more falls.

**RESULTS:** There were 382 (194 intervention; 188 control) participants [mean age 77.7 (SD 8.7) years]. There were 378 falls (fall rate/1000 patient days, 5.9 intervention; 5.9 control) reported by 164 (42.9%) participants in the six months following hospital discharge; 188 (49.7%) of these falls were injurious. There were no significant differences in falls rates between intervention and control groups: [adjusted IRR, 1.09; 95% CI (0.78 to 1.52)] or the proportion of participants who fell once or more [adjusted OR, 1.37; 95% CI (0.90 to 2.07)].

**CONCLUSIONS:** Providing individualized falls prevention education prior to discharge did not reduce falls at home after discharge. Further research is warranted to investigate how to reduce falls during this high risk transition period.

PDF Y, Endnote Y

## High parathyroid hormone levels are associated with poor balance in older persons: a cross-sectional study

de França NAG, Murthy LS, Phu S, Liberts E, Vogrin S, Araujo Martini L, Duque G. [Maturitas](#) 2019; 121: 57-62.

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30704566

### Abstract

**OBJECTIVES:** A high level of parathyroid hormone (PTH) was recently identified as a risk factor for falling. As balance instability is one of the major risk factors for falls, we aimed to investigate whether high PTH concentrations are associated with poor balance in older persons. **STUDY DESIGN:** Cross-sectional study with 127 community-dwelling older adults (75% female), aged 65-96 years, at the Falls and Fracture Clinic, Western Health-Sunshine Hospital, Melbourne, Australia. Patients with clinical conditions that could affect balance (e.g. Meniere's disease), denosumab users, and those with advanced kidney failure were excluded. **MAIN OUTCOME MEASURES:** We assessed dynamic balance by timed "up and go" (TUG) and four-square step tests, and by gait parameters; and static balance by posturography on a force platform. Blood tests provided values of PTH, vitamin D, calcium, albumin, and creatinine. Standard questionnaires were applied to assess clinical condition, medications and nutritional status, and to screen for depression.

**RESULTS:** For dynamic balance, elevated PTH concentrations resulted in increased time to complete the TUG test ( $\beta = 0.13$ ; 95%CI: 0.01-0.26), indicating worse performance. For static balance, increased PTH was associated with increased instability in the center of pressure while standing with eyes closed on a hard surface ( $\beta = 0.38$ ; 95%CI: 0.03-0.73). Both models were controlled for vitamin D, renal function, nutritional and depressive status, age, sex, and number of medications.

**CONCLUSION:** Increasing concentrations of PTH in this population of older persons had an independent negative association with both static and dynamic balance, which could place them at risk of falls. However, longitudinal studies are still required.

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PDF Y, Endnote Y

### Interrelated neuromuscular and clinical risk factors that contribute to falls

Ward RE, Quach L, Welch SA, Leveille SG, Leritz E, Bean JF. [J. Gerontol. A Biol. Sci. Med. Sci.](#) 2019; ePub(ePub): ePub.

#### Affiliation

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30721929

#### Abstract

**BACKGROUND:** Neuromuscular and clinical factors contribute to falls among older adults, yet the interrelated nature of these factors is not well understood. We investigated the relationships between these factors and how they contribute to falls, which may help optimize fall risk assessment and prevention.

**METHODS:** 365 primary care patients (age=77±7, 67% female) were included from the Boston Rehabilitative Impairment Study of the Elderly. Neuromuscular measures included leg strength and leg velocity, trunk extensor endurance, and knee range of motion. Clinical measures included memory, executive function, depressive symptoms, pain, sensory loss, vision, comorbidity, physical activity, mobility self-efficacy, and psychiatric medication. Factor analysis was used to evaluate clustering of factors. Negative binomial regression assessed the relationship of factors with 3-year fall rate. Interactions were tested to examine whether clinical factors modified the relationship between neuromuscular factors and falls.

**RESULTS:** Three factors emerged: 1) Neuromuscular factors, pain, and self-efficacy; 2) memory; and 3) executive function. Having 3 neuromuscular impairments predicted higher fall rate (IRR [95% CI]: 3.39 [1.82-6.32]) but was attenuated by memory (1.69 [1.10-2.61]), mobility self-efficacy (0.99 [0.98-0.99]), psychiatric medication use (1.54 [1.10-2.14]), and pain (1.13 [1.04-1.23]). Pain modified the relationship between neuromuscular impairment burden (number of neuromuscular impairments) and falls. Having 3 neuromuscular impairments was associated with a higher fall rate in patients with high levels of pain (5.73 [2.46-13.34]) but not among those with low pain.

**CONCLUSIONS:** Neuromuscular impairment burden was strongly associated with fall rate in older adults with pain. These factors should be considered together during fall risk assessment, post fall assessment, and prevention.

**PDF Y, Endnote Y**

## Patients 10 years after total hip arthroplasty have the deficits in functional performance, physical activity, and high fall rate compared to healthy adults

Ninomiya K, Hirakawa K, Ikeda T, Nakura N, Suzuki K. [Phys. Ther. Res.](#) 2018; 21(2): 53-58.

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### Copyright

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### Abstract

**Background** Long-term results in muscle strength, physical activity (PA), and functional improvement after total hip arthroplasty (THA) have not been studied. The purpose of this study was to evaluate the deficits in functional performance, PA, and high fall rate in patient 10 years after THA compared to healthy adults. **Methods** The subjects were 58 patients who underwent primary THA for unilateral hip osteoarthritis 10 years, and 46 healthy adults. Hip abductor strength, balance function (single-leg stance time), Maximal Walking Speed (MWS), fall rate, and PA (IPAQ short ver.) were evaluated. The unpaired t-test and  $\chi^2$  test were used to assess differences between the groups. Statistical significance was set at p value <0.05. **Results** Compared to healthy adults, THA patients had 9.5% less hip abductor muscle strength on the operated side, 42.1% shorter single-leg stance time on the operated side, 14.8% slower MWS, 2.0 times less High-PA group, and 2.8 times higher fall rate (p<0.05). **Conclusion** This study showed that hip abductor muscle strength, gait speed, balance function, and PA were significantly lower in patients 10 years after THA than in healthy adults. Additionally, the fall rate was significantly higher in patients 10 years post-THA than in healthy adults.

Language: en

### Keywords

fall; muscle strength; physical activity; total hip arthroplasty

PDF Y, Endnote Y

## Physical performance predictor measures in older adults with falls-related emergency department visits

### Citation

Pua YH, Matchar DB. [J. Am. Med. Dir. Assoc.](#) 2019; ePub(ePub): ePub.

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**PMID**

30711461

**Abstract**

**OBJECTIVES:** Identifying strong predictors for falls and mobility limitations in older adults with a falls-related emergency department visit is crucial. This study aimed to compare, in this clinical population, the incremental predictive value of the Short Physical Performance Battery (SPPB) component tests for incident falls, injurious falls, and mobility limitations. **DESIGN AND MEASURES:** Prospective cohort study. **SETTING AND PARTICIPANTS:** A total of 323 community-dwelling older adults with a falls-related emergency department visit participated. Baseline physical performance was measured by the SPPB standing balance test, sit-to-stand test, and habitual gait speed test. Six-month prospective fall rate and self-reported mobility limitations at 6 months post baseline assessment were also measured. An injurious fall was defined as a fall for which the participant sought medical attention or that restricted his or her daily activities for at least 48 hours.

**RESULTS:** In multivariable proportional odds analyses adjusted for demographics and clinical covariates, higher levels of full-tandem balance and sit-to-stand performance were significantly associated with fewer incident falls ( $P = .04$  and  $.02$ , respectively) and lower odds of mobility limitations ( $P = .05$  and  $.03$ , respectively) and marginally associated with lower odds of injurious falls ( $P = .06$  and  $.07$ , respectively). Habitual gait speed was the weakest predictor of falls but the strongest predictor (odds ratio 0.24, 95% confidence interval 0.08-0.70;  $P < .001$ ) of mobility limitations.

**CONCLUSIONS/IMPLICATIONS:** In high-fall-risk older adults, the SPPB balance and sit-to-stand tests predicted falls whereas the SPPB gait speed test was adept at predicting mobility limitations. No one test is best across all situations, so the choice of test will depend on the goal of the assessment.

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Language: en

**Keywords:** Falls; balance; disability; gait; injury; older adults

**PDF Y, Endnote Y**

**Polypharmacy, gait performance, and falls in community-dwelling older adults. Results from the Gait and Brain Study**

Montero-Odasso M, Sarquis-Adamson Y, Song HY, Bray NW, Pieruccini-Faria F, Speechley M. [J. Am. Geriatr. Soc.](#) 2019; ePub(ePub): ePub.

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30698285

**Abstract**

**BACKGROUND AND OBJECTIVES:** Polypharmacy, defined as the use of five or more medications, has been repeatedly linked to fall incidence, and recently it was cross-sectionally associated with gait disturbances. Our objectives were to evaluate cross-sectional and longitudinal associations between polypharmacy and gait performance in a well-established clinic-based cohort study. We also assessed whether gait impairments could mediate associations between number of medications and fall incidence.

**DESIGN:** Prospective cohort of community-dwelling older adults, with 5 years of follow-up. **SETTING:** Geriatric clinics in an academic hospital in London, ON, Canada. **PARTICIPANTS:** Community-dwelling older adults aged 65 and older (n = 249; 76.6 ± 8.6 y; 63% women). **MEASUREMENTS:** Number of medications, quantitative spatiotemporal gait parameters, and fall incidence during follow-up.

**RESULTS:** The number of medications was cross-sectionally associated with poor gait performance (slow gait, speed p <.001; higher variability, p <.001; and higher stride, p <.001; step, p = .013, and double support times, p <.001). Prospectively, the number of medications was associated with overall gait decline (odds ratio = 1.23; 95% confidence interval [CI] = 1.13-1.33; p <.001), faster gait decline (hazard ratio = 4.62; 95%CI = 1.82-11.73; p <.001), and higher falls incidence (p = .006). These associations remained true after adjusting for age, sex, and accounting for "confounding by indication bias" by using a comorbidity propensity score adjustment. Each additional medication taken, significantly increased gait decline risk by 12% to 16% and fall incidence risk by 5% to 7%. Mediation analyses revealed that gait impairments in stride length, step length, and step width mediated the strength of the association between medications and fall incidence.

**CONCLUSION:** Polypharmacy was cross-sectionally associated with poor gait performance and longitudinally associated with gait decline and fall incidence. Despite our use of propensity matching, confounding by indication could have influenced the results. Quantitative spatial gait parameters performance mediated the strength of the association between medications and falls, suggesting a role of gait disturbances in the medication-related falls pathway.

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Language: en

**Keywords:** falls; gait; mediation analysis; polypharmacy; prospective study

**Endnote Y, PDF Y**

**Postural sway, falls, and self-reported neuropathy in aging female cancer survivors**

Fino PC, Horak FB, El-Gohary M, Guidarelli C, Medysky ME, Nagle SJ, Winters-Stone KM. [Gait Posture](#) 2019; 69: 136-142.

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30716669

**Abstract**

**BACKGROUND:** Falls are a major public health concern in older adults, and the proportion of older adults that has been diagnosed with cancer is growing. Yet, while falls, peripheral neuropathy, and postural instability are more common in aging cancer survivors, it is unclear how these factors interact. **RESEARCH QUESTION:** Our objective was to examine how components of sway related to self-reported neuropathy and falls.

**METHODS:** Postural sway during static stance was recorded with an inertial sensor (APDM Opal), placed on the lumbar spine region in 434 older female cancer survivors (mean age 63) and 49 healthy older female control subjects (mean age 63). Measures of sway were resolved into principal components that were compared between women with and women without self-reported falls in the previous 6 months and between those with and without self-reported symptoms of peripheral neuropathy.

**RESULTS:** Cancer survivors had worse sway than healthy control subjects in components related to sway magnitude and mediolateral frequency of sway, but no difference in the component related to resultant / AP sway jerk and frequency. Cancer survivors who reported neuropathy were more likely to have higher resultant / AP sway frequencies and jerk than asymptomatic survivors, while survivors who reported a fall were more likely to have lower frequencies of mediolateral sway than non-fallers. Falls were more strongly associated with mediolateral sway in survivors with more severe neuropathy; whereas falls were more strongly associated with resultant / AP sway frequency in survivors with less severe neuropathy. **SIGNIFICANCE:** Postural stability, falls, and neuropathy have complex interactions that can vary across components of postural sway. While the frequency of mediolateral sway was associated with falls across our entire cohort, neuropathy influenced the associations between specific characteristics of sway and falls, which may have implications for fall prevention interventions.

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Language: en

**Keywords:** Balance; Chemotherapy; Mediolateral; Postural stability

**PDF Y, Endnote Y**

**Potentially modifiable factors associated with agitation and aggression in Alzheimer's disease: results of the ICTUS study**

De Mauléon A, Soto M, Ousset PJ, Nourhashemi F, Lepage B, Vellas B. [Int. Psychogeriatr.](#) 2019; ePub(ePub): ePub.

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30714541

**Abstract**

**ABSTRACT** Objectives: To study potentially modifiable factors associated with the severity of agitation or aggression (A/A) symptoms among Alzheimer's disease (AD) patients.

**DESIGN:** Data from the Impact of Cholinergic Treatment Use (ICTUS) study, European longitudinal prospective observational study. **SETTING:** Community dwelling outpatients included in 29 European memory clinics. **PARTICIPANTS:** 1375 participants with probable AD (Mini-Mental State Examination score of 10-26) with an informal caregiver. **MEASUREMENTS:** At baseline and twice yearly over the two-year follow-up, patients underwent comprehensive clinical and neuropsychological assessments: sociodemographic data, cognitive status, functional impairment, and assessment of neuropsychiatric symptoms based on Neuro-Psychiatric Inventory (NPI). The ZARIT scale assessed the caregiver's burden. The variable of interest was the severity of the item of A/A of the NPI. To study factors associated to the severity of A/A symptoms six months later, a multivariate mixed regression model was used.

**RESULTS:** Frequency of A/A symptom varied from 30% to 34% at each visit. Two factors were found to be independently associated with the severity of A/A: (1) the presence of affective disorder (anxiety, depression, and/or irritability) that increased the severity of the A/A by 0.89 point (coefficient:0.89; 95% Confidence Interval (CI) = [0.48,1.30],  $p < 0.001$ ), and (2) a severe caregiver burden that increased the severity of the A/A by 1.08 point (coefficient:1.08; 95% CI = [0.69,1.47],  $p < 0.001$ ).

**CONCLUSION:** Research should evaluate whether the identification and treatment of an affective disorder along with the evaluation and optimal management of the caregiver would have a positive impact on the course of A/A in mild to moderate AD patients.

Language: en

**Keywords:** Alzheimer's disease; affective disorder; agitation/aggression; behavioral and psychological symptoms of dementia; caregiver burden; dementia; factors associated; management; neuro-psychiatric symptoms

**PDF Y, Endnote Y**

**Quality improvement strategies to prevent falls in older adults: a systematic review and network meta-analysis**

Tricco AC, Thomas SM, Veroniki AA, Hamid JS, Cogo E, Striffler L, Khan PA, Sibley KM, Robson R, MacDonald H, Riva JJ, Thavorn K, Wilson C, Holroyd-Leduc J, Kerr GD, Feldman F, Majumdar SR, Jaglal SB, Hui W, Straus SE. [Age Ageing](#) 2019; ePub(ePub): ePub.

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30721919

**Abstract**

**BACKGROUND:** Falls are a common occurrence and the most effective quality improvement (QI) strategies remain unclear.

**METHODS:** We conducted a systematic review and network meta-analysis (NMA) to elucidate effective quality improvement (QI) strategies for falls prevention. Multiple databases were searched (inception-April 2017). We included randomised controlled trials (RCTs) of falls prevention QI strategies for participants aged  $\geq 65$  years. Two investigators screened titles and abstracts, full-text articles, conducted data abstraction and appraised risk of bias independently.

**RESULTS:** A total of 126 RCTs including 84,307 participants were included after screening 10,650 titles and abstracts and 1210 full-text articles. NMA including 29 RCTs and 26,326 patients found that team changes was statistically superior in reducing the risk of injurious falls relative to usual care (odds ratio [OR] 0.57 [0.33 to 0.99]; absolute risk difference [ARD] -0.11 [95% CI, -0.18 to -0.002]). NMA for the outcome of number of fallers including 61 RCTs and 40 128 patients found that combined case management, patient reminders and staff education (OR 0.18 [0.07 to 0.47]; ARD -0.27 [95% CI, -0.33 to -0.15]) and combined case management and patient reminders (OR, 0.36 [0.13 to 0.97]; ARD -0.19 [95% CI, -0.30 to -0.01]) were both statistically superior compared to usual care.

**CONCLUSIONS:** Team changes may reduce risk of injurious falls and a combination of case management, patient reminders, and staff education, as well as case management and patient reminders may reduce risk of falls. Our results can be tailored to decision-maker preferences and availability of resources. **SYSTEMATIC REVIEW REGISTRATION:** PROSPERO (CRD42013004151).

**PDF Y, Endnote Y****Reliability and validity of Fall Efficacy Scale-International in people with Parkinson's disease during on- and off-drug phases**

Mehdizadeh M, Martinez-Martin P, Habibi SA, Fereshtehnejad SM, Abasi A, Niazi Khatoon J, Saneii SH, Taghizadeh G. [Parkinsons Dis.](https://doi.org/10.1155/2019/6505232) 2019; 2019: e6505232.

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30719277

**PMCID**[PMC6334372](#)**Abstract**

**PURPOSE:** Since fear of falling may be one of the main problems in people with Parkinson's disease (PD), its assessment with valid tools is necessary in both drug phases. This study was carried out to investigate the psychometric attributes of the Fall Efficacy Scale-International (FES-I) in people with PD, both in On and Off phases.

**METHODS:** One hundred twenty-four patients with PD (mean age  $\pm$  standard deviation, 60.33  $\pm$  12.59 years) were assessed with the FES-I, both in On- and Off-drug phases. Dimensionality, internal consistency, and test-retest reliability were, respectively, explored by means of factor analysis, Cronbach's alpha, and Intraclass Correlation Coefficient. Convergent validity of FES-I was established with Visual Analog Scale-Fear of Falling, Berg Balance Scale, and Functional Reach Test. Parkinson's Disease Questionnaire-39 and Unified Parkinson Disease Rating Scale-Activities of Daily Living were also applied. Discriminative validity was tested between patients with and without a history of falling.

**RESULTS:** Factor analysis showed two factors for On- and one factor for Off-drug phase. Internal consistency ( $\alpha = 0.96$ , On phase; 0.98, Off phase) and test-retest reliability (0.94; 0.91) were satisfactory in both drug phases. There was a moderate/high correlation ( $r_s = |0.50-0.70|$ ) between FES-I and Visual Analog Scale-Fear of Falling, Berg Balance Scale, and Functional Reach Test. Parkinson's Disease Questionnaire-39 and Unified Parkinson Disease Rating Scale-Activities of Daily Living were achieved in both drug phases too. The sensitivity of FES-I to discriminate Parkinson's disease with and without falls showed moderate effect size in both phases.

**CONCLUSION:** This study verified that FES-I is unidimensional, reliable, and valid to measure the Fear of Falling during On- and Off-drug phases in people with PD.

**PDF Y, Endnote Y****Vitamin D and falls in older African American women: the PODA Randomized Clinical Trial**

Aloia JF, Rubinova R, Fazzari M, Islam S, Mikhail M, Ragolia L. [J. Am. Geriatr. Soc.](#) 2019; ePub(ePub): ePub.

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30698279

**Abstract**

**BACKGROUND:** Limited information is available on the influence of vitamin D on falls in older high-functioning black American women. Endocrine Society guidelines propose serum 25(OH)D levels over 30 ng/mL.

**OBJECTIVE:** To determine if maintenance of serum 25(OH)D above 30 ng/mL protects against falls.

**DESIGN:** The Physical Performance, Osteoporosis and Vitamin D in African American Women (PODA) trial had a prospective, randomized, placebo-controlled, double-dummy design with two arms: one with placebo and one with vitamin D<sub>3</sub> adjusted to maintain serum 25(OH)D above 30 ng/mL. The primary outcomes were the prevention of bone loss and the decline in physical performance.

**PATIENTS:** The target population was healthy black women older than 60 years with serum 25(OH)D between 8 and 26 ng/mL. The trial was 3 years in duration with a falls questionnaire administered every 3 months. A total of 260 women entered the study, and 184 completed the 3 years. Mean age was 68.2 years. **SETTING:** Research center in an academic health center. **MAIN OUTCOMES MEASURE:** Prevention of falls. **INTERVENTION:** Participants were randomly assigned to placebo or active vitamin D. Vitamin D<sub>3</sub> dose was adjusted to maintain serum 25(OH)D above 30 ng/mL in the active group using a double-dummy design.

**RESULTS:** Baseline 25(OH)D was 22 ng/mL. Mean serum 25(OH)D reached 47 ng/mL in the active group compared with 21 ng/mL in the placebo group. There were 14.2% falls in the previous year recalled at baseline. During the study, 46% reported falling in the treatment group compared with 47% in the placebo group. There was no association of serum 25(OH)D or vitamin D dose with the risk of falling.

**CONCLUSIONS:** There is no benefit of maintaining serum 25(OH)D above 30 ng/mL compared with the Institute of Medicine recommendation (20 ng/mL) in preventing falls in healthy older black American women.

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Language: en

**Keywords**”falls; polypharmacy; race; vitamin D

**PDF Y, Endnote Y**

### **Objective measures of rollator user stability and device loading during different walking scenarios**

Costamagna E, Thies SB, Kenney LPJ, Howard D, Lindemann U, Klenk J, Baker R. [PLoS One](#) 2019; 14(1): e0210960.

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30699170



## Abstract

Walking aids are widely used by older adults, however, alarmingly, their use has been linked to increased falls-risk, yet clinicians have no objective way of assessing user stability. This work aims to demonstrate the application of a novel methodology to investigate how the type of walking task, the amount of body weight supported by the device (i.e., device loading), and task performance strategy affect stability of rollator users. In this context, ten users performed six walking tasks with an instrumented rollator. The combined stability margin "SM" was calculated, which considers user and rollator as a combined system. A Friedman Test was used to investigate the effects of task on SM and a least-squares regression model was applied to investigate the relationship between device loading and SM. In addition, the effects of task performance strategy on SM were explored. As a result, it was found that: the minimum SM for straight line walking was higher than for more complex tasks ( $p < 0.05$ ); an increase in device loading was associated with an increase in SM ( $p < 0.05$ ); stepping up a kerb with at least 1 rollator wheel in ground contact at all times resulted in higher SM than lifting all four wheels simultaneously. Hence, we conclude that training should not be limited to straight line walking but should include various everyday tasks. Within person, SM informs on which tasks need practicing, and which strategy facilitates stability, thereby enabling person-specific guidance/training. The relevance of this work lies in an increase in walking aid users, and the costs arising from fall-related injuries.

## Endnote Y, PDF Y

### The relationship between walking speed and step length in older aged patients

Morio Y, Izawa KP, Omori Y, Katata H, Ishiyama D, Koyama S, Yamano Y. [Diseases \(Basel\)](#) 2019; 7(1): e7010017.

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## Abstract

Compared with elderly people who have not experienced falls, those who have were reported to have a shortened step length, large fluctuations in their pace, and a slow walking speed. The purpose of this study was to elucidate the step length required to maintain a walking speed of 1.0 m/s in patients aged 75 years or older. We measured the 10 m maximum walking speed in patients aged 75 years or older and divided them into the following two groups: Those who could walk 1.0 m/s or faster (fast group) and those who could not (slow group). Step length was determined from the number of steps taken during the 10 m-maximum walking speed test, and the step length-to-height ratio was calculated. Isometric knee extension muscle force (kgf), modified functional reach (cm), and one-leg standing time (s) were also measured. We included 261 patients (average age: 82.1 years, 50.6% men) in this study. The fast group included 119 participants, and the slow group included 142 participants. In a regression logistic analysis, knee extension muscle force ( $p = 0.03$ ) and step length-to-height ratio ( $p < 0.01$ ) were determined as factors significantly related to the fast group. As a result of ROC curve analysis, a step length-to-height ratio of 31.0% could discriminate



between the two walking speed groups. The results suggest that the step length-to-height ratio required to maintain a walking speed of 1.0 m/s is 31.0% in patients aged 75 years or older.

Language: en

**Keywords**

elderly patients; maximum walking speed; muscle force; step length

**Endnote Y, PDF Y**