SafetyLit February 3, 2019

A multicenter investigation of reablement in Norway: a clinical controlled trial

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BMC Geriatr. 2019; 19(1): e29.

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DOI 10.1186/s12877-019-1038-x **PMID** 30700255

Abstract

BACKGROUND: Reablement is an emerging approach in rehabilitation services, but evidence for its efficacy is rather weak and inconsistent. The purpose of the present study is therefore to investigate the health effects of reablement in home-dwelling adults.

METHODS: A multicenter, clinical controlled trial involving 47 municipalities in Norway, with assessments at baseline, and after 10 weeks and at 6 and 12 months. The sample consisted of 707 persons that received a 4-10 week reablement program and 121 underwent treatment as usual. Primary outcomes were activity performance and satisfaction with performance measured by the Canadian Occupational Performance Measure (COPM, 1-10). Secondary outcomes included the Short Physical Performance Measure Battery (SPPB), the European Quality of Life Scale (EQ-5D-5 L), and the Sense of Coherence Questionnaire (SOC). Overall treatment effects were estimated with mixed-model repeated measures analyses.

RESULTS: Significant treatment effects in the rehabilitation group compared with the control group were found in COPM-Performance and COPM-Satisfaction scores at 10 weeks (mean differences between groups (MD), 1.61, 95% confidence interval (CI), 1.13, 2.10 and MD 1.47, CI 0.98, 1.97, respectively), and at 6 months (MD 1.42; CI 0.82,2.02 and MD 1.37; CI 0.77,1.98, respectively). There were also significant treatment effects in the SPPB-subscales for balance and walking after 6 months, in the total SPPB score and in the subscale for sit-to-stand after 12 months. In the EQ-5D-5 L assessment, significant treatment effects were found in the subscales for mobility, and for usual activities and health after 6 months. There was a significant difference in the SOC after six months.

CONCLUSION: Reablement seems to be a more effective rehabilitation service for persons with functional decline than traditional home-based services after six months. After 12 months, the differences between the groups decreased. TRIAL REGISTRATION: The trial was registered at ClinicalTrials.gov on October 24, 2014, (retrospectively registered) identifier: NCT02273934.

PDF Y Endnote Y

Adequate use of definitions in diagnostic studies: regarding a study about the four square step test with foam for discriminating fall history

Patiño A, Oré-Ramo B, Araujo-Castillo RV.

J. Aging Phys. Act. 2019; ePub(ePub): ePub.

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DOI 10.1123/japa.2018-0400 **PMID** 30676197

Abstract

We would like to express our opinion regarding a paper by Phakkanut Mathurapongsakul and Akkradate Siriphorn recently published in your journal about a test for Discriminating between Older Adults with and without fall History. The goal of our letter is to highlight the importance of using adequate definitions of sensibility and specificity in test accuracy studies.

PDF Y Endnote Y

Differences in cognitive-motor interference in older adults while walking and performing a visual-verbal Stroop task

Wollesen B, Voelcker-Rehage C.

Front. Aging Neurosci. 2018; 10: e426.

Affiliation: Sports Psychology, Institute of Human Movement Science and Health, Faculty of Behavioral and Social Sciences, Chemnitz University of Technology, Chemnitz, Germany.

DOI 10.3389/fnagi.2018.00426 **PMID** 30687077 **PMCID** PMC6333862

Abstract

Objectives: Studies using the dual-task (DT) paradigm to explain age-related performance decline due to cognitive-motor interference (CMI) which causes DT costs (DTCs) revealed contradictory results for performances under DT conditions. This cross-sectional study analyzed whether differences in demographics, physical functioning, concerns of falling (CoF), and other mental factors can explain positive and negative DTCs in older adults while walking in DT situations.

Methodology: *N* = 222 participants (57-89 years) performed a single task (ST) and a DT walking condition (visual-verbal Stroop task) in randomized order on a treadmill. Gait parameters (step length, step width) were measured at a constant self-selected walking speed. Demographics [age, Mini Mental Status Examination (MMSE)], physical functioning (hand grip strength), CoF [Falls Efficacy Scale International (FES-I)], and mental factors [Short Form-12 (SF-12)] were assessed. An analysis of variance (ANOVA) was used to reveal subgroup differences. A four-step hierarchical regression analysis was conducted to identify which variables determine the DTC.

Results: Three subgroups were identified: (1) participants (*n* = 53) with positive DTCs (improvements under DT conditions); (2) participants with negative DTCs (*n* = 60) in all gait parameters; and (3) participants (*n* = 109) who revealed non-uniform DTCs. Baseline characteristics between the subgroups showed differences in age ($F_{(2,215)}$ = 4.953; p = 0.008; η^2 = 0.044). The regression analysis revealed that physical functioning was associated with positive DTC and CoF with negative DTC.

Conclusion: The results confirmed a huge inter-individual variability in older adults. They lead us to suggest that factors causing performance differences in DTCs needs to be reassessed. Functional age seems to determine DTCs rather than calendric age. Psychological variables particularly seem to negatively influence DT performance.

PDF Y Endnote Y

Efficacy of the treatment of elderly trauma patients requiring intensive care

Oshima K, Murata M, Aoki M, Nakajima J, Sawada Y, Isshiki Y, Ichikawa Y, Fukushima K, Hagiwara S, Hinohara H.

Emerg. Med. Int. 2018; 2018: e2137658.

Affiliation: Intensive Care Unit, Gunma University Hospital, Japan.

DOI 10.1155/2018/2137658 **PMID** 30693109 **PMCID** PMC6332988

Abstract

PURPOSE: To evaluate the effectiveness of intensive care for the elderly trauma patients aged 80 years and older.
METHODS: Trauma patients admitted to the intensive care unit (ICU) through the emergency room (ER) at our hospital between January 2013 and December 2016 were analyzed. Patients were divided into two groups: patients aged 80 and older (group E) and <80 years old (group Y). Clinical courses and the total treatment costs were compared between the two groups. Data are shown as median (interquartile range).
RESULTS: A hundred and seven trauma patients were included in the study. There were 26 patients in group E and 81 patients in group Y. There was no significant difference in Injury Severity Score (ISS) (group E, 19 (13, 32); group Y, 17 (14, 25); p=0.708); however, the probability of survival (Ps) was significantly lower in group E (group E, 0.895 (0.757, 0.950); group Y, 0.955 (0.878, 0.986); p=0.004). The duration of ICU stay (days) was significantly longer in group E (10 (5, 23)) than in group Y (4 (3, 9); p=0.001), and the total hospital stay (days) was longer in group E (33 (13, 57)) than in group Y (22 (12, 42); p=0.179). The hospital mortality was higher in group E (11.5%) than in group Y (6.2%) without a significant difference (p=0.365). The total treatment costs were significantly higher in group E ($23,558 (12,456, 42,790) with $1 = ¥110.57) than in group Y ($16,538 (7,412, 25,422); p=0.023).
CONCLUSIONS: Elderly trauma patients require longer-term treatment including ICU stay and greater cost with higher hospital mortality compared with young trauma patients.

PDF Y Endnote Y

Enhancing foot somatosensory inputs by barefoot practice optimizes the effects of physical activity on plantar sensation and postural control in institutionalized older adults: pilot study

Korchi K, Noé F, Bru N, Paillard T.

J. Aging Phys. Act. 2019; ePub(ePub): ePub.

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DOI 10.1123/japa.2018-0016 **PMID** 30676219

Abstract

Increasing somatosensory information from the foot by exercising barefoot can potentially optimize the effectiveness of physical exercise interventions on falls prevention in the older adults. This pilot study was then undertaken in order to explore the effects of increased somatosensory information from the foot by exercising barefoot on balance, gait and plantar cutaneous sensitivity in institutionalized older adults involved in multimodal exercise intervention. Participants were assigned to three groups: a control group which did not perform any physical exercise and two groups in which they were involved in a multimodal exercise program performed barefoot or shod. Postural, gait and plantar cutaneous sensitivity parameters were collected. The results showed that the exercise program produced larger effects on balance and plantar cutaneous sensitivity when exercises were performed barefoot, without any noticeable effect on gait. Hence barefoot exercising

could be a relevant means to optimize the fall-prevention exercise programs in institutionalized older adults.

PDF Y Endnote Y

Exercise for preventing falls in older people living in the community

Sherrington C, Fairhall NJ, Wallbank GK, Tiedemann A, Michaleff ZA, Howard K, Clemson L, Hopewell S, Lamb SE.

Cochrane Database Syst. Rev. 2019; 1: CD012424.

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DOI 10.1002/14651858.CD012424.pub2 **PMID** 30703272

Abstract

BACKGROUND: At least one-third of community-dwelling people over 65 years of age fall each year. Exercises that target balance, gait and muscle strength have been found to prevent falls in these people. An up-to-date synthesis of the evidence is important given the major long-term consequences associated with falls and fall-related injuries

OBJECTIVES: To assess the effects (benefits and harms) of exercise interventions for preventing falls in older people living in the community.

SEARCH METHODS: We searched CENTRAL, MEDLINE, Embase, three other databases and two trial registers up to 2 May 2018, together with reference checking and contact with study authors to identify additional studies.

SELECTION CRITERIA: We included randomised controlled trials (RCTs) evaluating the effects of any form of exercise as a single intervention on falls in people aged 60+ years living in the community. We excluded trials focused on particular conditions, such as stroke. DATA COLLECTION AND ANALYSIS: We used standard methodological procedures expected by Cochrane. Our primary outcome was rate of falls. MAIN RESULTS: We included 108 RCTs with 23,407 participants living in the community in 25 countries. There were nine cluster-RCTs. On average, participants were 76 years old and 77% were women. Most trials had unclear or high risk of bias for one or more items. RESULTS from four trials focusing on people who had been recently discharged from hospital and from comparisons of different exercises are not described here.Exercise (all types) versus control Eighty-one trials (19,684 participants) compared exercise (all types) with control intervention (one not thought to reduce falls). Exercise reduces the rate of falls by 23% (rate ratio (RaR) 0.77, 95% confidence interval (CI) 0.71 to 0.83; 12,981 participants, 59 studies; high-certainty evidence). Based on an illustrative risk of 850 falls in 1000 people followed over one year (data based on control group risk data from the 59 studies), this equates to 195 (95% CI 144 to 246) fewer falls in the exercise group. Exercise also reduces the number of people experiencing one or more falls by 15% (risk ratio (RR) 0.85, 95% CI 0.81 to 0.89; 13,518 participants, 63 studies; high-certainty evidence). Based on an illustrative risk of 480 fallers in 1000 people followed over one year (data based on control group risk data from the 63 studies), this equates to 72 (95% CI 52 to 91) fewer fallers in the exercise group. Subgroup analyses showed no evidence of a difference in effect on both falls outcomes according to whether trials selected participants at increased risk of falling or not.The findings for other outcomes are less certain, reflecting in part the relatively low number of studies

and participants. Exercise may reduce the number of people experiencing one or more fall-related fractures (RR 0.73, 95% CI 0.56 to 0.95; 4047 participants, 10 studies; low-certainty evidence) and the number of people experiencing one or more falls requiring medical attention (RR 0.61, 95% CI 0.47 to 0.79; 1019 participants, 5 studies; low-certainty evidence). The effect of exercise on the number of people who experience one or more falls requiring hospital admission is unclear (RR 0.78, 95% CI 0.51 to 1.18; 1705 participants, 2 studies, very low-certainty evidence). Exercise may make little important difference to health-related quality of life: conversion of the pooled result (standardised mean difference (SMD) -0.03, 95% CI -0.10 to 0.04; 3172 participants, 15 studies; low-certainty evidence) to the EQ-5D and SF-36 scores showed the respective 95% CIs were much smaller than minimally important differences for both scales.Adverse events were reported to some degree in 27 trials (6019 participants) but were monitored closely in both exercise and control groups in only one trial. Fourteen trials reported no adverse events. Aside from two serious adverse events (one pelvic stress fracture and one inguinal hernia surgery) reported in one trial, the remainder were non-serious adverse events, primarily of a musculoskeletal nature. There was a median of three events (range 1 to 26) in the exercise groups.Different exercise types versus controlDifferent forms of exercise had different impacts on falls (test for subgroup differences, rate of falls: P = 0.004, I^2 = 71%). Compared with control, balance and functional exercises reduce the rate of falls by 24% (RaR 0.76, 95% CI 0.70 to 0.81; 7920 participants, 39 studies; high-certainty evidence) and the number of people experiencing one or more falls by 13% (RR 0.87, 95% CI 0.82 to 0.91; 8288 participants, 37 studies; high-certainty evidence). Multiple types of exercise (most commonly balance and functional exercises plus resistance exercises) probably reduce the rate of falls by 34% (RaR 0.66, 95% CI 0.50 to 0.88; 1374 participants, 11 studies; moderate-certainty evidence) and the number of people experiencing one or more falls by 22% (RR 0.78, 95% CI 0.64 to 0.96; 1623 participants, 17 studies; moderate-certainty evidence). Tai Chi may reduce the rate of falls by 19% (RaR 0.81, 95% CI 0.67 to 0.99; 2655 participants, 7 studies; low-certainty evidence) as well as reducing the number of people who experience falls by 20% (RR 0.80, 95% CI 0.70 to 0.91; 2677 participants, 8 studies; high-certainty evidence). We are uncertain of the effects of programmes that are primarily resistance training, or dance or walking programmes on the rate of falls and the number of people who experience falls. No trials compared flexibility or endurance exercise versus control.

AUTHORS' CONCLUSIONS: Exercise programmes reduce the rate of falls and the number of people experiencing falls in older people living in the community (high-certainty evidence). The effects of such exercise programmes are uncertain for other non-falls outcomes. Where reported, adverse events were predominantly non-serious.Exercise programmes that reduce falls primarily involve balance and functional exercises, while programmes that probably reduce falls include multiple exercise categories (typically balance and functional exercises plus resistance exercises). Tai Chi may also prevent falls but we are uncertain of the effect of resistance exercise (without balance and functional exercises), dance, or walking on the rate of falls.

PDF Y Endnote Y

Frailty and health services use among Quebec seniors with non-hip fractures: a population-based study using adminsitrative databases

Fillion V, Sirois MJ, Gamache P, Guertin JR, Morin SN, Jean S.

BMC Health Serv. Res. 2019; 19(1): e70.

Affiliation : Université Laval, Québec, Canada.

DOI 10.1186/s12913-019-3865-z **PMID** 30683094

Abstract

BACKGROUND: The number of frail elderly will increase as the world population ageing accelerates. Since frail elders are at risk of falls, hospitalizations and disabilities, they will require more health care and services. To assess frailty prevalence using health administrative databases, to examine the association between frailty and the use of medical services and to measure the excess use of health services following a non-hip fracture across frailty levels among community-dwelling seniors.

METHODS: A population-based cohort study was built from the Quebec Integrated Chronic Disease Surveillance System, including men and women ≥65 years old, non-institutionalized in the pre-fracture year. Frailty was measured using the Elders Risk Assessment (ERA) index. Multivariate Generalized Estimating Equation models were used to examine the relationship between frailty levels and health services while adjusting for covariates. The excess numbers of visits to Emergency Departments (ED) and to Primary Care Practitioners (PCP) as well as hospitalizations were also estimated.

RESULTS: The cohort included 178,304 fractures. There were 13.6 and 5.2% frail and robust seniors, respectively. In the post-fracture year, the risks of ED visits, PCP visits and hospitalizations, were significantly higher in frail vs. non-frail seniors: adjusted relative risk (RR) = 2.69 [95% CI: 2.50-2.90] for ED visits, RR = 1.28 [95% CI: 1.23-1.32] for PCP visits and RR = 2.34 [95% CI: 2.14-2.55] for hospitalizations.

CONCLUSION: Our results suggest that it is possible to characterize seniors' frailty status at a population level using health administrative databases. Furthermore, this study shows that non-institutionalized frail seniors require more health services after an incident fracture. Screening for frailty in seniors should be part of clinical management in order to identify those at a higher risk of needing health services.

PDF Y Endnote Y

Gait test or no gait test: do we need walking assessment to determine physical frailty?

Najafi B, Zhou H, Nguyen H.

Gerontology 2019; ePub(ePub): ePub.

Affiliation: Interdisciplinary Consortium on Advanced Motion Performance (iCAMP), Division of Vascular Surgery and Endovascular Therapy, Michael E. DeBakey Department of Surgery, Baylor College of Medicine, Houston, Texas, USA.

DOI 10.1159/000495984 **PMID** 30677758

Abstract [Abstract unavailable]

PDF Y Endnote Y

Implementing behaviour change theory and techniques to increase physical activity and prevent functional decline among adults aged 61-70: The PreventIT project

Boulton E, Hawley-Hague H, French DP, Mellone S, Zacchi A, Clemson L, Vereijken B, Todd C.

Prog. Cardiovasc. Dis. 2019; ePub(ePub): ePub.

Affiliation: School of Health Sciences, University of Manchester, and Manchester Academic Health, Science Centre, Manchester, UK.

DOI 10.1016/j.pcad.2019.01.003 **PMID** 30685469

Abstract

The health and wellbeing benefits of engaging in physical activity (PA), and of improving strength and balance, are well documented. The World Health Organization's recommendations of 150 min per week of moderate intensity physical activity have been adopted across the world in policy and practice recommendations. However, the number of older adults engaging in this level of PA remains low. The European Project, PreventIT, has adapted the Lifestyle-integrated Functional Exercise (LiFE) programme, which reduced falls in people 75 years and over, for a younger cohort (aLiFE). aLiFE incorporates challenging strength and balance/agility tasks, as well as specific recommendations for increasing physical activity and reducing sedentary behaviour in young-older adults, aged 60-70 years. Personalised advice is given on how to integrate strength, balance and physical activities into daily life. aLiFE has been further developed to be delivered using smartphones and smartwatches (eLiFE), providing the opportunity to send timely motivational messages and real-time feedback to the user. Both aLiFE and eLiFE are behaviour change interventions, supporting older adults to form long-term physical activity habits. PreventIT has taken the original LiFE concept and further developed the behaviour change elements, explicitly mapping them to Social Cognitive Theory, Habit Formation Theory and 30 Behaviour Change Techniques (BCTs). Goal setting, planning, prompts and real-time feedback are used to deliver a person-centred experience. Over 1300 motivational messages have been written, mapped to psychological theory, BCTs and evidence regarding the importance of strength, balance and PA. A motivational assessment tool has been developed to enable us to investigate stated motivational drivers with actual performed behaviour within the feasibility Randomised Controlled Trial. The PreventIT mHealth intervention focusses on behaviour change from initiation to long-term maintenance, addressing the different phases of adopting a healthier lifestyle. As such, it makes a strong contribution to the developing field of evidence-based mobile health (mHealth). ABBREVIATIONS AND ACRONYMS.

PDF Y Endnote Y

Improving walking ability in people with neurological conditions: a theoretical framework for biomechanics driven exercise prescription

Williams G, Hassett L, Clark R, Bryant A, Olver J, Morris ME, Ada L.

Arch. Phys. Med. Rehabil. 2019; ePub(ePub): ePub.

Affiliation: Faculty of Health Sciences, The University of Sydney, Sydney, Australia.

DOI 10.1016/j.apmr.2019.01.003 **PMID** 30690011

Abstract

The purpose of this paper is to discuss how knowledge of the biomechanics of walking can be used to inform the prescription of resistance exercises for people with mobility limitations. Muscle weakness is a key physical impairment that limits walking in commonly occurring neurological conditions such as cerebral palsy, traumatic brain injury and stroke. Few randomised trials to date have shown conclusively that strength training improves walking in people living with these conditions. This appears to be because 1) the most important muscle groups for forward propulsion when walking have not been targeted for strengthening, and 2) strength training protocols have focused on slow and heavy resistance exercises, which do not improve the fast muscle contractions required for walking. We propose a theoretical framework to improve exercise prescription by integrating the biomechanics of walking with the principles of strength training outlined by the American College of Sports Medicine (ACSM), to prescribe exercises that are specific to improving the task of walking. The high angular velocities that occur in the lower limb joints during walking indicate that resistance exercises targeting power generation would be most appropriate. Therefore, we propose the prescription of plyometric and ballistic resistance exercise, applied using the ACSM guidelines for task-specificity, once people with neurological conditions are ambulating, to improve walking outcomes. This new theoretical framework for resistance training ensures that exercise prescription matches how the muscles work during walking.

PDF Y Endnote Y

Objectively measured mobility of rural community-dwelling people aged 80 and over is strongly associated with greater use of services for community integration and social support: an observational study

Lester D, Tiedemann A, Sherrington C.
Aust. J. Rural Health 2019; ePub(ePub): ePub.
Affiliation: School of Public Health, Sydney Medical School, The University of Sydney, Sydney, New South Wales, Australia.

DOI 10.1111/ajr.12438 **PMID** 30693997
Abstract
OBJECTIVE: The objective of this study was to investigate the relationship between the objectively measured mobility status of rural community-dwelling older people and their use of formal and informal services.
DESIGN: Observational cross-sectional study.
SETTING: Community volunteers, rural New South Wales, Australia.
PARTICIPANTS: Seventy community-dwelling people aged 80 years or older.
MAIN OUTCOME MEASURES: The sum of formal and informal services used, expressed as both total hours per month and the risk of using five hours (the median) or more per month. Predictor variables were usual gait speed, Four Square Step Test, short physical performance battery and de Morton Mobility Index.
RESULTS: Each predictor variable was significantly associated with service use as a continuous or dichotomous variable. The strongest associations were with gait speed and the short physical

performance battery continuous scoring. These relationships remained significant after adjusting for likely confounders, including age, sex, nutritional risk status, cognition and negative affect.
CONCLUSION: This study provides strong evidence that the worse an older person's objectively measured mobility scores, the greater their use of community services to remain living in their rural community. Every measure of mobility proved to be strongly associated with the hours of service use. This objective evidence enhances previous knowledge based on self-report measures. The impact on service use of strategies that enhance older people's mobility warrants investigation.

PDF Y Endnote Y

Revisiting the relationship between internal focus and balance control in young and older adults
Chow VWK, Ellmers TJ, Young WR, Mak TCT, Wong TWL.
Front. Neurol. 2018; 9: e1131.
Affiliation: Li Ka Shing Faculty of Medicine, School of Public Health, The University of Hong Kong, Hong Kong, China.

DOI 10.3389/fneur.2018.01131 **PMID** 30687212 **PMCID** PMC6333651
Abstract
Research highlights the detrimental effect that directing too much conscious attention toward movement can have on postural control. While this concept has received support from many studies, recent evidence demonstrates that this principle does not always translate to aging clinical populations. Given the increasing clinical interest in this topic, the current study evaluated if the original notion (that an internal focus results in compromised balance performance) is upheld in young and older adults during a challenging balance task where we are able to objectively corroborate changes in attentional focus; using an electroencephalography (EEG) method previously identified as an objective indicator of conscious movement control. This method assesses the neural coherence, or "communication," between T3 (verbal-analytical) and Fz (motor-planning) regions of the brain. Thirty-nine young and 40 older adults performed a challenging balance task while holding a 2-meter pole under two randomized conditions: Baseline and Internal focus of attention (directing attention internally toward movement production).
RESULTS showed that young adults demonstrated increased EEG T3-Fz coherence in conjunction with increased sway path during the Internal focus condition. However, no significant differences were observed in older adults between conditions for any measure. The current study provides supporting evidence for the detrimental effect that adopting an Internal focus can have on postural control-especially in populations able to govern these processes in a relatively "automatic" manner (e.g., young adults). However, this work illustrates that such observations may not readily translate between populations and are not robust to age-related changes. Further work is necessary to examine mechanisms underlying this clear translational issue.
PDF Y Endnote Y

Role of gender in dual-tasking timed up and go tests: a cross-sectional study

Almajid R, Keshner E.

J. Mot. Behav. 2019; ePub(ePub): ePub.

Affiliation: Physical Therapy Department , Temple University , Philadelphia , Pennsylvania .

DOI 10.1080/00222895.2019.1565528 **PMID** 30676272

Abstract

Gender plays a role in cognitive performance (Van Hooren et al.). Yet the selection of a secondary task, an important paradigm in studies of posture control, has not considered gender as a variable. We explored whether different cognitive tasks differentially influence performance during the Timed Up and Go (TUG) test in men and women. Twenty young adults performed five cognitive tasks while seated and during the TUG test. Men exhibited a slower normalized cadence than women. When seated, women recalled more items than men and men were more accurate in mental calculation task. There were no changes in spatiotemporal measures. We conclude that gender did not play a major role in motor-cognitive interference during dual task TUG test.

PDF Y Endnote Y

Short-term outcomes of interdisciplinary hip fracture rehabilitation in frail elderly inpatients

Bayon-Calatayud M, Benavente-Valdepeñas AM.

Rehabil. Res. Pract. 2018; 2018: e1708272.

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DOI 10.1155/2018/1708272 **PMID** 30693110 **PMCID** PMC6332931

Abstract

OBJECTIVE: To investigate short-term outcomes of an interdisciplinary rehabilitation program for elderly inpatients who underwent surgical treatment for hip fractures.

METHODS: This is a prospective cohort study of fifty older inpatients who were admitted to a geriatric rehabilitation unit. Clinical and functional outcomes were assessed at admission, at discharge, and one month postdischarge.

RESULTS: Patients mean age was 84.1 ± 4.7 years. Proportions of study population with risk factors of frailty were cognitive impairment (64%), Charlson comorbidity index > 1 (72%), and protein malnutrition (59.2%). Before fracture, Barthel median was 90 (IQR 85, 100), and functional ambulation classification (FAC) score was ≥ 4 for 90% of study participants. One month after concluding rehabilitation, Barthel median was 80, 1 month postdischarge FAC ≥ 4 - prefracture FAC ≥ 4 mean change was - 8% (95% CI, -21.5%, 3.4%), and average for gait speed was 0.48 ± 0.18 m/s (95% CI, 0.43, 0.54). Significant correlation was found between admission Barthel score and 1 month postdischarge Barthel score (ρ= 0.27, p=0.05), and between prefracture FAC score and FAC score 1 month postdischarge (ρ = 0.57, p = 0.05). According to regression analysis, age, cognitive status, prefracture Barthel, prefracture FAC, type of surgery, and length of stay were associated with short-term recovery outcomes.

CONCLUSION: An early interdisciplinary rehabilitation management was insufficient to recover prefracture functional status. Future studies should investigate the best therapeutic strategies to

optimize functional recovery, according to clinical and prefracture frail conditions of these patients.
PDF Y Endnote Y

Surveying the quality of prehospital emergency services for the elderly falls 2017
Azarkhavarani MG, Alavi NM.
J. Educ. Health Promot. 2018; 7: e164.
Affiliation: Medical Surgical Nursing Department, Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, Iran.

DOI 10.4103/jehp.jehp_86_18 **PMID** 30693301 **PMCID** PMC6332656
Abstract
INTRODUCTION: Falls are the most common cause of injuries in elderly population. This study aimed to determine the quality of prehospital emergency services (EMS) for the elderly falls in 2017. MATERIALS AND METHODS: This cross-sectional study was carried out at the Pre-hospital Emergency Center of Kashan in 2017. The sample consisted of elderly people who had reported fall incidents in EMS. The questionnaire consisted of 7 areas with 54 items. Data collected by descriptive and inferential statistics of Friedman and Mann-Whitney were analyzed by SPSS v. 16 software. RESULTS: The number of elderly people was 150 (58% female) and the average age was 68.22 ± 6.75 years. Most falls (88.65%) occurred at home. The average performance scores (between 0 and 2) were as follows: assessment of the scene of the incident (1.51), primary assessment of the elderly (1.46), airway management (1.64), circulation management (1.78), fixation (1.82), secondary and continuous assessment (1.59), and patient transfer (1.68). It was found that secondary assessment and transfer of the male patients were significantly higher in quality than female patients ($P < 0.05$). CONCLUSIONS: In this research, the quality of care in all areas was reported to be desirable. It is recommended that the weaknesses of each area are investigated and the necessary strategies are taken into account such as staff training, changes in data collection forms, and training for the elderly.
PDF Y Endnote Y

The effects of a divided-attention timed stepping accuracy task on balance, strength, endurance and functional performance in healthy older adults: a pilot study
Leach SJ, Maring JR, Costello E.
J. Aging Phys. Act. 2019; ePub(ePub): ePub.
Affiliation: Physical Therapy Program, Department of Health, Human Function and Rehabilitation Sciences, School of Medicine and Health Sciences, The George Washington University, Washington, DC.

DOI 10.1123/japa.2018-0010 **PMID** 30676218
Abstract
The study aim was to investigate whether a 6-week Divided-Attention Stepping Accuracy Task (DATSAT) intervention improved the primary outcome measure, Maximal Step Length (MSL), other balance measures [Berg Balance Scale, Timed Up and Go (TUG)], leg strength, endurance (6-Minute Walk Test) and functional tasks in 15 community dwelling healthy older adults (CHOA) (x̄ age 71.5,

female 46.7%) compared to 15 CHOA in a Bike and Strength (B&S) program (x̄ age 73.8, female 33.3%). Participants trained 3 x per week, 30-60 minutes per session. Stepping group differences were significant for all measures. B&S group improved in MSL (anterior, lateral), strength and 1 functional task. Stepping group outperformed B&S group in TUG and MSL posterior. B&S group outperformed Stepping group in 2 strength measures. Exertion scores were lower for the Stepping group. Overall, DATSAT training resulted in more within-group improvements and 2 between-group measures with less perceived effort and shorter intervention times.
PDF Y Endnote Y

The effects of age and cognitive load on peripheral-detection performance
Savage SW, Spano LP, Bowers AR.
J. Vis. 2019; 19(1): e15.
Affiliation: Schepens Eye Research Institute of Massachusetts Eye and Ear, Department of Ophthalmology, Harvard Medical School, Boston, MA.

DOI 10.1167/19.1.15 **PMID** 30677125
Abstract
Age-related declines in both peripheral vision and cognitive resources could contribute to the increased crash risk of older drivers. However, it is unclear whether increases in age and cognitive load result in equal detriments to detection rates across all peripheral target eccentricities (general interference effect) or whether these detriments become greater with increasing eccentricity (tunnel effect). In the current study we investigated the effects of age and cognitive load on the detection of peripheral motorcycle targets (at 5°-30° eccentricity) in static images of intersections. We used a dual-task paradigm in which cognitive load was manipulated without changing the complexity of the central (foveal) visual stimulus. Each image was displayed briefly (250 ms) to prevent eye movements. When no cognitive load was present, age resulted in a tunnel effect; however, when cognitive load was high, age resulted in a general interference effect. These findings suggest that tunnel and general interference effects can co-occur and that the predominant effect varies with the level of demand placed on participants' resources. High cognitive load had a general interference effect in both age groups, but the effect attenuated at large target eccentricities (opposite of a tunnel effect). Low cognitive load had a general interference effect in the older but not the younger group, impairing detection of motorcycle targets even at 5° eccentricity, which could present an imminent collision risk in real driving.
PDF Y Endnote Y

The factors affecting older adults' intention toward ongoing participation in virtual reality leisure activities
Yeh TM, Pai FY, Jeng MY.
Int. J. Environ. Res. Public Health 2019; 16(3): e16030333.
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DOI 10.3390/ijerph16030333 **PMID** 30691062

Abstract
Due to the aging of organs, older adults may have limited physical strength for participating in outdoor activities. Therefore, indoor activities offer an alternative for maintaining the health of older adults. Following advances in technology, individuals can use virtual reality to exercise in their homes and are no longer subject to the constraints of the outdoor environment or weather conditions. In addition, these activities are easier to participate in when compared to real-world leisure activities. The present research included 294 older adults as its research subjects. They were given firsthand experience of Wii games for 10 weeks, in order to examine the ongoing participation intention of older adults following an experience with virtual reality leisure activities. The study found that experience attributes, experience consequences, and experience values were important factors in determining ongoing participation intention and can effectively predict ongoing participation intention. Four experience attributes-ease of use, usefulness, safety and flexibility, and fun-significantly influenced the experience value and experience consequences of older adults' participants. Experience values also influenced ongoing participation intention.
PDF Y Endnote Y

The Y balance test lower quarter is a valid and reliable assessment in older adults
Sipe CL, Ramey KD, Plisky PP, Taylor JD.
J. Aging Phys. Act. 2019; ePub(ePub): ePub.
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DOI 10.1123/japa.2018-0330 **PMID** 30676192
Abstract
Testing balance and fall risk with older adults of varying abilities is of increasing importance. The primary aim of this study was to evaluate the validity of the Y Balance Test Lower Quarter (YBT-LQ) in older adults. A secondary aim was to provide estimates of reliability with this population. Thirty male (n=15) and female (n=15) subjects (66.8+6.5 years) performed the YBT-LQ, 30-second Chair Stand Test (CST), 8' Up and Go (8UG), Timed Up and Go (TUG), Single Leg Stance (SLS) and Activities Specific Balance Confidence (ABCS) questionnaire. The YBT-LQ was performed on two separate occasions by two investigators in random order. YBT-LQ was significantly correlated with age ($p<.01$), TUG ($p=0.003$), 8UG ($p<0.001$), CST ($p<0.001$), ABCS ($p=0.002$) and SLS ($p=0.005$) performance. The $ICC_{[3,1]}$ score for the reliability of the YBT-LQ was 0.95 (95% CI [0.89, 0.97]). The YBT-LQ appears to be a valid and reliable assessment to use with older adults.
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Use of a dual mobility cup to prevent hip early arthroplasty dislocation in patients at high falls risk
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Injury 2019; ePub(ePub): ePub.
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DOI 10.1016/j.injury.2019.01.022 **PMID** 30691923

Abstract
INTRODUCTION: Hip fracture is a common serious injury that occurs mainly in elderly. Dual-mobility hip arthroplasty or bipolar emiarthroplasty for its treatment remains a controversial decision. Co-morbidities and risk of fall represent additional aspects to be considered. The aim of our study was to determine the rate of mechanical complications for these two types of implants related to fall risk status of patients.
PATIENTS AND METHODS: Our study is a retrospective clinical trial of patients operated with a biarticular hemiarthroplasty or a dual-mobility total hip arthroplasty. Primary outcome was dislocation rate and need for any revision procedure. Patients were treated in a single center from January 2013 to March 2017. In all cases Morse Fall Scale (MSF) was calculated at patient admission to evaluate the risk of postoperative fall. Inclusion criteria to the study were: subcapital or femoral neck fracture of non-pathologic nature, patients with neuromuscular disorders or cognitive dysfunction, age > 75 years with MFS ≥ 45. The patients were reviewed postoperatively at 8 weeks, 6 months, 12 months, and then annually. Patients had clinical (Harris hip score) and radiological assessment.
RESULTS: The mean duration of the follow-up was 283 months. There were five dislocations in Group A (5,6%) and no dislocations in Group B (0%). All dislocations occurred within the first 6 months after surgery. The mean Harris Hip score was 81,7 in Group A patients and 79, 8 in Group B patients.
DISCUSSION: Treatment of hip fractures on non-cooperative patients still represents a dilemma. Falls and runaway motions represent high risk factors of dislocation. Use of dual-mobility cup has been found to be associated with a not statistically proved decrease of dislocation compared to traditional cups.
CONCLUSION: Dual-mobility cups might be considered a valuable option to prevent postoperative dislocation but further study is needed before extending the indications for dual-mobility following a fracture of the femoral neck, to assess the potential cost and complications of a longer procedure. So far, despite a lower dislocation risk, the authors actually cannot recommend widely use of a dual-motility cup instead of emiarthroplasty in high falls risk patients.

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Coordination in adults with neurological impairment - a systematic review of uncontrolled manifold studies
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Gait Posture 2019; 69: 66-78.
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DOI 10.1016/j.gaitpost.2019.01.003 **PMID** 30677709
Abstract
BACKGROUND: Analysis of sensorimotor synergies has been greatly advanced by the Uncontrolled Manifold (UCM) approach. The UCM method is based on partitioning inter-trial variance displayed by elemental variables into 'good' (V_{UCM}) and 'bad' (V_{ORT}) variability that, respectively, indicate

maintenance or loss of task stability. In clinical populations, these indices can be used to investigate the strength, flexibility, stereotypy and agility of synergistic control. RESEARCH QUESTION: How are synergies affected by neurological impairment in adults? Specifically, this study aimed to determine i) the impact of pathology on V_{UCM}, V_{ORT}, and their ratio (synergy index); ii) the relationship between synergy indices and functional performance; iii) changes in anticipatory synergy adjustments (ASAs); and iv) the effects of interventions on synergies.
METHODS: Systematic review of UCM studies on adults with neurological impairment.
RESULTS: Most of the 17 studies had moderate to high quality scores in the adapted Critical Review Form and the UCM reporting quality checklist developed for this review. i) Most of the studies found reduced synergy indices for patients with Parkinson's disease (PD), olivo-ponto-cerebellar atrophy, multiple sclerosis and spinocerebellar degeneration, with variable levels of change in V_{UCM} and V_{ORT}. Reduction in synergy indices was not as consistent for stroke, in three out of six studies it was unchanged. ii) Five of seven studies found no significant correlations between scores on motor function scales and UCM indices. iii) Seven studies consistently reported ASAs that are smaller in magnitude, delayed, or both, for patients compared to healthy controls. iv) Two studies reported increased synergy indices, either via increase in V_{UCM} or decrease in V_{ORT}, after dopaminergic drugs for patients with PD. There were similar synergy indices but improved ASAs after deep brain stimulation for patients with PD. SIGNIFICANCE: UCM can provide reliable and sensitive indicators of altered synergistic control in adults with neurological impairment.

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Does the level of difficulty in balancing tasks affect haptic sensitivity via light touch?
Magre FL, Costa TDAD, Paiva ACS, Moraes R, Mauerberg-deCastro E.
J. Mot. Behav. 2019; ePub(ePub): ePub.
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DOI 10.1080/00222895.2019.1565529 **PMID** 30676290
Abstract
The purpose of this study was to determine whether the contribution of bimanual light touch varies according to the difficulty level of postural tasks (e.g., vision occlusion, height of support surface). Fourteen healthy young adults each were asked to stand in a tandem position, on a 20-cm height balance beam. Postural tasks included light touch and no touch conditions in two vision conditions, nonvision and full vision. The root mean square of amplitude of oscillation (mediolateral), mean velocity, ellipse area, and path length of the center of pressure revealed that touch conditions reduced sway to a greater extent in the elevated support surface, nonvision condition. Highly unstable balance tasks increase the optimization of light touch and affect the attenuation of postural sway.
PDF Y Endnote Y

Effect of estrogen on musculoskeletal performance and injury risk

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Front. Physiol. 2018; 9: e1834.

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DOI 10.3389/fphys.2018.01834 **PMID** 30697162 **PMCID** PMC6341375

Abstract

Estrogen has a dramatic effect on musculoskeletal function. Beyond the known relationship between estrogen and bone, it directly affects the structure and function of other musculoskeletal tissues such as muscle, tendon, and ligament. In these other musculoskeletal tissues, estrogen improves muscle mass and strength, and increases the collagen content of connective tissues. However, unlike bone and muscle where estrogen improves function, in tendons and ligaments estrogen decreases stiffness, and this directly affects performance and injury rates. High estrogen levels can decrease power and performance and make women more prone for catastrophic ligament injury. The goal of the current work is to review the research that forms the basis of our understanding how estrogen affects muscle, tendon, and ligament and how hormonal manipulation can be used to optimize performance and promote female participation in an active lifestyle at any age.

PDF Y Endnote Y

Evaluating knowledge of falls risk factors and falls prevention strategies among lower extremity amputees after inpatient prosthetic rehabilitation: a prospective study

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Disabil. Rehabil. 2019; ePub(ePub): ePub.

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DOI 10.1080/09638288.2018.1555721 **PMID** 30686062

Abstract

PURPOSE: Falls are prevalent among people with lower extremity amputations. A knowledge of risk factors is important in preventing falls, though no research has evaluated patient understanding of falls in this population. The study objective was to evaluate knowledge of falls risk factors and falls prevention strategies at discharge and 4-months after inpatient prosthetic rehabilitation.
METHODS: Participants completed a falls questionnaires with four sections: (1) falls during rehabilitation and after discharge, (2) falls self-efficacy using the Activities-specific Balance Confidence scale, (3) knowledge of falls risk factors, and (4) falls prevention strategies. Questionnaire responses were quantified using means and standard deviations or frequencies and percentages. Data were analyzed using paired t-tests for the Activities-specific Balance Confidence scale and the knowledge of falls risk factors, and using chi-square analyses for fall prevention strategies.

RESULTS: Twenty-seven individuals (aged 62.6 ± 8.4; 55.6% male) were included. Unsafe or risky behaviours and not paying attention to surroundings were perceived as the top two falls risk factors. Although these factors are modifiable, only 5.9% of participants listed preventative behavioural modifications. No significant differences were found in Activities-specific Balance Confidence scale scores (p = 0.404) or knowledge of falls risk factors (p = 0.361) between discharge and follow-up. CONCLUSION: This study highlights a gap between knowledge of falls risk factors and the application of knowledge to prevent falls. Follow-up data suggest that lived experience does not affect the knowledge of falls risk factors. IMPLICATIONS FOR REHABILITATION Falls and falls prevention are an important health concern for those with lower extremityamputations and should be addressed during the rehabilitation process. Balance confidence among individuals with lower extremity amputations is low, indicating that this population is at an increased falls risk and may require intervention to prevent falls. Rehabilitation programs should encourage all forms of falls prevention modifications and strategies, such as behavioural modifications, physical activity and environmental modifications. There is a gap between knowledge of falls risk factors and how to apply this to prevent falls, which may be a target for rehabilitation.

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Frailty predicts fractures among women with and at-risk for HIV

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AIDS 2019; 33(3): 455-463.

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DOI 10.1097/QAD.0000000000002082 **PMID** 30702514

Abstract

OBJECTIVE: To determine associations between frailty and fracture in women with and without HIV infection.

DESIGN: Prospective longitudinal cohort study evaluating associations between baseline frailty status and frailty components, with first and second incident fractures.

METHODS: We evaluated associations of frailty with fracture among 1332 women with HIV and 532 uninfected women without HIV. Frailty was defined as at least three of five Fried Frailty Index components: slow gait, reduced grip strength, exhaustion, unintentional weight loss, and low physical activity. Cox proportional hazards models determined predictors of time to first and second fracture; similar models evaluated Fried Frailty Index components.

RESULTS: Women with HIV were older (median 42 vs. 39 years, P < 0.0001) and more often frail (14 vs. 8%, P = 0.04) than women without HIV; median follow-up was 10.6 years. Frailty was independently associated with time to first fracture in women with and without HIV combined [adjusted hazard ratio (aHR) 1.71, 95% confidence interval (CI): 1.30-2.26; P = 0.0001], and among women with HIV only (aHR 1.91, 95% CI: 1.41-2.58; P < 0.0001), as well as with time from first to second fracture among women with HIV (aHR 1.86, 95% CI: 1.15-3.01; P = 0.01).

CONCLUSION: In this cohort of middle-aged racial and ethnic minority women with or at-risk for HIV, frailty was a strong and independent predictor of fracture risk. As women with HIV continue to age,

early frailty screening may be a useful clinical tool to help identify those at greatest risk of fracture.
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Prediction of life-space mobility in patients with stroke 2 months after discharge from rehabilitation: a retrospective cohort study
Nakao M, Izumi S, Yokoshima Y, Matsuba Y, Maeno Y.
Disabil. Rehabil. 2019; ePub(ePub): ePub.
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DOI 10.1080/09638288.2018.1550533 **PMID** 30676134
Abstract
PURPOSE: To determine the predictors of life-space mobility among patients with stroke 2 months after discharge from a post-acute rehabilitation unit.
MATERIALS AND METHODS: The study population was 1023 patients discharged from a post-acute rehabilitation unit in Japan. We assessed the relationships between life-space mobility 2 months after discharge and age, sex, length of hospital stay, cognition and motor function (Functional Independence Measure), severity of hemiparesis, falls efficacy, physical function (Timed Up and Go (TUG) test), walking distance ability and social support from family and friends.
RESULTS: Bivariate and multiple regression analyses showed that life-space mobility was predicted by sex, age, cognitive score at discharge, TUG score <15 s, length of hospital stay and falls efficacy at discharge. Taken together, these factors accounted for 54% of the variability in life-space mobility. A predictive formula was determined for clinical use.
CONCLUSIONS: The predictive formula provides an objective measure of life-space mobility for stroke patients after discharge. The clinical application of this formula could help health care professionals working in stroke rehabilitation to prepare patients for discharge and to set concrete goals for in-hospital rehabilitation to improve life-space mobility after discharge. Implications for rehabilitation Accurate prediction of the prognosis for life-space mobility 2 months after discharge is useful in establishing clear goals for community-based rehabilitation. Long-term life-space mobility in the community is not only affected by physical function, but also by sex, age, cognitive ability and falls efficacy at discharge. Life-space mobility in female patients is affected by factors reflecting physical function, whereas life-space mobility in male patients is affected by both physical and cognitive function. Prediction of life-space mobility after stroke is important to determine unique mobility goals in rehabilitation and the required use of adaptive equipment after discharge (e.g., returning to work, engaging in a hobby or travelling beyond the immediate neighbourhood).
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Relationship between observational Wisconsin Gait Scale, gait deviation index and gait variability index in individuals after stroke
Guzik A, Drużbicki M, Maistrello L, Turolla A, Agostini M, Kiper P.
Arch. Phys. Med. Rehabil. 2019; ePub(ePub): ePub.
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DOI 10.1016/j.apmr.2018.12.031 **PMID** 30690010

Abstract
OBJECTIVE: To compare results of the observational Wisconsin Gait Scale (WGS) and global gait indexes such as GDI/GVI, constituting an objective method of assessing gait, and taking into account parameters identified during 3-dimensional gait analysis.
DESIGN: A validation study.
SETTING: Rehabilitation Clinic.
PARTICIPANTS: 50 individuals after a stroke and 50 healthy individuals without gait disorders
INTERVENTIONS: Not applicable.
MAIN OUTCOME MEASURES: Gait was evaluated using the WGS. GDI and GVI values were acquired using a movement analysis system. The global gait indexes GDI and GVI were determined based on the kinematic and spatiotemporal parameters respectively.
RESULTS: The study showed statistically significant correlations between the parameters of GDI affected leg and WGS total score (R=-0.87), GVI affected leg and WGS total score (R=-0.93), GVI unaffected leg and WGS total score (R=-0.88), GVI affected/unaffected leg and the total score in the assessment of spatiotemporal parameters on the WGS (R=-0.81) as well as GDI affected leg and the total score in the assessment of kinematics parameters on the WGS (R=-0.85). All correlations were strong ($0.7 \leq |R| < 0.9$) or very strong ($0.9 \leq |R| < 1$).
CONCLUSIONS: WGS scores have a strong or very strong correlation with GDI and GVI. The WGS may be recommended as a substitute tool to be used when 3DGA is unavailable, as it is a useful ordinal scale, enabling simple and accurate observational assessment of gait in patients after stroke, with effectiveness that is comparable to the GDI and GVI indexes.

Shoe-mounted accelerometers should be used with caution in gait retraining
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Scand. J. Med. Sci. Sports 2019; ePub(ePub): ePub.
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DOI 10.1111/sms.13396 **PMID** 30693580
Abstract
Real time biofeedback gait retraining has been reported to be an effective intervention to lower the impact loading during gait. While many of the previous gait retraining studies have utilized a laboratory-based setup, some studies used accelerometers affixed at the distal tibia to allow training outside the laboratory environment. However, many commercial sensors for gait modification are shoe-mounted. Hence, this study sought to compare impact loading parameters measured by shoe-mounted and tibia sensors in participants before and after a course of walking or running retraining using signal source from the shoe-mounted sensors. We also compared the correlations between peak positive acceleration measured at shoe (PPA_S) and tibia (PPA_T) and vertical loading rates, as these loading rates have been related to injury. Twenty four and 14 participants underwent a two-week visual biofeedback walking and running retraining respectively. Participants in the walking retraining group experienced lower PPA_S following the intervention ($p<0.005$). However, they demonstrated no change in PPA_T ($p=0.409$) nor vertical loading rates ($p>0.098$) following the walking

retraining. In contrast, participants in the running retraining group experienced a reduction in the PPA_T ($p=0.001$) and vertical loading rates ($p<0.013$) after running retraining. PPA_S values were 4 times that of PPA_T for both walking and running suggesting an uncoupling of the shoe with tibia. As such, PPA_S was not correlated with vertical loading rates for either walking or running, while significant correlations between PPA_T and vertical loading rates were noted. The present study suggests potential limitations of the existing commercial shoe-mounted sensors.
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