SafetyLit February 18, 2017

36-Item Short Form Survey (SF-36) versus gait speed as predictor of preclinical mobility disability in older women: the women's health initiative

Laddu DR, Wertheim BC, Garcia DO, Woods NF, LaMonte MJ, Chen B, Anton-Culver H, Zaslavsky O, Cauley JA, Chlebowski R, Manson JE, Thomson CA, Stefanick ML.

J. Am. Geriatr. Soc. 2018; ePub(ePub): ePub.

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DOI 10.1111/jgs.15273 **PMID** 29427503

Abstract

OBJECTIVES: To compare the value of clinically measured gait speed with that of the self-reported Medical Outcomes Study 36-item Short-Form Survey Physical Function Index (SF-36 PF) in predicting future preclinical mobility disability (PCMD) in older women.

DESIGN: Prospective cohort study.

SETTING: Forty clinical centers in the United States.

PARTICIPANTS: Women aged 65 to 79 enrolled in the Women's Health Initiative Clinical Trials with gait speed and SF-36 assessed at baseline (1993-1998) and follow-up Years 1, 3, and 6 (N = 3,587).

MEASUREMENTS: Women were categorized as nondecliners or decliners based on changes (from baseline to Year 1) in gait speed and SF-36 PF scores. Logistic regression models were used to estimate incident PCMD (gait speed <1.0 m/s) at Years 3 and 6. Area under the receiver operating characteristic curve (AUC) was used to compare the predictive value of SF-36 PF with that of measured gait speed.

RESULTS: Slower baseline gait speed and lower SF-36 PF scores were associated with higher adjusted odds of PCMD at Years 3 and 6 (all P <.001). For gait speed, decliners were 2.59 times as likely to have developed PCMD as nondecliners by Year 3 and 2.35 times as likely by Year 6. Likewise, for SF-36, decliners were 1.42 times as likely to have developed PCMD by Year 3 and 1.49 times as likely by Year 6. Baseline gait speed (AUC = 0.713) was nonsignificantly better than SF-36 (AUC = 0.705) at predicting PCMD over 6 years (P =.21); including measures at a second time point significantly improved model discrimination for predicting PCMD (all P <.001).

CONCLUSION: Gait speed identified PCMD risk in older women better than the SF-36 PF did, although the results may be limited given that gait speed served as a predictor and to define the PCMD outcome. Nonetheless, monitoring trajectories of change in mobility are better predictors of future mobility disability than single measures.

PDF Y Endnote Y

Axial reflexes are present in older subjects and may contribute to balance responses

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Exp. Brain Res. 2018; ePub(ePub): ePub.

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DOI 10.1007/s00221-018-5193-7 **PMID** 29417172

Abstract

We studied the response to axial taps (mini-perturbations) of a group of 13 healthy older subjects (mean age 63 ± 12 years, 7 females, 6 males), 12 of whom were also studied using larger applied (macro-) perturbations requiring active postural responses. The mini-perturbation consisted of a brief impulsive force produced by a mini-shaker applied to the trunk at the level of the shoulders and anteriorly at the upper sternum which was perceived as a tap. Acceleration, force platform, and EMG measurements were made. The average peak accelerations for the mini-perturbations were 108 mG (anterior) and - 78.9 mG (posterior). Responses overall were very similar to those previously reported for younger subjects: the perturbation evoked short latency responses in leg muscles, modulated by degree and direction of lean, and were largest for the muscle most relevant for the postural correction. The increases in the amplitude for the main agonist were greater than the increase in tonic activity. With both anterior and posterior lean, co-contraction responses were present. The size of the EMG response to the mini-perturbations correlated with the corresponding earliest EMG responses (0-100, 100-200 ms intervals) to the larger postural perturbations, timing which corresponds to balance responses. The balance responses evoked by the larger imposed postural perturbations may, therefore, receive a contribution through the reflex pathway mediating the axial tap responses, whose efferent limb appears to be the reticulospinal tract.

PDF Y Endnote Y

Comprehensive geriatric assessment pilot of a randomized control study in a Swedish acute hospital: a feasibility study

Westgård T, Ottenvall Hammar I, Holmgren E, Ehrenberg A, Wisten A, Ekdahl AW, Dahlin-Ivanoff S, Wilhelmson K.

Pilot Feasibility Stud. 2018; 4: e41.

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DOI 10.1186/s40814-018-0228-1 **PMID** 29423259 **PMCID** PMC5789623

Abstract

BACKGROUND: Comprehensive geriatric assessment (CGA) represent an important component of geriatric acute hospital care for frail older people, secured by a multidisciplinary team who addresses the multiple needs of physical health, functional ability, psychological state, cognition and social status. The primary objective of the pilot study was to determine feasibility for recruitment and retention rates. Secondary objectives were to establish proof of principle that CGA has the potential to increase patient safety.

METHODS: The CGA pilot took place at a University hospital in Western Sweden, from March to November 2016, with data analyses in March 2017. Participants were frail people aged 75 and older, who required an acute admission to hospital. Participants were recruited and randomized in the emergency room. The intervention group received CGA, a person-centered multidisciplinary team addressing health, participation, and safety. The control group received usual care. The main objective measured the recruitment procedure and retention rates. Secondary objectives were also collected regarding services received on the ward including discharge plan, care plan meeting and hospital risk assessments including risk for falls, nutrition, decubitus ulcers, and activities of daily living status.

RESULT: Participants were recruited from the emergency department, over 32 weeks. Thirty participants were approached and 100% (30/30) were included and randomized, and 100% (30/30) met the inclusion criteria. Sixteen participants were included in the intervention and 14 participants

were included in the control. At baseline, 100% (16/16) intervention and 100% (14/14) control completed the data collection. A positive propensity towards the secondary objectives for the intervention was also evidenced, as this group received more care assessments. There was an average difference between the intervention and control in occupational therapy assessment - 0.80 [95% CI 1.06, - 0.57], occupational therapy assistive devices - 0.73 [95% CI 1.00, - 0.47], discharge planning -0.21 [95% CI 0.43, 0.00] and care planning meeting 0.36 [95% CI-1.70, -0.02]. Controlling for documented risk assessments, the intervention had for falls - 0.94 [95% CI 1.08, - 0.08], nutrition - 0.87 [95% CI 1.06, - 0.67], decubitus ulcers - 0.94 [95% CI 1.08, - 0.80], and ADL status - 0.80 [95% CI 1.04, - 0.57].
CONCLUSION: The CGA pilot was feasible and proof that the intervention increased safety justifies carrying forward to a large-scale study. TRIAL REGISTRATION: Clinical Trials ID: NCT02773914. Registered 16 May 2016.
PDF Y Endnote Y

Declining incidence in fall-induced deaths of older adults: Finnish statistics during 1971-2015
Kannus P, Niemi S, Sievänen H, Parkkari
J. Aging Clin. Exp. Res. 2018; ePub(ePub): ePub.
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DOI 10.1007/s40520-018-0898-9 **PMID** 29411330
Abstract
BACKGROUND: Fall-induced deaths of elderly people are a major problem.
AIM AND METHODS: Using the Official Cause-of-Death Statistics of Finland, we aimed to determine the current trends in the number and age-adjusted incidence (per 100,000 persons) of fall deaths among older Finns by taking into account 50 years or older persons who died because of a fall-induced injury in 1971-2015.
RESULTS: Among men, the number of fall-induced deaths increased considerably between 1971 and 2003 (from 162 in 1971 to 564 in 2003), while thereafter, this number has been relatively stable (579 deaths in 2015). Men's age-adjusted incidence of fall deaths rose from 45.6 in 1971 to 69.5 in 1998, after which it stayed relatively stable until 2005 (69.9). Since 2005, this figure has shown a steady, deep decline (only 45.1 in 2015). Among women, the number of fall-induced deaths increased considerably between 1971 and 1998 (from 279 in 1971 to 563 in 1998), while thereafter, this number has been relatively stable (532 deaths in 2015). In sharp contrast to men, women's age-adjusted incidence of fall-induced deaths has been declining since the early 1970s, the incidence being 82.6 in 1971 while only 33.0 in 2015. A steady, deep decline started in 1998.
CONCLUSIONS: Among 50 years or older Finns the number of fall-induced deaths increased considerably from the early 1970s until the late 1990s but stabilized thereafter. In the new millennium, the age-adjusted incidence of these deaths has started to decline in both sexes. Despite this we have to effectively continue the falls prevention efforts, because our elderly population will grow rapidly in the near future.
PDF Y Endnote Y

Effect of a Matter of Balance programme on avoidance behaviour due to fear of falling in older adults

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Psychogeriatr. 2018; ePub(ePub): ePub.

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DOI 10.1111/psyg.12310 **PMID** 29424113

Abstract

BACKGROUND: Fear of falling (FOF) is associated with restricted activities, increased risk of falling, and decreased quality of life. A Matter of Balance (AMOB) is an evidence-based programme designed to decrease FOF. The current study investigated the influence of the AMOB on activity avoidance caused by FOF in older adults using the Fear of Falling Avoidance Behavior Questionnaire (FFABQ), health-related quality of life, and a question regarding concerns about falling.

METHODS: Participants of this quasi-experimental, one-group, pretest-post-test study design were older adults from community sites in the Phoenix, Arizona, metropolitan area. Participants attended the AMOB programme, which consisted of one weekly 2-h session for 8 weeks. At the beginning and end of the programme, participants completed the standard AMOB assessments, the FFABQ, the Centers for Disease Control Core Healthy Days Measure (CDC HRQOL-4), and a question regarding concerns about falling.

RESULTS: Sixty-three participants completed the study; their mean ± SD age was 75.3 ± 7.1 years (range: 60.0-90.0 years), and 84.1% were women. The FFABQ scores decreased from baseline (24.4 ± 12.7 points) to post-AMOB (20.1 ± 11.9 points; t = 2.62, P = 0.01). No changes in any of the CDC HRQOL-4 questions were noted (CDC HRQOL-4 question (Q)1 (z = -1.41, P = 0.16), CDC HRQOL-4 Q2 and Q3 summary index (z = -1.60, P = 0.11), and CDC HRQOL-4 Q4 (z = -0.97, P = 0.33)). Concerns about falling decreased from baseline (3.4 ± 0.9 points) to post-AMOB (2.8 ± 0.8 points; z = -4.09, P < 0.001).

CONCLUSION: Avoidance behaviour caused by FOF, as measured by the FFABQ, and concerns about falling decreased in community-dwelling older adults who participated in the AMOB.

FINDINGS support the efficacy of the AMOB for reducing both avoidance behaviour caused by FOF and concerns about falling through an approach that combines education and exercise.

PDF Y Endnote Y

Experiences of fear of falling in persons with Parkinson's disease - a qualitative study

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BMC Geriatr. 2018; 18(1): e44.

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DOI 10.1186/s12877-018-0735-1 **PMID** 29409443

Abstract

BACKGROUND: Fear of falling is common among persons with Parkinson's disease and is negatively associated with quality of life. However a lack of in-depth understanding of fear of falling as a phenomenon persists. This qualitative study aimed to explore the experiences of fear of falling in persons with Parkinson's disease.

METHODS: Individual interviews were performed with twelve persons with Parkinson's disease (median age 70 years, median Parkinson duration 9 years, 50% women). The interviews were semi-structured and followed a study-specific interview guide. The transcribed interviews were analyzed using qualitative content analysis.
RESULTS: Fear of falling was experienced as a disturbing factor in everyday life. It generated a feeling of vulnerability and made daily activities and everyday environments seem potentially hazardous. Persons also missed performing previous activities. The fear of falling was a varying experience, fueled by an awareness of falls and near falls, Parkinson-related symptoms and disabilities, and by others in their environment. The persons adopted different strategies to handle their fear of falling. Activities were adapted, avoided, performed with help, or carried out despite their fear of falling.
CONCLUSIONS: The experiences of fear of falling were complex, multifaceted and varied over time and in relation to different activities and environments. This indicates that interventions targeting fear of falling need to be individually tailored for persons with Parkinson's disease and should focus on several aspects, such as Parkinson-related symptoms and disabilities, activities and environmental factors. This study provides new information that increases the understanding of fear of falling, which has implications for researchers as well as clinicians working with persons with Parkinson's disease and fear of falling.
PDF Y Endnote Y

Factors influencing survival following hip fracture among octogenarians and nonagenarians in the United States
Bokshan SL, Marcaccio SE, Blood TD, Hayda RA.
Injury 2018; ePub(ePub): ePub.
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DOI 10.1016/j.injury.2018.02.004 **PMID**29426609
Abstract
INTRODUCTION: Hip fractures account for a significant disease burden in the Unites States. With an aging population, this disease burden is expected to increase in the upcoming decades.
MATERIALS AND METHODS: This represents a retrospective cohort study to assess mortality following hip fracture in the octogenarian and nonagenarian populations. Odds ratios for postoperative mortality were constructed using normalized patients from United States Social Security death tables. Kaplan Meier analysis and binary logistic regression were used to assess the impact of surgical delay and medical comorbidity (measured by the Carlson Comorbidity Index (CCI)) on postoperative mortality.
RESULTS: 189 octogenarians and 95 nonagenarians were included. One-year mortality was nearly three times higher for both the octogenarians (OR: 3.1) and nonagenarians (OR: 3.14), and returned to that of the normal population 4 years post-op for octogenarians and 5 years post-op for nonagenarians. Higher preoperative medical comorbidity (CCI) was associated with higher post-op mortality for both octogenarians (log rank = 0.026) and nonagenarians (log rank = 0.034). A 48-h surgical delay resulted in significantly increased postoperative mortality among healthy patients (CCI of 0 or 1, OR: 18.1), but was protective for patients with significant medical comorbidity (CCI ≥ 3). Age, preoperative CCI, and 48-h surgical delay were all independent predictors of 1-year post-op mortality.

CONCLUSIONS: Following hip fracture, there is a 3-fold increase in mortality for octogenarians and nonagenarians at 1 year post-op. A 48-h surgical delay significantly increased mortality for healthier patients but was protective against mortality for sicker patients.

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Fall hazards within senior independent living: a case-control study
Kim D, Portillo M.
HERD 2018; ePub(ePub): ePub.
Affiliation: College of Design, Construction and Planning, University of Florida, Gainesville, FL, USA.

DOI 10.1177/1937586717754185 **PMID**29417846
Abstract
AIM: The main purpose of this research was to identify significant relationships between environmental hazards and older adults' falling.
BACKGROUND: Falls can present a major health risk to older persons. Identifying potential environmental hazard that increases fall risks can be effective for developing fall prevention strategies that can create safer residential environments for older adults.
METHODS: The research included a retrospective analysis of 449 fall incident reports in two case-control buildings. In the homes of 88 older adults residing in independent living, an observational study was conducted to identify environmental hazards using two assessment tools including Westmead Home Safety Assessment (WeHSA) and resident interviews.
RESULTS: A fall history analysis indicated that falls occurred in the bathroom were significantly associated with hospitalization. The observational study revealed that the bathroom was the most common place for environmental hazards. The research showed, with increasing age and use of mobility assistive aids, there was a corresponding increase in the total number of environmental hazards. Home hazards were significantly and independently associated with the incidence rate of falls. In other words, the high fall rate building included more environmental hazards compared to the low fall rate building while controlling for residents' age and mobility.
CONCLUSION: The current study provides empirical evidence of the link between environmental hazards and older adults' falling, which is useful for developing effective fall intervention design strategies.
PDF Y Endnote Y

Fall-risk-increasing drugs: a systematic review and meta-analysis: II. Psychotropics
Seppala LJ, Wermelink AMAT, de Vries M, Ploegmakers KJ, van de Glind EMM, Daams JG, van der Velde N.
J. Am. Med. Dir. Assoc. 2018; ePub(ePub): ePub.
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DOI 10.1016/j.jamda.2017.12.098 **PMID** 29402652
Abstract

BACKGROUND AND OBJECTIVE: Falls are a major public health problem in older adults. Earlier studies showed that psychotropic medication use increases the risk of falls. The aim of this study is to update the current knowledge by providing a comprehensive systematic review and meta-analysis on psychotropic medication use and falls in older adults.
METHODS AND DESIGN: This study is a systematic review and meta-analysis. A search was conducted in Medline, PsycINFO, and Embase. Key search concepts were "falls," "aged," "medication," and "causality." Studies were included that investigated psychotropics (antipsychotics, antidepressants, anxiolytics, sedatives, and hypnotics) as risk factors for falls in participants ≥60 years of age or participants with a mean age of ≥70 years. Meta-analyses were performed using generic inverse variance method pooling unadjusted and adjusted odds ratio (OR) estimates separately.
RESULTS: In total, 248 studies met the inclusion criteria for qualitative synthesis. Meta-analyses using adjusted data showed the following pooled ORs: antipsychotics 1.54 [95% confidence interval (CI) 1.28-1.85], antidepressants 1.57 (95% CI 1.43-1.74), tricyclic antidepressants 1.41 (95% CI 1.07-1.86), selective serotonin reuptake inhibitors 2.02 (95% CI 1.85-2.20), benzodiazepines 1.42 (95%, CI 1.22-1.65), long-acting benzodiazepines 1.81 (95%, CI 1.05-3.16), and short-acting benzodiazepines 1.27 (95%, CI 1.04-1.56) Most of the meta-analyses resulted in substantial heterogeneity that did not disappear after stratification for population and healthcare setting.
CONCLUSIONS: Antipsychotics, antidepressants, and benzodiazepines are consistently associated with a higher risk of falls. It is unclear whether specific subgroups such as short-acting benzodiazepines and selective serotonin reuptake inhibitors are safer in terms of fall risk. Prescription bias could not be accounted for. Future studies need to address pharmacologic subgroups as fall risk may differ depending on specific medication properties. Precise and uniform classification of target medication (Anatomical Therapeutic Chemical Classification) is essential for valid comparisons between studies.

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Fall-risk-increasing drugs: a systematic review and meta-analysis: III. Others
Seppala LJ, van de Glind EMM, Daams JG, Ploegmakers KJ, de Vries M, Wermelink AMAT, van der Velde N.
J. Am. Med. Dir. Assoc. 2018; ePub(ePub): ePub.
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DOI 10.1016/j.jamda.2017.12.099 **PMID** 29402646
Abstract
BACKGROUND AND OBJECTIVE: The use of psychotropic medication and cardiovascular medication has been associated with an increased risk of falling. However, other frequently prescribed medication classes are still under debate as potential risk factors for falls in the older population. The aim of this systematic review and meta-analysis is to evaluate the associations between fall risk and nonpsychotropic and noncardiovascular medications.

METHODS AND DESIGN: A systematic review and meta-analysis. A search was conducted in Medline, PsycINFO, and Embase. Key search concepts were "falls," "aged," "medication," and "causality." Studies were included that investigated nonpsychotropic and noncardiovascular medications as risk factors for falls in participants ≥60 years or participants with a mean age ≥70 years. A meta-analysis was performed using the generic inverse variance method, pooling unadjusted and adjusted odds ratio (OR) estimates separately.
RESULTS: In a qualitative synthesis, 281 studies were included. The results of meta-analysis using adjusted data were as follows (a pooled OR [95% confidence interval]): analgesics, 1.42 (0.91-2.23); nonsteroidal anti-inflammatory drugs (NSAIDs), 1.09 (0.96-1.23); opioids, 1.60 (1.35-1.91); anti-Parkinson drugs, 1.54 (0.99-2.39); antiepileptics, 1.55 (1.25-1.92); and polypharmacy, 1.75 (1.27-2.41). Most of the meta-analyses resulted in substantial heterogeneity that did not disappear after stratification for population and setting in most cases. In a descriptive synthesis, consistent associations with falls were observed for long-term proton pump inhibitor use and opioid initiation. Laxatives showed inconsistent associations with falls (7/20 studies showing a positive association).
CONCLUSION: Opioid and antiepileptic use and polypharmacy were significantly associated with increased risk of falling in the meta-analyses. Long-term use of proton pump inhibitors and opioid initiation might increase the fall risk. Future research is necessary because the causal role of some medication classes as fall-risk-increasing drugs remains unclear, and the existing literature contains significant limitations.

PDF Y Endnote Y

Fear of falling and associated variables in community-dwelling elderly
Akulkwar Isha, Sakina D.
Am. J. Appl. Psychol. 2017; 6(6): 153.

DOI 10.11648/j.ajap.20170606.13 **PMID** unavailable
Abstract
The purpose of this study was to determine the prevalence of fear of falling and its association with fall, avoidance of activity, balance deficits and risk of fall in community-dwelling older individuals. It was a cross-sectional study conducted in general community setting. Fifty community-dwelling elderly (mean age of 77.98 ± 2.83years), ambulatory, without any severe medical conditions participated in the study. Main outcome measures of the study were fear of falling (FOF), fall and activity avoidance assessed through an interview-based questionnaire; balance assessed using Berg Balance Scale (BBS); balance confidence assessed using Activities-specific Balance Confidence (ABC) scale. FOF and associated avoidance of activity was reported by 60% and 52% of the elderly respectively. In subjects reporting FOF, 76% were fallers, 44% being non-fallers. BBS score of the subjects reporting FOF was significantly lower (42.7 ± 10.12) than the subjects without FOF (53.65 ± 3.51). Also, the subjects with FOF had a score below 46, the cut-off point for predicting risk of falling. In subjects having FOF, 56.66% had low risk of falls and 43.33% had medium risk of falls whereas all the subjects with no fear of fall had low risk of falls. Subjects FOF reported a significantly lower balance confidence on ABC scale as compared to subjects without FOF. Thus, it is concluded that FOF and associated avoidance of activity are highly prevalent in the community-dwelling older people. FOF is significantly associated with fall/s, balance deficits with an increased fall risk,

avoidance of activity and low balance confidence in doing activities of daily living. FOF can be considered as a significant health problem of equal importance to a fall. This study highlights the importance of identifying FOF and addressing factors related to it in the rehabilitation of the elderly.
PDF Y Endnote Y

Feasibility of using risk prompts to prevent falls, dehydration and pulmonary aspiration in nursing homes: a clinical study protocol
Duarte M, Bouça-Machado R, Domingos J, Godinho C, Ferreira JJ.
Pilot Feasibility Stud. 2018; 4: e39.
Affiliation: Laboratory of Clinical Pharmacology and Therapeutics, Faculty of Medicine, University of Lisbon, Lisbon, Portugal.

DOI 10.1186/s40814-018-0236-1 **PMID** 29416872 **PMCID** PMC5785817
Abstract
BACKGROUND: Evidence has shown a relationship between dehydration, falls, and pulmonary aspiration among older adults in nursing homes, all of which contribute to loss of independence and quality of life. It is believed that improving communication among healthcare professionals in nursing homes (physicians, nurses, rehabilitation team, psychologist, social workers, dieticians and medical assistants) decreases the number of adverse events in institutionalized patients. This study will evaluate the feasibility of using a set of written signs, designed to caution against the risk of falls, dehydration, and pulmonary aspiration, and will enable the proposal of tailored interventions to manage these events in nursing homes.
METHODS/DESIGN: All patients from Campus Neurológico Sénior (CNS) nursing home, at risk of falls and/ordysphagia and/or dehydration will be invited to participate in the study. Patients will undertake a screeningrisk assessment and the corresponding risk prompts will be attributed. Study duration will be a minimum ofthree months per participant, including daily record of falls, dehydration and pulmonary aspiration eventsand monthly interview assessments, conducted by a member of the research team. Data of the events that occur will be compared with historical data extracted retrospectively from medical and nursing charts. This study has been approved by the Ethics Committee of the Medical Academic Center of Lisbon, Faculty of Medicine, University of Lisbon (Ref. 176/15). All participants will give their written informed consent before entering the study.
DISCUSSION: This study is unique in evaluating the feasibility of a communication system in preventing the three major risks in nursing home. Thoughtful selection and display of proper risk prompts in nursing homes could be an essential step along a path toward efficient communication of risks among healthcare teams. We expect that the displays will be easily applicable given their simplicity, low complexity, and minimal physical requirements. TRIAL REGISTRATION: NCT03123601. March 7, 2017. Retrospectively registered.
PDF Y Endnote Y

Finding balance: optimizing medication prescribing in older patients
Sponsler KC, Mixon AS.
Cleve. Clin. J. Med. 2018; 85(2): 136-137.
Affiliation: Geriatric Research Education and Clinical Center, VA Tennessee Valley Healthcare System, Nashville, TN, USA.

(Copyright © 2018, Cleveland Clinic Educational Foundation)
DOI 10.3949/ccjm.85a.17087 **PMID** 29425084
Abstract [Abstract unavailable]
PDF Y Endnote Y

Four Square Step Test with foam is more accurate than those without foam for discriminating between older adults with and without fall history

Mathurapongsakul P, Siriphorn A.
J. Aging Phys. Act. 2018; ePub(ePub): ePub.
Affiliation: Department of Physical Therapy, Faculty of Allied Health Sciences, Chulalongkorn University, Thailand.

DOI 10.1123/japa.2017-0363 **PMID** 29431557
Abstract
OBJECTIVE: The aim was to compare the use of the four square step test (FSST) and the four square step test with foam surface (FSST+foam) scores for discriminating between adults, faller older adults, and non-faller older adults.
METHODS: Fifty-four participants (18 for each group) were assessed using the FSST and FSST+foam. The area under the curve (AUC) of receiver operating characteristic curve was calculated and used to compare the accuracy of the tests.
RESULTS: The FSST+foam was more accurate than FSST for discriminating between faller and non-faller older adults (AUCs were 0.765 and 0.725, respectively.) and between non-faller older adults and adults (AUCs were 0.99 and 0.95, respectively.). The cutoff score for discriminating between faller and non-faller older adults was 11.21, with sensitivity and specificity of 0.889 and 0.611, respectively.
CONCLUSION: FSST+foam could be used as an alternative assessment for discriminating between adults, faller and non-faller older adults.
PDF Y Endnote Y

Frailty versus Stopping Elderly Accidents, Deaths and Injuries Initiative Fall Risk Score: ability to predict future falls

Crow RS, Lohman MC, Pidgeon D, Bruce ML, Bartels SJ, Batsis JA.
J. Am. Geriatr. Soc. 2018; ePub(ePub): ePub.
Affiliation: Dartmouth Institute for Health Policy and Clinical Research, Lebanon, New Hampshire.

DOI 10.1111/jgs.15275 **PMID** 29427525
Abstract
OBJECTIVES: To compare the ability of frailty status to predict fall risk with that of community fall risk screening tools.
DESIGN: Analysis of cross-sectional and longitudinal data from NHATS.
SETTING: National Health and Aging Trend Study (NHATS) 2011-2015.
PARTICIPANTS: Individuals aged 65 and older (N = 7,392).
MEASUREMENTS: Fall risk was defined according to the Stopping Elderly Accidents, Deaths and Injuries (STEADI) initiative. Frailty was defined as exhaustion, weight loss, low activity, slow gait speed, and weak grip strength. Robust was defined as meeting 0 criteria, prefrailty as 1 or 2 criteria,

and frailty as 3 or more criteria. Falls were self-reported and ascertained using NHATS subsequent rounds (2012-2015). We compared the ability of frailty to predict future falls with that of STEADI score, adjusting for age, race, sex, education, comorbidities, hearing and vision impairment, and disability.
RESULTS: Of the 7,392 participants (58.5% female), there 3,545 (48.0%) were classified as being at low risk of falling, 2,966 (40.1%) as being at moderate risk, and 881 (11.9%) as being at high risk. The adjusted risk of falling over the 4 subsequent years was 2.5 times as great for the moderate-risk group (hazard ratio (HR) = 2.50, 95% confidence interval (CI) = 2.16-2.89) and almost 4 times as great (HR = 3.79, 95% CI = 2.76-5.21) for the high-risk group as for the low-risk group. Risk of falling was greater for those who were prefrail (HR = 1.34, 95% CI 1.16-1.55) and frail (HR = 1.20, 95% CI = 0.94-1.54) than for those who were robust.
CONCLUSION: STEADI score is a strong predictor of future falls. Addition of frailty status does not improve the ability of the STEADI measure to predict future falls.

PDF Y Endnote Y

Gait adaptations of older adults on an uneven brick surface can be predicted by age-related physiological changes in strength

Dixon PC, Schütte KH, Vanwanseele B, Jacobs JV, Dennerlein JT, Schiffman JM.
Gait Posture 2018; 61: 257-262.
Affiliation: Liberty Mutual Research Institute for Safety, Hopkinton, USA.

DOI 10.1016/j.gaitpost.2018.01.027 **PMID** 29413794

Abstract
BACKGROUND: Outdoor falls in community-dwelling older adults are often triggered by uneven pedestrian walkways. It remains unclear how older adults adapt to uneven surfaces typically encountered in the outdoor built-environment and whether these adaptations are associated to age-related physiological changes.
RESEARCH QUESTION: The aims of this study were to (1) compare gait parameters over uneven and flat brick walkways, (2) evaluate the differences between older and young adults for these two surfaces, and (3) assess if physiological characteristics could predict adaptations in older adults.
METHODS: Balance, strength, reaction-time, full-body marker positions, and acceleration signals from a trunk-mounted inertial measurement unit were collected in seventeen older (71.5 ± 4.2 years) and eighteen young (27.0 ± 4.7 years) healthy adults to compute lower-limb joint kinematics, spatio-temporal parameters, dynamic stability, and accelerometry-derived metrics (symmetry, consistency, and smoothness).
RESULTS: Both groups increased hip flexion at foot-strike, while decreasing ankle dorsiflexion, margin of stability, symmetry, and consistency on the uneven, compared to flat, surface. Older, compared to young, adults showed a larger increase in knee flexion at foot-strike and a larger decrease in smoothness on the uneven surface. Only young adults decreased hip abduction on the uneven surface. Strength, not balance nor reaction-time, was the main predictor of hip abduction in older adults on both surfaces. SIGNIFICANCE: While older adults may be especially vulnerable, uneven surfaces negatively impact gait, irrespective of age, and could represent a risk to all pedestrians.

PDF Not yet available Endnote Y

Gait speed and dynamic stability decline accelerates only in late life: a cross-sectional study in community-dwelling older adults

Lee A, Bhatt T, Smith-Ray RL, Wang E, Pai YC.

J. Geriatr. Phys. Ther. 2018; ePub(ePub): ePub.

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DOI 10.1519/JPT.0000000000000171 **PMID** 29406322

Abstract

BACKGROUND AND PURPOSE: Incidence of falls increases with age whereas gait speed declines. The purposes of this study were to examine (1) whether gait speed and center-of-mass (COM) velocity declined steadily across ages in a linear fashion among community-dwelling older adults, and (2) whether such decline corresponded to the similar decline in dynamic stability, which is governed by the control of their COM position and COM velocity relative to base of support (BOS).

METHODS: A total of 184 community-dwelling older adults (≥65 years) participated in the cross-sectional study. The participants were categorized into 5 age groups (65-69, 70-74, 75-79, 80-84, and 85+ years) and were asked to walk on the 7-m walkway at their preferred walking speed. Their speed, gait pattern, relative COM position, and relative COM velocity were measured.

RESULTS: Very close relationship was confirmed between a clinical gait speed measurement and the COM velocity (R = 0.875, P <.05), which enabled us to use the 2 terms interchangeably. Gait speed decline was not noticeable from 65 to 84 years of age (P >.05), but it accelerated after 85 years of age. This decline was most likely influenced by a reduction in both step length (P <.05) and cadence (P <.05). Similarly, dynamic stability against backward loss of balance changed little between 65 and 84 years of age (P >.05). Yet, it declined significantly after 85 years of age (P <.05), primarily affected by the reduction in the COM velocity relative to the BOS, whereby the COM position relative to the BOS remained constant during their walking.

CONCLUSION: Expected steady decline in gait speed and in the control of gait stability cannot be confirmed. Rather, we found that both declined precipitously only after 85 years of age, when the risk of falls is likely to increase correspondingly.

PDF Y Endnote Y

Is the word 'Osteoporosis' a reason for kinesiophobia?

Gunendi Z, Eker D, Tecer D, Karaoglan B.

Eur. J. Phys. Rehabil. Med. 2018; ePub(ePub): ePub.

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DOI 10.23736/S1973-9087.18.04931-6 **PMID** 29422485

Abstract

BACKGROUND: Osteoporosis is a systemic skeletal disease that causes weakening of the bones which increases the risk of fractures. Especially hip fractures lead to substantial physical,

psychological, social and economic burden both for the patients and the governments. Excercises and physically active life style are essential preventive and therapeutic approaches for osteoporosis. Kinesiophobia is an irrational fear of movement due to the belief of susceptibility to injury. It is associated with lower levels of physical activity. Having a diagnosis of osteoporosis without an adequate education about the disease may lead to kinesiophobia in patients due to an illogical belief about increasing possibility of falls and related fractures during physical activity.
AIM: To evaluate relationship between the diagnosis of osteoporosis and kinesiophobia.
DESIGN: Case-control study.
SETTING: Rheumatology Division, Rehabilitation Department, University Hospital.
POPULATION: Fifty four subjects with osteoporosis and fifty four healthy subjects who were age- and gender-matched.
METHODS: Demographic data of subjects (age, gender, weight, height, body mass index, disease duration) were recorded. The Tampa Kinesiophobia Scale (TKS) was applied to determine the level of fear of movement. Hospital Anxiety and Depression Scale (HADS) was used to evaluate mood status. The Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO-41) was performed to assess health related quality of life. Scores were compared between groups by Mann Whitney U test. Correlation between kinesiophobia and QUALEFFO-41 scores was performed by Spearman rank correlation.
RESULTS: Subjects with osteoporosis had higher level of kinesiophobia than healthy control subjects. There was no significant difference in HADS scores between the groups. QUALEFFO-41 total score was worse in subjects with osteoporosis than those in healthy subjects. There was a significant correlation between QUALEFFO-41 total score and kinesiophobia score in subjects with osteoporosis.
CONCLUSIONS: Subjects with osteoporosis have higher levels of kinesiophobia compared to age and gender-matched healthy subjects. Kinesiophobia may affect the quality of life in subjects with osteoporosis.
CLINICAL REHABILITATION IMPACT: As physical activity is essential for bone and general health, individuals should be educated and counseled about osteoporosis and the importance of physical activity to overcome kinesiophobia.
PDF Y Endnote Y

Longitudinal associations between serum 25-hydroxyvitamin D, physical activity, knee pain and dysfunction and physiological falls risk in community-dwelling older adults
Balogun S, Winzenberg T, Wills K, Scott D, Jones G, Callisaya M, Aitken D.
Exp. Gerontol. 2018; ePub(ePub): ePub.
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DOI 10.1016/j.exger.2018.01.026 **PMID** 29421606
Abstract
AIMS: To describe the longitudinal associations between physiological falls risk, and between-person and within-person effects of 25-hydroxyvitamin D (25OHD), physical activity (PA), knee pain and dysfunction in community-dwelling older people.
METHODS: Data for 1053 participants (51% women; mean age 63 ± 7.4 years) studied at baseline, 2.5, 5, and 10 years were analysed. Falls risk (Z-score) was measured using the Physiological Profile

Assessment. Knee pain and dysfunction were assessed using the Western Ontario and McMaster Universities Osteoarthritis index (WOMAC). Moderate-to-vigorous PA (MVPA) was measured using accelerometer. Linear mixed-effect regression models, with adjustment for confounders, were used to estimate the association between physiological falls risk and between-person and within-person effects of PA, 25OHD and WOMAC score.
RESULTS: Between-person effects showed that 10-year average physiological falls risk was lower in participants who had a higher 10-year average 25OHD (β = -0.005 per nmol/l, 95% CI: -0.008, -0.002), log-MVPA (β = -0.16 per minute, 95% CI: -0.22, -0.10) and lower mean WOMAC score (β = 0.005 per-unit score, 95% CI: 0.003, 0.01). Within-person effects showed that a higher physiological falls risk at any time-point was associated with higher than average WOMAC score (β = 0.002 per-unit score, 95% CI: 0.0003, 0.004) and lower than average log-MVPA (β = -0.15 per minute, 95% CI: -0.24, -0.06), but not 25OHD, at the same time-point.
CONCLUSION: Having higher WOMAC global score above an individual's average increases the risk of falling, whereas, increasing one's own MVPA level further reduces their risk of falling. The presence of between-person but not within-person associations for 25OHD suggests the former may be confounded by other factors.

PDF Y Endnote Y

Lumbopelvic pain and threats to walking ability in well-functioning older adults: findings from the Baltimore Longitudinal Study of Aging

Simonsick EM, Aronson B, Schrack JA, Hicks GE, Jerome GJ, Patel KV, Studenski SA, Ferrucci L.
J. Am. Geriatr. Soc. 2018; ePub(ePub): ePub.
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DOI 10.1111/jgs.15280 **PMID** 29411349

Abstract

OBJECTIVES: To examine the potential contribution of severity of lumbopelvic pain (LPP) in well-functioning older adults to poorer walking efficiency, lack of endurance, slower gait speed, and decline in these mobility parameters over 1 to 5 years.
DESIGN: Longitudinal analysis of Baltimore Longitudinal Study of Aging data.
SETTING: National Institute on Aging, Clinical Research Unit, Baltimore, Maryland.
PARTICIPANTS: Well-functioning men and women aged 60 to 89 (N=878).
MEASUREMENTS: An interviewer-administered questionnaire was used to ascertain reported presence and severity of back and hip pain in the preceding 12 months and reported walking ability, including ease of walking a mile. Certified examiners assessed usual gait speed, the energetic cost of walking (oxygen consumption, mL per kg/m), and time taken to walk 400 m as quickly as possible. Covariates included sex, age, age-squared, race, height, weight, exercise, and smoking.
RESULTS: Overall, 31.4% had mild LPP, and 15.7% had moderate to severe LPP. In adjusted analyses, reported walking ability (p<.001), endurance walk performance (p=.007), and energetic cost of walking (p=.049) were worse with increasing LPP severity. Usual gait speed did not vary according to LPP (p=.31). Longitudinally, over an average 2.3 years, persons with new or sustained LPP had worse follow-up level, greater mean decline, and higher likelihood of meaningful decline in reported walking ability than persons free of LPP or whose LPP resolved. Walking performance did not differ according to LPP follow-up status.

CONCLUSION: LPP was common in well-functioning older adults and was associated with greater energetic cost of walking and poorer perceived and observed walking endurance. The longitudinal effect of LPP is unclear, but worsening perception of walking ability and its contribution to future mobility loss warrants further attention.

PDF Y Endnote Y

Progressive resistance and balance training for falls prevention in long-term residential aged care: a cluster randomized trial of the Sunbeam program

Hewitt J, Goodall S, Clemson L, Henwood T, Refshauge K.
J. Am. Med. Dir. Assoc. 2018; ePub(ePub): ePub.
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DOI 10.1016/j.jamda.2017.12.014 **PMID** 29402651

Abstract

BACKGROUND: Falls prevention is an international priority, and residents of long-term aged care fall approximately 3 times more often than community dwellers. There is a relative scarcity of published trials in this setting.
OBJECTIVES: Our objective was to undertake a randomized controlled trial to test the effect of published best practice exercise in long-term residential aged care. The trial was designed to determine if combined high level balance and moderate intensity progressive resistance training (the Sunbeam Program) is effective in reducing the rate of falls in residents of aged care facilities.
METHOD: A cluster randomized controlled trial of 16 residential aged care facilities and 221 participants was conducted. The broad inclusion criterion was permanent residents of aged care. Exclusions were diagnosed terminal illness, no medical clearance, permanent bed- or wheelchair-bound status, advanced Parkinson's disease, or insufficient cognition to participate in group exercise. Assessments were taken at baseline, after intervention, and at 12 months. Randomization was performed by computer-generated sequence to receive either the Sunbeam program or usual care. A cluster refers to an aged care facility. INTERVENTION: The program consisted of individually prescribed progressive resistance training plus balance exercise performed in a group setting for 50 hours over a 25-week period, followed by a maintenance period for 6 months. OUTCOME MEASURES: The primary outcome measure was the rate of falls (number of falls and days followed up). Secondary outcomes included physical performance (Short Physical Performance Battery), quality of life (36-item Short-Form Health Survey), functional mobility (University of Alabama Life Space Assessment), fear of falling (Falls Efficacy Scale International), and cognition (Addenbrooke's Cognitive Evaluation-revised).
RESULTS: The rate of falls was reduced by 55% in the exercise group (incidence rate ratio = 0.45, 95% confidence interval 0.17-0.74); an improvement was also seen in physical performance (P = .02). There were no serious adverse events.
CONCLUSION: The Sunbeam Program significantly reduced the rate of falls and improved physical performance in residents of aged care. This finding is important as prior work in this setting has returned inconsistent outcomes, resulting in best practice guidelines being cautious about recommending exercise in this setting. This work provides an opportunity to improve clinical practice and health outcomes for long-term care residents.

PDF Y Endnote Y

The physical capabilities underlying timed "Up and Go" test are time-dependent in community-dwelling older women
Coelho-Junior HJ, Rodrigues B, de Oliveira Gonçalves I, Asano RY, Uchida MC, Marzetti E.
Exp. Gerontol. 2018; ePub(ePub): ePub.
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DOI 10.1016/j.exger.2018.01.025 **PMID** 29410234
Abstract
Timed 'Up and Go' (TUG) has been widely used in research and clinical practice to evaluate physical function and mobility in older adults. However, the physical capabilities underlying TUG performance are not well elucidated. Therefore, the present study aimed at investigating a selection of physical capacities underlying TUG performance in community-dwelling older women. Four hundred and sixty-eight apparently healthy older women independent to perform the activities of daily living (mean age: 65.8 ± 6.0 years) were recruited from two specialized healthcare centers for older adults to participate in the study. Volunteers had their medical books reviewed and underwent evaluations of anthropometric data as well as physical and functional capacities. Pearson's correlation results indicate that TUG performance was significantly associated with upper (i.e., handgrip strength) and lower (i.e., sit-to-stand) limb muscle strength, balance (i.e., one-leg stand), lower limb muscle power (i.e., countermovement jump), aerobic capacity (i.e., 6-minute walk test), and mobility (i.e., usual and maximal walking speeds). When the analyses were performed based on TUG quartiles, a larger number of physical capabilities were associated with TUG >75% in comparison with TUG <25%. Multiple linear regression results indicate that the variability in TUG (~20%) was explained by lower limb muscle strength (13%) and power (1%), balance (4%), mobility (2%), and aerobic capacity (<1%), even after adjusted by age and age plus body mass index (BMI). However, when TUG results were added as quartiles, a decrease in the impact of physical capacities on TUG performance was determined. As a whole, our findings indicate that the contribution of physical capabilities to TUG performance is altered according to the time taken to perform the test, so that older women in the lower quartiles - indicating a higher performance - have an important contribution of lower limb muscle strength, while volunteers in the highest quartile demonstrate a decreased dependence on lower limb muscle strength and an increased contribution of other physical capabilities, such as lower limb muscle power and balance.

PDF Y Endnote Y

The state of knowledge on technologies and their use for fall detection: a scoping review
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Int. J. Med. Inform. 2018; 111: 58-71.
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DOI 10.1016/j.ijmedinf.2017.12.015 **PMID** 29425635

Abstract

BACKGROUND: Globally, populations are aging with increasing life spans. The normal aging process and the resulting disabilities increase fall risks. Falls are an important cause of injury, loss of independence and institutionalization. Technologies have been developed to detect falls and reduce their consequences but their use and impact on quality of life remain debatable. Reviews on fall detection technologies exist but are not extensive. A comprehensive literature review on the state of knowledge of fall detection technologies can inform research, practice, and user adoption.
OBJECTIVES: To examine the extent and the diversity of current technologies for fall detection in older adults.
METHODS: A scoping review design was used to search peer-reviewed literature on technologies to detect falls, published in English, French or Spanish since 2006. Data from the studies were analyzed descriptively.
RESULTS: The literature search identified 3202 studies of which 118 were included for analysis. Ten types of technologies were identified ranging from wearable (e.g., inertial sensors) to ambient sensors (e.g., vision sensors). Their Technology Readiness Level was low (mean 4.54 SD 1.25; 95% CI [4.31, 4.77] out of a maximum of 9). Outcomes were typically evaluated on technological basis and in controlled environments. Few were evaluated in home settings or care units with older adults. Acceptability, implementation cost and barriers were seldom addressed.
CONCLUSIONS: Further research should focus on increasing Technology Readiness Levels of fall detection technologies by testing them in real-life settings with older adults.

PDF Y Endnote Y

Biomechanical and physiological age differences in a simulated forward fall on outstretched hands in women

Lattimer LJ, Lanovaz JL, Farthing JP, Madill S, Kim SY, Robinovitch S, Arnold CM.
Clin. Biomech. 2018; 52: 102-108.
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DOI 10.1016/j.clinbiomech.2018.01.018 **PMID** 29407858

Abstract

BACKGROUND: Falling on the outstretched hands, a protective mechanism to arrest the body and avoid injury, requires upper limb and trunk motor control for effective body descent. Older women are particularly susceptible to injury from a forward fall, but the biomechanical and physiological (e.g., muscle strength) factors related to this increased risk are poorly understood. Determining age differences in the modifiable neuromuscular factors related to a forward fall landing and descent could help to inform injury prevention strategies. The purpose was to investigate age related differences in upper extremity strength and fall arrest strategy differences during a simulated fall and to evaluate the relationships between muscle strength and biomechanical variables.

METHODS: Nineteen younger (mean age 23.0 yrs., SD 3.8) and 16 older (mean age 68.2 yrs., SD 5.3) women performed five trials of simulated falls. Biomechanical measures and electromyographic muscle activity were recorded during the descents. Concentric, isometric and eccentric strength of the non-dominant upper limb was measured via a dynamometer using a customized protocol.
FINDINGS: Older women demonstrated lower concentric elbow extension strength compared to younger women ($p = 0.002$). Landing strategies differed where younger women had significantly greater elbow joint angle ($p = 0.006$) and velocity ($p = 0.02$) at impact. Older women demonstrated diminished capacity to absorb energy and control descent on outstretched hands compared to younger women ($p = 0.001$).
INTERPRETATION: The landing strategy used by older women along with decreased energy absorption may increase risk of fall-related injury and increase the likelihood of trunk or head impact with the ground.

PDF Y Endnote Y

Cognitive performance under motor demands - on the influence of task difficulty and postural control

Liebherr M, Weiland-Breckle H, Grewe T, Schumacher PB.
Brain Res. 2018; ePub(ePub): ePub.
Affiliation: University of Cologne, Department of German Language and Literature I, Cologne, Germany.

DOI 10.1016/j.brainres.2018.01.025 **PMID** 29409797

Abstract

We often walk around when we have to think about something, but suddenly stop when we are confronted with a demanding cognitive task, such as calculating 1540∗24. While previous neurophysiological research investigated cognitive and motor performance separately, findings that combine both are rare. To get a deeper understanding of the influence of motor demands as well as the difficulty of a simultaneously performed cognitive task, we investigated 20 healthy individuals. Participants performed two cognitive tasks with different levels of difficulty while sitting or standing on one leg. In addition to behavioral data, we recorded the electroencephalogram from 26Ag/AgCI scalp electrodes. The critical time-windows, predefined by visual inspection, yielded an early (200-300 ms, P2) and a subsequent positivity (350-500 ms, P3). Statistical analysis of the early time window registered a motor x cognition interaction. Resolution of this interaction revealed an effect of the cognitive task in the one-legged stance motor condition, with a more pronounced positivity for the difficult task. No significant differences between cognitive tasks emerged for the simple motor condition. The time-window between 350 and 500 ms registered main effects of the motor task and a trend for the cognitive task. While the influence of cognitive task difficulty (in the P3) is in accordance with previous studies, the motor task effect is specific to one-legged stance (cf. no effects for running in previous research). The motor-cognition interaction found in the P2 indicates that the more difficult motor task (one-legged stance) facilitates cognitive task performance.

PDF Y Endnote Y

Conceptual definitions of indicators for the nursing outcome "Knowledge: Fall Prevention"

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Rev. Bras. Enferm. 2018; 71(2): 431-439.

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DOI 10.1590/0034-7167-2016-0686 **PMID** 29412303

Abstract

OBJECTIVE: to construct conceptual definitions for indicators of nursing outcome Knowledge: Fall Prevention, selected for evaluation of hospitalized patients with the nursing diagnosis Risk for falls.

METHOD: integrative literature review performed in the LILACS, MEDLINE and Web of Science databases, comprising articles published in English, Spanish and Portuguese languages from 2005 to 2015.

RESULTS: the final sample of the study was composed of 17 articles. The conceptualizations were constructed for 14 indicators of nursing outcome Knowledge: Fall Prevention focused on hospitalized patients.

CONCLUSION: the theoretical support of the Nursing Outcomes Classification (NOC), through the process of constructing the conceptual definitions of the indicators of its results, allows nurses to accurately implement this classification in clinical practice and to evaluate the effectiveness of their interventions through the change of the patients' status over time.

PDF Y Endnote Y

Impacts of freezing of gait on forward and backward gait in Parkinson's disease

Son M, Cheon SM, Youm C, Kim Y, Kim JW.

Gait Posture 2018; 61: 320-324.

Affiliation: Department of Neurology, School of Medicine, Dong-A University, Busan, Republic of Korea.

DOI 10.1016/j.gaitpost.2018.01.034 **PMID** 29413804

Abstract

Freezing of gait (FOG) is a major risk factor for falls and fall-related injuries in patients with Parkinson's disease (PD). The characteristics of gait in PD patients with FOG have been studied but remain controversial. To investigate gait characteristics of FOG in PD, this study analyzed the forward and backward walking of patients with PD. Twenty-six patients with PD were recruited [age: 71.0 ± 6.2 years, Hoehn and Yahr stage: 2-3 (median 2.5)]. Based on responses to the New Freezing of Gait Questionnaire, we classified patients into either the "freezer" or "non-freezer" group. Spatiotemporal and kinematic analyses of forward and backward walking were completed using a three-dimensional motion analysis system over an 8 m walkway in the defined "off" state. There was no difference in demographic and clinical characteristics between the freezers (n = 10) and non-freezers (n = 16). Analysis of forward walking revealed no between-group differences, except for faster walking speed among the non-freezers. During backward walking, the freezers exhibited slower walking speed, shorter stride length, and increased asymmetry of step length. Kinematic analysis of backward walking revealed smaller range of motion in hip and ankle joints and lower step height in freezers. Further investigations of backward walking might expand our understanding of the pathophysiology of FOG in patients with PD.

PDF Y Endnote Y

Motor learning in people with Parkinson's disease: implications for fall prevention across the disease spectrum

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Gait Posture 2018; 61: 311-319.
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DOI 10.1016/j.gaitpost.2018.01.026 **PMID** 29413803
Abstract
BACKGROUND: Falls are a significant burden for people with Parkinson's disease (PD), however, individuals across the spectrum of disease severity respond differently to fall prevention interventions. Despite the multifactorial causes of falls in people with PD, recent work has provided insight into interventions that hold promise for fall prevention. Further, studies have begun to identify patient characteristics that may predict responsiveness to such interventions.
RESEARCH QUESTION: We discuss (i) the postural motor learning abilities of people with mild versus severe PD that could affect their ability to benefit from fall prevention interventions, (ii) how people with different severity of PD respond to such interventions, and (iii) the practical considerations of providing effective fall prevention interventions for people with PD across the spectrum of disease severity.
METHODS: This narrative review consolidates recent work on postural motor learning and fall prevention rehabilitation involving exercise in people with PD.
RESULTS: People with PD are able to improve postural motor control through practice, enabling them to benefit from exercise which challenges their gait and balance to reduce falling. Worsening of axial and cognitive symptoms may result in diminished learning, and those with more severe PD may require fully supervised, high intensity programs to reduce falls. SIGNIFICANCE: Understanding how people with PD across the spectrum of disease severity differ in their postural motor learning ability and response to different fall prevention interventions will enable researchers and clinicians to refine such interventions and their delivery to minimize falls and their negative sequelae in people with PD.

PDF Y Endnote Y

Pre-operative risk factors for postoperative falls in persons with hip or knee arthroplasty: a longitudinal study of data from the Osteoarthritis Initiative

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Arch. Phys. Med. Rehabil. 2018; ePub(ePub): ePub.
Affiliation: Associate Professor, Department of Orthopaedic Surgery, VCU Health, 1200 E. Marshall St. Department of Orthopaedic Surgery, Box 980153, Richmond, VA.

DOI 10.1016/j.apmr.2017.12.030 **PMID** 29407516

Abstract
OBJECTIVE: The primary purpose was to identify preoperative risk factors associated with post-hospitalization falls over an approximate 2-year postoperative period in patients undergoing hip and knee arthroplasty.
DESIGN: The study utilized a longitudinal cohort design.
SETTING: Participants were recruited from communities surrounding four urban university-based medical centers.
PARTICIPANTS: All participants underwent hip or knee arthroplasty over a 9-year study period and were followed yearly in the Osteoarthritis Initiative study.
MAIN OUTCOME MEASURE: The primary outcome measure was a self-reported history of falls over the two-year postoperative period. A fall was recorded when the participant reported landing on the floor or ground. Preoperative predictors of falls derived from prior evidence included preoperative fall history, depressive symptom severity, narcotic use, age, activity level and comorbidity. Multinomial regression analysis was applied to determine factors that predicted either a single fall or multiple falls during a two-year postoperative period.
RESULTS: Preoperative predictors of multiple postoperative falls were a preoperative history of falling, depressive symptoms and hip versus knee arthroplasty. Patients with hip arthroplasty were more than twice as likely (Odds Ratio = 2.26, 95% CI = 1.21, 4.20) as patients with knee arthroplasty to have multiple self-reported falls in the first two postoperative years. No predictors were found for persons who reported falling only once postoperatively.
FINDINGS were generally supported in a sensitivity analysis.
CONCLUSIONS: Clinicians involved with the pre-and postoperative care of persons undergoing hip or knee arthroplasty can use these findings to inform fall risk screening and intervention delivery to reduce fall risk in patients who are at risk for multiple falls following hip or knee arthroplasty.

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Predicting falls in multiple sclerosis: do electrophysiological measures have a better predictive accuracy compared to clinical measures?
Chinnadurai SA, Gandhirajan D, Srinivasan AV, Kesavamurthy B, Ranganathan LN, Pamidimukkala V.
Mult. Scler. Relat. Disord. 2018; 20: 199-203.
Affiliation: Lalitha Super Specialty Hospital, Kothapet, Guntur 522001, Andhra Pradesh, India.

DOI 10.1016/j.msard.2018.01.027 **PMID** 29414299
Abstract
BACKGROUND: The risk of falls in people with Multiple Sclerosis (MS) is much greater than that of the general population due to impaired coordination, gait, sensation, muscle tone, strength, and cognition. These MS related falls hamper the day to day living of these individuals and are one of the prime factors aggravating the disease related morbidity. The fear of falling itself may make these individuals more dependent and hinder their professional and leisurely activities. Hence, the significance of identifying individuals who are at risk of falling and instituting preventive counter-measures cannot be overemphasized. Various simple clinical tests and questionnaires have been recommended for this purpose, but are far from ideal.
OBJECTIVE: The objective was to find accurate measures to predict a future fall in MS patients. We also aimed to enquire about the prevalence of falls in MS population and its clinical profile which

included detailed history about the past falls, Expanded disability status scale (EDSS) scores, Timed 25 foot walk (T25FW) scores, Activities specific balance confidence (ABC) scores, Falls efficacy scale international (FESI) scores, Multiple Sclerosis Walking Scale 12 (MSWS12) questionnaire.
DESIGN/METHODS: This was a prospective cohort study conducted at the Institute of Neurology, Chennai from January 2015 to August 2017. MS patients of any subtype attending Neurology OPD satisfying revised 2010 McDonald criteria were recruited. 134 subjects with MS consented to participate in this study and 113 of them who met the criteria were included. Baseline history was obtained about the number of falls in the previous year. EDSS, T25FW, ABC, FESI, and MSWS12 scores were obtained at the baseline. VEMP and SEP tests were done and the baseline P13/N23 cVEMP latencies, N10 oVEMP latency, and P37 lower limb SEP latency were obtained. These subjects were followed up for one year and were enquired if they had fallen during that period and the number of falls was recorded. Logistic regression models were used to compute the area under receiver operating characteristic curve (AUC) for each variable tested. Pearson correlation coefficients were calculated for each variable with the number of future falls.
RESULTS: Among the 113 patients, 72% (n = 81) had one or more falls during follow-up. Among all variables tested P13 cervical VEMP latency had the highest predictive accuracy (AUC = 0.820) followed by N10 ocular VEMP latency (AUC = 0.794) and P37 SEP latency (AUC = 0.732). P13 latency also had the highest correlation coefficient (R = 0.689, R2 = 0.475) with the number of future falls.
CONCLUSION: P13, N10 and P37 latencies were the most accurate in predicting a future fall when compared to clinical measures.

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Process evaluation of a participatory organizational change program to reduce musculoskeletal and slip, trip and fall injuries
Van Eerd D, Ferron EM, D'Elia T, Morgan D, Ziesmann F, Amick BC.
Appl. Ergon. 2018; 68: 42-53.
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DOI 10.1016/j.apergo.2017.10.015 **PMID** 29409654
Abstract
BACKGROUND: Long-term care (LTC) workers are at significant risk for occupational-related injuries. Our objective was to evaluate the implementation process of a participatory change program to reduce risk.
METHODS: A process evaluation was conducted in three LTC sites using a qualitative approach employing structured interviews, consultant logs and a focus group.
ESULTS: Findings revealed recruitment/reach themes of being "voluntold", using established methods, and challenges related to work schedules. Additional themes about dose were related to communication, iterative solution development, participation and engagement. For program fidelity and satisfaction, themes emerged around engagement, capacity building and time demands.
CONCLUSION: Process evaluation revealed idiosyncratic approaches to recruitment and related challenges of reaching staff. Solutions to prioritized hazards were developed and implemented, despite time challenges. The iterative solution development approach was embraced. Program

fidelity was considered good despite early program time demands. Post implementation reports revealed sustained hazard identification and solution development.

PDF Endnote

Risk for injuries and accidents in epilepsy: a prospective population-based cohort study
Mahler B, Carlsson S, Andersson T, Tomson T.
Neurology 2018; ePub(ePub): ePub.
Affiliation: From the Department of Clinical Neuroscience (B.M., T.T.) and the Epidemiology Unit of the Institute of Environmental Medicine (B.M., S.C.), Karolinska Institutet; and Center for Occupational and Environmental Medicine (T.A.), Stockholm County Council, Sweden.

DOI 10.1212/WNL.0000000000005035 **PMID** 29386275
Abstract
OBJECTIVE: To study the risk for injuries/accidents in people with newly diagnosed epileptic seizures in relation to comorbidities.
METHODS: Between September 1, 2001, and August 31, 2008, individuals in northern Stockholm with incident unprovoked seizures (epilepsy; n = 2,130) were included in a registry. For every epilepsy patient, 8 individuals matched for sex and inclusion year (n = 16,992) were randomly selected as references from the population of the catchment area. Occurrence of injuries/accidents was monitored through the national patient and cause of death registers until December 31, 2013. These registers also provided information on comorbidities (e.g., brain tumor, stroke, psychiatric disease, diabetes mellitus).
RESULTS: Injury/accident was demonstrated in 1,033 epilepsy cases and 6,202 references (hazard ratio [HR] 1.71, 95% confidence interval 1.60-1.83). The excess risk was seen mainly during the first 2 years after diagnosis. Sex and educational status had no significant effect on HR. The risk was normal in children but increased in adults. Highest HR was seen for drowning, poisoning, adverse effect of medication, and severe traumatic brain injury. Compared to references without comorbidities, HR was 1.17 (1.07-1.28) in epilepsy without comorbidities, 4.52 (4.18-4.88) in references with comorbidities, and 7.15 (6.49-7.87) in epilepsy with comorbidities.
CONCLUSION: Presence of comorbidities should be considered when counseling patients with newly diagnosed epilepsy concerning risk for injuries/accidents. Early information is important, as the risk is highest during the first 2 years following seizure onset.

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Symptomatic orthostatic hypotension in Parkinson's disease patients: prevalence, associated factors and its impact on balance confidence
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Abstract

BACKGROUND: Orthostatic hypotension (OH) is a commonly reported sign of the cardiovascular autonomic dysfunctions associated with Parkinson's disease (PD). Patients might suffer from a variety of the clinical symptoms of OH, including dizziness, lightheadedness, or problems with vision and fatigue.

OBJECTIVES: To determine the prevalence of, and factors associated with, symptomatic orthostatic hypotension (OH) in Parkinson's disease (PD) and to identify any relationships between the clinical symptoms of OH and balance confidence in this patient population.

METHODS: Symptomatic OH was defined as a systolic or diastolic BP fall of ≥20 or ≥10mmHg respectively, within 3min of standing and an Orthostatic Hypotension Questionnaire (OHQ) score of more than zero. Factors related to symptomatic OH were identified from a multivariate logistic regression analysis. Pearson's correlation test was used to reveal any relationships between the clinical symptoms of OH and a patient's confidence in their ability to balance, assessed using the Activities-specific Balance Confidence (ABC) scale.

RESULTS: 100 Thai PD patients were consecutively recruited into this study. The prevalence of symptomatic OH was 18%, asymptomatic OH was 4%, while 78% were patients without OH. Factors associated with symptomatic OH were age (OR, 95%CI: 1.06, 1.003-1.115, p=0.038) and hypertension (OR, 95%CI: 6.16, 1.171-32.440, p=0.032). A significant and negative correlation (r=-0.229, p=0.022) between OHQ composite scores and item 3 of the ABC scale (picking up slippers from floor), one of the movements in a vertical orientation, was found.

CONCLUSION: Elderly PD patients and with a co-morbidity of essential hypertension should be closely evaluated for the presence of symptomatic OH. In addition, they should be advised to change positions slowly, especially those in a vertical orientation.

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Test-retest reliability of daily life gait speed as measured by smartphone global positioning system

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Abstract

BACKGROUND: Gait speed is useful in predicting adverse health outcomes among older adults. In previous studies, gait speed has typically been measured when subjects walk in laboratory settings, where they are able to intentionally change their gait speed. Thus, it is unclear whether the gait speed captured in a laboratory setting is representative of the subjects' actual walking pace in daily life.

RESEARCH QUESTION: This study proposes using the more accurate "daily life gait speed" (DGS), measured as the subject's average gait speed over a week-long period using the global positioning system (GPS) in their smartphone. We examined the test-retest reliability of the DGS measure in the present study.

METHODS: Three daily life gait parameters with 186 volunteers (57 men and 129 women), aged 19 to 84 years, were measured using a smartphone application: DGS, average of daily gait cycle during a

week (DCY), and average of daily cadence during a week (DCA). Test-retest reliability of the daily gait parameters between test week (T1) and retest week (T2) was assessed with the intraclass correlation coefficient, ICC (2,1), and systematic biases were observed via Bland-Altman plots. RESULTS: The ICCs between the daily gait parameters at T1 and T2 were 0.902 for DGS, 0.916 for DCY, and 0.917 for DCA. The Bland-Altman plots showed no significant fixed or proportional bias between the measurements at T1 and T2. SIGNIFICANCE: These results verify that the test-retest reliability of the daily gait parameters in the present study was adequate.

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Temporal trends in fall rates with the implementation of a multifaceted fall prevention program: persistence pays off
Walsh CM, Liang LJ, Grogan T, Coles C, McNair N, Nuckols TK.
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Abstract
BACKGROUND: Most fall prevention programs are only modestly effective, and their sustainability is unknown. An academic medical center implemented a series of fall prevention interventions from 2001 to 2014.
METHODS: The medical center's series of fall prevention interventions were as follows: reorganized the Falls Committee (2001), started flagging high-risk patients (2001), improved fall reporting (2002), increased scrutiny of falls (2005), instituted hourly nursing rounds (2006), reorganized leadership systems (2007), standardized fall prevention equipment (2008), adapted to a move to a new hospital building (2008), routinely investigated root causes (2009), mitigated fall risk during hourly nursing rounds (2009), educated patients about falls (2011), and taught nurses to think critically about risk (2012). To evaluate temporal trends in falls and injury falls, piecewise negative binomial regression with study unit-level random effects was used to analyze structured validated data sets available since 2003.
RESULTS: From July 2003 through December 2014, the crude fall rate declined from 3.07 to 2.22 per 1,000 patient days, and injury falls declined from 0.77 to 0.65 per 1,000 patient days. Nonsignificant increases in falls occurred after nurses started rounding hourly and after the move to the new hospital. On the basis of regression models, significant declines occurred after nurses began to mitigate fall risk during hourly rounds ($p = 0.009$).
CONCLUSION: Instituting incremental changes for more than a decade was associated with a meaningful (about 28%) and sustained decline in falls, although the rate of decline varied over time. Hospitals interested in reducing falls but concerned about competing clinical and financial priorities may find an incremental approach to be effective.

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