

SafetyLit December 4, 2016

Activity engagement and physical function in old age sample

Shah KN, Lin FV, Yu F, McMahon JM.

Arch. Gerontol. Geriatr. 2016; 69: 55-60.

Affiliation: School of Nursing, University of Rochester, Rochester, NY, USA.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.archger.2016.11.007 **PMID** 27888736

Abstract

OBJECTIVES: To describe the patterns of engagement in mental, physical, and social activity (MA, PA, and SA) and to examine the relationship between combined activity engagement and physical function among community-dwelling older adults.

DESIGN: Cross-sectional correlational study.

SETTING: Multiple communities.

PARTICIPANTS: A total of 466 individuals aged 55 years or older.

MEASUREMENTS: Physical function was assessed using grip strength and gait speed. Engagement in PA, MA and SA was obtained from self-report questionnaires.

RESULTS: We identified four classes ("Active PA and MA", "Active MA", "Active PA", and "Inactive") that significantly differed in the frequency of engagement in MA and PA using latent class analysis. SA didn't differ across classes. Controlling for age, the "Active PA and MA", "Active MA", "Active PA" groups displayed similar grip strength that was superior to the "Inactive" group. "Active PA and MA" group had best gait speed relative to other groups, especially "Active MA" and "Inactive" group, while the "Active PA", "Active MA", and "Inactive" group were similar in gait speed.

CONCLUSION: Combined physical and mental activity engagement was associated with better physical function, especially in gait speed. Future interventional research should investigate the combination of both physical and cognitive training to prevent decline of physical function in older adults.

Copyright © 2016 Elsevier Ireland Ltd. All rights reserved.

PDF Y Endnote Y

Artificial neural networks: predicting head CT findings in elderly patients presenting with minor head injury after a fall

Dusenberry MW, Brown CK, Brewer KL.

Am. J. Emerg. Med. 2016; ePub(ePub): ePub.

Affiliation: Department of Emergency Medicine, Brody School of Medicine, East Carolina University, 600 Moye Blvd, Greenville, NC 27834, USA. Electronic address: brewerk@ecu.edu.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.ajem.2016.10.065 **PMID** 27876174

Abstract

OBJECTIVES: To construct an artificial neural network (ANN) model that can predict the presence of acute CT findings with both high sensitivity and high specificity when applied to the population of patients \geq age 65 years who have incurred minor head injury after a fall.

METHODS: An ANN was created in the Python programming language using a population of 514 patients \geq age 65 years presenting to the ED with minor head injury after a fall. The patient dataset was divided into three parts: 60% for "training", 20% for "cross validation", and 20% for "testing". Sensitivity, specificity, positive and negative predictive values, and accuracy were determined by

comparing the model's predictions to the actual correct answers for each patient.

RESULTS: On the "cross validation" data, the model attained a sensitivity ("recall") of 100.00%, specificity of 78.95%, PPV ("precision") of 78.95%, NPV of 100.00%, and accuracy of 88.24% in detecting the presence of positive head CTs. On the "test" data, the model attained a sensitivity of 97.78%, specificity of 89.47%, PPV of 88.00%, NPV of 98.08%, and accuracy of 93.14% in detecting the presence of positive head CTs.

CONCLUSIONS: ANNs show great potential for predicting CT findings in the population of patients \geq 65 years of age presenting with minor head injury after a fall. As a good first step, the ANN showed comparable sensitivity, predictive values, and accuracy, with a much higher specificity than the existing decision rules in clinical usage for predicting head CTs with acute intracranial findings.

Copyright © 2016 Elsevier Inc. All rights reserved.

PDF Y Endnote Y

Comorbid Parkinson's disease, falls and fractures in the 2010 National Emergency Department Sample

Beydoun HA, Beydoun MA, Mishra NK, Rostant OS, Zonderman AB, Eid SM.

Parkinsonism Relat. Disord. 2016; ePub(ePub): ePub.

Affiliation: Johns Hopkins University School of Medicine, Baltimore, MD, USA. Electronic address: seid1@jhmi.edu.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.parkreldis.2016.11.005 **PMID** 27887896

Abstract

INTRODUCTION: Parkinson's disease (PD) is a progressive, neurodegenerative disorder of multifactorial etiology affecting ~1% of older adults. Research focused on linking PD to falls and bone fractures has been limited in Emergency Department (ED) settings, where most injuries are identified. We assessed whether injured U.S. ED admissions with PD diagnoses were more likely to exhibit comorbid fall- or non-fall related bone fractures and whether a PD diagnosis with a concomitant fall or bone fracture is linked to worse prognosis.

METHODS: We performed secondary analyses of 2010 Healthcare Utilization Project National ED Sample from 4,253,987 admissions to U.S. EDs linked to injured elderly patients. ED discharges with ICD-9-CM code (332.0) were identified as PD and those with ICD-9-CM code (800.0-829.0) were used to define bone fracture location. Linear and logistic regression models were constructed to estimate slopes (B) and odds ratios (OR) with 95% confidence intervals (CI).

RESULTS: PD admissions had 28% increased adjusted prevalence of bone fracture. Non-fall injuries showed stronger relationship between PD and bone fracture (OR_{adj} = 1.33, 95% CI: 1.22-1.45) than fall injuries (OR_{adj} = 1.06, 95% CI: 1.01-1.10). PD had the strongest impact on hospitalization length when bone fracture and fall co-occurred, and total charges were directly associated with PD only for fall injuries. Finally, PD status was not related to in-hospital death in this population.

CONCLUSION: Among injured U.S. ED elderly patient visits, those with PD had higher bone fracture prevalence and more resource utilization especially among fall-related injuries. No association of PD with in-hospital death was noted.

Published by Elsevier Ltd.

PDF Y Endnote Y

Determining whether a dosage-specific and individualized home exercise program with consults reduces fall risk and falls in community-dwelling older adults with difficulty walking: a randomized control trial

Gallo E, Stelmach M, Frigeri F, Ahn DH.

J. Geriatr. Phys. Ther. 2016; ePub(ePub): ePub.

Affiliation: NYU Langone Medical Center Rusk Rehabilitation, New York.

(Copyright © 2016, American Physical Therapy Association)

DOI 10.1519/JPT.000000000000114 **PMID** 27893567

Abstract

BACKGROUND AND PURPOSE: The development and implementation of effective interventions to prevent falls in older adults is a public health priority. The purpose of this study was to compare the efficacy of a new practice model, incorporating Shubert's evidence-based fall prevention recommendations, with the usual ambulatory physical therapy (PT) at Rusk Rehabilitation, to decrease fall risk among older adults living in the community. The hypotheses were (1) the proposed program would decrease participants' fall risk, (2) it would be more effective than our usual PT, and (3) the addition of 4 consults after discharge would improve compliance with a home exercise program.

METHODS: This was a randomized controlled trial. Sixty-nine participants who were independent community dwellers, were 65 years or older, had difficulty walking or complaints of instability, and had 1 or more risk of falls were randomly assigned into a usual care group (UCG, n = 43) or an experimental group (EG, n = 26). Both groups received PT 2 times per week for 30 minutes for 10 to 32 visits. The UCG received the usual PT delivered at Rusk. The EG was instructed in a moderate- to high-intensity home exercise program designed after completing the mini-Balance Evaluation Systems Test to assist with exercise prescription. The EG was educated on performing a recommended dosage of exercise over 6 months using a diary. The EG received 4 additional 30-minute consults every 2 to 4 weeks postdischarge to reinforce compliance. Self-report of number of falls, number of minutes of exercise per week, and performance on outcome measures (Timed Up and Go, 5-times sit-to-stand, Berg Balance Scale, and Activity Balance Confidence Scale) were monitored at evaluation, 2, 4, and 6 months.

RESULTS AND DISCUSSION: Thirty-five participants completed the study (UCG n = 22; EG n = 13). Both groups were similar at baseline on outcome measures and number of visits. Random effect model analyses demonstrated that both groups made significant reductions in fall risk over 6 months as identified by performance on outcome measures. However, the EG improved significantly more compared with the UCG over time ($P < .05$). Linear regression analyses showed that the EG exercised significantly more compared with the UCG at all times ($P < .05$). The EG exceeded the target of 115 min/wk of exercise (154 minutes, standard deviation [SD] 68.5; 170 minutes, SD 96.8; and 143 minutes, SD 68.5) at 2, 4, and 6 months, respectively. This study demonstrated that the experimental program is effective in decreasing fall risk in community-dwelling older adults and is more effective than our usual care. Moreover, it suggests that the overall experimental protocol may offer an effective strategy to foster adherence to an exercise program without the increasing number of visits.

CONCLUSION: This study supports the efficacy of the experimental program in decreasing fall risk and being more effective than our usual care, as well as fostering greater compliance with an exercise regimen.

It provides some preliminary evidence to support Shubert's recommendation on exercise prescription for fall prevention.

PDF N Endnote Y

Effect of uphill and downhill walking on walking performance in geriatric patients using a wheeled walker

Lindemann U, Schwenk M, Schmitt S, Weyrich M, Schlicht W, Becker C.

Z. Gerontol. 2016; ePub(ePub): ePub.

Affiliation : Research Initiative Human Factors in Ageing, Technology and Environment, University Stuttgart, Stuttgart, Germany.

(Copyright © 2016, Springer Science+Business Media)

DOI 10.1007/s00391-016-1156-4 **PMID** 27878412

Abstract

BACKGROUND: Wheeled walkers are recommended to improve walking performance in older persons and to encourage and assist participation in daily life. Nevertheless, using a wheeled walker can cause serious problems in the natural environment. This study aimed to compare uphill and downhill walking with walking level in geriatric patients using a wheeled walker. Furthermore, we investigated the effect of using a wheeled walker with respect to dual tasking when walking level. **METHODS:** A total of 20 geriatric patients (median age 84.5 years) walked 10 m at their habitual pace along a level surface, uphill and downhill, with and without a standard wheeled walker. Gait speed, stride length and cadence were assessed by wearable sensors and the walk ratio was calculated.

RESULTS: When using a wheeled walker while walking level the walk ratio improved (0.58 m/[steps/min] versus 0.57 m/[steps/min], $p = 0.023$) but gait speed decreased (1.07 m/s versus 1.12 m/s, $p = 0.020$) when compared to not using a wheeled walker. With respect to the walk ratio, uphill and downhill walking with a wheeled walker decreased walking performance when compared to level walking (0.54 m/[steps/min] versus 0.58 m/[steps/min], $p = 0.023$ and 0.55 m/[steps/min] versus 0.58 m/[steps/min], $p = 0.001$, respectively). At the same time, gait speed decreased (0.079 m/s versus 1.07 m/s, $p < 0.0001$) or was unaffected.

CONCLUSION: The use of a wheeled walker improved the quality of level walking but the performance of uphill and downhill walking was worse compared to walking level when using a wheeled walker.

PDF Y Endnote Y

Essential resources for implementation and sustainability of evidence-based health promotion programs: a mixed methods multi-site case study

Dattalo M, Wise M, Ford li JH, Abramson B, Mahoney J.

J. Community Health 2016; ePub(ePub): ePub.

Affiliation: Wisconsin Institute for Healthy Aging, Madison, WI, 53714, USA.

(Copyright © 2016, Springer Science+Business Media)

DOI 10.1007/s10900-016-0263-x **PMID** 27896504

Abstract

As of October 2016, use of federal Older Americans Act funds for health promotion and disease prevention will be restricted to the Administration on Aging's criteria for high-level evidence-based health promotion programs. Dissemination of these programs to rural communities remains limited.

Therefore a strong need exists to identify strategies that facilitate program implementation and sustainability. The objective of this study was to compare organizational readiness and implementation strategies used by rural communities that achieved varying levels of success in sustaining evidence-based health promotion programs for older adults. We utilized a qualitative multi-site case study design to analyze the longitudinal experiences of eight rural sites working to implement evidence-based health promotion program over 3 years (8/2012-7/2015). Multiple sources of data (interviews, documents, reports, surveys) from each site informed the analysis. We used conventional content analysis to conduct a cross-case comparison to identify common features of rural counties that successfully implemented and sustained their target evidence-based health promotion program. Readiness to implement evidence-based programs as low at baseline as all site leaders described needing to secure additional resources for program implementation. Sites that successfully utilized six essential resources implemented and sustained greater numbers of workshops: (1) External Partnerships, (2) Agency Leadership Commitment, (3) Ongoing Source of Workshop Leaders, (4) Health Promotion Coordination Tasks Assigned to Specific Staff, (5) Organizational Stability, and (6) Change Team Engagement. The six essential resources described in this study can help rural communities assess their readiness to implement health promotion programs and work secure the resources necessary for successful implementation.

PDF Y Endnote Y

Instrumented test of sensory integration for balance: a validation study

Freeman L, Gera G, Horak FB, Blackinton MT, Besch M, King L.

J. Geriatr. Phys. Ther. 2016; ePub(ePub): ePub.

Affiliation: Aegis Therapies, Plano, Texas. Oregon Health & Science University, Portland. Nova Southeastern University, Fort Lauderdale, Florida. PATH Clinical Research Institute, USA.

(Copyright © 2016, American Physical Therapy Association)

DOI 10.1519/JPT.000000000000110 **PMID** 27893564

Abstract

BACKGROUND AND PURPOSE: Abnormal postural sway is associated with an increase in risk of falls but is difficult for clinicians to accurately quantify without access to laboratory equipment.

Instrumenting clinical outcome measures using body-worn movement monitors is a low-cost alternative. This is the first study to compare the modified Clinical Test of Sensory Integration for Balance (i-mCTSIB) to the laboratory test of the Sensory Organization Test (SOT) with dynamic posturography in a group of participants with Parkinson's disease (PD) and subtle balance limitations. The purpose of this study was to (1) determine the concurrent validity of the i-mCTSIB with the SOT (6 and 4 conditions) and (2) compare the i-mCTSIB and the SOT to differentiate between individuals with and without recent falls within the previous 6 months.

METHODS: This cross-sectional study examined 26 participants with idiopathic PD who had a Motor Unified Parkinson's Disease Rating Scale score of 32.7 (13.5) out of 108.

RESULTS: The composite and conditions 1 and 4 of the i-mCTSIB and SOT scores were significantly correlated: composite scores $r = -0.64$ ($P \leq .001$), C1 $r = -0.43$ ($P = .03$), C3 $r = -0.60$ ($P \leq .01$), and C4 $r = -0.54$ ($P \leq .001$). A significant difference was observed in mean i-mCTSIB composite scores between fallers and nonfallers ($P = .04$). In contrast, the SOT composite was not significantly different between fallers and nonfallers ($P = .31$).

DISCUSSION: The results suggest that the i-mCTSIB may be a valid and clinically meaningful measure of sensory organization in persons with PD, even those with mild postural instability as measured by

the median Hoehn and Yahr score (2.0). Future research should evaluate predictive validity of the i-mCTSIB for prospective falls.

CONCLUSION: The instrumented mCTSIB with portable, body-worn movement allows clinicians to quantify abnormal postural sway without the ceiling effects of clinical balance testing or the expense and importability of force plate technology in the SOT. Instrumenting mCTSIB may also distinguish between fallers and nonfallers.

PDF N Endnote Y

Investigating the relationship between reduced self-awareness of falls risk, rehabilitation engagement and falls in older adults

Mihaljcic T, Haines TP, Ponsford JL, Stolwyk RJ.

Arch. Gerontol. Geriatr. 2016; 69: 38-44.

Affiliation: School of Psychological Sciences, Monash University, Wellington Road, Clayton, VIC 3800, Australia. Electronic address: Rene.Stolwyk@monash.edu.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.archger.2016.11.003 **PMID** 27886565

Abstract

The present study aimed to investigate whether self-awareness of falls risk is associated with rehabilitation engagement, motivation for rehabilitation, and number of falls after hospital discharge. The sample comprised 91 older adults (Mage=77.97, SD=8.04) undergoing inpatient rehabilitation. The Self-Awareness of Falls Risk Measure (SAFRM) was used to measure different aspects of self-awareness. The treating physiotherapist and occupational therapist rated the patient's engagement in rehabilitation and the patient reported his/her motivation for treatment. Falls information was collected from the patient and significant other once a month for three months following hospital discharge. Significant correlations were found between physiotherapist-rated engagement and intellectual ($r_s=-0.22$, $p<0.05$) and anticipatory awareness ($r_s=-0.24$, $p<0.05$). Occupational therapist-rated engagement and patient-reported motivation for rehabilitation was correlated with emergent awareness ($r_s=-0.38$ and -0.31 , $p<0.05$, respectively) and overall self-awareness ($r_s=-0.31$ and -0.26 , $p<0.05$, respectively). Regression analyses indicated that overall self-awareness provided a unique contribution to occupational therapist-rated engagement when controlling for age, gender, cognition and functional ability. Falls were reported by 29.9% of participants, however, self-awareness did not differ significantly between fallers and non-fallers. The findings suggest that self-awareness of falls risk is associated with rehabilitation engagement and motivation. Therefore, improving patient self-awareness of falls risk may increase engagement in therapy leading to better patient outcomes.

Copyright © 2016 Elsevier Ireland Ltd. All rights reserved.

PDF Y Endnote Y

Lower-extremity resistance training on unstable surfaces improves proxies of muscle strength, power and balance in healthy older adults: a randomised control trial

Eckardt N.

BMC Geriatr. 2016; 16(1): e191.

Affiliation: Department of Training and Movement Science, Institute of Sport and Sports Science, University of Kassel, Damaschkestraße 25, 34121, Kassel, Germany. nilseckardt@uni-kassel.de.

(Copyright © 2016, BioMed Central)

DOI 10.1186/s12877-016-0366-3 PMID 27881086

Abstract

BACKGROUND: It is well documented that both balance and resistance training have the potential to mitigate intrinsic fall risk factors in older adults. However, knowledge about the effects of simultaneously executed balance and resistance training (i.e., resistance training conducted on unstable surfaces [URT]) on lower-extremity muscle strength, power and balance in older adults is insufficient. The objective of the present study was to compare the effects of machine-based stable resistance training (M-SRT) and two types of URT, i.e., machine-based (M-URT) and free-weight URT (F-URT), on measures of lower-extremity muscle strength, power and balance in older adults.

METHODS: Seventy-five healthy community-dwelling older adults aged 65-80 years, were assigned to three intervention groups: M-SRT, M-URT and F-URT. Over a period of ten weeks, all participants exercised two times per week with each session lasting ~60 min. Tests included assessment of leg muscle strength (e.g., maximal isometric leg extension strength), power (e.g., chair rise test) and balance (e.g., functional reach test), carried out before and after the training period. Furthermore, maximal training load of the squat-movement was assessed during the last training week.

RESULTS: Maximal training load of the squat-movement was significantly lower in F-URT in comparison to M-SRT and M-URT. However, lower-extremity resistance training conducted on even and uneven surfaces meaningfully improved proxies of strength, power and balance in all groups. M-URT produced the greatest improvements in leg extension strength and F-URT in the chair rise test and functional reach test.

CONCLUSION: Aside from two interaction effects, overall improvements in measures of lower-extremity muscle strength, power and balance were similar across training groups. Importantly, F-URT produced similar results with considerably lower training load as compared to M-SRT and M-URT. Concluding, F-URT seems an effective and safe alternative training program to mitigate intrinsic fall risk factors in older adults. **TRIAL REGISTRATION:** This trial has been registered with clinicaltrials.gov (NCT02555033) on 09/18/2015.

PDF Y Endnote Y

Postural sway, balance confidence and fear of falling in women with knee osteoarthritis in comparison to matched controls

Taglietti M, Dela Bela LF, Dias JM, Marcondes Pelegrinelli AR, Nogueira JF, Batista Júnior JP, da Silva Carvalho RG, McVeigh JG, Facci LM, Moura FA, Cardoso JR.

PM R 2016; ePub(ePub): ePub.

Affiliation: Laboratory of Biomechanics and Clinical Epidemiology, PAIFIT Research Group, Universidade Estadual de Londrina, Londrina, PR, Brazil. Electronic address: jeffcar@uel.br. (Copyright © 2016, American Academy of Physical Medicine and Rehabilitation, Publisher Elsevier Publishing)

DOI 10.1016/j.pmrj.2016.11.003 PMID 27876656

Abstract

BACKGROUND: Osteoarthritis (OA) is a chronic degenerative disease that commonly affects the knee joints. Individuals over 65 years with knee OA have a greater risk of falls. However, there has been limited examination of the parameters of postural sway (increased time, speed and postural sway area (center of pressure area (CoP))), and OA of the knee.

OBJECTIVES: Primary: to determine whether the CoP variables discriminate between patients with knee OA and matched healthy volunteers, and to correlate the CoP variables with the Activities-

Specific Balance Confidence Scale (ABC) and Falls Self-Efficacy Scale (FES); Secondary: to compare the CoP of the older women with OA with a control group in bipedal support condition with eyes opened and closed.

DESIGN: Cross-sectional study.

SETTING: University Biomechanics Laboratory.

PARTICIPANTS: Twenty-two participants were divided into two groups of 11: OA group (\bar{x} =68 years (SD=7.4) and a control group (\bar{x} =66 years (SD=4.4).

METHODS: Static postural balance was measured by a portable force platform. Data were collected in both visual conditions (eyes open and closed), in a random order. Three attempts of 30 seconds were allowed for each participant on the force platform, with a one minute interval between attempts.

MAIN OUTCOME MEASURE: Variables the CoP: total displacement of sway (TDS, in cm), anteroposterior amplitude displacement (APAD, in cm), medial-lateral amplitude displacement (MLAD, in cm), total mean velocity (TMV, in cm/s) and dispersion of the center of pressure (AREA, in cm^2).

RESULTS: The postural sway analysis found statistically significant differences in the eyes open condition for the TDS ($p=.020$), APAD ($p=.042$), TMV ($p=.010$), and AREA ($p=.045$). In the discriminant analysis none of CoP variables were able to classify the groups ($p=.15$). The correlation analysis showed only the AREA with eyes closed was associated with the ABC Scale ($\rho=-0.42$).

CONCLUSIONS: Women with knee OA had greater postural sway when compared to a control group for the eyes open condition. CoP variables could not discriminate between the groups. The AREA (dispersion of the center of pressure) was negatively correlated with the ABC Scale, when the eyes were closed.

Copyright © 2016 American Academy of Physical Medicine and Rehabilitation. Published by Elsevier Inc. All rights reserved.

PDF Y Endnote Y

The effect anticoagulation status on geriatric fall trauma patients

Coleman J, Baldawi M, Heidt D.

Am. J. Surg. 2016; ePub(ePub): ePub.

Affiliation: Department of Surgery, University of Toledo, 3000 Arlington Avenue, Toledo, OH 43614, USA.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.amjsurg.2016.09.036 **PMID** 27889266

Abstract

BACKGROUND: This research study aims to identify the effect of anticoagulation status on hospital course, complications, and outcomes among geriatric fall trauma patients.

METHODS: The study design is a retrospective cohort study, looking at fall trauma among patients aged 60 to 80 years from 2009 to 2013 at a university hospital in the United States. The statistical analysis, conducted with SPSS software with a threshold for statistical significance of $P < .05$, was stratified by anticoagulation status and then further by type of anticoagulation (aspirin, warfarin, clopidogrel, enoxaparin, and dipyridamole). Outcomes variables include mortality, length of stay (LOS), intensive care unit (ICU) admission, and complications.

RESULTS: The total number of patients included in this study was 1,121. Compared with patients not on anticoagulation, there was a higher LOS among patients on anticoagulation (6.3 ± 6.2 vs 4.9 ± 5.2 , $P = .001$). A higher LOS (7.2 ± 6.8 vs 5.0 ± 5.3 , $P = .001$) and days in the ICU (2.1 ± 5.4 vs 1.1 ± 3.8 , $P = .010$) was observed in patients on warfarin. A higher mortality (7.1% vs 2.8% , $P = .013$), LOS (6.3 ± 6.2 vs 5.1 ± 5.396 , $P = .036$), and complication rate (49.1 vs 36.7 , $P = .010$) was observed among patients on clopidogrel.

CONCLUSIONS: In this study, a higher mortality and complication rate were seen among clopidogrel, and a greater LOS and number of days in the ICU were seen in patients on warfarin. These differences are important, as they can serve as a screening tool for triaging the severity of a geriatric trauma patient's condition and complication risk. For patients on clopidogrel, it is essential that these patients are recognized early as high-risk patients who will need to be monitored more closely. For patients on clopidogrel or warfarin, bridging a patient's anticoagulation should be initiated as soon as possible to prevent unnecessary increased LOS. At last, these data also provide support against prescribing patients clopidogrel when other anticoagulation options are available.

Published by Elsevier Inc.

PDF Y Endnote Y

The role of pharmacists in preventing falls among America's older adults

Karani MV, Haddad Y, Lee R.

Front. Public Health 2016; 4: e250.

Affiliation: Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, USA.

(Copyright © 2016, Frontiers Editorial Office)

DOI 10.3389/fpubh.2016.00250 **PMID** 27882314 **PMCID** PMC5101193

Abstract

Falls are the leading cause of both fatal and non-fatal injuries in people aged 65 years and older and can lead to significant costs, injuries, functional decline, and reduced quality of life. While certain medications are known to increase fall risk, medication use is a modifiable risk factor. Pharmacists have specialized training in medication management and can play an important role in fall prevention. Working in a patient-centered team-based approach, pharmacists can collaborate with the primary care providers to reduce fall risk. They can screen for fall risk, review and optimize medication therapy, recommend vitamin D, and educate patients and caregivers about ways to prevent falls. To help health-care providers implement fall prevention, the Centers for Disease Control and Prevention developed the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative. Based on the established clinical guidelines, STEADI provides members of the health-care team, including pharmacists, with the tools and resources they need to manage their older patients' fall risk. These tools are being adapted to specifically advance the roles of pharmacists in reviewing medications, identifying those that increase fall risk, and communicating those risks with patients' primary care providers. Through a multidisciplinary approach, pharmacists along with other members of the health-care team can better meet the needs of America's growing older adult population and reduce falls.

PDF Y Endnote Y

Traumatic brain injury in England and Wales: prospective audit of epidemiology, complications and standardised mortality

Lawrence T, Helmy A, Bouamra O, Woodford M, Lecky F, Hutchinson PJ.

BMJ Open 2016; 6(11): e012197.

Affiliation: Department of Neurosurgery, Addenbrooke's Hospital, Cambridge, UK.

(Copyright © 2016, BMJ Publishing Group)

DOI 10.1136/bmjopen-2016-012197 **PMID** 27884843

Abstract

OBJECTIVES: To provide a comprehensive assessment of the management of traumatic brain injury (TBI) relating to epidemiology, complications and standardised mortality across specialist units.

DESIGN: The Trauma Audit and Research Network collects data prospectively on patients suffering trauma across England and Wales. We analysed all data collected on patients with TBI between April 2014 and June 2015.

SETTING: Data were collected on patients presenting to emergency departments across 187 hospitals including 26 with specialist neurosurgical services, incorporating factors previously identified in the Ps14 multivariate logistic regression (Ps14(n)) model multivariate TBI outcome prediction model. The frequency and timing of secondary transfer to neurosurgical centres was assessed.

RESULTS: We identified 15 820 patients with TBI presenting to neurosurgical centres directly (6258), transferred from a district hospital to a neurosurgical centre (3682) and remaining in a district general hospital (5880). The commonest mechanisms of injury were falls in the elderly and road traffic collisions in the young, which were more likely to present in coma. In severe TBI (Glasgow Coma Score (GCS) ≤ 8), the median time from admission to imaging with CT scan is 0.5 hours. Median time to craniotomy from admission is 2.6 hours and median time to intracranial pressure monitoring is 3 hours. The most frequently documented complication of severe TBI is bronchopneumonia in 5% of patients. Risk-adjusted W scores derived from the Ps14(n) model indicate that no neurosurgical unit fell outside the 3 SD limits on a funnel plot.

CONCLUSIONS: We provide the first comprehensive report of the management of TBI in England and Wales, including data from all neurosurgical units. These data provide transparency and suggests equity of access to high-quality TBI management provided in England and Wales.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://www.bmj.com/company/products-services/rights-and-licensing/>.

PDF Y Endnote Y

Validity and reliability of a portable balance tracking system, BTrackS, in older adults

Levy SS, Thralls KJ, Kviatkovsky SA.

J. Geriatr. Phys. Ther. 2016; ePub(ePub): ePub.

Affiliation: San Diego State University, School of Exercise and Nutritional Sciences, San Diego, California. San Diego State University, Graduate School of Public Health, San Diego, California.

Department of Family and Preventive Medicine, University of California, San Diego.

(Copyright © 2016, American Physical Therapy Association)

DOI 10.1519/JPT.000000000000111 **PMID** 27893566

Abstract

BACKGROUND AND PURPOSE: Falls are the leading cause of disability, injury, hospital admission, and injury-related death among older adults. Balance limitations have consistently been identified as predictors of falls and increased fall risk. Field measures of balance are limited by issues of subjectivity, ceiling effects, and low sensitivity to change. The gold standard for measuring balance is the force plate; however, its field use is untenable due to high cost and lack of portability. Thus, a critical need is observed for valid objective field measures of balance to accurately assess balance and identify limitations over time. The purpose of this study was to examine the concurrent validity and 3-day test-retest reliability of Balance Tracking System (BTrackS) in community-dwelling older adults. Minimal detectable change values were also calculated to reflect changes in balance beyond measurement error.

METHODS: Postural sway data were collected from community-dwelling older adults (N = 49, mean [SD] age = 71.3 [7.3] years) with a force plate and BTrackS in multitrial eyes open (EO) and eyes closed (EC) static balance conditions. Force sensors transmitted BTrackS data via a USB to a computer running custom software. Three approaches to concurrent validity were taken including calculation of Pearson product moment correlation coefficients, repeated-measures ANOVAs, and Bland-Altman plots. Three-day test-retest reliability of BTrackS was examined in a second sample of 47 community-dwelling older adults (mean [SD] age = 75.8 [7.7] years) using intraclass correlation coefficients and MDC values at 95% CI (MDC95) were calculated.

RESULTS: BTrackS demonstrated good validity using Pearson product moment correlations ($r > 0.90$). Repeated-measures ANOVA and Bland-Altman plots indicated some BTrackS bias with center of pressure (COP) values higher than FP COP values in the EO (mean [SD] bias = 4.0 [6.8]) and EC (mean [SD] bias = 9.6 [12.3]) conditions. Test-retest reliability using intraclass correlation coefficients (ICC2.1 was excellent (0.83) and calculated MDC95 for EO (9.6 cm) and EC (19.4 cm) and suggested that postural sway changes of these amounts are meaningful.

DISCUSSION: BTrackS showed some bias with values exceeding force plate values in both EO and EC conditions. Excellent test-retest reliability and resulting MDC95 values indicated that BTrackS has the potential to identify meaningful changes in balance that may warrant intervention.

CONCLUSION: BTrackS is an objective measure of balance that can be used to monitor balance in community-dwelling older adults over time. It can reliably identify changes that may require further attention (eg, fall-prevention strategies, declines in physical function) and shows promise for assessing intervention efficacy in this growing segment of the population.

PDF N Endnote Y

Balance versus resistance training on postural control in patients with Parkinson's disease. A randomised controlled trial

Santos SM, da Silva RA, Terra MB, Almeida IA, De Melo LB, Ferraz HB.

Eur. J. Phys. Rehabil. Med. 2016; ePub(ePub): ePub.

Affiliation: Department of Physiotherapy, Universidade Estadual de Londrina, Doctoral and Master Program in Rehabilitation Sciences (UEL/UNOPAR), Londrina, PR, Brazil - suhailaneuro@gmail.com. (Copyright © 2016, Edizioni Minerva Medica)

DOI unavailable **PMID** 27879959

Abstract

BACKGROUND: Evidences have shown that physiotherapy programs may improve the balance of individuals with Parkinson's disease (PD); although it is not clear which specific exercise program is

better.

AIM: Compare the effectiveness of balance versus resistance training on postural control measures in PD patients.

DESIGN: Randomised controlled trial.

SETTING: The study was conducted in a physiotherapy outpatient clinic of a university hospital.

POPULATION: A total of 40 PD participants were randomly divided into two groups: balance training (BT) and resistance training (RT).

METHODS: The BT group focused on balance training, functional independence and gait while the RT group performed resistance exercises emphasizing the lower limbs and trunk, both supervised by trained physiotherapists. Therapy sessions were held twice a week (at 60 minutes), totaling 24 sessions. The primary outcome was evaluated by force platform with center of pressure sway measures in different balance conditions and the secondary outcome was evaluated by Balance Evaluation Systems Test (BESTest) scale to determine the effects of the intervention on postural control.

RESULTS: Significant improvement of postural control (pre = 15.1 vs post = 9.6 cm²) was only reported in favor of BT group (d = 1.17) for one-legged stand condition on force platform. The standardized mean difference between groups was significantly (P < 0.02), with 36% of improvement for BT vs. 0.07% for RT on this condition. Significant improvement (P < 0.05) was also observed in favor of BT (in mean 3.2%) for balance gains in some BESTest scores, when compared to RT group (-0.98%).

CONCLUSIONS: Postural control in Parkinson's disease is improved when training by a directional and specific balance program than a resistance training program. CLINICAL REHABILITATION IMPACT: Balance training is superior to resistance training in regard to improving postural control of individuals with PD. Gold standard instruments (high in cost and difficult to access) were used to assess balance, as well as scales with clinical applicability (low cost, easily acceptable, applicable and valid), which can guide the management of physiotherapists both in their decision-making and in clinical practice.

PDF Endnote Y

Clinical and neurophysiological risk factors for falls in patients with bilateral vestibulopathy

Schniepp R, Schlick C, Schenkel F, Pradhan C, Jahn K, Brandt T, Wuehr M.

J. Neurol. 2016; ePub(ePub): ePub.

Affiliation: German Center for Vertigo and Balance Disorders (DSGZ), University of Munich, Munich, Germany.

(Copyright © 2016, Springer Science+Business Media)

DOI 10.1007/s00415-016-8342-6 PMID 27878442

Abstract

Patients with bilateral vestibular failure (BVF) exhibit imbalance when standing and walking that is linked to a higher fall risk. The purpose of this study was to identify risk factors for falls in BVF. We therefore systematically investigated the interrelationship of clinical and demographic characteristics, gait impairments, and the fall frequency of these patients. Clinical and demographic characteristics as well as quantitative measures of gait performance on a pressure-sensitive gait carpet were collected from 55 patients with different etiologies of BVF. Clinical and demographic data as well as spatiotemporal gait characteristics were used for ANOVA testing and a logistic regression model with categorized fall events as dependent variables. The impairment of peripheral

vestibular function, duration of disease, and the overall gait status were not associated with the history of falls in patients with BVF. In contrast, the most predictive factors for falls in BVF were an increase in temporal gait variability, especially at slow walking speeds ($p < 0.001$; OR = 1.3), and the presence of a concomitant peripheral neuropathy ($p < 0.045$; OR = 3.6). BVF patients with a high risk of falling exhibit specific gait alterations in a speed-dependent manner. In particular, increased gait fluctuations during slow walking are most predictive for an increased fall risk. The presence of a concomitant peripheral neuropathy further critically impairs postural stability in these patients. Clinical assessment of both these aspects is therefore important to identify those patients at a particularly high fall risk and to initiate preventive procedures early.

PDF Endnote Y

Collaborative falls prevention: interprofessional team formation, implementation, and evaluation

Lasater K, Cotrell V, McKenzie G, Simonson W, Morgove MW, Long EE, Eckstrom E.

J. Contin. Educ. Nurs. 2016; 47(12): 545-550.

(Copyright © 2016, Healio)

DOI 10.3928/00220124-20161115-07 PMID 27893917

Abstract

As health care rapidly evolves to promote person-centered care, evidence-based practice, and team-structured environments, nurses must lead interprofessional (IP) teams to collaborate for optimal health of the populations and more cost-effective health care. Four professions—nursing, medicine, social work, and pharmacy—formed a teaching team to address fall prevention among older adults in Oregon using an IP approach. The teaching team developed training sessions that included interactive, evidence-based sessions, followed by individualized team coaching. This article describes how the IP teaching team came together to use a unique cross-training approach to teach each other. They then taught and coached IP teams from a variety of community practice settings to foster their integration of team-based falls-prevention strategies into practice. After coaching 25 teams for a year each, the authors present the lessons learned from the teaching team's formation and experiences, as well as feedback from practice team participants that can provide direction for other IP teams. *J Contin Educ Nurs.* 2016;47(12):545-550.

Copyright 2016, SLACK Incorporated.

PDF Endnote Y

Evaluation of major trauma in elderly patients - a single trauma center analysis

Kocuvan S, Brilej D, Stropnik D, Lefering R, Komadina R.

Wien. Klin. Wochenschr. 2016; ePub(ePub): ePub.

Affiliation: Trauma Department, General and Teaching Hospital Celje, Oblakova 5, 3000, Celje, Slovakia.

(Copyright © 2016, Springer Science+Business Media)

DOI 10.1007/s00508-016-1140-4 PMID 27896468

Abstract

BACKGROUND: The objective of the study was to gather information about elderly major trauma patients admitted to one particular Slovenian trauma centre in Celje and examine this group of polytrauma patients, specifically with respect to mechanisms of injury, injury severity and distribution of injuries. Further on, to identify morbidity and mortality rates and compare these to the younger population and, finally, to determine the factors that have the most impact on

treatment results.

METHODS: The study gathered and evaluated data of 532 patients included in the Trauma Register DGU® of the German Trauma Society (TR-DGU) during a 10-year period and two distinct groups of patients were established, separated on account of age as older or younger than 65 years. The differences between these two groups were analyzed with respect to demographics, comorbidities, preclinical management, injury patterns, relevant clinical and laboratory findings. Furthermore, differences between deceased and surviving elderly patients were also analyzed.

RESULTS: The majority of elderly patients suffered from a blunt mechanism of trauma (96.6%) and of these simple falls represented 47.9% within this injury mechanism. There were two body regions, which were most frequently represented, namely head and thorax injuries, accounting for 54.7% each. Complications were more frequent among the elderly, with sepsis being present in 29.9% and multiple organ failure (MOF) in 19.7% of cases. Cardiovascular failure was also high in both the elderly and young, accounting for 45.3% of the elderly and 31.3% of the younger population. The in-hospital mortality rate for the elderly group was 25.6% and was significantly higher compared to the younger counterparts (14.7%). Low fall mechanism of injury, coma and the new injury severity score (NISS) were statistically important factors for the mortality of seriously injured elderly patients during the acute phase of treatment.

CONCLUSIONS: Despite advances in care, morbidity and mortality in elderly patients after major trauma remains considerably higher than in younger populations with head injuries accounting for the majority of fatalities. The elderly patient population in this study mostly suffered from blunt mechanisms of injury, with simple falls representing a high proportion of injury mechanisms. Generally, the injury severity scale (ISS) in the elderly is not statistically higher than with the younger population. Likewise, the distribution of injuries according to body regions is also similar; however, the elderly are more prone to complications (e. g. sepsis and MOF), which is likely due to a lower physiological reserves.

PDF Y Endnote Y

Frailty is a geriatric syndrome characterized by multiple impairments: a comprehensive approach is needed

Chen LK, Hwang AC, Liu LK, Lee WJ, Peng LN.

J. Frailty Aging 2016; 5(4): 208-213.

Affiliation: Prof Liang-Kung Chen, Center for Geriatrics and Gerontology, Taipei Veterans General Hospital, No 201, Sec 2, Shih-Pai Road, Taipei, Taiwan, TEL: +886-2-28757830, FAX: +886-2-28757711, Email: lkchen2@vghtpe.gov.tw.

(Copyright © 2016, Journal of frailty and aging)

DOI 10.14283/jfa.2016.109 **PMID** 27883167

Abstract

OBJECTIVE: To evaluate the prevalence of frailty and the associated multimorbidity and functional impairments among community-dwelling middle-aged and elderly people in Taiwan.

DESIGN: a cross-sectional study.

SETTING: communities in I-Lan County of Taiwan.

PARTICIPANTS: 1839 community-dwelling people aged 50 years and older.

INTERVENTION: None.

MEASUREMENTS: Frailty defined by Fried's criteria, Charlson's comorbidity index (CCI), Functional Autonomy Measurement System (SMAF), Center for Epidemiologic Studies Depression Scale (CES-D),

Mini-Nutrition Assessment (MNA), Mini-Mental State Examination (MMSE), and Short Form-12 quality of life questionnaire.

RESULTS: Overall, 1839 subjects (mean age: 63.9±9.3 years, 47.5% males) participated in this study and men were more likely to have higher educational level, more smoking and alcohol drinking habit. The prevalence of frailty was 6.8% in this study, while pre-frailty was 40.5% and 53.7% of all participants were robust. Compared to subjects with different frailty status, age, education year, alcohol drinking, hypertension, diabetes mellitus, hyperlipidemia, CCI, walking speed, handgrip strength, score of SMAF, CES-D, MNA, MMSE, quality of life were significantly different between groups (P all < 0.05). Older age, poorer physical function, poorer cognitive function, poorer nutritional status, more depressive symptoms, higher CCI and poorer quality of life were all independently associated with frailty.

CONCLUSIONS: Frailty was not simply a geriatric syndrome, but the combination of multiple geriatric syndromes. Further study is needed to evaluate the clinical benefits of intervention programs for community-dwelling middle-aged and older people to reverse frailty and its associated functional impairments.

PDF Endnote Y

Gait adaptation on surfaces with different degrees of slipperiness

Chang WR, Chang CC, Lesch MF, Matz S.

Appl. Ergon. 2017; 59: 333-341.

Affiliation: Liberty Mutual Research Institute for Safety, Hopkinton, MA 01748, USA.

(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.apergo.2016.09.008 **PMID** 27890145

Abstract

\Gait adaptation to employ different ways to avoid a potential slip is needed to continue walking safely on a new surface, especially when transitioning to a slippery surface. In this experiment, participants walked back and forth five times (trials) on surfaces with different degrees of slipperiness. The results show that trial 1 was significantly different from other trials for most of the dependent variables, especially for the low and high friction conditions. Kinematics on high and medium friction surfaces were very similar, but more adjustments were needed for low friction surfaces. The data for the first trial reflect gait after walking for 2.4 m on the walkway, not the first step onto the walkway. The current data show that gait adaptation continued beyond the first trial. Since participants in this experiment were aware of the floor conditions, the results could have important safety implications that user awareness alone might be insufficient for safe floor designs. Copyright © 2016 The Authors. Published by Elsevier Ltd.. All rights reserved.

PDF Y Endnote Y

Improving fidelity of translation of the Stepping on Falls prevention program through root cause analysis

Mahoney JE, Gobel VL, Shea T, Janczewski J, Cech S, Clemson L.

Front. Public Health 2016; 4: 251.

Affiliation: Ageing, Work and Health Research Unit, Faculty of Health Sciences, University of Sydney, Sydney, NSW, Australia.

(Copyright © 2016, Frontiers Editorial Office)

DOI 10.3389/fpubh.2016.00251 **PMID** 27896264

Abstract

BACKGROUND: Fidelity monitoring is essential with implementation of complex health interventions, but there is little description of how to use results of fidelity monitoring to improve the draft program package prior to widespread dissemination. Root cause analysis (RCA) provides a systematic approach to identifying underlying causes and devising solutions to prevent errors in complex processes. Its use has not been described in implementation science.

METHODS: Stepping On (SO) is a small group, community-based intervention that has been shown to reduce falls by 31%. To prepare SO for widespread U.S. dissemination, we conducted a pilot of the draft program package, monitoring the seven SO sessions for fidelity of program delivery and assessing participant receipt and enactment through participant interviews after the workshop. Lapses to fidelity in program delivery, receipt, and enactment were identified. We performed a RCA to identify underlying causes of, and solutions to, such lapses, with the goal of preventing fidelity lapses with widespread dissemination.

RESULTS: Lapses to fidelity in program delivery were in the domains of group leader's role, use of adult learning principles, and introducing and upgrading the exercises. Lapses in fidelity of participant receipt and enactment included lack of knowledge about balance exercises and reduced adherence to frequency of exercise practice and advancement of exercise. Root causes related to leader training and background, site characteristics and capacity, and participant frailty and expectations prior to starting the program. The RCA resulted in changes to the program manual, the training program, and training manual for new leaders, and to the methods for and criteria for participant and leader recruitment. A Site Implementation Guide was created to provide information to sites interested in the program.

CONCLUSION: Disseminating complex interventions can be done more smoothly by first using a systematic quality improvement technique, such as the RCA, to identify how lapses in fidelity occur during the earliest stages of implementation. This technique can also help bring about solutions to these lapses of fidelity prior to widespread dissemination across multiple domain lapses.

PDF Y Endnote Y

Interession reliability of self-selected and narrow stance balance testing in older adults

Riemann BL, Piersol K.

Aging Clin. Exp. Res. 2016; ePub(ePub): ePub.

Affiliation: Biodynamics and Human Performance Center, Department of Health Sciences, Armstrong State University, 11935 Abercorn Street, Savannah, GA, 31419, USA.

(Copyright © 2016, Editrice Kurtis)

DOI 10.1007/s40520-016-0687-2 **PMID** 27896795

Abstract

BACKGROUND: Despite the common practice of using force platforms to assess balance of older adults, few investigations have examined the reliability of postural screening tests in this population.

AIM: We sought to determine the test-retest reliability of self-selected and narrow stance balance testing with eyes open and eyes closed in healthy older adults.

METHODS: Thirty older adults (>65 years) completed 45 s trials of eyes open and eyes closed stability tests using self-selected and narrow stances on two separate days (1.9 ± .7 days). Average medial-lateral center of pressure velocity was computed.

RESULTS: The ICC results ranged from .74 to .86, and no significant systematic changes ($P < .05$) occurred between the testing sessions for any of the tests. The standard error of measurement

ranged from 15.9 to 23.6%.

DISCUSSION: Reliability estimates were similar between the two stances and visual conditions assessed. Slightly higher coefficients were identified for the self-selected stances compared to the narrow stances under both visual conditions; however, there were negligible differences between the sessions. The within subject session-to-session variability provides a basis for further research to consider differences between fallers and non-fallers.

CONCLUSION: Reliability for eyes open and closed balance testing using self-selected and narrow stances in older adults was established which should provide a foundation for the development of fall risk screening tests.

PDF Y Endnote Y

Managing patient falls in psychiatric inpatient units: Part 1

Abraham S. *Health Care Manag. (Frederick)* 2016; 35(1): 21-27.

Affiliation: Author Affiliation: Bethel College, Mishawaka, Indiana.

(Copyright © 2016, Lippencott Williams and Wilkins)

DOI 10.1097/HCM.000000000000094 **PMID** 27892909

Abstract

The problem addressed in the current quantitative, descriptive study was the significantly higher number of patient falls in hospital inpatient psychiatric units than in medical-surgical areas, resulting in patient-safety issues. The purpose of this study was to explore psychiatric unit directors' perceptions of the factors that contribute to patient falls in the State of Michigan. Two research questions guided the study: (a) What are psychiatric unit directors' perceptions of the possible intrinsic factors that contribute to patient falls in the psychiatric inpatient units, and (b) what are psychiatric unit directors' perceptions of the possible extrinsic factors that contribute to patient falls in the psychiatric inpatient units? An online survey was the tool used to gather data from the State of Michigan psychiatric unit directors. The analyses for the 2 questions indicated the participants believed that intrinsic factors were more strongly related to the likelihood of patient falls than were extrinsic factors.

PDF N (will get copy) Endnote Y

Psychometric properties of dual-task balance and walking assessments for individuals with neurological conditions: a systematic review

Yang L, Lam FM, Liao LR, Huang MZ, He CQ, Pang MY.

Gait Posture 2016; 52: 110-123.

Affiliation: Department of Rehabilitation Sciences, Hong Kong Polytechnic University, Hong Kong, China. Electronic address: Marco.Pang@polyu.edu.hk.

(Copyright © 2016, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2016.11.007 **PMID** 27893997

Abstract

BACKGROUND: The ability of performing a balance or walking task in conjunction with a secondary cognitive or motor task, referred to as dual-task (DT) ability, is essential in daily living. While there is some evidence that DT performance is impaired in individuals with neurological conditions, using reliable and valid tools to measure DT performance is essential. This systematic review aimed to evaluate the psychometric properties of DT balance and walking assessments in individuals with different neurological conditions.

METHODS: A systematic literature search was conducted using PubMed, CINAHL, MEDLINE, PsycINFO, SCOPUS, Web of Science, and Cochrane Library (last search done in April 2016). The methodological quality was rated using the Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) checklist.

RESULTS: Twenty-three articles involving individuals with stroke, Parkinson's disease, mild cognitive impairment, dementia, Alzheimer's disease, and multiple sclerosis were included. Outcomes derived from the walking tasks under DT condition generally demonstrated good reliability (correlation coefficient ≥ 0.75) across different neurological disorders, but their usefulness in distinguishing fallers from non-fallers was inconclusive. The reliability of outcomes derived from the cognitive/motor tasks and from the dual-task effect (DTE) (i.e., DT performance minus single-task performance) seemed to be lower but was understudied. The reliability of static or dynamic sitting/standing balance outcomes in DT condition was not assessed in any of the selected studies.

CONCLUSIONS: The reliability of the outcomes derived from walking tasks was good. The psychometric properties of other DT outcomes need to be further investigated.

Copyright © 2016 Elsevier B.V. All rights reserved.

PDF Y Endnote Y

Reliability and validity of the inertial sensor-based Timed "Up and Go" test in individuals affected by stroke

Wüest S, Masse F, Aminian K, Gonzenbach R, de Bruin ED.

J. Rehabil. Res. Dev. 2016; 53(5): 599-610.

Affiliation: Department of Health Sciences and Technology, Institute of Human Movement Sciences and Sport, ETH Zurich, Zurich, Switzerland.

(Copyright © 2016, Rehabilitation Research and Development Service, U.S. Department of Veterans Affairs)

DOI 10.1682/JRRD.2015.04.0065 **PMID** 27898161

Abstract

The instrumented Timed "Up and Go" test (iTUG) has the potential for playing an important role in providing clinically useful information regarding an individual's balance and mobility that cannot be derived from the original single-outcome Timed "Up and Go" test protocol. The purpose of this study was to determine the reliability and validity of the iTUG using body-fixed inertial sensors in people affected by stroke. For test-retest reliability analysis, 14 individuals with stroke and 25 nondisabled elderly patients were assessed. For validity analysis, an age-matched comparison of 12 patients with stroke and 12 nondisabled controls was performed. Out of the 14 computed iTUG metrics, the majority showed excellent test-retest reliability expressed by high intraclass correlation coefficients (range 0.431-0.994) together with low standard error of measurement and smallest detectable difference values. Bland-Altman plots demonstrated good agreement between two repeated measurements. Significant differences between patients with stroke and nondisabled controls were found in 9 of 14 iTUG parameters analyzed. Consequently, these results warrant the future application of the inertial sensor-based iTUG test for the assessment of physical deficits poststroke in longitudinal study designs.

PDF Y Endnote Y

Review of fall detection techniques: a data availability perspective

Khan SS, Hoey

J. Med. Eng. Phys. 2016; ePub(ePub): ePub.

Affiliation: David R. Cheriton School of Computer Science, University of Waterloo, 200 University Ave W, Waterloo, ON N2L 3G1, Canada. Electronic address: jhoey@uwaterloo.ca.

(Copyright © 2016, Institute of Physics and Engineering in Medicine, Publisher Elsevier Publishing)

DOI 10.1016/j.medengphy.2016.10.014 **PMID** 27889391

Abstract

A fall is an abnormal activity that occurs rarely; however, missing to identify falls can have serious health and safety implications on an individual. Due to the rarity of occurrence of falls, there may be insufficient or no training data available for them. Therefore, standard supervised machine learning methods may not be directly applied to handle this problem. In this paper, we present a taxonomy for the study of fall detection from the perspective of availability of fall data. The proposed taxonomy is independent of the type of sensors used and specific feature extraction/selection methods. The taxonomy identifies different categories of classification methods for the study of fall detection based on the availability of their data during training the classifiers. Then, we present a comprehensive literature review within those categories and identify the approach of treating a fall as an abnormal activity to be a plausible research direction. We conclude our paper by discussing several open research problems in the field and pointers for future research.

Copyright © 2016 IPEM. Published by Elsevier Ltd. All rights reserved.

PDF Y Endnote Y

Risk of fractures after stroke: results from the Ontario Stroke Registry

Kapral MK, Fang J, Alibhai SM, Cram P, Cheung AM, Casaubon LK, Prager M, Stamplecoski M, Rashkovan B, Austin PC.

Neurology 2016; ePub(ePub): ePub.

Affiliation: From the Institute for Clinical Evaluative Sciences (M.K.K., J.F., P.C., M.S., P.C.A.), Toronto (Copyright © 2016, Lippincott Williams and Wilkins)

DOI 10.1212/WNL.0000000000003457 **PMID** 27881629

Abstract

OBJECTIVE: To determine the risk of fractures after stroke.

METHODS: Using the Ontario Stroke Registry, we identified a population-based sample of consecutive patients seen in the emergency department or hospitalized with stroke ($n = 23,751$) or TIA ($n = 11,240$) at any of 11 stroke centers in Ontario, Canada, and discharged alive between July 1, 2003, and March 31, 2012. We compared the risk of low-trauma fractures in patients with stroke vs those with TIA using propensity score methods to adjust for differences in baseline factors.

Secondary analyses compared fracture risk poststroke with that in age-/sex-matched controls without stroke or TIA ($n = 23,751$) identified from the Ontario Registered Persons Database.

RESULTS: The 2-year rate of fracture was 5.7% in those with stroke compared to 4.8% in those with TIA (adjusted cause-specific hazard ratio [aHR] for those with stroke vs TIA 1.32; 95% confidence interval [CI] 1.19-1.46) and 4.1% in age-/sex-matched controls (aHR for those with stroke vs controls 1.47; 95% CI 1.35-1.60). In the cohort with stroke, factors associated with fractures were older age, female sex, moderate stroke severity, prior fractures or falls, and preexisting osteoporosis, rheumatoid arthritis, hyperparathyroidism, and atrial fibrillation.

CONCLUSIONS: Stroke is associated with an increased risk of low-trauma fractures. Individuals with



stroke and additional risk factors for fractures may benefit from targeted screening for low bone mineral density and initiation of treatment for fracture prevention.

© 2016 American Academy of Neurology.

PDF N Endnote Y