SafetyLit May 14, 2017

A hybrid algorithm for fall detection

Turkeli S, Elmas F, Atay HT, Kurt KK, Sonmez RY.

Stud. Health Technol. Inform. 2017; 237: 163-168.

Affiliation: Electric Engineering Graduate Program, Istanbul Technical University, Turkey.

DOI unavailable **PMID** 28479561

Abstract

Falling is a major problem among the people globally, frequently due to some health problems including vision loss or balance disorder as a consequence of aging. As a result of the falling in elder people; injuries, complications, neurological problems and mortality are generally occurred. This situation also affects the patients' families psychologically. A large number of studies show that significant fractures, injuries and in some cases death are commonly encountered in elderly. Nonetheless, in the immediate intervention, the rate of damage is reduced and the life quality can be significantly restored. The purpose of this paper is to reduce fall-related problems by developing a new fall detector that we called Tesodev fall detector. In addition, a proper algorithm and a wearable electronic device attaching the sensor to patient's clothes are provided. The electronic device is an IOT device which can send and receive data wirelessly, which means that the device can inform the medical centres to improve medical attention time. Also, this device is modular and device allows keeping other medical data such as blood sugar, tension, heart rate, SPO2. Sensitivity, error rate and classification accuracy in this study are 89.8%, 23.4%, 76%, respectively.

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A two-question tool to assess the risk of repeated falls in the elderly

Rodríguez-Molinero A, Gálvez-Barrón C, Narvaiza L, Miñarro A, Ruíz J, Valldosera E, Gonzalo N, Ng T, Sanguino MJ, Yuste A.

PLoS One 2017; 12(5): e0176703.

Affiliation: Consorci Sanitari del Garraf, Fundació Privada Sant Antoni Abat, Vilanova i la Geltrú, Barcelona, Spain.

DOI 10.1371/journal.pone.0176703 **PMID** 28489888

Abstract

INTRODUCTION: Older adults' perception of their own risk of fall has never been included into screening tools. The goal of this study was to evaluate the predictive validity of questions on subjects' self-perception of their own risk of fall.

METHODS: This prospective study was conducted on a probabilistic sample of 772 Spanish community-dwelling older adults, who were followed-up for a one year period. At a baseline visit, subjects were asked about their recent history of falls (question 1: "Have you fallen in the last 6 months?"), as well as on their perception of their own risk of fall by using two questions (question 2: "Do you think you may fall in the next few months?" possible answers: yes/no; question 3: "What is the probability that you fall in the next few months?" possible answers: low/intermediate/high). The follow-up consisted of quarterly telephone calls, where the number of falls occurred in that period was recorded.

RESULTS: A short questionnaire built with questions 1 and 3 showed 70% sensitivity (95% CI: 56%-84%), 72% specificity (95% CI: 68%-76%) and 0.74 area under the ROC curve (95% CI: 0.66-0.82) for

prediction of repeated falls in the subsequent year.
CONCLUSIONS: The estimation of one's own risk of fall has predictive validity for the occurrence of repeated falls in older adults. A short questionnaire including a question on perception of one's own risk of fall and a question on the recent history of falls had good predictive validity.
PDF Y Endnote Y

Age-related interference between the selection of input-output modality mappings and postural control-a pilot study
Stelzel C, Schauenburg G, Rapp MA, Heinzel S, Granacher U.
Front. Psychol. 2017; 8: e613.
Affiliation: Division of Training and Movement Sciences, University of PotsdamPotsdam, Germany.

DOI 10.3389/fpsyg.2017.00613 **PMID** 28484411 **PMCID** PMC5399084
Abstract
Age-related decline in executive functions and postural control due to degenerative processes in the central nervous system have been related to increased fall-risk in old age. Many studies have shown cognitive-postural dual-task interference in old adults, but research on the role of specific executive functions in this context has just begun. In this study, we addressed the question whether postural control is impaired depending on the coordination of concurrent response-selection processes related to the compatibility of input and output modality mappings as compared to impairments related to working-memory load in the comparison of cognitive dual and single tasks. Specifically, we measured total center of pressure (CoP) displacements in healthy female participants aged 19-30 and 66-84 years while they performed different versions of a spatial one-back working memory task during semi-tandem stance on an unstable surface (i.e., balance pad) while standing on a force plate. The specific working-memory tasks comprised: (i) modality compatible single tasks (i.e., visual-manual or auditory-vocal tasks), (ii) modality compatible dual tasks (i.e., visual-manual and auditory-vocal tasks), (iii) modality incompatible single tasks (i.e., visual-vocal or auditory-manual tasks), and (iv) modality incompatible dual tasks (i.e., visual-vocal and auditory-manual tasks). In addition, participants performed the same tasks while sitting. As expected from previous research, old adults showed generally impaired performance under high working-memory load (i.e., dual vs. single one-back task). In addition, modality compatibility affected one-back performance in dual-task but not in single-task conditions with strikingly pronounced impairments in old adults. Notably, the modality incompatible dual task also resulted in a selective increase in total CoP displacements compared to the modality compatible dual task in the old but not in the young participants. These results suggest that in addition to effects of working-memory load, processes related to simultaneously overcoming special linkages between input- and output modalities interfere with postural control in old but not in young female adults. Our preliminary data provide further evidence for the involvement of cognitive control processes in postural tasks.
PDF Y Endnote Y

Altered spatiotemporal characteristics of gait in older adults with chronic low back pain
Hicks GE, Sions JM, Coyle PC, Pohlig RT.
Gait Posture 2017; 55: 172-176.
Affiliation: Biostatistics Core Facility, University of Delaware, Newark, DE, United States.

DOI 10.1016/j.gaitpost.2017.04.027 **PMID** 28458149

Abstract

Previous studies in older adults have identified that chronic low back pain (CLBP) is associated with slower gait speed. Given that slower gait speed is a predictor of greater morbidity and mortality among older adults, it is important to understand the underlying spatiotemporal characteristics of gait among older adults with CLBP. The purposes of this study were to determine (1) if there are differences in spatiotemporal parameters of gait between older adults with and without CLBP during self-selected and fast walking and (2) whether any of these gait characteristics are correlated with performance of a challenging walking task, e.g. stair negotiation. Spatiotemporal characteristics of gait were evaluated using a computerized walkway in 54 community-dwelling older adults with CLBP and 54 age- and sex-matched healthy controls. Older adults with CLBP walked slower than their pain-free peers during self-selected and fast walking. After controlling for body mass index and gait speed, step width was significantly greater in the CLBP group during the fast walking condition. Within the CLBP group, step width and double limb support time are significantly correlated with stair ascent/descent times. From a clinical perspective, these gait characteristics, which may be indicative of balance performance, may need to be addressed to improve overall gait speed, as well as stair-climbing performance. Future longitudinal studies confirming our findings are needed, as well as investigations focused on developing interventions to improve gait speed and decrease subsequent risk of mobility decline.

PDF Y Endnote Y

Applying comprehensive geriatric assessment to investigate falls

Rodgers G.

Nurs. Older People 2016; 28(3): 27-31.

DOI 10.7748/nop.28.3.27.s24 **PMID** unavailable

Abstract

This is the second article in a short series that presents case study examples of the use of comprehensive geriatric assessment (CGA) in different clinical settings. CGA is a holistic assessment model designed to determine frail older people's medical and mental health status, as well as functional, social and environmental issues. When applied by nurses, it can enable individualised planning for health, safety and wellbeing. This article presents the case of an older man who had a three-month history of falls. After his most recent fall he was admitted to an emergency department, where examination identified no significant abnormal pathology, and subsequently to a nurse-led older person's clinic. The article describes how a CGA approach was adopted to assess the man, establish an underlying diagnosis of Parkinson's disease, and develop a personalised care plan to address immediate falls risk and long-term planning.

PDF N Endnote Y

Can recovery foot placement affect older adults' slip-fall severity?

Wang S, Liu X, Lee A, Pai YC.

Ann. Biomed. Eng. 2017; ePub(ePub): ePub.

Affiliation: Department of Physical Therapy, University of Illinois at Chicago, 1919 West Taylor St., Room 426 (M/C 898), Chicago, IL, 60612, USA. clivepai08@gmail.com.

DOI 10.1007/s10439-017-1834-4 **PMID** 28474271

Abstract

Following a slip occurred in the overground walking, a fall can be classified into two exclusive categories: feet-forward fall or split fall. The purposes of this study were to investigate whether the placement of the recovery foot would determine the slip types, the likelihood of fall, and the severity associated with each fall. The fall severity was estimated based on the impact velocity of body segments or trunk orientation upon fall arrest. One hundred ninety-five participants experienced a novel, unannounced slip while walking on a 7-m walkway. Kinematics of a full-body marker set was collected by a motion capture system which was synchronized with the force plates and loadcell. The results showed that the recovery foot landing position relative to the projected center of mass position at the recovery foot touchdown determined the slip type by 90.8%. Feet-forward slips led to significantly lower rate of falls than did split slips (47.6 vs. 67.8%, $p < 0.01$). Yet, feet-forward falls were much more dangerous because they were associated with significantly greater estimated maximum hip impact velocity ($p < 0.001$) and trunk backward leaning angle ($p < 0.001$) in comparison to split falls.

PDF Y Endnote Y

Effects of three different chair-based exercise programs on people over 80 years old

Cancela J, Pallin E, Orbegozo A, Ayan C.

Rejuvenation Res. 2017; ePub(ePub): ePub.

Affiliation: Faculty of Education and Sport Sciences, Sport Sciences, Pontevedra, Pontevedra, Spain ; ca@uvigo.es.

DOI10.1089/rej.2017.1924 **PMID** 28482740

Abstract

This study aimed at comparing the effects of three chair-based exercise programs on people over 80 years. Thirty-six participants (87.91 ± 4.70 years) were randomly allocated to an elastic-band, pedal exerciser or range of motion exercise program. The participants exercised three days per week during three months. A hand-held dynamometer, the Tinetti Gait Balance, the Barthel Index and the Timed Up & Go tests (assessed by means of the Wiva® science sensor) were used to evaluate the effects of the programs on the participants strength, balance, functional independence and functional mobility, respectively. After the intervention, it was observed that only the elastic-band program resulted in significant improvements in strength, and balance. This results imply that when choosing a low cost exercise program for very old people, the use of elastic bands stands as a far better option than cycling on a pedal exerciser or performing mobility exercises.

PDF Y Endnote Y

Evaluating physical function and activity in the elderly patient using wearable motion sensors

Grimm B, Bolink S.

EFORT Open Rev. 2016; 1(5): 112-120.

Affiliation: AHORSE Research Foundation, Zuyderland Medical Center, Heerlen, The Netherlands.

DOI 10.1302/2058-5241.1.160022 **PMID** 28461937 **PMCID** PMC5367538

Abstract
Wearable sensors, in particular inertial measurement units (IMUs) allow the objective, valid, discriminative and responsive assessment of physical function during functional tests such as gait, stair climbing or sit-to-stand. Applied to various body segments, precise capture of time-to-task achievement, spatiotemporal gait and kinematic parameters of demanding tests or specific to an affected limb are the most used measures. In activity monitoring (AM), accelerometry has mainly been used to derive energy expenditure or general health related parameters such as total step counts. In orthopaedics and the elderly, counting specific events such as stairs or high intensity activities were clinimetrically most powerful; as were qualitative parameters at the 'micro-level' of activity such as step frequency or sit-stand duration. Low cost and ease of use allow routine clinical application but with many options for sensors, algorithms, test and parameter definitions, choice and comparability remain difficult, calling for consensus or standardisation.
PDF Y Endnote Y

Factors associated with falling in early, treated Parkinson's disease: the NET-PD LS1 cohort
Chou KL, Elm JJ, Wielinski CL, Simon DK, Aminoff MJ, Christine CW, Liang GS, Hauser RA, Sudarsky L, Umeh CC, Voss T, Juncos J, Fang JY, Boyd JT, Bodis-Wollner I, Mari Z, Morgan JC, Wills AM, Lee SL, Parashos SA.
J. Neurol. Sci. 2017; 377: 137-143.
Affiliation: Struthers Parkinson's Center, Golden Valley, MN, United States.

DOI 10.1016/j.jns.2017.04.011 **PMID** 28477684
Abstract
BACKGROUND: Recognizing the factors associated with falling in Parkinson's disease (PD) would improve identification of at-risk individuals.
OBJECTIVE: To examine frequency of falling and baseline characteristics associated with falling in PD using the National Institute of Neurological Disorders and Stroke (NINDS) Exploratory Trials in PD Long-term Study-1 (NET-PD LS-1) dataset.
METHODS: The LS-1 database included 1741 early treated PD subjects (median 4year follow-up). Baseline characteristics were tested for a univariate association with post-baseline falling during the trial. Significant variables were included in a multivariable logistic regression model. A separate analysis using a negative binomial model investigated baseline factors on fall rate.
RESULTS: 728 subjects (42%) fell during the trial, including at baseline. A baseline history of falls was the factor most associated with post-baseline falling. Men had lower odds of post-baseline falling compared to women, but for men, the probability of a post-baseline fall increased with age such that after age 70, men and women had similar odds of falling. Other baseline factors associated with a post-baseline fall and increased fall rate included the Unified PD Rating Scale (UPDRS) Activities of Daily Living (ADL) score, total functional capacity (TFC), baseline ambulatory capacity score and dopamine agonist monotherapy.
CONCLUSION: Falls are common in early treated PD. The biggest risk factor for falls in PD remains a history of falling. Measures of functional ability (UPDRS ADL, TFC) and ambulatory capacity are novel clinical risk factors needing further study. A significant age by sex interaction may help to explain why age has been an inconsistent risk factor for falls in PD.

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Fall determinants and associated factors in older people

Silva WFLT, Rica RL, Ramalho B, Machado AF, Ceschini F, Júnior FLP, Serra AJ, Rodrigues GM, Evangelista AL, Júnior AF, Alonso AC, Bocalini DS, Silva WFLT, Rica RL, Ramalho B, Machado AF, Ceschini F, Júnior FLP, Serra AJ, Rodrigues GM, Evangelista AL, Júnior AF, Alonso AC, Bocalini DS. *International Journal of Sports Science* 2016; 6(4): 146-152.

DOI 10.5923/j.sports.20160604.03 **PMID** unavailable

Abstract

With aging, the body goes through a natural process characterized by functional and structural changes, which may be accompanied by physical and mental health problems caused often by chronic illnesses that make the elderly frail and more likely to suffer falls.

OBJECTIVE: to identify through literature review the main intrinsic and extrinsic factors associated with falls in the elderly.

METHODS: a literature search was performed from the databases SciELO, MedLine, Bireme and books.

RESULTS: The studies revealed the importance of identification of intrinsic and extrinsic factors in episodes of falls in the elderly. In most studies analysed the major emphasis is given to the root causes as the main causes of these events; however you need to consider environmental factors.

CONCLUSION: during the aging process the older people becomes more prone to suffer falls where these are caused by a multifactorial process.

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Fall risk among older adult high-risk populations: a review of current screening and assessment tools

Renfro M, Maring J, Bainbridge D, Blair M.

Curr. Geriatr. Rep. 2016; 5(3): 160-171.

DOI 10.1007/s13670-016-0181-x **PMID** unavailable

Abstract

Falls are a leading cause of injury and accidental death among older adults. This is especially true for high-risk populations such as those who experience intellectual and developmental disabilities, multiple sclerosis, Parkinson's disease, cerebrovascular accidents, Alzheimer's disease, and related dementias. We outline general concerns related to falls for those who belong to these populations. This is followed with a description of general fall risk screening instruments and an introduction to fall risk tests and measures. We provide a brief overview of their applicability to high-risk populations. We conclude with guidance on how practitioners can use existing tools to conduct appropriate fall risk prevention screening and assessment activities that lead to the appropriate selection of evidence-based fall prevention programs for older adult high-fall-risk populations.

PDF Y Endnote Y

Falls frequency in elderly assisted in the family health strategy

Lucena IM, Nogueira MF, Moreira SAP, Silva LM, Alves MSCF, Silva AO, Borges APA, Almeida JLT, Simpson CA, Mendes FRP. Int. Arch. Med. 2016; 9: e1610.

DOI 10.3823/1984 **PMID** unavailable

Abstract

INTRODUCTION: The growth of the elderly population is a global phenomenon and, in Brazil, this transformation is happening in a very fast way.
OBJECTIVE: knowing the frequency of falls in the context of an aging population attended in a Health Family Unit.
METHOD: This is a transversal research with a sample consisted of 121 elderly. A questionnaire was applied to the participants and the results were statistically analyzed with the Chi-Square test and Fisher's exact used to verify the association between variables.
RESULTS: The results show that the majorities were female (76.9%); concerning marital status, 35.3% are married; 92.1% with family income between one and two minimum wages; and 91.8% live with their spouse and/or children. The study showed a significant statistically association between female gender (p=0.001), leading to the conclusion that there is a tendency that older woman suffers more falls than men. We found an occurrence of falls in 69.9% of women while this rate reaches 32.1% in male elderly.
CONCLUSION: Therefore, it is expected that these results can help to give a new look to the understanding of the falls with the Health Family Units.
PDF Y Endnote Y

Fear of falling and activities of daily living function: mediation effect of dual-task ability

Brustio PR, Magistro D, Zecca M, Liubicich ME, Rabaglietti E.
Aging Ment. Health 2017; ePub(ePub): ePub.
Affiliation: SUISM, Centro Servizi , University of Torino , Torino , Italy.

DOI 10.1080/13607863.2017.1318257 **PMID** 28485621
Abstract

OBJECTIVE: The aim of the study was to explore the association between fear of falling (FOF), dual-task ability during a mobility task, and the activities of daily living (ADL) in a sample of older adults.
METHODS: Seventy-six older adults (mean age M = 70.87 ± 5.16 years) participated in the study. Data on FOF (using the Falls Self-Efficacy Scale-International), walking ability during both single- and dual-task performances and ADL were collected.
RESULTS: Mediation analysis demonstrated the mediation effect of dual-task ability (β = 0.238, p = 0.011) between FOF and ADL level (β = 0.559, p < 0.001). Moreover, significantly lower performances were observed during dual-task condition [F (2, 73) = 7.386, p < 0.001], and lower ADL levels were also found in older adults with FOF [F (2, 73) = 13.734, p < 0.001].
CONCLUSION: The study underlines the relationship between FOF, dual-task ability and ADL level. These results could be used to develop specific intervention programmes for successful ageing.
PDF Y Endnote Y

Foot function, foot pain, and falls in older adults: the Framingham Foot Study

Awale A, Hagedorn TJ, Dufour AB, Menz HB, Casey VA, Hannan MT.
Gerontology 2017; ePub(ePub): ePub.
Affiliation: Institute for Aging Research, Hebrew SeniorLife, Boston, MA, USA.

DOI 10.1159/000475710 **PMID** 28482340
Abstract

BACKGROUND: Although foot pain has been linked to fall risk, contributions of pain severity, foot posture, or foot function are unclear. These factors were examined in a cohort of older adults.
OBJECTIVE: The purpose of this study was to examine the associations of foot pain, severity of foot pain, and measures of foot posture and dynamic foot function with reported falls in a large, well-described cohort of older adults from the Framingham Foot Study.
METHODS: Foot pain, posture, and function were collected from Framingham Foot Study participants who were queried about falls over the past year (0, 1, and ≥2 falls). Logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for the relation of falls with foot pain, pain severity, foot posture, and foot function adjusting for covariates.
RESULTS: The mean age of the 1,375 participants was 69 years; 57% were female, and 21% reported foot pain (40% mild pain, 47% moderate pain, and 13% severe pain). One-third reported falls in the past year (1 fall: n = 263, ≥2 falls: n = 152). Foot pain was associated with a 62% increased odds of recurrent falls. Those with moderate and severe foot pain showed increased odds of ≥2 falls (OR 1.78, CI 1.06-2.99, and OR 3.25, CI 1.65-7.48, respectively) compared to those with no foot pain. Foot function was not associated with falls. Compared to normal foot posture, those with planus foot posture had 78% higher odds of ≥2 falls.
CONCLUSION: Higher odds of recurrent falls were observed in individuals with foot pain, especially severe foot pain, as well as in individuals with planus foot posture, indicating that both foot pain and foot posture may play a role in increasing the risk of falls among older adults.

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Identifying distinct risk profiles to predict adverse events among community-dwelling older adults
O'Connor M, Hanlon A, Mauer E, Meghani S, Masterson-Creber R, Marcantonio S, Coburn K, Van Cleave J, Davitt J, Riegel B, Bowles KH, Keim S, Greenberg SA, Sefcik JS, Topaz M, Kong D, Naylor M. *Geriatr. Nurs.* 2017; ePub(ePub): ePub.
Affiliation: NewCourtland Center for Transitions in Health, University of Pennsylvania School of Nursing, USA.

DOI 10.1016/j.gerinurse.2017.03.013 **PMID** 28479081
Abstract
Preventing adverse events among chronically ill older adults living in the community is a national health priority. The purpose of this study was to generate distinct risk profiles and compare these profiles in time to: hospitalization, emergency department (ED) visit or death in 371 community-dwelling older adults enrolled in a Medicare demonstration project. Guided by the Behavioral Model of Health Service Use, a secondary analysis was conducted using Latent Class Analysis to generate the risk profiles with Kaplan Meier methodology and log rank statistics to compare risk profiles. The Vuong-Lo-Mendell-Rubin Likelihood Ratio Test demonstrated optimal fit for three risk profiles (High, Medium, and Low Risk). The High Risk profile had significantly shorter time to hospitalization, ED visit, and death ($p < 0.001$ for each). These findings provide a road map for generating risk profiles that could enable more effective targeting of interventions and be instrumental in reducing health care costs for subgroups of chronically ill community-dwelling older adults.

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Impacts of muscle strength and balance control on sit-to-walk and turn durations in the timed up and go test

Chen TB, Chou LS.

Arch. Phys. Med. Rehabil. 2017; ePub(ePub): ePub.

Affiliation: Department of Human Physiology, University of Oregon, Eugene, Oregon, USA. Electronic address: chou@uoregon.edu.

DOI 10.1016/j.apmr.2017.04.003 **PMID** 28465222

Abstract

OBJECTIVE: To examine the association of muscle strength and balance control with the amount of time taken to perform sit-to-walk (STW) or turning components of Timed Up and Go test (TUG) in elderly adults DESIGN: Correlations; multiple regression models.

SETTING: General community.

PARTICIPANTS: Sixty elderly adults over the age of 70 years recruited from the community.

INTERVENTIONS: Not applicable.

MAIN OUTCOME MEASURE(S): Muscle strength, balance control and TUG performance time. Muscle strength was quantified by peak joint moments during the isometric maximal voluntary contraction test for bilateral hip abductors, knee extensors, and ankle plantar flexors. Balance control was assessed with Berg Balance Scale, Fullerton Advanced Balance Scale, as well as the center of mass and ankle inclination angle derived during TUG performance.

RESULTS: We found that balance control measures were significantly associated with both STW and turning durations even after controlling for muscle strength and other confounders (STW duration: $p < 0.001$, turning duration: $p = 0.001$). Adding strength to the regression model was found to significantly improve its prediction of STW duration (F change = 5.945, $p = 0.018$), but not turning duration (F change = 1.03, $p = 0.14$).

CONCLUSIONS: Our findings suggest that poor balance control is an important factor that contributes to longer STW and turning durations on the TUG. Furthermore, strength has a higher association with STW than turning duration.

PDF Y Endnote Y

Measuring functional ability in hospitalized older adults: a validation study

Wales K, Lannin NA, Clemson L, Cameron ID. Disabil. Rehabil. 2017; ePub(ePub): ePub.

Affiliation: John Walsh Centre for Rehabilitation Research, University of Sydney, Sydney, Australia.

DOI 10.1080/09638288.2017.1323021 **PMID** 28482704

Abstract

PURPOSE: To examine the internal consistency, construct validity and responsiveness of functional assessments tools when used with hospitalized older adults.

MATERIALS AND METHODS: The functional ability of 66 patients was assessed using a semi-structured interview scale (n = 16 tools). The assessment of motor and process skills was administered during hospital admission and again at three months post-discharge.

RESULTS: Tools showed poor-to-excellent internal consistency ($\alpha = 0.27$-0.92). Of the tools that were internally consistent, only two demonstrated change: the Groningen activity restriction scale (GARS)

(smallest detectable change [SDC] 11.68, effect size -1.59) and the modified reintegration to normal living scale (SDC 7.04, effect size -1.20). Validity was supported by strong correlations between the functional independence measure™ (FIM™) and the GARS, FIM™ and Sunnaas activity daily living (ADL) index.
CONCLUSIONS: Findings suggest that the GARS and the modified reintegration to normal living index (mRNLI) are internally consistent, valid and responsive to change over time when applied to a sample of hospitalized older adults. Further investigation of these tools in terms of inter and intra rater reliability in clinical practice is warranted. Implications for Rehabilitation Therapists and researchers need to choose standardized functional assessments carefully when working with hospitalized older adults, as not all assessments are reliable and valid in this population. The GARS and mRNLI are valid and responsive functional assessments for hospitalized older adults. Activity and participation have been viewed traditionally as only one component of function. Therapists and researchers can use standardized assessments of function that are activity or participation-based.
PDF Y Endnote Y

Modified 30-second Sit to Stand test predicts falls in a cohort of institutionalized older veterans
Applebaum EV, Breton D, Feng ZW, Ta AT, Walsh K, Chassé K, Robbins SM.
PLoS One 2017; 12(5): e0176946.
Affiliation: Centre for Interdisciplinary Research in Rehabilitation; Constance Lethbridge Rehabilitation, Montreal, QC, Canada.

DOI 10.1371/journal.pone.0176946 **PMID** 28464024
Abstract
Physical function performance tests, including sit to stand tests and Timed Up and Go, assess the functional capacity of older adults. Their ability to predict falls warrants further investigation. The objective was to determine if a modified 30-second Sit to Stand test that allowed upper extremity use and Timed Up and Go test predicted falls in institutionalized Veterans. Fifty-three older adult Veterans (mean age = 91 years, 49 men) residing in a long-term care hospital completed modified 30-second Sit to Stand and Timed Up and Go tests. The number of falls over one year was collected. The ability of modified 30-second Sit to Stand or Timed Up and Go to predict if participants had fallen was examined using logistic regression. The ability of these tests to predict the number of falls was examined using negative binomial regression. Both analyses controlled for age, history of falls, cognition, and comorbidities. The modified 30-second Sit to Stand was significantly ($p < 0.05$) related to if participants fell (odds ratio = 0.75, 95% confidence interval = 0.58, 0.97) and the number of falls (incidence rate ratio = 0.82, 95% confidence interval = 0.68, 0.98); decreased repetitions were associated with increased number of falls. Timed Up and Go was not significantly ($p > 0.05$) related to if participants fell (odds ratio = 1.03, 95% confidence interval = 0.96, 1.10) or the number of falls (incidence rate ratio = 1.01, 95% confidence interval = 0.98, 1.05). The modified 30-second Sit to Stand that allowed upper extremity use offers an alternative method to screen for fall risk in older adults in long-term care.
PDF Y Endnote Y

Perceived fall risk and functional decline: gender differences in patient's willingness to discuss fall risk, fall history, or to have a home safety evaluation

Greenberg MR, Moore EC, Nguyen MC, Stello B, Goldberg A, Barraco RD, Porter BG, Kurt A, Dusza SW, Kane BG. Yale J. Biol. Med. 2016; 89(2): 261-267.

DOI unavailable **PMID** unavailable

Abstract

The CDC reports that among older adults, falls are the leading cause of injury-related death and rates of fall-related fractures among older women are twice those of men. We set out to 1) determine patient perceptions (analyzed by gender) about their perceived fall risk compared to their actual risk for functional decline and death and 2) to report their comfort level in discussing their fall history or a home safety plan with their provider. Elders who presented to the Emergency Department (ED†) were surveyed. The survey included demographics, the Falls Efficacy Scale (FES) and the Vulnerable Elders Survey (VES); both validated surveys measuring fall concern and functional decline. Females had higher FES scores (mean 12.3, SD 5.9) than males (mean 9.7, SD 5.9 p =.007) in the 146 surveys analyzed. Females were more likely to report an increased fear of falling, and almost three times more likely to have a VES score of 3 or greater than males (OR = 2.86, 95% CI: 1.17-7.00, p =.02). A strong correlation was observed between FES and VES scores (r = 0.80, p <.001). No difference in correlation was observed between males and females, p =.26. Participants (77 percent) reported they would be comfortable discussing their fall risk with a provider; there was no difference between genders (p =.57). In this study, irrespective of gender, there appears to be a high association between subjects' perceived fall risk and risk for functional decline and death. The majority of patients are likely willing to discuss their fall risk with their provider. These findings may suggest a meaningful opportunity for fall risk mitigation in this setting.

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Polytrauma in the elderly: a review

Braun BJ, Holstein J, Fritz T, Veith NT, Herath S, Mörsdorf P, Pohlemann T.

EFORT Open Rev. 2016; 1(5): 146-151.

Affiliation: Department of Trauma, Hand and Reconstructive Surgery, Saarland University Hospital, Homburg, Germany.

DOI 10.1302/2058-5241.1.160002 **PMID** 28461941 **PMCID** PMC5367536

Abstract

Although the field of geriatric trauma is - ironically - young, care for the elderly trauma patient is increasingly recognised as an important challenge, considering the worldwide trend towards increasing longevity.Increasing age is associated with physiological changes and resulting comorbidities that present multiple challenges to the treating physician.Even though polytrauma is less likely with increasing age, lower-energy trauma can also result in life-threatening injuries due to the reduced physiological reserve.Mechanisms of injury and resulting injury patterns are markedly changed in the elderly population and new management strategies are needed. From initial triage to long-term rehabilitation, these patients require care that differs from the everyday standard.In the current review, the special requirements of this increasing patient population are reviewed and management options discussed. With the increase in orthogeriatrics as a speciality, the current

status quo will almost certainly shift towards a more tailored treatment approach for the elderly patient. Further research expanding our current knowledge is needed to reduce the high morbidity and mortality rate. Cite this article: Braun BJ, Holstein J, Fritz T, Veith NT, Herath S, Mörsdorf P, Pohlemann T. Polytrauma in the elderly: a review. EFORT Open Rev 2016;1:146-151. DOI: 10.1302/2058-5241.1.160002.
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Prevalence of falls among community-dwelling elderly and its associated factors: a cross-sectional study in Perak, Malaysia
Yeong UY, Tan SY, Yap JF, Choo WY.
Malays. Fam. Physician 2016; 11(1): 7-14.
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DOI unavailable **PMID** 28461842 **PMCID** PMC5405326
Abstract
INTRODUCTION: Fall is a major cause of injuries and can increase the risk of early mortality among elderly. The objective of this study was to determine the prevalence of falls among community-dwelling elderly in rural Malaysia and its associated factors.
METHODS: Data were obtained from a cross-sectional survey in five randomly selected districts in the state of Perak, Malaysia. A total of 250 households were randomly selected. A total of 811 individuals aged 60 years or more were recruited and interviewed using a structured questionnaire. Information about socio-demographic, history of falls in the past 1 year, medical history, drug history and physical activity level were enquired.
RESULTS: The prevalence of falls in the past 1 year among community-dwelling elderly was reported to be 4.07%. Indigenous elderly (Adjusted odd ratio, AOR = 6.06, 95% CI = 1.10-33.55, p = 0.039) and living alone (AOR = 2.60, 95% CI = 1.04-6.50, p = 0.042) were shown to be factors associated with falls. Physical activity level, number of co-morbidities and number of medications used were not associated with falls.
CONCLUSION: Elderly of indigenous ethnicity and living alone are the main factors associated with falls in this population. Indigenous people may be at higher risk, which warrant further investigation with a larger sample to improve the precision of estimates.
PDF Y Endnote Y

Stabilized incidence in proximal humeral fractures of elderly women: nationwide statistics from Finland in 1970-2015
Kannus P, Niemi S, Sievänen H, Parkkari J.
J. Gerontol. A Biol. Sci. Med. Sci. 2017; ePub(ePub): ePub.
Affiliation: Tampere Research Center of Sports Medicine, UKK Institute for Health Promotion Research, Tampere, Finland.

DOI 10.1093/gerona/glx073 **PMID** 28475669
Abstract
BACKGROUND: Low-trauma fractures of elderly women are a major public health concern.

METHODS: We determined the current trend in the absolute number and incidence (per 100,000 persons) of fresh low-trauma fractures of the proximal humerus among 80-year-old or older Finnish women by taking into account all women who were admitted to Finnish hospitals for primary treatment of such a fracture between 1970 and 2015.
RESULTS: The number of low-trauma fractures of the proximal humerus among 80-year-old or older Finnish women rose continuously between 1970 (32 fractures) and 2015 (568 fractures), whereas the age-adjusted fracture rate (showing a clear rise from 87 fractures per 100,000 persons in 1970 to 304 fractures in 1995) became stabilized between 1995 and 2015 (297 fractures per 100,000 persons in 2015).
CONCLUSIONS: The clear rise in the incidence of low-trauma proximal humeral fractures in Finnish elderly women from early 1970s until mid 1990s has been followed by stabilized fracture rates. Reasons for this are largely unknown, but a cohort effect toward a healthier aging population with improved functional ability, as well as measures to prevent falls and alleviate fall severity, could partly explain the phenomenon.
PDF Y Endnote Y

The physical and cognitive performance test for residents in assisted living facilities
Bowen ME, Rowe M, Ersek M, Ibrahim S, Shea JA.
J. Am. Geriatr. Soc. 2017; ePub(ePub): ePub.
Affiliation: Department of Internal Medicine, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

DOI 10.1111/jgs.14932 **PMID** 28481408
Abstract
OBJECTIVES: To develop and evaluate the psychometric properties of a new performance-based instrument (Physical and Cognitive Performance Test for Assisted Living Facilities (PCPT ALF)) designed to assess the physical and cognitive skills associated with performance of activities of daily living (ADLs) and instrumental activities of daily living (IADLs).
DESIGN: There were three stages in this study: development of instrument items and validity testing, a feasibility pilot study, and a cross-sectional trial to establish construct and criterion validity and reliability.
SETTING: One 116-bed assisted living facility (ALF).
PARTICIPANTS: After a pilot test with 10 residents, a cross-sectional trial was conducted with 55 additional residents. MEASUREMENTS: The Barthel Index and Functional Independence Measure were used to estimate criterion validity. Construct validity was examined using exploratory factor analyses (EFAs).
RESULTS: Disattenuated correlations between the PCPT ALF and other tools were all greater than 0.72, supporting criterion validity. Internal consistency (physical ability, $\alpha = 0.95$; cognitive support, $\alpha = 0.92$) and 1-week test-retest reliability (PCPT ALF, P =.93) were high, as was interrater reliability (IRR) (physical ability, 0.99; cognitive support, 1.00). In two EFAs, a one-factor solution accounted for 64.1% of the variance for the physical ability subscale and 63.5% of the variance for the cognitive support subscale.
CONCLUSION: The findings provide early evidence of the PCPT ALF's validity and reliability. If confirmed, this study's findings may be used in future work to assess the success of interventions to prevent or slow decline in the skills associated with ADL and IADL performance in ALFs.

PDF Y Endnote Y

The prevalence of pain and its relationship to falls, fatigue and depression in a cohort of older people living in the community

Crowe M, Jordan J, Gillon D, Mccall C, Frampton C, Jamieson H.

J. Adv. Nurs. 2017; ePub(ePub): ePub.

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DOI 10.1111/jan.13328 **PMID** 28475222

Abstract

AIM: To examine the relationship of the pain severity scores with demographic variables (age, gender and ethnicity) and with the frequency of falls, fatigue and depression in a very large New Zealand sample of people over 65 years assessed using the Home Care International Residential Assessment Instrument.

BACKGROUND: Pain is reported to be highly prevalent in older people yet it is poorly correlated with tissue damage. There is convincing evidence that it is related to depression and some evidence of its relationship with fatigue and falls.

DESIGN: This is a cross-sectional study examining a national cohort assessed on referral for a needs assessment for access to publicly funded service provision or support.

METHOD: Participants were 45418 adults aged over 65 years referred for a mandatory needs assessment between 2012 - 2014. All variables analysed were drawn from the Home Care International Residential Assessment Instrument. Univariate descriptive statistics were used to characterize the sample in relation to the association of severe pain with age, gender and ethnicity and with the key variables of interest: falls, fatigue and depression. Logistic regression models were used to examine the relationship of the presence or not of severe pain with the other key health-related variables: falls, fatigue and depression respectively, after controlling for the presence of age, gender and ethnicity. Odds ratios are reported to quantify the difference in risk with increasing severity of falls, fatigue and depression.

RESULTS: The mean age of the cohort was 82.48 years (SD 7.48) and 48.5% of the sample reported experiencing daily pain. The rates of severe daily pain were 12-18% with those in the 65-74 years group having the highest reported rate of severe pain (18%) and a gradual decrease in severe pain with age. After co-varying for age, ethnicity and gender, the presence of severe daily pain was predicted by increasing frequency of falls and fatigue and having current depression. While two-thirds reported their pain control was adequate, a third reported that their pain control was not adequate despite adhering to a therapeutic regime.

CONCLUSION: The study highlights how pervasive pain is in this group and its correlation with falls, fatigue and depression. While the effect sizes were relatively small the results may be clinically significant and it may be clinically important that the presence of pain in older people could indicate the need for further nursing assessment in relation to falls, fatigue and depression. This article is protected by copyright. All rights reserved.

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The relationship between depression and cognitive impairment with falls leading to fractures in elderly

Davoodi F, Etemad K, Tanjani PT, Khodakarim S.

*Safety Promot. Inj. Prev. (*Tehran) 2016; 4(2): 75-82.

DOI unavailable **PMID** unavailable

Abstract

BACKGROUND AND OBJECTIVES: Fall is a major health problem among the elderly.This study has been done to investigate association between depression and cognitive impairment with falls in elderly referred to the selected hospitals in Tehran.

MATERIALS AND METHODS: This was a hospital-based case-control study that carried out in Tehran, 2014. In this study, 225 elder adults (81 men and 144 women), including 75 cases (27 men and 48 women) and 150 controls (54 men and 96 women) referred to the 5 hospitals in the North, south, East, west and center of Tehran were assessed and compared. Minimal Mental Status Examination questionnaire (MMSE) and Geriatric Depression Scale were used to measure the cognitive status and depression, respectively. Chi-square test, Mann-Whitney, correlation and logistic regression model were used to data analysis in STATA version 12 software.

RESULTS: Results showed that odds ratio (OR) of fall in depressed elder people was 8.2 times higher than the elder people without depression. Also, OR of fall in elderly with cognitive impairment was 6.7 times higher than the elderly without cognitive impairment. The co-occurrence of depression and cognitive impairment is higher risk of fall than from each condition alone.

CONCLUSION: There is a significant positive relationship between depression and cognitive impairment with fall in elder people. It is recommended to health policy makers to provide appropriate educational programs for families in order to prevent these risk factors in elderly.

PDF N Endnote Y

The relationship between objective balance, perceived sense of balance, and fear of falling in stroke patients

Oguz S, Demırbüken İ, Kavlak B, Acar G, Yurdalan SU, Polat MG.

Top. Stroke Rehabil. 2017; ePub(ePub): ePub.

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DOI 10.1080/10749357.2017.1322251 **PMID** 28472895

Abstract

OBJECTIVE: The objective of our study was to investigate the relationship between objective balance, fear of falling, and perceived sense of balance (PSB) in stroke patients.

METHODS: Seventy patients aged 18-65 years with chronically developed hemiplegia or hemiparesis were enrolled in the study. Patients' objective balance scores, fear of falling, and PSB were obtained using the berg balance scale (BBS), the falls efficacy scale (FES), and a visual analog scale, respectively. The Standard Mini-Mental Examination was performed to exclude patients with mental disorders from the study.

RESULTS: There was a moderate negative correlation between PSB and BBS scores ($p = 0.001$, $\rho = -0.588$); a strong negative correlation between BBS and FES scores ($p = 0.001$, $\rho = -0.808$); and a strong positive correlation between PSB and FES scores ($p = 0.001$, $\rho = 0.714$). We found that BBS

scores had negative correlation with PBS scores in left hemiplegic patients while there was no any relationship between BBS and PBS scores in right hemiplegic patients.
CONCLUSION: PSB assessment, besides the BBS, should be considered among the routine assessment methods that enable the rehabilitation team to be aware of patients' balance capacities.
PDF Y Endnote Y

The role of the environment in falls among stroke survivors
Wing JJ, Burke JF, Clarke PJ, Feng C, Skolarus LE.
Arch. Gerontol. Geriatr. 2017; 72: 1-5.
Affiliation: Department of Neurology, Stroke Program, University of Michigan, Ann Arbor, MI, United States.

DOI 10.1016/j.archger.2017.04.007 **PMID** 28482268
Abstract
BACKGROUND: Stroke survivors' risk of falls may be particularly sensitive to the environment due to deficits such as visuospatial neglect or homonymous hemianopia. We sought to identify the prevalence of falls among stroke survivors and investigate the possible role of the environment in falling.
MATERIALS AND METHODS: Data from the National Health and Aging Trends Study (NHATS), a nationally representative population of community-dwelling adults over 65, were used. We compared the prevalence of falling in the past month between stroke survivors and demographic and comorbidity matched controls using sequential Poisson regression models.
RESULTS: The proportion of stroke survivors reporting a fall in the previous month was 18.8% compared to 10.8% among matched controls (PR: 1.74; 95% CI: 1.36-2.25). These differences were attenuated after adjusting for known confounders, mediators and aspects of the environment (PR: 1.17; 95% CI: 0.86-1.60). Indoor tripping hazards were associated with falls (PR: 1.24; 95% CI: 1.01-1.53). The association between stroke and falls was modified by neighborhood social disorder, such that in areas of low social disorder, falls in the previous month were more common in stroke survivors compared to non-stroke controls.
CONCLUSIONS: The difference in falls among stroke survivors and matched controls is largely explained by known risk factors and physical capacity. Indoor tripping hazards were associated with falls among stroke survivors and matched controls. Explanations of why the association between stroke and falls was protective in areas of high social disorder are unclear, but may warrant additional research.

PDF Y Endnote Y

Cortical correlates of human balance control
Mierau A, Pester B, Hülsdünker T, Schiecke K, Strüder HK, Witte H.
Brain Topogr. 2017; ePub(ePub): ePub.
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DOI 10.1007/s10548-017-0567-x **PMID** 28466295

Abstract
Balance control is a fundamental component of human every day motor activities such as standing or walking, and its impairment is associated with an increased risk of falling. However, in humans the exact neurobiological mechanisms underlying balance control are still unclear. Specifically, although previous studies have identified a number of cortical regions that become significantly activated during real or imagined balancing, the interactions within and between the relevant cortical regions remain to be investigated. The working hypothesis of this study is that cortical networks contribute to an optimization of balance control, and that this contribution can be revealed by partial directed coherence-a time-variant, frequency-selective and directed functional connectivity analysis tool. Electroencephalographic activity was recorded in 37 subjects during single-leg balancing on a stable as well as an unstable surface.
RESULTS of this study show that in the transition from balancing on a stable surface to an unstable surface, two topographically delimitable connectivity networks (weighted directed networks) are established; one associated with the alpha and one with the theta frequency band. The theta network sequence can be described as a set of subnetworks (modules) comprising the frontal, central and parietal cortex with individual temporal and spatial developments within and between those modules. In the alpha network, the occipital electrodes O1 and O2 act as a source, and the interactions propagate predominantly in the directions from occipital to parietal and to centro-parietal areas. These important findings indicate that balance control is supported by at least two functional cortical networks.
PDF Y Endnote Y

Evaluating individualized falls prevention for clients with medically complex conditions
Chien T, Goddard M, Casey J, Devitt R, Filinski J.
Phys. Occup. Ther. Geriatrics 2016; 34(2-3): 124-140.

DOI 10.3109/02703181.2015.1136367 **PMID** unavailable
Abstract
AIMS: To evaluate mobility outcomes and concerns about falling for community dwelling medically complex clients (MCCs) participating in an individualized falls prevention clinic.
METHODS: A quantitative retrospective chart review with one group pretest, posttest design compared four outcome measures of Gait Speed, 30 Second Sit-to-Stand Test, Timed Up and Go, and The Falls Efficacy Scale International. Consecutive participants discharged from the Falls Prevention Clinic between January 2014 and December 2014 were screened. Paired t-test was used to determine outcome measure significance. Descriptive statistics and analysis of participant satisfaction surveys were completed.
RESULTS: Sixty-nine participants were included. Over 75% of participants had at least one fall in the past year and average number of falls totaled five. Statistical significance was achieved on all four outcome measures.
CONCLUSIONS: An individualized, multifactorial approach appears to benefit MCCs despite average outcome measure scores still indicating a falls risk. Further examination of defining falls risk for MCCs is warranted
PDF Y Endnote Y

Epidemiology of isolated versus nonisolated mild traumatic brain injury treated in emergency departments in the United States, 2006-2012: sociodemographic characteristics

Cancelliere C, Coronado VG, Taylor CA, Xu L.

J. Head Trauma Rehabil. 2016; ePub(ePub): ePub.

Affiliation: Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada (Dr Cancelliere); and National Center for Injury Prevention and Control (Drs Taylor and Xu), Centers for Disease Control and Prevention, Atlanta, Georgia (Dr Coronado).

DOI 10.1097/HTR.0000000000000260 **PMID** 28489698

Abstract

OBJECTIVES: To describe the frequencies and rates of mild traumatic brain injury (mTBI) emergency department (ED) visits, analyze the trend across the years, and compare sociodemographic characteristics of visits by mTBI type (ie, mTBI as the only injury, or present along with other injuries).

DESIGN: Population-based descriptive study using data from the Nationwide Emergency Department Sample (2006-2012).

METHODS: Joinpoint regression was used to calculate the average annual percent changes of mTBI incidence rates. Characteristics between isolated and nonisolated visits were compared, and the odds ratios were reported.

RESULTS: The rate per 100 000 population of mTBI ED visits in the United States increased significantly from 569.4 (in 2006) to 807.9 (in 2012). The highest rates were observed in 0- to 4-year-olds, followed by male 15- to 24-year-olds and females 65 years and older; the lowest rates were among 45- to 64-year-olds. The majority (70%) of all visits were nonisolated and occurred more frequently in residents of metropolitan areas. Falls were the leading external cause. Most visits were privately insured or covered by Medicare/Medicaid, and the injury occurred on weekdays in predominantly metropolitan hospitals in the South region.

CONCLUSIONS: The burden of mTBI in US EDs is high. Most mTBI ED visits present with other injuries. Awareness of sociodemographic factors associated with nonisolated mTBI may help improve diagnosis in US EDs. This information has implications for resource planning and mTBI screening in EDs.

PDF Y Endnote Y

Real-time constant monitoring of Fall Risk Index by means of fully-wireless insoles

Arndt H, Burkard S, Talavera G, Garcia J, Castells D, Codina M, Hausdorff J, Mirelman A, Harte R, Casey M, Glynn L, Di Rosa M, Rossi L, Stara V, Rösevall J, Rusu C, Carenas C, Breuil F, Reixach E, Carrabina J.

Stud. Health Technol. Inform. 2017; 237: 193-197.

Affiliation: Universitat Autònoma de Barcelona, CEPHIS, Barcelona, Spain.

DOI unavailable **PMID** 28479567

Abstract

Constant monitoring of gait in real life conditions is considered the best way to assess Fall Risk Index (FRI) since most falls happen out of the ideal conditions in which clinicians are currently analyzing the patient's behavior. This paper presents the WIISEL platform and results obtained through the use of the first full-wireless insole devices that can measure almost all gait related data directly on the

feet (not in the upper part of the body as most existing wearable solutions). The platform consists of a complete tool-chain: insoles, smartphone & app, server & analysis tool, FRI estimation and user access.
RESULTS are obtained by combining parameters in a personalized way to build individual fall risk index assessed by experts with the help of data analytics. New FRI has been compared with standards that validate the quality of its prediction in a statistically significant way. That qualitatively relevant information is being provided to the platform users, being either end-users/patients, relatives or caregivers and the related clinicians to ideally assess about their long term evolution.
PDF Endnote Y

Risk of intracranial hemorrhage in ground level fall with antiplatelet or anticoagulant agents
Ganetsky M, Lopez G, Coreanu T, Novack V, Horng S, Shapiro NI, Bauer KA.
Acad. Emerg. Med. 2017; ePub(ePub): ePub.
Affiliation: Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA.

DOI 10.1111/acem.13217 **PMID** 28475282
Abstract
OBJECTIVES: Anticoagulant and antiplatelet medications are known to increase the risk and severity of traumatic intracranial hemorrhage (tICH), even with minor head trauma. Most studies on bleeding propensity with head trauma are retrospective, based on trauma registries, or include heterogeneous mechanisms of injury. The goal of this study was to determine the rate of tICH from only a common low-acuity mechanism of injury, that of a ground level fall, in patients taking one or more of the following antiplatelet or anticoagulant medications: aspirin, warfarin, prasugrel, ticagrelor, dabigatran, rivaroxaban, apixaban or enoxaparin.
METHODS: This was a prospective cohort study conducted at a level 1 tertiary care trauma center of consecutive patients meeting the inclusion criteria of: a ground level fall with head trauma as affirmed by the treating clinician, a CT head obtained, and taking and one of the above antiplatelet or anticoagulants. Patients were identified prospectively through electronic screening with confirmatory chart review. ED charts were abstracted without subsequent knowledge of the hospital course. Patients transferred with a known abnormal CT head were excluded. Primary outcome was rate of tICH on initial CT head. Rates with 95% confidence intervals were compared.
RESULTS: Over 30 months, we enrolled 939 subjects. The average age was 79.2 years and 44.6% were male. There were a total of 33 patients with tICH (3.5%, 95% CI 2.5%-4.9%). Antiplatelets had a rate of tICH of 4.3% (3.0 - 6.2%) compared to anticoagulants with a rate of 1.7% (0.4 - 4.5%). Aspirin without other agents had an tICH rate of 4.6% (3.2 - 6.6%); of these, 81.5% were taking low dose 81mg. Two patients received a craniotomy (1 taking aspirin, 1 taking warfarin). There were 4 deaths (3 taking aspirin, 1 taking warfarin). Most (72.7%) subjects with tICH were discharged home or to a rehabilitation facility. There were no tICH in 31 subjects taking a DOAC. Confidence intervals were overlapping for the groups.
CONCLUSION: There is a low incidence of clinically significant tICH with a ground level fall in head trauma in patients taking an anticoagulant or antiplatelet medication. There was no statistical difference in rate of tICH between antiplatelet and anticoagulants, which is unanticipated and counter-intuitive as most literature and teaching suggests a higher rate with anticoagulants. A larger

data set is needed to determine if small differences between the groups exist. This article is protected by copyright. All rights reserved.
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The impact of compensation on late mortality after traumatic brain injury: a multi-centre study
Gates TM, Baguley IJ, Simpson GK, Barden HLH, Nott MT.
Brain Inj. 2017; ePub(ePub): ePub.
Affiliation: School of Community Health , Charles Sturt University , Albury , Australia.

DOI 10.1080/02699052.2017.1298002 **PMID** 28481650
Abstract
OBJECTIVES: To determine the impact of financial compensation on long-term mortality in adults with severe traumatic brain injury (TBI).
DESIGN, SETTING AND PARTICIPANTS: An inception cohort of 2545 adults consecutively discharged from three metropolitan, post-acute inpatient rehabilitation services of the NSW Brain Injury Rehabilitation Programme from 1 July 1990 to 1 October 2007.
MAIN OUTCOME MEASURE: Survival status at 1 October 2009.
RESULTS: Compensation data were available for 1851 (73%) participants, with 826 (45%) receiving financial compensation. Yearly standardized mortality ratios remained elevated above general population norms for six to ten years for both groups. Compensation had a protective effect on mortality risk as a univariate predictor. However, when considered in multivariate Cox regression analysis, compensation had minimal effect on mortality risk when modelled with non-modifiable demographic factors and pre-existing medical history. Conversely, compensation trended towards a protective effect when modelled with post-injury variables.
CONCLUSIONS: Financial compensation had a protective effect against late mortality following rehabilitation for severe TBI through complex interactions with rehabilitation service variables but not with injury-related variables. This finding suggests that wider access to compensation (and hence rehabilitation) through recently implemented schemes (e.g., NSW Lifetime Care and Support) may further improve life expectancy for this clinical population.
PDF Y Endnote Y

Unintentional drifts during quiet stance and voluntary body sway
Rasouli O, Solnik S, Furmanek MP, Piscitelli D, Falaki A, Latash ML.
Exp. Brain Res. 2017; ePub(ePub): ePub.
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DOI 10.1007/s00221-017-4972-x **PMID** 28477042
Abstract
We explored unintentional drifts in voluntary whole-body sway tasks following the removal of visual feedback. The main hypothesis was that the unintentional drifts were produced by drifts of referent coordinates for salient performance variables. Young healthy subjects stood quietly on a force platform and also performed voluntary body sway at 0.5 Hz both in the anterio-posterior and medio-lateral directions. Visual feedback on the center of pressure (COP) coordinate was provided and then turned off. During quiet stance trials, the subjects matched the initial COP coordinate with a target

shifted by 3 cm anterior, posterior, left, or right from the coordinate during natural standing and activated the right tibialis anterior to 30% of its maximal voluntary contraction. During cyclical voluntary sway task, the nominal sway amplitude was always 4 cm while the midpoint was at one of the four mentioned locations. Removing visual feedback caused COP drifts during quiet stance trials that were consistent across trials performed by a subject but could be in opposite directions across subjects; there was a consistent drop in the activation level of tibialis anterior. During voluntary body sway, removing visual feedback caused a consistent increase in the voluntary sway amplitude and a drift of the midpoint that was consistent within but not across subjects. Motor equivalent and non-motor equivalent inter-cycle motion components were quantified within the space of muscle groups (muscle modes) under visual feedback and at the end of the period without visual feedback. Throughout the trial, there were large motor equivalent motion components, and they increased over the period without visual feedback. The results corroborate the idea that referent coordinate drifts at different levels of the control hierarchy can lead to unintentional drifts in performance. It suggests that directions of COP drifts are defined by two main factors, drift of the body referent coordinate toward the actual coordinate (that can lead to fall) and an opposite drift to ensure body motion to a safer location. Analysis of motor equivalence suggests that postural stability is not compromised during unintentional drifts in performance in contrast to earlier studies of multi-finger tasks. This may be due to the vital importance of postural stability for everyday actions.

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