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"Text It" program to track falls in patients with Alzheimer's disease and dementia

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Alzheimers Dement. (N Y) 2018; 4: 137-140.

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Abstract

INTRODUCTION: Falls are a significant problem among older adults with Alzheimer's disease, leading to high rates of fracture, hospitalization, and death. Tracking falls in older adults, particularly those with cognitive impairment, is a clinical and research challenge.

METHODS: This prospective pilot study evaluated the feasibility of a text message program to track falls among patients with dementia. We also compared this technique with the calendar method of fall data collection.

RESULTS: There was a 96% completion rate of text messaging and 100% of calendars; however, the text-gathered data were more accurate.

DISCUSSION: A text-messaging platform to track falls shows promise in cognitively impaired individuals.

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Biomarkers of agitation and aggression in Alzheimer's disease: a systematic review

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Alzheimers Dement. 2018; ePub(ePub): ePub.

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Abstract

INTRODUCTION: Agitation is one of the most challenging neuropsychiatric symptoms to treat in Alzheimer's disease and has significant implications for patient and caregiver. A major source of difficulty in identifying safe and effective treatments for agitation is the lack of validated biomarkers. As such, patients may not be appropriately targeted, and biological response to pharmacotherapy cannot be adequately monitored.

METHODS: This systematic review aimed to summarize evidence on the association between biomarkers and agitation/aggression in patients with Alzheimer's disease, utilizing the National Institute on Aging-Alzheimer's Association Research Framework and the Biomarkers, EndpointS, and other Tools Resource of the Food and Drug Association-National Institutes of Health Biomarker Working Group.

RESULTS: This review identified six classes of biomarkers (neuropathological, neurotransmitter,

neuroimaging, apolipoprotein E (APOE) genotype, inflammatory, and clusterin) associated with agitation/aggression, which were mostly diagnostic in nature.

DISCUSSION: Future studies should investigate the predictive, prognostic, and monitoring capacity of biomarkers to provide insight into the longitudinal course of agitation/aggression, as well as predict and monitor biological response to a pharmacological intervention.

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Cost-effectiveness of a multifaceted podiatry intervention for the prevention of falls in older people: the REducing Falls with Orthoses and a Multifaceted Podiatry Intervention Trial findings

Corbacho B, Cockayne S, Fairhurst C, Hewitt CE, Hicks K, Kenan AM, Lamb SE, MacIntosh C, Menz HB, Redmond AC, Rodgers S, Scantlebury A, Watson J, Torgerson DJ.

Gerontology 2018; ePub(ePub): ePub.

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Abstract

BACKGROUND: Falls are a major cause of morbidity among older people. Multifaceted interventions may be effective in preventing falls and related fractures.

OBJECTIVE: To evaluate the cost-effectiveness alongside the REducing Falls with Orthoses and a Multifaceted podiatry intervention (REFORM) trial.

METHODS: REFORM was a pragmatic multicentre cohort randomised controlled trial in England and Ireland; 1,010 participants (> 65 years) were randomised to receive either a podiatry intervention (n = 493), including foot and ankle strengthening exercises, foot orthoses, new footwear if required, and a falls prevention leaflet, or usual podiatry treatment plus a falls prevention leaflet (n = 517).

PRIMARY OUTCOME: incidence of falls per participant in the 12 months following randomisation.

SECONDARY OUTCOMES: proportion of fallers and quality of life (EQ-5D-3L) which was converted into quality-adjusted life years (QALYs) for each participant. Differences in mean costs and QALYs at 12 months were used to assess the cost-effectiveness of the intervention relative to usual care. Cost-effectiveness analyses were conducted in accordance with National Institute for Health and Clinical Excellence reference case standards, using a regression-based approach with costs expressed in GBP (2015 price). The base case analysis used an intention-to-treat approach on the imputed data set using multiple imputation.

RESULTS: There was a small, non-statistically significant reduction in the incidence rate of falls in the intervention group (adjusted incidence rate ratio 0.88, 95% CI 0.73-1.05, p = 0.16). Participants allocated to the intervention group accumulated on average marginally higher QALYs than the usual care participants (mean difference 0.0129, 95% CI -0.0050 to 0.0314). The intervention costs were on average GBP 252 more per participant compared to the usual care participants (95% CI GBP -69 to GBP 589). Incremental cost-effectiveness ratios ranged between GBP 19,494 and GBP 20,593 per QALY gained, below the conventional National Health Service cost-effectiveness thresholds of GBP 20,000 to GBP 30,000 per additional QALY. The probability that the podiatry intervention is cost-

effective at a threshold of GBP 30,000 per QALY gained was 0.65. The results were robust to sensitivity analyses.

CONCLUSION: The benefits of the intervention justified the moderate cost. The intervention could be a cost-effective option for falls prevention when compared with usual care in the UK.

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Effectiveness of a direct-to-consumer written health education program in the reduction of benzodiazepine and sedative-hypnotic use in an elderly population at a single Veterans Affairs medical center

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Abstract

INTRODUCTION: The use of benzodiazepines and sedative-hypnotics in the elderly is associated with a significant risk of delirium, falls, fractures, cognitive impairment, and motor vehicle accidents. This quality improvement project applies a direct-to-consumer intervention to an elderly veteran population to reduce the use of these medications.

METHODS: Patients aged 75 and older currently taking a benzodiazepine and/or a sedative-hypnotic were included in the project. Direct-to-consumer education intervention letters were mailed to patients within 30 days of their next appointment. Their providers were emailed a questionnaire after the patient's appointment. Providers were asked if the letter prompted a conversation regarding medication use, whether the provider initiated discussion regarding a taper, and whether a specific taper plan was developed. Medical records were reviewed to determine if a reduction in dose or discontinuation occurred.

RESULTS: Fifty-nine direct-to-consumer education letters were mailed to the patients. Follow-up questionnaires were e-mailed to 44 providers, and 27 providers responded. Twenty-two percent of patients had their benzodiazepine and/or sedative hypnotic dose reduced or discontinued after their follow-up appointment. Sixty-seven percent of veterans initiated a conversation with their provider regarding their medication with 74% of providers discussing dose reduction. Fifty-six percent of recipients developed a specific taper plan with their provider.

DISCUSSION: The data from this project suggests that direct-to-consumer patient education can reduce the exposure to benzodiazepines and sedative-hypnotics in an elderly veteran population. More data is needed on larger populations to further explore the benefit of direct-to-consumer interventions.

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Effects of task velocity and center of mass acceleration during Y-Balance Test in elderly females with good and poor visual acuity

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Abstract

PURPOSE: To explore the effects of good binocular visual acuity (BVA) compared to poor BVA, reach distance, task velocity, and center of mass (COM) acceleration were evaluated in elderly females performing the Y-Balance Test (YBT) using a cross-sectional design.

SUBJECTS AND METHODS: A total of 13 participants had BVA of ≥0.4 log of the minimum angle of resolution (logMAR) (poor BVA group), and the other 13 had BVA of ≤0.3 logMAR (good BVA group). An accelerometer was attached over participants' L3 spinous process, and they then performed the YBT.

RESULTS: The normalized reach distances in the three directions among the good BVA group were longer than those among the poor BVA group. The task velocity in the good BVA group was significantly higher, whereas COM acceleration in the A direction was significantly lower compared with the poor BVA group.

CONCLUSION: Visual status must be considered when older adult individuals undergo physical therapy and functional training to ensure that healthcare professionals can better assist older adult women.

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Fall prevention programs for culturally and linguistically diverse groups: program provider perspectives

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Abstract

OBJECTIVES: Older people from culturally and linguistically diverse (CALD) backgrounds are one of the fastest growing and rapidly ageing population segments in Australia. This qualitative study aims to explore the experiences, needs and challenges that individual program providers encountered in implementing and delivering a fall prevention program for CALD groups and meeting the linguistic, cultural and contextual needs of the program participants.

DESIGN: Semi-structured in-depth interviews were conducted with a convenience sample of 24 program providers implementing, delivering or supporting fall prevention programs including Stepping On for CALD groups. Interview transcripts were analysed using thematic analysis.

RESULTS: Two major themes emerged: (1) extra layers of complexity are needed in program

planning, delivery, recruitment and enabling participation of older people from CALD background and (2) program leaders 'going the extra mile' influences success of the program. Complexity included accommodating the linguistic and sociocultural needs in planning the programs, knowing and using the 'right way' to reach and deliver the program to CALD groups and understanding the nuances of facilitating program participation. While it was important to ensure the acceptability and accessibility of the program for the older people from diverse CALD communities, it was the drive and determination of the program leader and their striving for cultural relevance that made the program possible. Sustainability and wider implementation requires unique support and additional resources.

CONCLUSION: These findings can be used by program providers, policy-makers and health researchers to improve the capacity of fall prevention programs to better respond to the growing diversity in needs and preferences among older populations in Australia and internationally.

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Falls and fall-related injuries among US adults aged 65 or older with chronic kidney disease
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Abstract
INTRODUCTION: Falls are among the leading causes of injury and death among adults aged 65 or older. People with chronic kidney disease (CKD) are at increased risk of falling and of having a serious injury from falls. However, information is limited about risk factors for falls and fall-related injuries among people with CKD.

METHODS: We performed a secondary analysis of 157,753 adults (6.1% with CKD) aged 65 or older surveyed in the 2014 Behavioral Risk Factor Surveillance System.

RESULTS: People with CKD were at increased risk of falls (odds ratio [OR] = 1.81; 95% confidence interval [CI], 1.63-2.01) and fall-related injuries (OR = 1.50; 95% CI, 1.27-1.78) even after adjusting for differences in demographic characteristics, health conditions, and lifestyle factors (P <.05 for all). Among people with CKD, women, people diagnosed with diabetes, diabetes duration, and arthritis were all significant predictors of falls and fall-related injuries (P <.05 for all). Lifestyle factors, such as engaging in recent exercise (adjusted odds ratio [AOR] = 0.68; 95% CI, 0.56-0.81) and limited physical function (assessed as difficulty in climbing stairs) (AOR = 2.84; 95% CI, 2.30-3.44), were most closely associated with falls and fall-related injuries.

CONCLUSION: Adults aged 65 or older with CKD were at increased risk of falling and of suffering an injury as a result of a fall compared with adults in the same age range without CKD. Potentially modifiable factors such as physical function and recent exercise were most closely related to reduced risk for falls and fall-related injuries and may be an appropriate target for fall prevention and rehabilitation programs in people with CKD.

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Fear of falling in older adults with diabetes mellitus: the IMIAS Study

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Abstract

Several determinants of developing fear of falling (FoF) overlap with the consequences of diabetes mellitus (DM). We compared the prevalence and severity of FoF in older adults with and without DM and identified which FoF determinants contribute to FoF severity in older adults with DM. We used Canadian baseline data from the International Mobility in Aging Study (IMIAS) which identified 141 older adults with DM (DM-group;age:68.88±2.80years) and 620 without DM (noDM-group;age:68.81±2.68years). FoF was quantified with Falls Efficacy Scale-International (FES-I). FoF determinants were evaluated in demographic/health-related, physical, psychological, and social domains. High concern of FoF was more prevalent and of higher severity in 10/16 FES-I activities in the DM-group compared to the noDM-group. Higher FoF severity in the DM-group was associated with poor physical performance, being female, fall history, and clinical depressive symptoms. Protocols developed for screening and interventions may reduce FoF severity in this population.

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Functionality and risk of falls in elders followed in a day care center in Brazil

Pinheiro IM, Alves C.

Abstract

Adult day centers provide comprehensive care for older adults and may enhance autonomy, well-being, and socialization. This quasi-experimental study evaluated the impact of such multidisciplinary day care on functionality, fear of falling, and risk of falls in community elders. Fifty-two seniors who attended day services were followed for 1 year. During the year, the adults maintained functionality for activities of daily living, presented improvement in instrumental activities of daily living, and no longer presented high risk for falls. No association was found between the risk of falling and fear of falling, however.
RESULTS are discussed in terms of the positive outcomes of attending day services.

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Gait abnormality predicts falls in women after total hip arthroplasty

Ikutomo H, Nagai K, Tagomori K, Miura N, Nakagawa N, Masuhara K.

Abstract

BACKGROUND: Patients who undergo total hip arthroplasty (THA) have an increased risk of falls during the first year postoperatively. However, risk factors for falls after THA remain unclear. We investigated the relationship between gait abnormality and falls during the first year after THA.

METHODS: We conducted a prospective cohort study of 286 patients with severe hip osteoarthritis who underwent THA and examined fall history during the first year postoperatively. Baseline characteristics including age, body mass index, number of prescribed medications, comorbidities, and history of falling in the past year were evaluated as covariates and determined using a self-administered questionnaire and interview preoperatively. We assessed functional outcomes, including passive range of motion of the hip joint (flexion, extension, abduction, and adduction), muscle strength (hip abduction and knee extension), gait velocity, and gait abnormality, at 3 weeks postoperatively. Cox proportional hazard regression models were used to analyze the relationship between the presence of gait abnormality and falls.

RESULTS: One hundred sixty-two women were included. The incidence of at least 1 fall during the first year after THA was 31.5%. Cox proportional hazard regression models showed that the presence of gait abnormality (hazard ratio, 2.91; 95% confidence interval, 1.55-5.48; P <.001) was significantly associated with falls during the first year postoperatively.

CONCLUSION: The presence of gait abnormality is a useful screening tool to predict future falls in women after THA. Clinicians should assess gait abnormality to identify patients who may require fall prevention measures and continuous rehabilitation to improve gait abnormality.

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Gait variability can predict the risk of cognitive decline in cognitively normal older people

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Abstract

BACKGROUND: The aim of this study was to investigate the association of gait speed and gait variability, an index of how much gait parameters, such as step time, fluctuate step-to-step, with risk of cognitive decline in cognitively normal elderly individuals. While high gait variability is emerging as an early indicator of dementing illnesses, there is little research on whether high gait variability predicts cognitive decline in cognitively normal elderly who have no evidence of cognitive impairment.

METHODS: In this 4-year prospective cohort study on 91 community-dwelling cognitively normal elderly individuals without cerebral ischemic burden or Parkinsonism, we evaluated gait speed and step time variability using a tri-axial accelerometer placed on the center of body mass, and

diagnosed mild cognitive impairment (MCI) according to the International Working Group on MCI. We performed Kaplan-Meier analysis with consecutive log-rank testing for MCI-free survival by cohort-specific tertiles of gait speed; hazard ratios (HR) of incident MCI were estimated using Cox proportional hazards regression analysis adjusted for age, sex, education level, Cumulative Illness Rating Scale score, GDS score, and presence of the apolipoprotein E ε4 allele.

RESULTS: Out of the 91 participants in the baseline assessment, 87 completed one or more 2-year follow-up assessments, and the median duration of follow-up was 47.1 months. Kaplan-Meier curves of incident MCI show evident differences in risk by gait variability group ($\chi2 = 9.64$, $p = 0.002$, log-rank test). Mean MCI-free survival in the high variability group was 12% shorter than in the mid-to-low tertile group (47.4 ± 1.74 [SD] vs. 54.04 ± 0.52 months), while it was comparable between gait speed groups (51.59 ± 0.70 vs. 50.64 ± 1.77 months; $\chi2 = 1.16$, $p = 0.281$). In multivariate analysis, subjects with high gait variability showed about 12-fold higher risk of MCI (HR = 11.97, 95% CI = 1.29-111.37) than those with mid-to-low variability. However, those with slow gait speed showed comparable MCI risk to those with mid-to-high speed (HR = 5.04, 95% CI = 0.53-48.18).

CONCLUSIONS: Gait variability may be a better predictor of cognitive decline than gait speed in cognitively normal elderly individuals without cerebral ischemic burden or Parkinsonism.

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Hearing loss contributes to balance difficulties in both younger and older adults

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Abstract

OBJECTIVE: The number of steps required to regain balance is an easily obtainable clinical outcome measure. This study assessed whether number of steps during loss of balance could identify older adults with hearing loss who have balance deficits. We aimed to answer two questions: 1) Does hearing loss negatively affect the ability to regain balance, as reflected by an increased number of steps needed to respond to a perturbation while simultaneously attending to speech-in-noise; and 2) Do hearing aids improve balance control, reflected by a decrease in number of steps needed to regain balance?

METHODS: 20 young adults and 20 older adults with normal hearing, and 19 older adults with hearing loss performed an auditory-balance dual-task. Participants were asked to listen and repeat back sentences from a standardized audiology test, while simultaneously responding to backward surface translations. Outcome measures were performed on the auditory test and number of steps needed to regain balance. Repeated measures ANCOVA models were run in using group, time, hearing levels, and perturbation levels as predictors.

RESULTS: Auditory scores confirmed difficulty hearing speech-in-noise in older adults with hearing loss and no hearing aids, and in young and older adults with normal hearing and simulated hearing loss.

RESULTS showed that group, auditory and balance conditions are significantly related to both outcomes measures and time is not significant for steps. Older adults with hearing loss had a significant increase in number of steps needed to regain balance compared to young adults and older adults with normal hearing.

CONCLUSION: Number of steps may be an appropriate clinical assessment tool for identifying fall risk in older adults with hearing loss. Further research needs to be performed to identify proper assessments and treatment interventions for older adults with hearing loss who have balance deficits.

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Home safety fall and accident risk among prematurely aging, formerly homeless adults
Gutman SA, Amarantos K, Berg J, Aponte M, Gordillo D, Rice C, Smith J, Perry A, Wills T, Chen E, Peters R, Schluger Z.
Am. J. Occup. Ther. 2018; 72(4): e7204195030p1-7204195030p9.
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(Copyright © 2018, American Occupational Therapy Association)
DOI 10.5014/ajot.2018.028050 **PMID** 29953833
Abstract
OBJECTIVE: Homelessness prematurely ages people. A large subgroup of formerly homeless adults between ages 40 and 64 yr have health conditions similar to or worse than people categorized as elderly. Little is known about the impact of this group's chronic health conditions on their ability to safely function in supportive housing.
METHOD: Home safety visits were carried out with 25 formerly homeless adults, ages 40-64 yr, now residing in supportive housing.
RESULTS: Participants had physical, cognitive, and mental health problems that significantly interfered with their ability to perform daily life skills, safely function in an apartment, and manage chronic health conditions. Home safety hazards included cluttered walking paths, the presence of steps, and the lack of grab bars and nonskid flooring.
CONCLUSION: The homeless population would benefit from aging specialists, such as occupational therapists, who could help people to maintain and function more safely in their homes. Without such services, this population may be at risk for home safety events leading to hospitalization and mortality.
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Implementing STEADI in academic primary care to address older adult fall risk
Eckstrom E, Parker EM, Lambert GH, Winkler G, Dowler D, Casey CM.
Innov. Aging 2017; 1(2): igx028.

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Abstract

BACKGROUND AND OBJECTIVES: Falls are the leading cause of injury-related deaths in older adults. OBJECTIVEs include describing implementation of the Centers for Disease Control and Prevention's Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative to help primary care providers (PCPs) identify and manage fall risk, and comparing a 12-item and a 3-item fall screening questionnaire. DESIGN AND METHODS: We systematically incorporated STEADI into routine patient care via team training, electronic health record tools, and tailored clinic workflow. A retrospective chart review of patients aged 65 and older who received STEADI measured fall screening rates, provider compliance with STEADI (high-risk patients), results from the 12-item questionnaire (*Stay Independent*), and comparison with a 3-item subset of this questionnaire (*three key questions*). RESULTS: Eighteen of 24 providers (75%) participated, screening 773 (64%) patients over 6 months; 170 (22%) were high-risk. Of these, 109 (64%) received STEADI interventions (gait, vision, and feet assessment, orthostatic blood pressure measurement, vitamin D, and medication review). Providers intervened on 85% with gait impairment, 97% with orthostatic hypotension, 82% with vision impairment, 90% taking inadequate vitamin D, 75% with foot issues, and 22% on high-risk medications. Using *three key questions* compared to the full *Stay Independent* questionnaire decreased screening burden, but increased the number of high-risk patients. DISCUSSION AND IMPLICATIONS: We successfully implemented STEADI, screening two-thirds of eligible patients. Most high-risk patients received recommended assessments and interventions, except medication reduction. Falls remain a substantial public health challenge. Systematic implementation of STEADI could help clinical teams reduce older patient fall risks.

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Mental well-being of older people in finland during the first year in senior housing and its association with physical performance

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Abstract

Growing numbers of older people relocate to senior housing, when their physical or mental performance declines. The relocation is known to be one of the most stressful events in the life of older people and affect their mental and physical well-being. More information about the relationships between mental and physical parameters is required. We examined self-reported mental well-being of 81 older people (aged 59⁻93, living in northern Finland), and changes in it 3 and 12 months after relocation to senior housing. The first measurement was 3 months and the second measurement 12 months after relocation. Most participants were female (70%). Their

physical performance was also measured, and associations between these two were analyzed. After 12 months, mental capability was very good or quite good in 38% of participants, however 22% of participants felt depressive symptoms daily or weekly. Moreover, 39% of participants reported daily or weekly loneliness. After 12 months participants reported a significant increase in forgetting appointments, losing items and difficulties in learn new things. They felt that opportunities to make decisions concerning their own life significantly decreased. Furthermore, their instrumental activities of daily living (IADL), dominant hand's grip strength and walking speed decreased significantly. Opportunities to make decisions concerning their life, feeling safe, loneliness, sleeping problems, negative thoughts as well as fear of falling or having an accident outdoors were associated with these physical parameters. In addition to assessing physical performance and regular exercise, the various components of mental well-being and their interactions with physical performance should be considered during adjustment to senior housing.

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Methods for the real-world evaluation of fall detection technology: a scoping review

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Sensors (Basel) 2018; 18(7): s18072060.
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Abstract

Falls in older adults present a major growing healthcare challenge and reliable detection of falls is crucial to minimise their consequences. The majority of development and testing has used laboratory simulations. As simulations do not cover the wide range of real-world scenarios performance is poor when retested using real-world data. There has been a move from the use of simulated falls towards the use of real-world data. This review aims to assess the current methods for real-world evaluation of fall detection systems, identify their limitations and propose improved robust methods of evaluation. Twenty-two articles met the inclusion criteria and were assessed with regard to the composition of the datasets, data processing methods and the measures of performance. Real-world tests of fall detection technology are inherently challenging and it is clear the field is in its infancy. Most studies used small datasets and studies differed on how to quantify the ability to avoid false alarms and how to identify non-falls, a concept which is virtually impossible to define and standardise. To increase robustness and make results comparable, larger standardised datasets are needed containing data from a range of participant groups. Measures that depend on the definition and identification of non-falls should be avoided. Sensitivity, precision and F-measure emerged as the most suitable robust measures for evaluating the real-world performance of fall detection systems.

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Risk factors and number of falls as determinants of quality of life of community-dwelling older adults

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Abstract

BACKGROUND AND PURPOSE: In older adults, the psychological impact and effects related to the loss of functional capacity are directly related to perceived quality of life (QOL). The predictors of better QOL are increased physical activity, lower prevalence of overweight, lower cases of depression, and lower rate of reported alcohol abuse. On the contrary, the predictors of decreased QOL are female gender, comorbidity, deficient nutritional condition, polypharmacy, loss of mobility, depression and dependency, poor economic conditions, and social isolation and loneliness. Furthermore, QOL in older adults is more dependent on the number of falls than comorbidity. The objective was to investigate the determinants of perceived QOL among independent community-dwelling older adults and to quantify the influence of number of falls and number of risk factors on QOL.

METHODS: This is a cross-sectional study of 572 older adults (>70 years of age) seen in 10 primary care centers in La Ribera, Valencia, Spain. Comprehensive geriatric assessment was done by 4 nurses in primary care centers. Functional status and sociodemographic and clinical variables were collected. Quality of life was assessed by EQ-5D scale.

RESULTS: Females predominated (63.3%). Mean age (standard deviation) was 76.1 (3.9) years. The male gender (β=.09; 95% confidence interval [CI]: 0.05-0.13) was found to be predictive of better QOL, together with physical activity (β=.04; 95% CI: 0.02-0.06), while the use of drugs affecting the central nervous system (β=-.08; 95% CI: -0.12 to -0.03), overweight (β=-.06; 95% CI: 0.1 to - 0.02), comorbidity (β=-.09; 95% CI: -0.13 to -0.05), the presence of fall risk factors (β=-.02; 95% CI: -0.03 to 0.01), and the number of previous falls (β=-.03; 95% CI: -0.06 to 0.01) had a negative impact upon the EQ-5D Index score.

CONCLUSIONS: If perceived QOL is used as an indicator of the success of intervention programs, certain factors accompanying the adoption of measures for the prevention of falls may mask the results (failure or success) of the intervention. Because most determinants of QOL are modifiable and physical activity has the potential to improve QOL, this research suggests that physical activity programs should be a component of health care for older adults.

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Social capital predicts accelerometry-measured physical activity among older adults in the U.S.: a cross-sectional study in the National Social Life, Health, and Aging Project

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Abstract

BACKGROUND: Older adults receive important health benefits from more robust social capital. Yet, the mechanisms behind these associations are not fully understood. Some evidence suggests that higher levels of social capital ultimately affect health through alterations in physical activity (PA), but most of this research has relied on self-reported levels of PA. The aim of this study was to determine whether components of social capital, including social network size and composition as well as the frequency of participation in various social and community activities, were associated with accelerometry-measured PA levels in a nationally representative sample of community-dwelling older adults (≥ 62 years).

METHODS: We conducted a cross-sectional analysis using data from the wrist accelerometry sub-study (n = 738) within Wave 2 of the National Social, Health, and Aging Project (NSHAP), a population-based longitudinal study that collects extensive survey data on the physical, cognitive, and social health of older adults. Participants' physical activity was measured with a wrist accelerometer worn for 72 consecutive hours. We related seven, self-reported social relationship variables (network size, network proportion friends, and frequencies of socializing with friends and family, visiting with neighbors, attending organized group meetings, attending religious services, and volunteering) to accelerometer-measured PA (mean counts-per-minute) using multivariate linear regression analysis, while adjusting for potential confounders.

RESULTS: Larger social networks (p = 0.042), higher network proportion friends (p = 0.013), more frequent visiting with neighbors (p = 0.009), and more frequent attendance at organized group meetings (p = 0.035) were associated with higher PA levels after controlling for demographic and health covariates. Volunteering was significant prior to adjusting for covariates. No significant associations were found between frequencies of socializing with friends and relatives or attendance at religious services and PA.

CONCLUSIONS: This study suggests social capital is significantly related to objectively measured PA levels among older adults, and that friendships as well as social participation in groups and with neighbors may be particularly pertinent to PA. These findings expand our understanding of and offer a potential mechanism linking social relationships and overall health among older adults. They also have implications for how we might motivate older adults to be more physically active.

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The Berg Balance Scale as a clinical screening tool to predict fall risk in older adults: a systematic review

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Abstract

BACKGROUND: The Berg Balance Scale (BBS) is often used in clinical practice to predict falls in the older adults. However, there is no consensus in research regarding its ability to predict falls. OBJECTIVE: To verify whether the BBS can predict falls risk in older adults. DATA SOURCE: Manual and electronic searches (Medline, EMBASE, CINAHL, Ageline, Lilacs, Web of Science, Cochrane Library and PEDro) were conducted using blocks of words (older adults, falls, BBS, study design) and their synonyms, with no language restrictions and published since 1989. STUDY SELECTION CRITERIA: Prognostic studies or clinical trials were used to assess the BBS and falls history. DATA EXTRACTION AND DATA SYNTHESIS: In this narrative synthesis, two independent assessors extracted data from articles and a third reviewer provided consensus, in case of disagreement. The methodological quality was assessed using the Quality In Prognosis Studies tool. RESULTS: 1047 studies were found and 8 studies were included in this review. The mean BBS score was high, regardless of the history of falls. Three studies presented cut-off scores for BBS, ranging from 45 to 51 points. Two studies reported a difference in the BBS score between fallers and non-fallers. Studies presented low to moderate risk of bias. LIMITATIONS: Unfeasible to conduct a meta-analysis due the heterogeneity of included studies. CONCLUSION: The evidence to support the use of BBS to predict falls is insufficient, and should not be used alone to determine the risk of falling in older adults. SYSTEMATIC REVIEW REGISTRATION NUMBER: PROSPERO CRD42016032309.

PDF Y Endnote Y

The development of simple screening tool for predict risk of falls in Thai community-dwelling elderly

Poncumhak P, Sittitan M, Srithawong A.

Abstract

OBJECTIVE: To develop and examine the psychometric properties of the Three Times Sit-to-Stand Test (TTSST) to evaluate its functional capacity and to predict the risk of fall in community-dwelling elderly.

MATERIAL AND METHOD: Thirty-six subjects aged older than 60 years, who experienced fall or non-fall, were tested for their functional ability using the TTSST and the Five Times Sit-to-Stand Test (FTSST).

RESULTS: The data demonstrated excellent reliability (ICCs = 0.943-0.991) and could clearly distinguish the ability of falling and non-falling subjects. In addition, the TTSST showed significant

correlation with the FTSST (r = 0.942, p<0.001), and was an excellent fall indicator (sensitivity 88.89%, specificity 100%, AUC = 0.92, 95% CI = 0.81-1.00).

CONCLUSION: The TTSST is a valid and reliable method for assessing fall risk factors of community-dwelling elderly. We recommend a TTSST greater than 4.54 seconds as the optimal cut-off score for reliable fall risk prediction for the elderly.

PDF Y Endnote Y

The relationship between muscle quality and incidence of falls in older community-dwelling women: An 18-month follow-up study

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Exp. Gerontol. 2018; ePub(ePub): ePub.

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Abstract

INTRODUCTION: Important components that might mediate the relationship between aging and falls are reduced muscle strength and mass. Although muscle-related phenotypes have been linked to falls in older people, the role of muscle quality has yet to be examined.

AIM: To investigate the relationship between muscle quality and incidence of falls over an 18-month follow-up in older community-dwelling women.

METHODS: A total of 167 women (68.1 ± 6.2 years) underwent quadriceps isometric peak torque and thigh-muscle thickness assessments using isokinetic dynamometer and ultrasound, respectively. Muscle quality was considered as the ratio between maximal strength and muscle thickness. Participants were tracked by phone calls for ascertainment of falls during the follow-up period. Cox proportional regressions and X^2 tests were performed, with statistical significance set at P < 0.05.

RESULTS: A total of 139 volunteers were successful tracked over the follow-up period. The overall incidence of fall was 23.4% (95% CI: 16.5-31.0). Rate of fallers among individuals with low-muscle quality (57.7%) was higher than in those with normal muscle quality (15.3%) (X^2 = 21.132; P < 0.001). The proportion of multiple fallers was also significantly higher (X^2 = 11.029; P < 0.001) among volunteers with low-muscle quality when compared to those with normal muscle quality (14.8% and 3.6%, respectively). The presence of low-muscle quality was associated with a significantly greater risk of falls over the follow-up (hazard ratio: 4.619; 95% CI: 2.302-9.269).

CONCLUSION: Low-muscle quality is associated with a higher incidence of falls in older women. These findings provide support for the concept that muscle quality is a clinically meaningful assessment among older people.

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The role of movement specific reinvestment in visuo-motor control of walking by older adults

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J. Gerontol. B Psychol. Sci. Soc. Sci. 2018; ePub(ePub): ePub.

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Abstract

OBJECTIVES: The aim of this study was to examine the association between conscious monitoring and control of movements (i.e., movement specific reinvestment) and visuo-motor control during walking by older adults.

METHOD: The Movement Specific Reinvestment Scale (MSRS; Masters, Eves, & Maxwell, 2005) was administered to ninety-two community-dwelling older adults, aged 65-81 years, who were required to walk along a 4.8-meter walkway and step on the middle of a target as accurately as possible. Participants' movement kinematics and gaze behavior were measured during approach to the target and when stepping on it.

RESULTS: High scores on the MSRS were associated with prolonged stance and double support times during approach to the stepping target, and less accurate foot placement when stepping on the target. No associations between MSRS and gaze behavior were observed.

DISCUSSION: Older adults with a high propensity for movement specific reinvestment seem to need more time to "plan" future stepping movements, yet show worse stepping accuracy than older adults with a low propensity for movement specific reinvestment. Future research should examine whether older adults with a higher propensity for reinvestment are more likely to display movement errors that lead to falling.

PDF Y Endnote Y

The use of the functional independence measure in elderly

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Abstract

OBJECTIVES: To analyze in scientific publications how the Functional Independence Measure (FIM) has been employed to evaluate the elderly.

METHODS: Integrative review of periodical publications between 2011 and 2015, available online in full-text in Portuguese, English and Spanish.

RESULTS: 129 articles were found; after the application of the criteria, they resulted in 21. The studies were categorized into two groups: A) follow or compare scores in FIM (cohort studies, case-control, clinical trials), focusing on rehabilitation, evaluation of programs and changes in the functional level after procedures/interventions; and B) measure/associate the functionality of the elderly (cross-sectional studies), focused on evaluation protocols in elderly health and associations to the caregiver burden, hospital stay, balance, satisfaction with life, cognition and clinical/socio-demographic aspects.

CONCLUSION: The FIM was used in several scenarios of healthcare for the elderly, particularly in rehabilitation and outpatient clinics or health centers.

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Thoracopelvic assisted movement training to improve gait and balance in elderly at risk of falling: a case series

Springer S, Friedman I, Ohry A.

Clin. Interv. Aging 2018; 13: 1143-1149.

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DOI 10.2147/CIA.S166956 **PMID** 29950824 **PMCID** PMC6016007

Abstract

BACKGROUND: Age-related changes in coordinated movement pattern of the thorax and pelvis may be one of the factors contributing to fall risk. This report describes the feasibility of using a new thoracopelvic assisted movement device to improve gait and balance in an elderly population with increased risk for falls.

METHODS: In this case series, 19 older adults were recruited from an assisted living facility. All had gait difficulties (gait speed <1.0 m/s) and history of falls. Participants received 12 training sessions with the thoracopelvic assisted movement device. Functional performance was measured before, during (after 6 sessions), and after the 12 sessions. Outcomes measures were Timed Up and Go, Functional Reach Test, and the 10-meter Walk Test. Changes in outcomes were calculated for each participant in the context of minimal detectable change (MDC) values.

ESULTS: More than 25% of participants showed changes >MDC in their clinical measures after 6 treatment sessions, and more than half improved >MDC after 12 sessions. Six subjects (32%) improved their Timed Up and Go time by >4 seconds after 6 sessions, and 10 (53%) after 12 sessions. After the intervention, 4 subjects (21%) improved their 10-meter Walk Test velocity from limited community ambulation (0.4-0.8 m/s) to functional community ambulation (>0.8 m/s).

CONCLUSION: Thoracopelvic assisted movement training that mimics normal walking pattern may have clinical implications, by improving skills that enhance balance and gait function. Additional randomized, controlled studies are required to examine the effects of this intervention on larger cohorts with a variety of subjects.

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Usability of a wearable fall detection prototype from the perspective of older people - a real field testing approach

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Abstract

AIMS AND OBJECTIVES: Community-dwelling older people were involved in the testing of a fall detection device to improve its utilization and acceptance in everyday life.

BACKGROUND: The usability of alerting devices remains unsatisfactory, as they are scarcely utilized by older people, despite wide recognition of the importance of rapid assistance after a fall. Moreover, the time a person remains on the floor negatively impacts the severity of fall consequences. However, it is unclear how to increase alerting device utilization in everyday life. Therefore, older people were involved in this research to consider their perspective during prototype development.

DESIGN: A qualitative focus group study was conducted, following a real-field testing approach, underpinned by the theoretical framework 'Medical Device Technology Development Process'.

METHODS: Fifteen community-dwelling older people tested the prototype in daily living over a period of nine days. Different means of involvement were exploited such as 'user seminars' or 'discussion with users'. On day nine, data was collected using focus groups and analysed with qualitative content analysis.

RESULTS: The participants' perspectives yielded positive aspects of the prototype along with aspects requiring improvement. They indicated that technical requirements are essential. They also revealed that a minimal change in daily routines, support for physical activity and independent living and the inclusion of trusted contact persons could lead to wider use of the alerting device.

CONCLUSIONS: Involving users is crucial in gaining a deeper understanding of aspects influencing utilization of an alerting device. The study revealed that usability is influenced both by technical requirements as well as habits and personal preferences. This finding is vital, as habits and personal preferences can only be identified through the involvement of target users. RELEVANCE TO CLINICAL PRACTICE: The study provides key insights for nurses interested in promoting the use of an alerting device in community-dwelling older people.

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Walking and walkability in pre-set and self-defined neighborhoods: a mental mapping study in older adults

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Abstract

Neighborhood walkability contributes to older adults' walking. However, associations vary depending on the neighborhood definition applied as well as between objective and perceived walkability measures. Therefore, this study aimed to comparatively assess walkability indices for commonly used pedestrian network buffers and perceived neighborhood areas. A total of 97 adults aged ≥65 years answered a written physical activity questionnaire and 69 respondents participated

in face-to-face interviews that involved mental mapping, i.e., to draw perceived neighborhood delineations on paper maps. Hierarchical regression analyses were used to compare the contribution of walkability indices for pre-set buffers and self-defined neighborhoods to older adults' walking after adjusting for covariates.

RESULTS show that older adults' self-defined neighborhoods are significantly larger, less home-centered, and more walkable than commonly used buffers. Furthermore, the variance accounted for in neighborhood walking increased from 35.9% to 40.4% (ΔR^2 = 0.046; p = 0.029), when the walkability index was calculated for self-defined neighborhoods rather than pre-set buffers. Therefore, the study supports that geometric differences between pre-set buffers and older adults' spatial ideas of perceived neighborhoods have a significant influence on estimated walkability effects and that exposure areas should be matched with the spatial dimension of outcome variables in future research.

PDF Y Endnote Y

A high anticholinergic burden is associated with a history of falls in the previous year in middle-aged women: findings from the Aberdeen Prospective Osteoporosis Screening Study

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DOI 10.1016/j.annepidem.2018.05.011 **PMID** 29937404

Abstract

PURPOSE: To examine the cross-sectional association between anticholinergic medication burden (ACB) and a history of falls, bone mineral density, and low trauma fractures in middle-aged women aged under 65 years from the Aberdeen Prospective Osteoporosis Screening Study.

METHODS: ACB (0 = none, 1 = possible, ≥2 = definite) was calculated from medication use for 3883 Caucasian women [mean age (SD) = 54.3 (2.3) years] attending the second Aberdeen Prospective Osteoporosis Screening Study visit (1997-2000). Outcomes were examined using logistic regression. Model adjustments were selected a priori based on expert opinion.

RESULTS: Of 3883 participants, 3293 scored ACB = 0, 328 scored ACB = 1, and 262 scored ACB ≥2. High ACB burden (≥2) was associated with increased odds (ACB = 0 reference) for falls (fully adjusted odds ratio [95% confidence intervals] = 1.81 [1.25-2.62]; P = 0.002) and having low bone mineral density (lowest quintile-20%) at Ward's triangle (3.22 [1.30-7.99]; P = 0.01). A history of falls over the year prior to the study visit in participants with ACB score ≥2 was 32 per 100. For ACB categories 1 and 0, a history of falls per 100 was 21 and 22, respectively.

CONCLUSIONS: The risk of falling associated with ACB observed in older age may also extend to middle-aged women.

PDF Y Endnote Y

A systematic review and meta-analyses of the association between anti-hypertensive classes and the risk of falls among older adults

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Abstract

BACKGROUND: Falls in individuals aged ≥ 60 years may result in injury, hospitalisation or death. The role of anti-hypertensive medications in falls among older adults is unclear.

OBJECTIVE: The objective of this study was to assess the association of six anti-hypertensive medication classes, namely α-blockers (AB), angiotensin converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARB), β-blockers (BB), calcium channel blockers (CCB) and diuretics, with the risk of falls, injurious falls or recurrent falls in individuals aged ≥ 60 years compared with non-users.

METHODS: We performed systematic searches in PubMed, EMBASE and CINAHL and included cohort, case-control and cross-sectional studies that investigated the associations between the use of anti-hypertensive medication classes and the risk of falls, injurious falls or recurrent falls in older adults (≥ 60 years) reported in English. We assessed study quality using the Newcastle-Ottawa Scale (NOS). Unadjusted and adjusted odds ratios (ORs) were pooled using random effects model. We performed meta-analyses for each anti-hypertensive medication class and each fall outcome. We also performed sensitivity analyses by pooling studies of high quality and subgroup analyses among studies with an average age of ≥ 80 years.

RESULTS: Seventy-eight articles (where 74, 34, 27, 18, 13 and 11 of them examined diuretics, BB, CCB, ACEi, AB and ARB, respectively) met our inclusion and exclusion criteria; we pooled estimates from 60 articles. ACEi [OR 0.85, 95% confidence interval (CI) 0.81-0.89], BB (OR 0.84, 95% CI 0.76-0.93) and CCB (OR 0.81, 95% CI 0.74-0.90) use were associated with a lower risk of injurious falls than in non-users.

RESULTS in sensitivity and subgroup analyses were largely consistent.

CONCLUSION: The use of ACEi, BB or CCB among older adults may be associated with a lower risk of injurious falls than non-use.

PDF N Endnote Y

Assessment of step accuracy using the Consumer Technology Association standard

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Abstract

The purpose of this study was to compare the accuracy of commercially-available physical activity devices when walking and running at various treadmill speeds using CTA 2056: Physical Activity Monitoring for Fitness Wearables: Step Counting, standard by the Consumer Technology Association (CTA). Twenty participants (10 males and 10 females) completed self-paced walking and running protocols on the treadmill for five minutes each. Eight devices (Apple iWatch series 1, Fitbit Surge, Garmin 235, Moto 360, Polar A360, Suunto Spartan Sport, Suunto Spartan Trainer, and TomTom Spark 3) were tested two at a time, one per wrist. Manual step counts were obtained from video to serve as the benchmark. The mean absolute percent error (MAPE) was calculated during walking and running. During walking, three devices: Fitbit Surge (11.20%), Suunto Sport (22.93%), and TomTom (10.11%) and during running, one device, Polar (10.66%), exceeded the CTA suggestion of a MAPE < 10%. The Moto 360 had the lowest MAPE of all devices for both walking and running. The devices tested had higher step accuracy with running than walking, except for the Polar. Overall, the Apple iWatch series 1, Moto 360, Garmin, and Suunto Spartan Trainer met the CTA standard for both walking and running.

PDF Y Endnote Y

Association of the video head impulse test with improvement of dynamic balance and fall risk in patients with dizziness

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Abstract

MPORTANCE: It is important to know whether recovery of the vestibuloocular reflex (VOR) as measured by the video head impulse test (vHIT) is associated with the recovery of dynamic balance. It is also critical to know how much change in VOR gain is clinically relevant for establishing the recovery of dynamic balance.

OBJECTIVES: To investigate the association between improved VOR gain as measured by the vHIT and improved dynamic balance (reduced fall risk) as measured by the dynamic gait index (DGI) and to calculate the minimal clinically important difference of VOR gain.

DESIGN, SETTING, AND PARTICIPANTS: This retrospective case series study was performed at a tertiary referral center at the Johns Hopkins University School of Medicine. Thirty-eight consecutive patients with subacute or chronic dizziness from January 1, 2014, through May 31, 2017, who visited the vestibular physical therapy clinic were included in the study. INTERVENTIONS: Each patient was evaluated with room light and video-infrared oculomotor examination, vHIT, and balance testing before and after vestibular physical therapy.

MAIN OUTCOMES AND MEASURES: Gain of the lesioned VOR and score on the DGI.

RESULTS: Among the 38 patients (25 women [66%]; mean [SD] age, 65 [14] years), the mean (SD) initial lesioned VOR gain was 0.66 (0.23) and initial DGI score was 16 (3). No correlation was found between initial VOR gain and initial DGI score (r = -0.04; 95% CI, -0.35 to 0.28). At follow-up, 15

patients (39%) had an improved VOR gain and 30 (79%) had an improved DGI score, which was correlated (r = 0.49; 95% CI, 0.20-0.69). In those 15 patients with improved VOR gain, 14 (93%) had improvement of DGI score. In the 23 patients without improvement of VOR gain, 16 (70%) still showed improvement in their DGI score. When using VOR gain to estimate improvement of DGI, the minimal clinically important difference of VOR gain was -0.06.

CONCLUSIONS AND RELEVANCE: The change of VOR gain in the vHIT was moderately associated with the change of DGI score. Improved VOR gain was associated with a high probability of improved dynamic balance. However, in most of the patients whose VOR gains did not improve, balance improvement occurred putatively through sensory reweighting strategies.

PDF Y Endnote Y

Balance exercise facilitates everyday life for people with multiple sclerosis: a qualitative study

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Abstract

OBJECTIVES: The aim of this qualitative study was to describe the experience and perceived effects on everyday life for people with multiple sclerosis after participating in a balance exercise programme focusing on core stability, dual tasking, and sensory strategies (the CoDuSe programme).

METHODS: A qualitative approach was chosen, using face-to-face interviews analysed with content analysis. Twenty-seven people with multiple sclerosis (20 women, 7 men) who had participated in the CoDuSe programme were included. All could walk 20 m with or without walking aids but could not walk further than 200 m. The CoDuSe programme was given twice weekly during a 7-week period.

RESULTS: The analysis revealed five categories. Learning to activate the core muscles described how the participants gained knowledge of using their core muscles and transferred this core muscle activation into everyday life activities. Improved bodily confidence covered narratives of being more certain of the ability to control their bodies. Easier and safer activities showed how they could now perform activities in everyday life more safely and easily. Increased independence and participation involved the participants' improved ability and self-confidence to execute activities by themselves, as well as their increased participation in activities in daily living. Experiences of the balance exercise programme revealed that they found the programme novel and challenging. The overall theme was balance exercise facilitates everyday life.

CONCLUSION: Participating in the CoDuSe programme was perceived to facilitate everyday life for people with multiple sclerosis. Taking part in the balance exercise programme taught the participants how to activate and use the core muscles, which increased their bodily confidence. Having increased bodily confidence helped them to perform everyday life activities with more ease and safety, which increased their independence and participation. The participants described the

CoDuSe programme as novel and challenging, yet feasible.

PDF Y Endnote Y

Cerebrovascular accidents associated with hip fractures: morbidity and mortality-5-year survival

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Abstract

BACKGROUND: Hip fractures are associated with increased cerebrovascular accidents (CVAs) in the first postoperative year. Long-term follow-up for CVA and mortality after hip fracture is lacking. The purpose of this study was to identify risk factors for CVA and follow mortality in hip fractures in a cohort with greater than 2 years follow-up.

METHODS: We compared past medical history of patients with hip fractures to long-term survival and the occurrence of CVA. Past medical history, surgical intervention, CVA occurrence, and death were queried from the electronic medical recorder system. Level of significance was set at p < 0.05 with 95% confidence interval.

RESULTS: Two thousand one hundred ninety-five patients met inclusion criteria. Mean follow-up was 5 years. One hundred ten (5.01%) patients were diagnosed with post-fracture CVA. Forty-one patients had CVA in the first year and 55 patients had CVA between 1 to 5 years after surgery. Among the potential risk factors, hypertension (HTN), atrial fibrillation (AF), and diabetes mellitus (DM) had the highest odds ratio for CVA (OR = 1.885, p value = 0.005; OR = 1.79, p value = 0.012; OR = 1.66, p value = 0.012). The median survival time in patients with CVA was 51.12 ± 3.76 months compared to 59.60 ± 0.93 months in patients without CVA (p = 0.033).

CONCLUSIONS: HTN, AF, and DM are significant risk factors for the occurrence of CVA after hip fracture. The majority of CVAs occur between the first and fifth year postoperatively, and CVA is a negative prognostic factor for postoperative survival.

PDF Y Endnote y

Cortical proprioceptive processing is altered by aging

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Abstract

Proprioceptive perception is impaired with aging, but little is known about aging-related deterioration of proprioception at the cortical level. Corticokinematic coherence (CKC) between limb

kinematic and magnetoencephalographic (MEG) signals reflects cortical processing of proprioceptive afference. We, thus, compared CKC strength to ankle movements between younger and older subjects, and examined whether CKC predicts postural stability. Fifteen younger (range 18-31 years) and eight older (66-73 years) sedentary volunteers were seated in MEG, while their right and left ankle joints were moved separately at 2 Hz (for 4 min each) using a novel MEG-compatible ankle-movement actuator. Coherence was computed between foot acceleration and MEG signals. CKC strength at the movement frequency (F0) and its first harmonic (F1) was quantified. In addition, postural sway was quantified during standing eyes-open and eyes-closed tasks to estimate motor performance. CKC peaked in the gradiometers over the vertex, and was significantly stronger (~76%) at F0 for the older than younger subjects. At F1, only the dominant-leg CKC was significantly stronger (~15%) for the older than younger subjects. In addition, CKC (at F1) was significantly stronger in the non-dominant than dominant leg, but only in the younger subjects. Postural sway was significantly (~64%) higher in the older than younger subjects when standing with eyes closed. Regression models indicated that CKC strength at F1 in the dominant leg and age were the only significant predictors for postural sway. Our results indicated that aging-related cortical-proprioceptive processing is altered by aging. Stronger CKC may reflect poorer cortical proprioceptive processing, and not solely the amount of proprioceptive afference as suggested earlier. In combination with ankle-movement actuator, CKC can be efficiently used to unravel proprioception-related-neuronal mechanisms and the related plastic changes in aging, rehabilitation, motor-skill acquisition, motor disorders etc.

PDF Endnote

Do patients with migraine experience an increased prevalence of falls and fear of falling? A cross-sectional study

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Abstract

OBJECTIVE: To assess the prevalence of falls and fear of falling in patients with migraine compared with controls.

DESIGN: Cross-sectional.

SETTING: Tertiary headache clinic.

PARTICIPANTS: This study consisted of 105 controls and 105 consecutive patients diagnosed with migraine with aura (MA, n=35), migraine without aura (MO, n=35) and chronic migraine (CM, n=35).

MAIN OUTCOME MEASURES: Patients were interviewed using a questionnaire containing questions about the history of falls and impairment in balance, and completed the International Falls Efficacy Scale (FES-I). Groups were contrasted using Student's t-test and analysis of variance, and prevalence ratios were estimated.

RESULTS: Falls and self-reported impairment in balance are more prevalent in patients with migraine (54% and 69%, respectively) than in controls (2% and 2%, respectively). In particular, patients with

CM and MA reported a greater mean number of falls during the previous year {CM 1.4 [standard deviation (SD) 2.2]; MA 2.2 (SD 2.3)} compared with patients with MO [0.5 (SD 1.0); P <0.04] and controls [0.05 (SD 0.2); P <0.002]. The prevalence ratio of falls was greater in patients with MA (7.2; P <0.002) and CM (4.5; P <0.002) compared with controls. Patients with migraine experienced a high level of concern about falls during their daily activities compared with controls (29.8 vs 20.1 points in the FES-I questionnaire; P<0.0001).

CONCLUSIONS: The balance impairment of patients with migraine may have a functional impact. Migraine is associated with risk of falling, and patients exhibit a higher prevalence of impairment in balance, falls and fear of falling.

PDF Y Endnote Y

Effects of shoe top visual patterns on shoe wearers' width perception and dynamic stability

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Abstract

Visual illusions caused by varied orientations of visual patterns may influence the perception of space and size, possibly affecting body stability during locomotion. This study examined the effect of variations in shoe top visual patterns on perception and biomechanical stability while walking and running. Twenty healthy adults performed five walking and running trials along an instrumented walkway when wearing shoes with five different striped patterns (plain, vertical, outward, horizontal, and inward). Before these locomotion trials, participants ranked their perceptions of shoe width. We used synchronized force platform and motion capturing systems to measure ground reaction force, mediolateral center of position displacement, ankle inversion and eversion, ankle excursion, and maximum eversion velocity. We rated stability perception on a 150-mm visual analog scale immediately after each shoe condition. Data analyses indicated that participants perceived plain and horizontal striped shoes as significantly wider than inward and vertical patterned shoes. During walking, participants wearing shoes with plain and horizontal striped patterns demonstrated smaller mediolateral center of position displacement, maximum eversion velocity, and ankle range of motion when compared with walking when wearing outward and vertical striped patterns; when running, we observed a similar effect for maximum eversion velocity. Thus, certain visual patterns on the tops of shoes influence the wearers' width perception and locomotion in ways that affect ankle stability during walking and running, with implications for risk of injury.

PDF Y Endnote Y

Falls after total knee arthroplasty: frequency, circumstances, and associated factors-a prospective cohort study

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Abstract

BACKGROUND: Individuals with total knee arthroplasty (TKA) often experience pain and reduced balance control, which may predispose them to greater fall risk.

OBJECTIVE: The objective of this study was to determine the frequency and circumstance of falls and fall-related risk factors within a 6-month follow-up period in individuals after TKA.

DESIGN: This study was a prospective cohort study.

METHODS: Knee proprioception, the Balance Systems Evaluation Test, knee pain, knee extension and flexion muscle strength, knee range of motion, and balance confidence were evaluated in 134 individuals (39 men, 95 women; mean age = 66.3 years [SD = 6.6 years]) 4 weeks after TKA. Monthly follow-up sessions, via face-to-face or telephone interviews, were implemented to obtain data on fall incidence over 6 months.

RESULTS: Twenty-three individuals after TKA (17.2%) sustained at least 1 fall during the 6-month follow-up period. The median time of the first fall episode was 15 weeks after TKA. Of the 31 fall episodes, most occurred during walking (67.7%). Slipping (35.5%) and tripping (35.5%) were identified as the most frequent causes of falling. Most falls occurred at home (45.2%) or another indoor environments (29.0%). Multivariate binary logistic regression revealed that younger age (odds ratio: 0.91), reduced proprioception of the knee that had undergone surgery ("operated knee") (odds ratio: 1.62), reduced sensory orientation (odds ratio: 0.92), and greater operated knee pain (odds ratio: 1.68) were significantly associated with more falls during the follow-up period.

LIMITATIONS: The results of this study may be generalizable only up to 6 months after TKA.

CONCLUSIONS: Intervention efforts should target deficits in knee proprioception and sensory orientation and operated knee pain to prevent future falls in individuals with TKA.

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Incidence, risk factors and consequences of epilepsy-related injuries and accidents: a retrospective, single center study

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Abstract

Introduction: This study was designed to evaluate risk factors and incidence of epilepsy-related injuries and accidents (ERIA) at an outpatient clinic of a German epilepsy center providing healthcare to a mixed urban and rural population of over one million inhabitants.

Methods: Data acquisition was performed between 10/2013 and 09/2014 using a validated patient questionnaire on socioeconomic status, course of epilepsy, quality of life (QoL), depression, injuries and accidents associated with seizures or inadequate periictal patterns of behavior concerning a

period of 3 months. Univariate analysis, multiple testing and regression analysis were performed to identify possible variables associated with ERIA.

Results: A total of 292 patients (mean age 40.8 years, range 18-86; 55% female) were enrolled and analyzed. Focal epilepsy was diagnosed in 75% of the patients. The majority was on an antiepileptic drug (AEDs) polytherapy (mean number of AEDs: 1.65). Overall, 41 patients (14.0%) suffered from epilepsy-related injuries and accidents in a 3-month period. Besides lacerations (*n* = 18, 6.2%), abrasions and bruises (*n* = 9, 3.1%), fractures (*n* = 6, 2.2%) and burns (*n* = 3, 1.0%), 17 mild injuries (5.8%) were reported. In 20 (6.8% of the total cohort) cases, urgent medical treatment with hospitalization was necessary. Epilepsy-related injuries and accidents were related to active epilepsy, occurrence of generalized tonic-clonic seizures (GTCS) and drug-refractory course as well as reported ictal falls, ictal loss of consciousness and abnormal peri-ictal behavior in the medical history. In addition, patients with ERIA had significantly higher depression rates and lower QoL.

Conclusion: ERIA and their consequences should be given more attention and standardized assessment for ERIA should be performed in every outpatient visit.

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Sway balance mobile application: reliability, acclimation, and baseline administration

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Abstract

OBJECTIVES: To describe historic baseline session administration practices, to assess the utility of a practice trial (an acclimation trial) before the official balance session, and to examine the within-session reliability of the Sway Balance Mobile Application (SBMA).

DESIGN: Retrospective observational study. SETTING: Middle schools, high schools, and colleges across the United States. PARTICIPANTS: More than 17 000 student-athletes were included in the Sway Medical database with 7968 individuals meeting this study's inclusion criteria. INDEPENDENT VARIABLES: The Sway Medical database included the following subject characteristics for each student-athlete: age, sex, weight, and height.

MAIN OUTCOME MEASURES: Balance assessment score generated by the SBMA.

RESULTS: Variable administration practices with significant differences between baseline session averages across methods were found. Individuals who performed an acclimation trial had a significantly higher baseline session average than those who did not. Within-session reliability estimates were in the low to adequate range (r = 0.53-0.78), with higher estimates found for 2 consecutive baseline tests (r = 0.75-0.78).

CONCLUSIONS: For maximum clinical utility, a standardized protocol for postural control baseline acquisition is necessary. Acclimation trial should be administered before a baseline session to minimize variability, especially with only 1 to 2 baseline tests. The highest reliability was observed across 2 consecutive baseline tests within the same baseline session. We suggest obtaining baseline

balance measurements with an acclimation trial followed by a baseline session with 2 baseline tests. Prospective studies are required for validation.

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