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A review of adverse outcomes associated with psychoactive drug use in nursing home residents with dementia

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Drugs Aging 2016; ePub(ePub): ePub.

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DOI 10.1007/s40266-016-0414-x **PMID** 27812994

Abstract

Treatment guidelines generally recommend careful assessment and non-pharmacological treatment approaches for behavioural and psychological symptoms of dementia. However, the inappropriate use of psychoactive drugs in patients with dementia in nursing homes is still prevalent. The aim of this narrative review is to summarise and criticize the most recent data investigating the adverse outcomes related to psychoactive drug use, specifically antipsychotics, antidepressants and benzodiazepines, in patients with dementia living in nursing homes. Searches of PubMed(®) and Web of Science(®) identified 790 potentially relevant articles, 23 of which were retained in this review. All studies investigated adverse outcomes of antipsychotics compared with non-use, or with antidepressants and/or benzodiazepine anxiolytic or hypnotic drugs. Several studies focused on the comparison between atypical and conventional antipsychotics, risperidone often being the reference. The most frequently reported outcomes were mortality (all-cause or cardiovascular), falls and/or fractures, and cardiovascular or cerebrovascular events. Overall, for mortality or falls, the highest risk is for benzodiazepines, followed by conventional antipsychotics, antidepressants and atypical antipsychotics. Whatever the drug, the patient must be carefully monitored during the first days of treatment, which needs to be initiated at the lowest possible dose and for the shortest duration. In light of the high risk of adverse outcomes (falls, cardiovascular events, infections, mortality) for patients with dementia living in nursing homes, all drugs must be carefully prescribed. However, further studies comparing pharmacological with non-pharmacological interventions, with a realistic consideration of the structural nursing home organisation, would be welcome.

PDF Endnote Y

Complicated fall in a 78-year-old lady

Looby S, Royston D, Brett F.

Brain Pathol. 2017; 27(1): 109-110.

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DOI 10.1111/bpa.12462 **PMID** 28032416

Abstract [Abstract unavailable]

PDF Y Endnote Y

Effectiveness of Senior Dance on risk factors for falls in older adults (DanSE): a study protocol for a randomised controlled trial

Franco MR, Sherrington C, Tiedemann A, Pereira LS, Perracini MR, Faria CR, Pinto RZ, Pastre CM.

BMJ Open 2016; 6(12): e013995.

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DOI 10.1136/bmjopen-2016-013995 **PMID** 28039296
Abstract

INTRODUCTION: Strong evidence shows that exercise is effective to improve fall risk factors among older people. However, older people's participation and adherence to exercise programmes is suboptimal. Type of exercise and apathy are reported to be barriers to exercise participation, suggesting that new effective interventions are needed. The primary aim of this randomised controlled trial is to investigate the effect of Senior Dance plus brief education for falls prevention on balance among people aged 60 years or over, compared with a control group receiving only brief education.

METHODS AND ANALYSIS: This single-blind randomised controlled trial will involve 82 community-dwelling older people aged 60 years or over who are cognitively intact. Participants allocated to the intervention group will attend a single educational class on strategies to prevent falls, and will participate in a 12-week, twice-weekly group-based programme of Senior Dance. The Senior Dance consists of different choreographies, which include rhythmic and simple movements with rhythmic folk songs. Participants allocated to the control group will attend the same educational class that intervention group participants will receive, and will be instructed not to take part in any regular exercise programme. The primary outcome will be single-leg stance with eyes closed. Secondary outcomes include: Short Physical Performance Battery, Falls Efficacy Scale, Trail Making Test and the Montreal Cognitive Assessment. Continuous outcomes will be reported using mean (SD) or median (IQR), depending on the distribution of the data. The linear regression approach to analysis of covariance will be used to compare the mean effect between groups. All patients will be included in the analyses following an intention-to-treat approach. ETHICS AND DISSEMINATION: Ethics approval has been granted by the Human Ethics Committee of the São Paulo State University (CAAE 48665215.9.0000.5402). Outcomes will be disseminated through publication in peer-reviewed journals and presentations at conferences. TRIAL REGISTRATION NUMBER: NCT02603523, Pre-results.

PDF Y Endnote Y

Elderly fall risk prediction based on a physiological profile approach using artificial neural networks

Razmara J, Zaboli MH.
Health Informatics J. 2016; ePub(ePub): ePub.
Affiliation: University of Tabriz, Iran.

DOI 10.1177/1460458216677841 **PMID** 28050920
Abstract

Falls play a critical role in older people's life as it is an important source of morbidity and mortality in elders. In this article, elders fall risk is predicted based on a physiological profile approach using a multilayer neural network with back-propagation learning algorithm. The personal physiological profile of 200 elders was collected through a questionnaire and used as the experimental data for learning and testing the neural network. The profile contains a series of simple factors putting elders at risk for falls such as vision abilities, muscle forces, and some other daily activities and grouped

into two sets: psychological factors and public factors. The experimental data were investigated to select factors with high impact using principal component analysis. The experimental results show an accuracy of ≈90 percent and ≈87.5 percent for fall prediction among the psychological and public factors, respectively. Furthermore, combining these two datasets yield an accuracy of ≈91 percent that is better than the accuracy of single datasets. The proposed method suggests a set of valid and reliable measurements that can be employed in a range of health care systems and physical therapy to distinguish people who are at risk for falls.

PDF Y Endnote Y

Enhancing elderly health examination effectiveness by adding physical function evaluations and interventions

Li CM, Chang CI, Yu WR, Yang W, Hsu CC, Chen CY.

Arch. Gerontol. Geriatr. 2016; 70: 38-43.

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DOI 10.1016/j.archger.2016.12.009 **PMID** 28042985

Abstract

This study aimed to assess the benefit of adding physical function evaluations and interventions to routine elderly health examination. This is a Quasi-experimental controlled trial. 404 elderly adults (aged 70 and over) scoring 3-6 on the Canadian Study of Health and Aging Clinical Frailty Scale Chinese In-Person Interview Version (CSHA-CFS) in a 2012 annual elderly health examination were enrolled. Both the control and experimental groups received the routine annual health examination with the latter further provided with functional evaluations, exercise instruction, and nutrition education. 112 (84.8%) persons in the experiment group and 267 (98.2%) in the control group completed the study. CSHA-CFS performance of the experimental group was more likely to improve (odds ratio=9.50, 95% confidence interval (CI)=4.62-19.56) and less likely to deteriorate (OR=0.04, 95% CI=0.01-0.31) one year after intervention. Within the experimental group, Fried Frailty Index improvement percentage surpassed the deterioration percentage (29.5% vs. 0.9%, p<0.001), five-meter walk speed rose from 1.0±0.2 to 1.2±0.2m/s (p<0.001), grip strength escalated from 22.3±7.1 to 24.8±6.7kg (p<0.001), Short-form Physical Performance Battery increased from 10.0±1.6 to 11.6±0.9 (p<0.001), and timed up and go test decreased from 10.9±2.9 to 8.9±2.7s (p<0.001). However, no statistical difference was detected in composite adverse endpoints, including hospitalization, emergency department visit and falls, between the two groups, though the incidence was higher in the control group. Adding functional evaluations, exercise and nutrition interventions to the annual elderly health examination appeared to benefit the health of adults aged 70 years and older.

PDF Y Endnote Y

Epidemiology and recent trends of geriatric fractures presenting to the emergency department for United States population from year 2004-2014

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Public Health 2017; 142: 64-69.
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DOI 10.1016/j.puhe.2016.10.018 **PMID** 28057200
Abstract
OBJECTIVES: Fractures in geriatric age group (over 65 years of age) are an important public health issue and frequent causes of emergency room visits. The purpose of this descriptive epidemiological study was to present the epidemiology of geriatric fractures and their trends in the USA using National Electronic Injury Surveillance System (NEISS) database from year 2004-2014.
METHODS: National Electronic Injury Surveillance System (NEISS) Database was queried for all fracture injuries from 2004 to 2014 for ages 65 years and above. The proportions of fractures based on NEISS national estimates were calculated and their trends using linear regression over last 11 years were studied.
RESULTS: Lower trunk (pelvis, hip and lower spine) fractures were the most common (34% for year 2014) type of fractures in this age group. Upper trunk (upper spine, clavicle and ribs) fractures were the second most common type of fractures (13% for year 2014). Other body parts commonly fractured involved the upper arm and wrist with an average of 7% fractures in both during the study period. About 5% of geriatric fractures pertained to shoulder and upper leg. Although less common, there was also about 2% increase in fractures to face and neck in 2014 as compared to about 3.2% and 1% respectively in 2004. Fractures to other body parts were less common with no major variations during the study period.
CONCLUSIONS: Overall, lower trunk (hip, pelvic and lower spine) fractures were the most common geriatric fractures followed by upper trunk (upper spine, clavicle and rib) fractures. We suggest that there were decreasing trends for incidence of lower trunk, wrist and upper body fractures over the last 11 years (2004-2014). Approximately half of the geriatric fractures presenting to Emergency Department needed hospitalizations.

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Fear of falling and its association with life-space mobility of older adults: a cross-sectional analysis using data from five international sites
Auais M, Alvarado B, Guerra R, Curcio C, Freeman EE, Ylli A, Guralnik J, Deshpande N.
Age Ageing 2017; ePub(ePub): ePub.
Affiliation: School of Rehabilitation Therapy, Queen's University, Kingston, Ontario, Canada.

DOI 10.1093/ageing/afw239 **PMID** 28043980
Abstract
BACKGROUND: fear of falling (FOF) is a major health concern among community-dwelling older adults that could restrict mobility.
OBJECTIVE: to examine the association of FOF with life-space mobility (i.e. the spatial area a person moves through in daily life) of community-dwelling older adults from five diverse sites.
METHODS: in total, 1,841 older adults (65-74 years) were recruited from Kingston, Canada; Saint-Hyacinthe, Canada; Tirana, Albania; Manizales, Colombia and Natal, Brazil. FOF was assessed using the Fall Efficacy Scale-International (FES-I total score), and the life space was quantified using the

Life-Space Assessment (LSA), a scale that runs from 0 (minimum life space) to 120 (maximum life space) RESULTS: the overall average LSA total score was 68.7 (SD: 21.2). Multiple-linear regression analysis demonstrated a significant relationship of FOF with life-space mobility, even after adjusting for functional, clinical and sociodemographic confounders (B = -0.15, 95% confidence interval (CI) -0.26 to -0.04). The FOF × site interaction term was significant with a stronger linear relationship found in the Canadian sites and Tirana compared with the South American sites. After adjusting for all confounders, the association between FOF with LSA remained significant at Kingston (B = -0.32, 95% CI -0.62 to -0.01), Saint-Hyacinthe (B = -0.81, 95% CI -1.31 to -0.32) and Tirana (B = -0.57, 95% CI -0.89 to -0.24).
CONCLUSION: FOF is an important psychological factor that is associated with reduction in life space of older adults in different social and cultural contexts, and the strength of this association is site specific. Addressing FOF among older adults would help improve their mobility in local communities, which in turn would improve social participation and health-related quality of life.

PDF Y Endnote Y

Gait performance trajectories and incident disabling dementia among community-dwelling older Japanese

Taniguchi Y, Kitamura A, Seino S, Murayama H, Amano H, Nofuji Y, Nishi M, Yokoyama Y, Shinozaki T, Yokota I, Matsuyama Y, Fujiwara Y, Shinkai S.
J. Am. Med. Dir. Assoc. 2016; ePub(ePub): ePub.
Affiliation: Research Team for Social Participation and Community Health, Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan.

DOI 10.1016/j.jamda.2016.10.015 **PMID** 28049615
Abstract
OBJECTIVES: Initial gait speed is a good predictor of dementia in later life. This prospective study used repeated measures analysis to identify potential gait performance trajectory patterns and to determine whether gait performance trajectory patterns were associated with incident disabling dementia among community-dwelling older Japanese.
DESIGN: A prospective, observational, population-based follow-up study.
SETTING: Japan, 2002 to 2014. PARTICIPANTS: A total of 1686 adults without dementia (mean [SD] age, 71.2 [5.6] years; women, 56.3%) aged 65 to 90 years participated in annual geriatric health assessments during the period from June 2002 through July 2014. The average number of follow-up assessments was 3.9, and the total number of observations was 6509.
MEASUREMENTS: Gait performance was assessed by measuring gait speed and step length at usual and maximum paces. A review of municipal databases in the Japanese public long-term care insurance system revealed that 196 (11.6%) participants developed disabling dementia through December 2014.
RESULTS: We identified 3 distinct trajectory patterns (high, middle, and low) in gait speed and step length at usual and maximum paces in adults aged 65 to 90 years; these trajectory patterns showed parallel declines among men and women. After adjusting for important confounders, participants in the low trajectory groups for gait speed and step length at usual pace were 3.46 (95% confidence interval 1.88-6.40) and 2.12 (1.29-3.49) times as likely to develop incident disabling dementia,

respectively, as those in the high trajectory group. The respective values for low trajectories of gait speed and step length at maximum pace were 2.05 (1.02-4.14) and 2.80 (1.48-5.28), respectively.
CONCLUSIONS: Regardless of baseline level, the 3 major trajectory patterns for gait speed and step length tended to show similar age-related changes in men and women in later life. Individuals with low trajectories for gait speed and step length had a higher dementia risk, which highlights the importance of interventions for improvements in gait performance, even among older adults with low gait performance.

PDF Y Endnote Y

Pathway from delirium to death: potential in-hospital mediators of excess mortality
Dharmarajan K, Swami S, Gou RY, Jones RN, Inouye SK.
J. Am. Geriatr. Soc. 2016; ePub(ePub): ePub.
Affiliation: Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

DOI 10.1111/jgs.14743 **PMID** 28039852
Abstract
OBJECTIVES: (1) To determine the relationship of incident delirium during hospitalization with 90-day mortality; (2) to identify potential in-hospital mediators through which delirium increases 90-day mortality.
DESIGN: Analysis of data from Project Recovery, a controlled clinical trial of a delirium prevention intervention from 1995 to 1998 with follow-up through 2000.
SETTING: Large academic hospital. PARTICIPANTS: Patients ≥70 years old without delirium at hospital admission who were at intermediate-to-high risk of developing delirium and received usual care only.
MEASUREMENTS: (1) Incident delirium; (2) potential mediators of delirium on death including use of restraining devices (physical restraints, urinary catheters), development of hospital acquired conditions (HACs) (falls, pressure ulcers), and exposure to other noxious insults (sleep deprivation, acute malnutrition, dehydration, aspiration pneumonia); (3) death within 90 days of admission.
RESULTS: Among 469 patients, 70 (15%) developed incident delirium. These patients were more likely to experience restraining devices (37% vs 16%, P <.001), HACs (37% vs 12%, P <.001), other noxious insults (63% vs 49%, P =.03), and 90-day mortality (24% vs 6%, P <.001). The inverse probability weighted hazard of death due to delirium was 4.2 (95% CI = 2.8-6.3) in bivariable analyses, increased in a graded manner with additional exposures to restraining devices, HACs, and other noxious insults, and declined by 10.9% after addition of these potential mediator categories, providing evidence of mediation.
CONCLUSION: Restraining devices, HACs, and additional noxious insults were more frequent among patients with delirium, increased mortality in a graded manner, and were responsible for a significant percentage of the association of delirium with death. Additional efforts to prevent potential downstream mediators through which delirium increases mortality may help to improve outcomes among hospitalized older adults.

PDF Y Endnote Y

Preventing falls in older people
Oxtoby K.
Br. J. Community Nurs. 2017; 22(1): 683.
Affiliation: Health journalist.

DOI 10.12968/bjcn.2017.22.1.683 **PMID**28034328
Abstract [Abstract unavailable]
PDF N Endnote Y

Risk factors for fear of falling in elderly patients with severe knee osteoarthritis before and one year after total knee arthroplasty
Tsonga T, Michalopoulou M, Kapetanakis S, Giovannopoulou E, Malliou P, Godolias G, Soucacos P.
J. Orthop. Surg. (Hong Kong) 2016; 24(3): 302-306.
Affiliation: Department of Orthopaedics, Amalia Fleming General Hospital, Melissia, Athens, Greece.

DOI unavailable **PMID** 28031495
Abstract
PURPOSE: To evaluate the regression of fear of falling (FOF) and identify its risk factors in patients with severe knee osteoarthritis before and one year after total knee arthroplasty (TKA).
METHODS: 11 men and 57 women with a mean age of 73 years and a mean body mass index of 30.36 kg/m2 who had severe (grade 3 or 4) knee osteoarthritis and knee pain of ≥1 year were included. Two weeks before and one year after TKA, patients were asked about their FOF status and falls history. Patients were asked to complete the Physical Activity Scale for the Elderly, Short Form 36 (SF-36), and Western Ontario and McMaster Universities Arthritis Index (WOMAC) questionnaires. Clinical performance was assessed using the Berg Balance Scale and Timed Up and Go (TUG) test.
RESULTS: Of the 68 patients, 56 (82.4%) had FOF preoperatively and 30 (44.1%) had FOF one year after TKA ($p<0.001$). The strongest predictors for FOF preoperatively were fallers (odds ratio [OR]=9.83, p=0.028), mental component summary (MCS) score of SF-36 (OR=0.88, p=0.024), and TUG (OR=3.4, p=0.013). The strongest predictors for FOF one year postoperatively were fallers (OR=16.51, p=0.041), patients with ≥2 chronic diseases (OR=17.33, p=0.011), physical function score of WOMAC (OR=1.015, p=0.005), and MCS score of SF-36 (OR=0.86, p=0.015).
CONCLUSION: TKA positively affected FOF and gradually reduced the FOF rate over a year period after TKA in an elderly population.
PDF Y Endnote Y

Sarcopenic obesity and its temporal associations with changes in bone mineral density, incident falls and fractures in older men: the concord health and ageing in men project
Scott D, Seibel M, Cumming R, Naganathan V, Blyth F, Le Couteur DG, Handelsman DJ, Waite LM, Hirani V.
J. Bone Miner. Res. 2016; ePub(ePub): ePub.
Affiliation: School of Life and Environmental Sciences, Charles Perkins Centre, University of Sydney, New South Wales, Sydney, Australia.

DOI 10.1002/jbmr.3016 **PMID** 27736026

Abstract
Body composition and muscle function have important implications for falls and fractures in older adults. We aimed to investigate longitudinal associations between sarcopenic obesity and its components with bone mineral density (BMD), and incident falls and fractures, in Australian community-dwelling older men. 1,486 men aged ≥70 years from the Concord Health and Ageing in Men Project (CHAMP) study were assessed at baseline (2005-2007), 2 year follow-up (2007-2009; N = 1,238), and 5 year follow-up (2010-2013; N = 861). At all three time-points measurements included appendicular lean mass [ALM], body fat percentage and total hip BMD, hand grip strength and gait speed. Participants were contacted every 4 months for 6.1 ± 2.1 years to ascertain incident falls and fractures, the latter being confirmed by radiographic reports. Sarcopenic obesity was defined using sarcopenia algorithms of the European Working Group on Sarcopenia (EWGSOP) and the Foundation for the National Institutes of Health (FNIH), and total body fat ≥30% of total mass. Sarcopenic obese men did not have significantly different total hip BMD over five years compared with non-sarcopenic non-obese men (P > 0.05). EWGSOP-defined sarcopenic obesity at baseline was associated with significantly higher two-year falls rates (incidence rate ratio: 1.66; 95% CI: 1.16, 2.37), as were non-sarcopenic obesity (1.30; 1.04, 1.62) and sarcopenic non-obesity (1.58; 1.14, 2.17), compared with non-sarcopenic non-obese. No association with falls was found for sarcopenic obesity using the FNIH definition (1.01; 0.63, 1.60), but after multivariable adjustment the FNIH-defined non-sarcopenic obese group had a reduced hazard for any six-year fracture compared with sarcopenic obese men (hazard ratio: 0.44; 95% CI: 0.23, 0.86). In older men, EWGSOP-defined sarcopenic obesity is associated with increased falls rates over two years, and FNIH-defined sarcopenic obese men have increased fracture risk over six years, compared with non-sarcopenic obese men. This article is protected by copyright. All rights reserved.

PDF Y Endnote Y

Spatial and temporal gait characteristics of elderly individuals during backward and forward walking with shoes and barefoot
Elboim-Gabyzon M, Rotchild S.
Gait Posture 2016; 52: 363-366.
Affiliation: Department of Physical Therapy, Faculty of Social Welfare and Health Sciences, University of Haifa, Haifa, Israel. Electronic address: shira.rotchild@gmail.com.

DOI 10.1016/j.gaitpost.2016.12.007 **PMID** 28049108
Abstract
Backward walking (BW) is an inherent component of mobility and function in daily activities, particularly indoors, when it is more likely that a person is barefoot. No studies to date have compared the spatio-temporal characteristics of BW with and without shoes in elderly individuals. This study compared spatio-temporal measures of BW and forward walking (FW) among elderly individuals while barefoot or wearing shoes. Forty-seven elderly individuals (13 men and 34 women, 76.7±7.7years of age) were evaluated. Participants were requested to walk at a comfortable, self-selected pace across the GAITRite(®) walkway for three trials under each of four conditions: walking forward (FW) and BW wearing their own comfortable low-heeled walking shoes and FW and BW walking without shoes. Gait speed, stride length and cadence were significantly reduced in BW versus FW, with an increase in double limb support (DLS), both with and without shoes. Barefoot BW

resulted in significantly increased gait speed and cadence, and decreased DLS compared to BW with shoes. BW stride length was not affected by footwear. While barefoot FW was also associated with a significant increase in cadence and decrease in DLS time compared to walking with shoes, it decreased stride length and had no detrimental effect on gait speed. Assessment of the spatio-temporal parameters of walking barefoot and with shoes during FW and BW can contribute to our understanding of the ability of elderly individuals to adapt to changing walking conditions, and should be included in the assessment of functional mobility of elderly individuals.

PDF Y Endnote Y

Supporting the information domains of fall-risk management in home care via health information technology
Alhuwail D, Koru G, Mills ME.
Home Health Care Serv. Q. 2017; ePub(ePub): ePub.
Affiliation: School of Nursing , University of Maryland, Baltimore , Baltimore , Maryland , USA.

DOI 10.1080/01621424.2016.1264340 **PMID** 28045596
Abstract
In the US, home care clinicians often start the episode of care devoid of relevant fall-risk information. By collecting and analyzing qualitative data from thirty clinicians in one home health agency, this case study aimed to understand how the currently adopted information technology solutions supported the clinicians' fall-risk management (FRM) information domains, and explored opportunities to adopt other solutions to better support FRM. The currently adopted electronic health record system and fall-reporting application served only some information domains with a limited capacity. Substantial improvement in addressing the FRM information domains is possible by effectively modifying the existing solutions and purposefully adopting new solutions.
PDF Y Endnote Y

The relationship between postural and movement stability
Feldman AG.
Adv. Exp. Med. Biol. 2016; 957: 105-120.
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anatol.g.feldman@umontreal.ca.

DOI 10.1007/978-3-319-47313-0_6 **PMID** 28035562
Abstract
Postural stabilization is provided by stretch reflexes, intermuscular reflexes, and intrinsic muscle properties. Taken together, these posture-stabilizing mechanisms resist deflections from the posture at which balance of muscle and external forces is maintained. Empirical findings suggest that for each muscle, these mechanisms become functional at a specific, spatial threshold-the muscle length or respective joint angle at which motor units begin to be recruited. Empirical data suggest that spinal and supraspinal centers can shift the spatial thresholds for a group of muscles that stabilized the initial posture. As a consequence, the same stabilizing mechanisms, instead of resisting motion from the initial posture, drive the body to another stable posture. In other words by shifting spatial thresholds, the nervous system converts movement resisting to movement-producing mechanisms.

It is illustrated that, contrary to conventional view, this control strategy allows the system to transfer body balance to produce locomotion and other actions without loosing stability at any point of them. It also helps orient posture and movement with the direction of gravity. It is concluded that postural and movement stability is provided by a common mechanism.
PDF Y Endnote Y

Visuomotor adaptability in older adults with mild cognitive decline
Schaffert J, Lee CM, Neill R, Bo J.
Acta Psychol. 2016; 173: 106-115.
Affiliation: Department of Psychology, Eastern Michigan University, Ypsilanti, MI 48197, United States; School of Physical Education, Central China Normal University, Wu Han, PR China; Center for Human Growth and Development, University of Michigan, Ann Arbor, MI 48109, United States. Electronic address: jbo@emich.edu.

DOI 10.1016/j.actpsy.2016.12.009 **PMID** 28039795
Abstract
The current study examined the augmentation of error feedback on visuomotor adaptability in older adults with varying degrees of cognitive decline (assessed by the Montreal Cognitive Assessment; MoCA). Twenty-three participants performed a center-out computerized visuomotor adaptation task when the visual feedback of their hand movement error was presented in a regular (ratio=1:1) or enhanced (ratio=1:2) error feedback schedule.
RESULTS showed that older adults with lower scores on the MoCA had less adaptability than those with higher MoCA scores during the regular feedback schedule. However, participants demonstrated similar adaptability during the enhanced feedback schedule, regardless of their cognitive ability. Furthermore, individuals with lower MoCA scores showed larger after-effects in spatial control during the enhanced schedule compared to the regular schedule, whereas individuals with higher MoCA scores displayed the opposite pattern. Additional neuro-cognitive assessments revealed that spatial working memory and processing speed were positively related to motor adaptability during the regular scheduled but negatively related to adaptability during the enhanced schedule. We argue that individuals with mild cognitive decline employed different adaptation strategies when encountering enhanced visual feedback, suggesting older adults with mild cognitive impairment (MCI) may benefit from enhanced visual error feedback during sensorimotor adaptation.

PDF Y Endnote Y

An exploration of factors influencing physical activity levels amongst a cohort of people living in the community after stroke in the south of England
Jackson S, Mercer C, Singer BJ.
Disabil. Rehabil. 2016; ePub(ePub): ePub.
Affiliation: School of Surgery, FMDHS , The Centre for Musculoskeletal Studies, The University of Western Australia , Perth , Australia.

DOI 10.1080/09638288.2016.1258437 **PMID** 28029070
Abstract

PURPOSE: To explore factors influencing physical activity (PA) reported by people living in rural/semi-rural communities in the south of England post-stroke, and to understand relationships between personal, interpersonal and environmental barriers and self-reported levels of PA.
METHOD: A survey was mailed to patients of NHS Trusts who were identified as potential participants. Self-reported PA levels, type, and frequency of reported barriers were tabulated. Spearman's rank correlation coefficient was used to explore associations between self-reported PA level and: age, gender, level of physical function, fear of falling, beliefs regarding PA, available supports, and socioeconomic status.
RESULTS: Seventy-six of 322 questionnaires distributed were returned (24%). Only 55.2% of respondents reported undertaking PA of sufficient intensity to meet current guidelines. Personal barriers included fear of falling, stroke-related disability, pain, and fatigue. Interpersonal and environmental barriers included lack of social support, transport, and inclement weather. Significant relationships existed between self-reported PA and fear of falling, functional mobility, and beliefs relating to PA.
CONCLUSIONS: Almost half of the survey cohort reported PA levels insufficient to meet current guidelines. Similar to barriers reported in previous studies in USA and other parts of the UK, numerous interlinking and overlapping personal, interpersonal, and environmental barriers to undertaking PA were identified. Implications for Rehabilitation This study found that although more than 60% of the survey population were able to ambulate >200 m, only 55.2% reported undertaking sufficient PA to meet current guidelines, putting them at increased risk of further stroke and other co-morbidities. Participants reported a number of interlinking and overlapping personal, interpersonal, and environmental barriers to undertaking PA, which may explain this discrepancy between mobility status and self reported activity levels. Rehabilitation professionals and primary care providers are well positioned to address the barriers identified in this survey, such as providing interventions to reduce fear of falling, pain, and fatigue, providing support and education about safely increasing physical activity and addressing unhelpful beliefs about PA. Behaviour change strategies, such as increasing self-efficacy, and partnering with the person with stroke to problem solve strategies to address the barriers identified by this, and related research, are likely to be more successful in increasing PA than providing information alone.
PDF Y Endnote Y

Structural validity of the Mini-Balance Evaluation Systems Test (Mini-BESTest) in people with mild to moderate Parkinson Disease
Benka Wallén M, Sorjonen K, Löfgren N, Franzén E.
Phys. Ther. 2016; 96(11): 1799-1806.
Affiliation: E. Franzén, PT, PhD, Division of Physiotherapy, Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, and Department of Physical Therapy, Karolinska University Hospital, Stockholm, Sweden. martin.benka-wallen@ki.se erika.franzen@ki.se.

DOI 10.2522/ptj.20150334 **PMID** 27231272
Abstract
BACKGROUND: The Mini-Balance Evaluation Systems Test (Mini-BESTest) is a clinical balance test comprising 14 items assumed to reflect the unidimensional construct "dynamic balance."
OBJECTIVE: The study objective was to examine the dimensionality of the test and the properties of each item and their interrelationships in elderly people with mild to moderate Parkinson disease

(PD).
DESIGN: This was a cross-sectional study in a laboratory setting.
METHODS: A total of 112 participants (mean age=73 years) with idiopathic PD (Hoehn and Yahr stages 1-3) were assessed by physical therapists. Local independence among items was examined with Rasch modeling. Unidimensionality was tested by running a principal component analysis on the residuals. An exploratory factor analysis was used to examine the structure of the test, and a confirmatory factor analysis was used to evaluate the fit of the derived model.
RESULTS: The first residual component of the principal component analysis, with an eigenvalue of greater than 2, superseded the assumption of unidimensionality. After the omission of item 7 because of convergence problems, the exploratory factor analysis suggested that a 3-factor solution best fit the data. A confirmatory factor analysis demonstrated acceptable fit of the final model, although item 14 loaded poorly on its factor. LIMITATIONS: The sample size was on the lower end of what is generally recommended.
CONCLUSIONS: This study could not confirm that the Mini-BESTest is unidimensional. Gait items were dispersed over all factors, indicating that they may reflect different constructs. Nonetheless, as there arguably is no clinical balance test superior to the Mini-BESTest today, we recommend using the total score for assessing gross balance in this population and individual items to identify specific weaknesses. Moreover, dual tasks should be assessed separately because they are an important aspect of balance control in people with PD, reflected in only one item of the test.

PDF N Endnote Y

The effect of walking speed on foot kinematics is modified when increased pronation is induced
Hornestam JF, Souza TR, Arantes P, Ocarino J, Silva PL.
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Abstract
BACKGROUND: The relation between walking speed and foot kinematics during gait is not well established, and neither is it clear whether this relation is modified in the presence of factors expected to increase pronation (eg, abnormal foot alignment). Understanding how foot kinematics is affected by walking speed under varying conditions could contribute to our understanding of stresses to the musculoskeletal system during walking. We evaluated the effect of walking speed on foot kinematics in the frontal plane during gait and determined whether this effect is modified by using medially inclined insoles that force the foot into increased pronation.
METHODS: Twenty-six healthy young adults were assessed while walking on a treadmill wearing flat insoles and wearing medially inclined insoles. Foot kinematics in the frontal plane was measured with a three-dimensional motion analysis system. Data were analyzed during the stance phase of gait.
RESULTS: There was no main effect of speed on average calcaneal position. However, there was a significant insole type × walking speed interaction effect. In the flat insole condition, increased walking speed was associated with a less inverted average calcaneal position (or greater magnitudes of eversion), whereas in the inclined insole condition, higher speeds were associated with a less everted average calcaneal position (or increased magnitudes of inversion).
CONCLUSIONS: The magnitude of foot eversion increases at faster gait speeds under typical

conditions. In the presence of factors that induce excessive pronation, however, this effect is reversed. Results suggest that individuals use greater active control of foot motion at faster speeds in the presence of excessive pronation to improve push-off efficiency. Potential clinical consequences of this functional strategy are discussed.

PDF Endnote Y

Vestibular control of standing balance is enhanced with increased cognitive load

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Abstract

When cognitive load is elevated during a motor task, cortical inhibition and reaction time are increased; yet, standing balance control is often unchanged. This disconnect is likely explained by compensatory mechanisms within the balance system such as increased sensitivity of the vestibulomotor pathway. This study aimed to determine the effects of increased cognitive load on the vestibular control of standing balance. Participants stood blindfolded on a force plate with their head facing left and arms relaxed at their sides for two trials while exposed to continuous electrical vestibular stimulation (EVS). Participants either stood quietly or executed a cognitive task (double-digit arithmetic). Surface electromyography (EMG) and anterior-posterior ground-body forces (APF) were measured in order to evaluate vestibular-evoked balance responses in the frequency (coherence and gain) and time (cumulant density) domains. Total distance traveled for anterior-posterior center of pressure (COP) was assessed as a metric of balance variability. Despite similar distances traveled for COP, EVS-medial gastrocnemius (MG) EMG and EVS-APF coherence and EVS-TA EMG and EVS-MG EMG gain were elevated for multiple frequencies when standing with increased cognitive load. For the time domain, medium-latency peak amplitudes increased by 13-54% for EVS-APF and EVS-EMG relationships with the cognitive task compared to without. Peak short-latency amplitudes were unchanged. These results indicate that reliance on vestibular control of balance is enhanced when cognitive load is elevated. This augmented neural strategy may act to supplement divided cortical processing resources within the balance system and compensate for the acute neuromuscular modifications associated with increased cognitive demand.

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