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A prospective study on the variation in falling and fall risk among community-dwelling older citizens in 12 European countries

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BMJ Open 2017; 7(6): e015827.

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DOI 10.1136/bmjopen-2017-015827 **PMID** 28667220

Abstract

OBJECTIVES: The rate of falling among older citizens appears to vary across different countries, but the underlying aspects causing this variation are unexplained. We aim to describe between-country variation in falling and explore whether intrinsic fall risk factors can explain possible variation.

DESIGN: Prospective study on data from the cross-national Survey of Health, Ageing and Retirement in Europe (SHARE).

SETTING: Twelve European countries (Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Italy, The Netherlands, Spain, Sweden, Switzerland).

PARTICIPANTS: Community-dwelling persons aged ≥65 years (n=18 596).

MEASUREMENTS: Socio-demographic factors (age, gender, education level and living situation) and intrinsic fall risk factors (less than good self-rated health (SRH), mobility limitations, limitations with activities of daily living (ADL), dizziness, impaired vision, depression and impaired cognition) were assessed in a baseline interview. Falling was assessed 2 years later by asking whether the participant had fallen within the 6 months prior to the follow-up interview.

RESULTS: There was significant between-country variation in the rate of falling (varying from 7.9% in Switzerland to 16.2% in the Czech Republic). The prevalence of intrinsic fall risk factors varied twofold to fourfold between countries. Associations between factors age ≥80 years, less than good SRH, mobility limitations, ADL limitations, dizziness and depression, and falling were different between countries ($p<0.05$). Between-country differences in falling largely persisted after adjusting for socio-demographic differences but strongly attenuated after adjusting for differences in intrinsic fall risk factors.

CONCLUSION: There is considerable variation in the rate of falling between European countries, which can largely be explained by between-country variation in the prevalence of intrinsic fall risk factors. There are also country-specific variations in the association between these intrinsic risk factors and falling. These findings emphasise the importance of addressing intrinsic fall risk in (inter)national fall-prevention strategies, while highlighting country-specific priorities.

PDF Y Endnote Y

A systematic review of gait analysis methods based on inertial sensors and adaptive algorithms

Caldas R, Mundt M, Potthast W, Buarque de Lima Neto F, Markert B.

Gait Posture 2017; 57: 204-210.

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DOI 10.1016/j.gaitpost.2017.06.019 **PMID** 28666178

Abstract

The conventional methods to assess human gait are either expensive or complex to be applied regularly in clinical practice. To reduce the cost and simplify the evaluation, inertial sensors and adaptive algorithms have been utilized, respectively. This paper aims to summarize studies that applied adaptive also called artificial intelligence (AI) algorithms to gait analysis based on inertial sensor data, verifying if they can support the clinical evaluation. Articles were identified through searches of the main databases, which were encompassed from 1968 to October 2016. We have identified 22 studies that met the inclusion criteria. The included papers were analyzed due to their data acquisition and processing methods with specific questionnaires. Concerning the data acquisition, the mean score is 6.1±1.62, what implies that 13 of 22 papers failed to report relevant outcomes. The quality assessment of AI algorithms presents an above-average rating (8.2±1.84). Therefore, AI algorithms seem to be able to support gait analysis based on inertial sensor data. Further research, however, is necessary to enhance and standardize the application in patients, since most of the studies used distinct methods to evaluate healthy subjects.

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Age slowing down in detection and visual discrimination under varying presentation times

Moret-Tatay C, Lemus-Zúñiga LG, Tortosa DA, Gamermann D, Vázquez-Martínez A, Navarro-Pardo E, Conejero JA. Scand. J. Psychol. 2017; 58(4): 304-311.

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DOI 10.1111/sjop.12372 **PMID** 28670767

Abstract

The reaction time has been described as a measure of perception, decision making, and other cognitive processes. The aim of this work is to examine age-related changes in executive functions in terms of demand load under varying presentation times. Two tasks were employed where a signal detection and a discrimination task were performed by young and older university students. Furthermore, a characterization of the response time distribution by an ex-Gaussian fit was carried out. The results indicated that the older participants were slower than the younger ones in signal detection and discrimination. Moreover, the differences between both processes for the older participants were higher, and they also showed a higher distribution average except for the lower and higher presentation time. The results suggest a general slowdown in both tasks for age under different presentation times, except for the cases where presentation times were lower and higher. Moreover, if these parameters are understood to be a reflection of executive functions, these findings are consistent with the common view that age-related cognitive deficits show a decline in this function.

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Clinical characteristics and outcome in elderly patients with traumatic brain injury: for establishment of management strategy

Karibe H, Hayashi T, Narisawa A, Kameyama M, Nakagawa A, Tominaga T.
Neurol. Med. Chir. 2017; ePub(ePub): ePub.

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DOI 10.2176/nmc.st.2017-0058 **PMID** 28679968

Abstract

In recent years, instances of neurotrauma in the elderly have been increasing. This article addresses the clinical characteristics, management strategy, and outcome in elderly patients with traumatic brain injury (TBI). Falls to the ground either from standing or from heights are the most common causes of TBI in the elderly, since both motor and physiological functions are degraded in the elderly. Subdural, contusional and intracerebral hematomas are more common in the elderly than the young as the acute traumatic intracranial lesion. High frequency of those lesions has been proposed to be associated with increased volume of the subdural space resulting from the atrophy of the brain in the elderly. The delayed aggravation of intracranial hematomas has been also explained by such anatomical and physiological changes present in the elderly. Delayed hyperemia/hyperperfusion may also be a characteristic of the elderly TBI, although its mechanisms are not fully understood. In addition, widely used pre-injury anticoagulant and antiplatelet therapies may be associated with delayed aggravation, making the management difficult for elderly TBI. It is an urgent issue to establish preventions and treatments for elderly TBI, since its outcome has been remained poor for more than 40 years.

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Comparison of quality of life among community-dwelling older adults with the frailty phenotype

Sánchez-García S, Gallegos-Carrillo K, Espinel-Bermudez MC, Doubova SV, Sánchez-Arenas R, García-Peña C, Salvà A, Briseño-Fabian SC.

Qual. Life Res. 2017; ePub(ePub): ePub.

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DOI 10.1007/s11136-017-1630-5 **PMID** 28667436

Abstract

PURPOSE: To compare the perception of the quality of life (QOL) of community-dwelling older adults with the phenotype of frailty.

METHODS: Cross-sectional analysis of baseline data of the "Cohort of Obesity, Sarcopenia and Frailty of Mexican Older Adults" (COSFOMA). Operationalization of frailty was carried out using the phenotype as follows: weight loss, self-report of exhaustion, low physical activity, slow gait, and weakness. QOL was measured using two scales: World Health Organization Quality of Life of Older Adults (WHOQOL-OLD), which is a specific instrument for the elderly population, and Short Form-36 Health Survey (SF-36), a generic instrument to evaluate the QOL related to health. One-way analyses of variance were conducted to assess the differences among the three phenotypes of frailty and QOL perception.

RESULTS: There were 1252 older adult participants who were analyzed; 11.2% (n = 140) had frailty, 50.3% (n = 630) pre-frailty and 38.5% (n = 482) were not frail. The mean (±SD) total score of the WHOQOL-OLD according to the phenotype of frailty was 60.3 (13.9) for those with frailty, 67.4 (12.7) pre-frailty and 72.4 (11.2) not frail (ANOVA, $p < 0.001$). The mean (±SD) of the SF-36 of the physical and mental component measures the sum, 38.9 (9.9) and 41.9 (11.3) with frailty, 45.7 (9.1) and 46.6 (9.8) pre-frailty, and 49.6 (7.3) and 49.4 (7.9) not frail, respectively (ANOVA, $p < 0.001$).

CONCLUSIONS: Frailty is observed in 1/10 community-dwelling older adults. Those with frailty and pre-frailty had a lower perception of QOL compared with those who were not frail.
PDF Y Endnote Y

Formal caregivers' experiences of aggressive behaviour in older people living with dementia in nursing homes: a systematic review
Holst A, Skär L.
Int. J. Older People Nurs. 2017; ePub(ePub): ePub.
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DOI 10.1111/opn.12158 **PMID** 28664607
Abstract
AIM: The purpose of this study was to investigate formal caregivers' experiences of aggressive behaviour in older people living with dementia in nursing homes.
BACKGROUND: Aggressive behaviour symptoms among older people living with dementia are reported to be prevalent. As aggressive behaviour includes both verbal and physical behaviours, such as kicking, hitting and screaming, it causes an increased burden on formal caregivers. Professionals experiencing this aggression perceived it as challenging, causing physical and psychological damage, leading to anger, stress and depression.
METHODS: A systematic review was conducted. A search of published research studies between 2000 and 2015 was conducted using appropriate search terms. Eleven studies were identified and included in this review.
RESULTS: The analysis resulted in four categories: formal caregivers' views on triggers of aggression, expressions of aggression, the effect of aggressive behaviours on formal caregivers and formal caregivers' strategies to address aggression. The results show that aggressive behaviour may lead to negative feelings in formal caregivers and nursing home residents.
CONCLUSION: The results of this study suggest that having the ability to identify triggers possibly assists caregivers with addressing aggressive behaviour. Aggressive behaviour might also affect quality of care.
IMPLICATIONS FOR PRACTICE: Results from this systematic review indicate that caregivers prefer person-centred strategies to handle aggressive behaviour among older people, while the use of pharmaceuticals and coercion strategies is a last resort.

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Gait implications of visual field damage from glaucoma
Mihailovic A, Swenor BK, Friedman DS, West SK, Gitlin LN, Ramulu PY.
Transl. Vis. Sci. Technol. 2017; 6(3): e23.
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DOI 10.1167/tvst.6.3.23 **PMID** 28660098 **PMCID** PMC5484170
Abstract
PURPOSE: To evaluate fall-relevant gait features in older glaucoma patients.
METHODS: The GAITRite Electronic Walkway was used to define fall-related gait parameters in 239 patients with suspected or manifest glaucoma under normal usual-pace walking conditions and

while carrying a cup or tray. Multiple linear regression models assessed the association between gait parameters and integrated visual field (IVF) sensitivity after controlling for age, race, sex, medications, and comorbid illness.
RESULTS: Under normal walking conditions, worse IVF sensitivity was associated with a wider base of support (β = 0.60 cm/5 dB IVF sensitivity decrement, 95% confidence interval [CI] = 0.12-1.09, P = 0.016). Worse IVF sensitivity was not associated with slower gait speed, shorter step or stride length, or greater left-right drift under normal walking conditions (P > 0.05 for all), but was during cup and/or tray carrying conditions (P < 0.05 for all). Worse IVF sensitivity was positively associated with greater stride-to-stride variability in step length, stride length, and stride velocity (P < 0.005 for all). Inferior and superior IVF sensitivity demonstrated associations with each of the above gait parameters as well, though these associations were consistently similar to, or weaker than, the associations noted for overall IVF sensitivity.
CONCLUSION: Glaucoma severity was associated with several gait parameters predictive of higher fall risk in prior studies, particularly measures of stride-to-stride variability. Gait may be useful in identifying glaucoma patients at higher risk of falls, and in designing and testing interventions to prevent falls in this high-risk group. TRANSLATIONAL RELEVANCE: These findings could serve to inform the development of the interventions for falls prevention in glaucoma patients.
PDF Y Endnote Y

Loss of peripheral sensory function explains much of the increase in postural sway in healthy older adults

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Front. Aging Neurosci. 2017; 9: e202.
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DOI 10.3389/fnagi.2017.00202 **PMID** 28676758 **PMCID** PMC5476729
Abstract
Postural sway increases with age and peripheral sensory disease. Whether, peripheral sensory function is related to postural sway independent of age in healthy adults is unclear. Here, we investigated the relationship between tests of visual function (VISFIELD), vestibular function (CANAL or OTOLITH), proprioceptive function (PROP), and age, with center of mass sway area (COM) measured with eyes open then closed on firm and then a foam surface. A cross-sectional sample of 366 community dwelling healthy adults from the Baltimore Longitudinal Study of Aging was tested. Multiple linear regressions examined the association between COM and VISFIELD, PROP, CANAL, and OTOLITH separately and in multi-sensory models controlling for age and gender. PROP dominated sensory prediction of sway across most balance conditions (β's = 0.09-0.19, p's < 0.001), except on foam eyes closed where CANAL function loss was the only significant sensory predictor of sway (β = 2.12, p < 0.016). Age was not a consistent predictor of sway. This suggests loss of peripheral sensory function explains much of the age-associated increase in sway.
PDF Y Endnote Y

Outcome of head injury in the elderly

Prasad GL.
World Neurosurg. 2017; 103: e944.

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DOI 10.1016/j.wneu.2017.02.134 **PMID**28672718
Abstract [Abstract unavailable] Letter to the Editor
PDF Y Endnote Y

The role of environmental factors for the onset of restricted mobility outside the home among older adults with osteoarthritis: a prospective cohort study
Rantakokko M, Wilkie R.
BMJ Open 2017; 7(6): e012826.
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DOI 10.1136/bmjopen-2016-012826 **PMID** 28667194
Abstract
OBJECTIVES: The study examines how environmental factors contribute to the onset of restricted mobility outside the home among older adults with osteoarthritis.
METHODS: This is a prospective cohort study of adults aged 50 years and older with osteoarthritis (n=1802). Logistic regression tested the association between the onset of restricted mobility outside the home and health, sociodemographic and perceived environmental barriers (hills and steep slopes, inaccessible public buildings, poor pavement condition, lack of access to public parks or sport facilities, heavy traffic or speeding cars and poor weather). The potential moderating role of environmental barriers on the association between health factors and onset was examined using interaction terms and stratified analysis.
RESULTS: Of 1802 participants, 13.5% (n=243) reported the onset of restricted mobility outside the home at 3-year follow-up. Walking disability, anxiety, depression, cognitive impairment and obesity and all environmental barriers were associated with onset after adjustment for confounders. Environmental barriers had an added contribution to the effect of the health conditions on onset of restricted mobility, which was attenuated when adjusted for confounders. The added contribution remained only for walking disability and the presence of hills and steep slopes; in the presence of both, the association with onset of restricted mobility was stronger (OR 7.66, 95% CI 4.64 to 12.64) than in the presence of walking disability (3.60, 2.43 to 5.32) or the presence of hills and steep slopes alone (4.55, 2.89 to 7.16).
CONCLUSION: For older adults with osteoarthritis, environmental barriers are associated and add a contribution to that of morbidities and walking disability on the onset of restricted mobility outside the home. Awareness of environmental barriers is important when aiming to maintain mobility and activities outside the home despite health conditions in older adults.

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The role of leisure activities in mediating the relationship between physical health and well-being: differential patterns in old and very old age

Ihle A, Gouveia ÉR, Gouveia BR, van der Linden BWA, Sauter J, Gabriel R, Oris M, Fagot D, Kliegel M.
Gerontology 2017; ePub(ePub): ePub.

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DOI 10.1159/000477628 **PMID** 28675907

Abstract

BACKGROUND: Recently, Paggi et al. [Gerontology 2016;62:450-458] for the very first time showed in a cross-sectional sample of 259 adults aged 18-81 years that the relation of physical health to psychological well-being was mediated via frequency of leisure activity participation.
OBJECTIVE: To extend this framework, we followed theories on successful aging and vulnerability to propose to add a differential perspective predicting that certain individuals may be more vulnerable than others and therefore may show differences in the mediation pattern. Specifically, we examined whether mediation patterns were differential in certain populations, such as in old-old (compared to young-old) adults and in individuals who carried out a low (compared to those with a high) number of activities.
METHODS: We analyzed data from 3,080 individuals on physical health (number of chronic diseases, subjective health status, and subjective evaluation of change in health over the last 10 years), frequency of participation in 18 leisure activities, and physical and psychological well-being using moderated mediation models with a path model approach that allowed the simultaneous estimation of all model paths, including their significance.
RESULTS: We found that the relation of physical health to physical and psychological well-being was mediated via frequency of activity participation. For physical (but not for psychological) well-being, this mediation was more pronounced in old-old (compared to young-old) adults and in individuals who carried out a low (compared to those with a high) number of activities. These moderated mediations were attributable to differential relations of physical health to frequency of activity participation and to differential relations of frequency of activity participation to physical well-being between the investigated moderator levels.
CONCLUSION: Present data suggest that participation in leisure activities may play a key role in mediating the relationship between physical health and well-being, particularly in very old age. FINDINGS are discussed with respect to theories of successful aging and differences between physical and psychological well-being.

PDF N Endnote Y

The role of the built environment in a randomized controlled trial to increase physical activity among men with prostate cancer: the PROMOTE trial

McGowan EL, Fuller D, Cutumisu N, North S, Courneya KS.
Support. Care Cancer 2017; ePub(ePub): ePub.

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DOI 10.1007/s00520-017-3798-1 **PMID** 28656468

Abstract

PURPOSE: The purpose of the study was to examine the association between the built environment and physical activity (PA) in prostate cancer survivors (PCS), as well as whether built environment factors (walkability, count of sports complexes) were effect modifiers of a PA intervention.
METHODS: Our study included 165 PCS residing in Edmonton, Alberta, from the PROMOTE trial. The PROMOTE trial was a randomized controlled trial of a behaviour change intervention to increase PA and quality of life in PCS. In the PROMOTE trial, 423 PCS were randomly assigned to a standard physical activity recommendation, self-administered implementation intention, or telephone-assisted implementation intention group. PA and quality of life outcomes were assessed at baseline, 1, and 3 months. To explore the role of the built environment, this study examined walkability and count of sport complexes.
RESULTS: Linear regression analyses revealed that the self-administered intervention group had an increase in self-reported PA minutes/week (β = 133.4, 95% CI = -18.9 to 285.6); however, none of the built environment variables were found to be significantly associated with PA. The logistic regression showed that the self-administered intervention group had a significantly greater likelihood of meeting the PA guidelines (OR = 2.1, 95% CI = 0.9 to 4.9), though no built environment variables were associated with PA levels.
CONCLUSIONS: Our findings suggest that the built environment was not associated with PA and was not an effect modifier in a PA behaviour change intervention for PCS. Further research is needed before clear conclusions can be generated (ClinicalTrials.gov number NCT01410656).
PDF Y Endnote Y

Validation of FRAX and the impact of self-reported falls among elderly in a general population: the HUNT study, Norway
Hoff M, Meyer HE, Skurtveit S, Langhammer A, Søgaard AJ, Syversen U, Dhainaut A, Skovlund E, Abrahamsen B, Schei B.
Osteoporos. Int. 2017; ePub(ePub): ePub.
Affiliation: Department of Gynecology, St. Olavs Hospital, Trondheim University Hospital, Trondheim, Norway.

DOI 10.1007/s00198-017-4134-9 **PMID** 28668994
Abstract
Fracture Risk Assessment Tool (FRAX) without bone mineral density (BMD) for hip fracture prediction was validated in a Norwegian population 50-90 years. Fracture risk increased with higher FRAX score, and the observed number of hip fractures agreed well with the predicted number, except for the youngest and oldest men. Self-reported fall was an independent risk factor for fracture in women.
INTRODUCTION: The primary aim was to validate FRAX without BMD for hip fracture prediction in a Norwegian population of men and women 50-90 years. Secondary, to study whether information of falls could improve prediction of fractures in the subgroup aged 70-90 years.
METHODS: Data were obtained from the third survey of the Nord-Trøndelag Health Study (HUNT3), the fracture registry in Nord-Trøndelag, and the Norwegian Prescription Database (NorPD), including 15,432 women and 13,585 men. FRAX hip without BMD was calculated, and hip fractures were registered for a median follow-up of 5.2 years. The number of estimated and observed fractures was assessed, ROC curves with area under the curve (AUC), and Cox regression analyses. For the group aged 70-90 years, self-reported falls the last year before HUNT3 were included in the

Cox regression model.
RESULTS: The risk of fracture increased with higher FRAX score. When FRAX groups were categorized in a 10-year percentage risk for hip fracture as follows, <4, 4-7.9, 8-11.9, and ≥12%, the hazard ratio (HR) for hip fracture between the lowest and the highest group was 17.80 (95% CI: 12.86-24.65) among women and 23.40 (13.93-39.30) in men. Observed number of hip fractures agreed quite well with the predicted number, except for the youngest and oldest men. AUC was 0.81 (0.78-0.83) for women and 0.79 (0.76-0.83) for men. Self-reported fall was an independent risk factor for fracture in women (HR 1.64, 1.20-2.24), and among men, this was not significant (1.09, 0.65-1.83).
CONCLUSIONS: FRAX without BMD predicted hip fracture reasonably well. In the age group 70-90 years, falls seemed to imply an additional risk among women.
PDF Y Endnote Y

Restricted vision increases sensorimotor cortex involvement in human walking
Oliveira AS, Schlink BR, Hairston WD, Konig P, Ferris DP.
J. Neurophysiol. 2017; ePub(ePub): ePub.
Affiliation: University of Michigan.

DOI 10.1152/jn.00926.2016 **PMID** 28679843
Abstract
This study aimed to determine if there are electrocortical evidence of augmented participation of sensory brain areas on walking modulation during walking with eyes closed. Healthy subjects (n=10) walked on a treadmill at 1 m/s while alternating 5 minutes walking with the eyes open or closed while we recorded ground reaction forces (GRF) and high-density scalp electroencephalography (EEG). We applied independent component analysis to parse EEG signals into maximally independent component (IC) processes and then computed equivalent current dipoles for each IC. We clustered cortical source ICs and analyzed event-related spectral perturbations synchronized to gait events. Our results indicated that walking with eyes closed reduced the first peak of the vertical ground reaction forces and induced shorter stride duration. Regarding the EEG, we found that walking with eyes closed induced significant increased relative theta desynchronization in the frontal and pre-motor cortex during stance, as well as greater desynchronization from theta to beta bands during transition to single support for both left and right somatosensory cortex. These results suggest a phase-specific increased participation of brain areas dedicated to sensory processing and integration when vision is not available for locomotor guidance. Furthermore, the lack of vision demands higher neural processing related to motor planning and execution. Our findings provide evidences for supporting the use of eyes closed tasks in clinical practice, such as gait rehabilitation and improvements in balance control, as there is higher demand for additional sensory integration for achieving postural control.

PDF Y Endnote Y

Syncope workup: greater yield in select trauma population
Harfouche M, Cline M, Mazzei M, Santora T.
Int. J. Surg. (London, England) 2017; 44: 210-214.
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DOI 10.1016/j.ijsu.2017.06.080 **PMID** 28676385

Abstract

BACKGROUND: There is great variation in practice regarding the assessment of trauma patients who present with syncope. The purpose of this study was to determine the yield of screening studies (electrocardiogram, echocardiogram, and carotid duplex) and define characteristics to identify groups that may benefit from these investigations.

METHODS: We conducted a retrospective cohort study of all trauma patients from 2003 to 2015 who received a carotid duplex as part of a syncope evaluation at our urban Level 1 Trauma Center. Demographics, clinical findings as well as interventions undertaken (ie: placement of defibrillators/pacemakers) as a result of the syncope evaluation were collected. Data analysis was performed with STATA 14 and relationships between comorbidities, positive findings and interventions were assessed. Significance was assumed for $p<0.05$.

RESULTS: 736 trauma patients were included in the study. The most common mechanism of injury was fall (592, 82%). A history of congestive heart failure (CHF) and/or coronary artery disease (CAD) and age > 65 were significantly associated with abnormal EKG and ECHO findings, but not with severe carotid stenosis. Elevated Injury Severity Scale (ISS) was significantly associated with an abnormal ECHO on both univariate and multivariate analysis. An abnormal EKG was predictive of an abnormal ECHO (p=0.02). Ten patients (1.4%) underwent placement of a defibrillator and/or pacemaker, all of whom reported having CHF. Only 11 patients (1.7%) had severe carotid stenosis (>70%) requiring intervention.

CONCLUSION: The screening studies used in a syncope evaluation have low yield in the general trauma population. Carotid duplex should not be routinely performed. Cardiac evaluation should be tailored to individuals with cardiac comorbidities, older age and elevated ISS. An EKG should be used as initial screening in this patient cohort.

PDF Y Endnote Y

The impact of mobile phone use on where we look and how we walk when negotiating floor based obstacles

Timmis MA, Bijl H, Turner K, Basevitch I, Taylor MJD, van Paridon KN.

PLoS One 2017; 12(6): e0179802.

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DOI 10.1371/journal.pone.0179802 **PMID** 28665942

Abstract

Pedestrians regularly engage with their mobile phone whilst walking. The current study investigated how mobile phone use affects where people look (visual search behaviour) and how they negotiate a floor based hazard placed along the walking path. Whilst wearing a mobile eye tracker and motion analysis sensors, participants walked up to and negotiated a surface height change whilst writing a text, reading a text, talking on the phone, or without a phone. Differences in gait and visual search behaviour were found when using a mobile phone compared to when not using a phone. Using a phone resulted in looking less frequently and for less time at the surface height change, which led to adaptations in gait by negotiating it in a manner consistent with adopting an increasingly cautious

stepping strategy. When using a mobile phone, writing a text whilst walking resulted in the greatest adaptions in gait and visual search behaviour compared to reading a text and talking on a mobile phone.
FINDINGS indicate that mobile phone users were able to adapt their visual search behaviour and gait to incorporate mobile phone use in a safe manner when negotiating floor based obstacles.
PDF Y Endnote Y

Transferability of dual-task coordination skills after practice with changing component tasks
Schubert T, Liepelt R, Kübler S, Strobach T.
Front. Psychol. 2017; 8: e956.
Affiliation: Department of Psychology, Medical School HamburgHamburg, Germany.

DOI 10.3389/fpsyg.2017.00956 **PMID** 28659844 **PMCID** PMC5468462
Abstract
Recent research has demonstrated that dual-task performance with two simultaneously presented tasks can be substantially improved as a result of practice. Among other mechanisms, theories of dual-task practice-relate this improvement to the acquisition of task coordination skills. These skills are assumed (1) to result from dual-task practice, but not from single-task practice, and (2) to be independent from the specific stimulus and response mappings during the practice situation and, therefore, transferable to new dual task situations. The present study is the first that provides an elaborated test of these assumptions in a context with well-controllable practice and transfer situations. To this end, we compared the effects of dual-task and single-task practice with a visual and an auditory sensory-motor component task on the dual-task performance in a subsequent transfer session. Importantly, stimulus and stimulus-response mapping conditions in the two component tasks changed repeatedly during practice sessions, which prevents that automatized stimulus-response associations may be transferred from practice to transfer. Dual-task performance was found to be improved after practice with the dual tasks in contrast to the single-task practice. These findings are consistent with the assumption that coordination skills had been acquired, which can be transferred to other dual-task situations independently on the specific stimulus and response mapping conditions of the practiced component tasks.
PDF Y Endnote Y

Validation of accuracy of SVM-based fall detection system using real-world fall and non-fall datasets
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PLoS One 2017; 12(7): e0180318.
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DOI 10.1371/journal.pone.0180318 **PMID** 28678808
Abstract
Falls are a major cause of injuries and deaths in older adults. Even when no injury occurs, about half of all older adults who fall are unable to get up without assistance. The extended period of lying on the floor often leads to medical complications, including muscle damage, dehydration, anxiety and fear of falling. Wearable sensor systems incorporating accelerometers and/or gyroscopes are

designed to prevent long lies by automatically detecting and alerting care providers to the occurrence of a fall. Research groups have reported up to 100% accuracy in detecting falls in experimental settings. However, there is a lack of studies examining accuracy in the real-world setting. In this study, we examined the accuracy of a fall detection system based on real-world fall and non-fall data sets. Five young adults and 19 older adults went about their daily activities while wearing tri-axial accelerometers. Older adults experienced 10 unanticipated falls during the data collection. Approximately 400 hours of activities of daily living were recorded. We employed a machine learning algorithm, Support Vector Machine (SVM) classifier, to identify falls and non-fall events. We found that our system was able to detect 8 out of the 10 falls in older adults using signals from a single accelerometer (waist or sternum). Furthermore, our system did not report any false alarm during approximately 28.5 hours of recorded data from young adults. However, with older adults, the false positive rate among individuals ranged from 0 to 0.3 false alarms per hour. While our system showed higher fall detection and substantially lower false positive rate than the existing fall detection systems, there is a need for continuous efforts to collect real-world data within the target population to perform fall validation studies for fall detection systems on bigger real-world fall and non-fall datasets.

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