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A comprehensive investigation of comorbidities, mechanisms, injury patterns, and outcomes in geriatric blunt trauma patients

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Am. Surg. 2016; 82(11): 1055-1062.

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(Copyright © 2016, Southeastern Surgical Congress)

DOI unavailable **PMID** 28877802

Abstract

The geriatric population is growing and trauma providers are often tasked with caring for injuries in the elderly. There is limited information regarding injury patterns in geriatric trauma patients stratified by mechanism of injury. This study intends to investigate the comorbidities, mechanisms, injury patterns, and outcomes in geriatric blunt trauma patients. A retrospective study of the 2012 National Trauma Databank was performed. Adult blunt trauma patients were identified; geriatric (≥ 65) patients were compared with younger (< 65) patients regarding admission demographics and vital signs, mechanism and severity of injury, and comorbidities. The primary outcome was injuries sustained and secondary outcomes included mortality, length of stay in the intensive care unit and hospital, and ventilator days. There were 589,830 blunt trauma patients who met the inclusion criteria, including 183,209 (31%) geriatric and 406,621 (69%) nongeriatric patients. Falls were more common in geriatric patients (79 vs 29%, $P < 0.0001$). Geriatric patients less often had an Injury Severity Score ≥ 16 (18 vs 20%, $P < 0.0001$) but more often a head Abbreviated Injury Scale ≥ 3 (24 vs 18%, $P < 0.0001$) and lower extremity Abbreviated Injury Scale ≥ 3 (24% vs 8%, $P < 0.0001$). After logistic regression older age was an independent risk factor for mortality for the overall population and across all mechanisms. Falls are the most common mechanism for geriatric trauma patients. Geriatric patients overall present with a lower Injury Severity Score, but more often sustain severe injuries to the head and lower extremities. Injury patterns vary significantly between older and younger patients when stratified by mechanism. Mortality is significantly higher for geriatric trauma patients and older age is independently associated with mortality across all mechanisms.

PDF N Endnote Y

A new system for sharing and informing serious incidents among multiple nursing facilities (Safety-2016 abstract #99)

Dakeshita T, Kitamura K, Nishida Y, Mizoguchi H.
Inj. Prev. 2016; 22(Suppl 2): A37.

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DOI 10.1136/injuryprev-2016-042156.99 **PMID** unavailable

Abstract

BACKGROUND: Nursing facilities hold a big problem in preventing accidents including "slip" and "fall". To prevent injury, it is required to collect a large number of data and analyse causal factors related to injury, such as devices and environments, care worker's action, physical function and action of care receivers, and to share characteristics and patterns of injury in nursing facilities. But now it is difficult to collect and share injury data.

METHODS: In this study, we implement a new system with two functions using a latest cloud computing technology; i) A function to accumulate and search important injury data using a geographical-information-system-like software, and ii) a function to find and inform fatal or serious

injury that facility staff should know by considering kinds of nursing tasks performed in the target facility. By applying the developed method into three nursing facilities, we confirmed the effectiveness of the system.

RESULTS: We collected 115 incident cases in total and input these incident data using the developed system; The system consists of a cloud server system and three client systems corresponding to three facilities. For example, using the system, staff could share not only statistics but also the concrete incident information as follows. By inputting a target moving route in order of "Cabin, Cafeteria, Water Closet, and Caregiver Station", the system find and inform a serious injury case occurred in the other facilities such as "a patient stood up and slipped before raising the underwear after elimination in the toilet."

CONCLUSIONS: We verified that it was possible to share and inform important serious injury among nursing facilities. The advantages of the proposed cloud-computing-type system lie in 1) a large number of data can be collected by sharing the data among multiple facilities using the system even if the number of incident in a single facility is relatively small, and 2) facility staff can find important serious injury that might occur in the facility.

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PDF Y Endnote Y

An investigation of the use of the Kinect system as a measure of dynamic balance and forward reach in the elderly

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Clin. Rehabil. 2017; ePub(ePub): ePub.

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DOI 10.1177/0269215517730117 **PMID**28879781

Abstract

OBJECTIVE: To investigate the reliability and correlations of Kinect-derived valuables of forward reach distance and velocity with the traditional functional reach distance, scores on posturography, and other measures of physical fitness.

DESIGN: Observational study.

SETTING: Community hospital.

SUBJECTS: Individuals >65 years who attended a geriatric health examination were enrolled. **MAIN**

MEASURES: The Kinect system was used to record the reach distance and velocity of the forward reach test. Center of pressure displacement was measured by posturography. Physical fitness performance was assessed using the 2-Minute Step Test, the 30-Second Chair Stand Test, the Sit-and-Reach Test, grip strength, and walking speed.

RESULTS: A total of 442 individuals were enrolled (mean age: 73.3 ± 5.2 years). Forward reach tracking using the Kinect system showed good repeatability and correlated with traditional functional reach ($r = 0.719$, $P < 0.001$); the reaching velocity correlated with scores on posturography ($r = -0.257$, $P = 0.047$). Reach distances were significantly decreased in the older group (≥ 75 years) than in the younger group (< 75 years) ($P < 0.001$).

CONCLUSION: The Kinect system provides a simple, reliable, and age-sensitive assessment of balance in older adults. The valuables correlate with the traditional functional reach, scores on posturography, and physical fitness performance. It provides alternative representation of both static and dynamic balance function.

PDF Y Endnote Y

Applying game thinking to slips, trips and falls prevention

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Stud. Health Technol. Inform. 2017; 242: 606-613.

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(Copyright © 2017, IOS Press)

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Abstract

Gamification is about the way in which 'game thinking' can engage participants and change behaviours in real, non-game contexts. This paper explores how game thinking can be applied to help prevent slips, trips and falls (STF), which are the largest cause of accidental death in older people across Europe. The paper contributes to the assistive technology, digital health and computer science/human behaviour communities by responding to a gap in the literature for papers detailing the innovation process of developing interventions to improve health and quality of life. The aim of the paper is of interest to the many stakeholders involved in enabling older people to live independent, confident, healthy and safe lives in the community.

PDF N Endnote Y

Associations between falls and driving outcomes in older adults: systematic review and metaanalysis

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J. Am. Geriatr. Soc. 2017; ePub(ePub): ePub.

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(Copyright © 2017, John Wiley and Sons)

DOI 10.1111/jgs.15047 **PMID** 28873218

Abstract

OBJECTIVES: To examine associations between falls and subsequent motor vehicle crashes (MVCs), crash-related injuries, driving performance, and driving behavior.

DESIGN: Systematic review and metaanalysis. **PARTICIPANTS:** Observational studies including drivers aged 55 and older or with a mean age of 65 and older. **MEASUREMENTS:** Two authors independently extracted study and participant characteristics, exposures, and outcomes and assessed risk of bias. Pooled risk estimates for MVCs and MVC-related injuries were calculated using random-effects models. Other results were synthesized narratively.

RESULTS: From 3,286 potentially eligible records, 15 studies (N = 27-17,349 subjects) met inclusion criteria. Risk of bias was low to moderate, except for cross-sectional studies (n = 3), which all had a high potential for bias. A fall history was associated with a significantly greater risk of subsequent MVC (summary risk estimate = 1.40, 95% confidence interval (CI) = 1.20-1.63; I(2) = 28%, N = 5 studies). One study found a significantly greater risk of MVC-related hospitalizations and deaths after a fall (hazard ratio = 3.12, 95% CI = 1.71-5.69). Evidence was inconclusive regarding an

association between falls and driving cessation and showed no association between falls and driving performance or behavior.

CONCLUSION: Falls in older adults appear to be a risk marker for subsequent MVCs and MVC-related injury. Given the nature of the evidence, which is limited to observational studies, the identified associations may also result at least partly from confounding or bias. Further research is needed to clarify the mechanisms linking falls to crash risk and to develop effective interventions to ensure driving safety in older adults with a history of falls.

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Cost-effectiveness analysis of a multifactorial fall prevention intervention in older home care clients at risk for falling

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BMC Geriatr. 2017; 17(1): e199.

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DOI 10.1186/s12877-017-0599-9 **PMID** 28863774

Abstract

BACKGROUND: Falls among older adults can cause serious morbidity and pose economic burdens on society. Older age is a known risk factor for falls and age has been shown to influence the effectiveness of fall prevention programs. To our knowledge, no studies have explicitly investigated whether cost-effectiveness of a multifactorial fall prevention intervention (the intervention) is influenced by age. This economic evaluation explores: 1) the cost-effectiveness of a multifactorial fall prevention intervention compared to usual care for community-dwelling adults ≥ 75 years at risk of falling in Canada; and 2) the influence of age on the cost-effectiveness of the intervention.

METHODS: Net benefit regression was used to examine the cost-effectiveness of the intervention with willingness-to-pay values ranging from \$0-\$50,000. Effects were measured as change in the number of falls, from baseline to 6-month follow-up. Costs were measured using a societal perspective. The cost-effectiveness analysis was conducted for both the total sample and by age subgroups (75-84 and 85+ years).

RESULTS: For the total sample, the intervention was not economically attractive. However, the intervention was cost-effective at higher willingness-to-pay (WTP) ($\geq \$25,000$) for adults 75-84 years and at lower WTP ($< \$5,000$) for adults 85+ years.

CONCLUSIONS: The cost-effectiveness of the intervention depends on age and decision makers' WTP to prevent falls. Understanding the influence of age on the cost-effectiveness of an intervention may help to target resources to those who benefit most. **TRIAL REGISTRATION:** Retrospectively registered. Clinicaltrials.gov identifier: NCT00463658 (18 April 2007).

PDF Y Endnote Y

Fall detection system for the elderly based on the classification of shimmer sensor prototype data

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Healthc. Inform. Res. 2017; 23(3): 147-158.

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(Copyright © 2017, Korean Society of Medical Informatics)

DOI 10.4258/hir.2017.23.3.147 PMID 28875049 PMCID PMC5572518

Abstract

OBJECTIVES: Falling in the elderly is considered a major cause of death. In recent years, ambient and wireless sensor platforms have been extensively used in developed countries for the detection of falls in the elderly. However, we believe extra efforts are required to address this issue in developing countries, such as Pakistan, where most deaths due to falls are not even reported. Considering this, in this paper, we propose a fall detection system prototype that is based on the classification on real time shimmer sensor data.

METHODS: We first developed a data set, 'SMotion' of certain postures that could lead to falls in the elderly by using a body area network of Shimmer sensors and categorized the items in this data set into age and weight groups. We developed a feature selection and classification system using three classifiers, namely, support vector machine (SVM), K-nearest neighbor (KNN), and neural network (NN). Finally, a prototype was fabricated to generate alerts to caregivers, health experts, or emergency services in case of fall.

RESULTS: To evaluate the proposed system, SVM, KNN, and NN were used. The results of this study identified KNN as the most accurate classifier with maximum accuracy of 96% for age groups and 93% for weight groups.

CONCLUSIONS: In this paper, a classification-based fall detection system is proposed. For this purpose, the SMotion data set was developed and categorized into two groups (age and weight groups). The proposed fall detection system for the elderly is implemented through a body area sensor network using third-generation sensors. The evaluation results demonstrate the reasonable performance of the proposed fall detection prototype system in the tested scenarios.

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Feet deformities are correlated with impaired balance and postural stability in seniors over 75

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PLoS One 2017; 12(9): e0183227.

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Abstract

OBJECTIVE: Understanding the factors and mechanisms that determine balance in seniors appears vital in terms of their self-reliance and overall safety. The study aimed to determine the relationship between the features of feet structure and the indicators of postural stability in the elderly.

METHODS: The study group comprised 80 seniors (41F, 39M; aged 75-85 years). CQ-ST podoscope and the CQ-Stab 2P two-platform posturograph were used as primary research tools. The data were analyzed based on Spearman's rank correlation and forward stepwise regression.

RESULTS: Analysis of forward stepwise regression identified the left foot length in females and Clarke's angle of the left foot in men as significant and independent predictors of postural up to 30% of the variance of dependent variables.

CONCLUSIONS: Longer feet provide older women with better stability, whereas in men, the lowering of the longitudinal arch results in postural deterioration. In the elderly, the left lower limb shows greater activity in the stabilizing processes in the standing position than the right one. In

gerontological rehabilitation special attention should be paid to the individually tailored, gender-specific treatment, with a view to enhancing overall safety and quality of seniors' lives.

PDF Y Endnote Y

Hip fracture and the influence of dementia on health outcomes and access to rehabilitation for older people (Safety-2016 abstract #96)

Mitchell R, Harvey L, Brodaty H, Draper B, Close J.

Inj. Prev. 2016; 22(Suppl 2): A36.

(Copyright © 2016, BMJ Publishing Group)

DOI 10.1136/injuryprev-2016-042156.96 **PMID** unavailable

Abstract

BACKGROUND: Recovery following hip fracture can be aided by access to, and participation in, rehabilitation-related activities. However, access to rehabilitation can differ for individuals with and without dementia. This study compares the characteristics and health outcomes of individuals with and without dementia following a hip fracture; and their access to and outcomes following hospital-based rehabilitation.

METHODS: An examination of hip fractures involving individuals aged 65 years and older with and without dementia using linked hospital separation, rehabilitation and mortality records during 1 January 2009 to 31 December 2013 in New South Wales, Australia. Comorbidities were identified using a 1-year lookback period and a modified Charlson Comorbidity Index. Logistic regression was used to examine the association of a hospital-based rehabilitation and individual characteristics.

RESULTS: There were 8,785 individuals with and 23,520 individuals without dementia who sustained a hip fracture. Individuals with dementia had a higher age-adjusted 30-day mortality rate compared to individuals without dementia (11.7% vs 5.7%), a lower proportion of age-adjusted 28-day re-admission (17.3% vs 24.4%), and a longer age-adjusted mean length of stay (22.2 vs 21.9 days). Compared to individuals without dementia, individuals with dementia had 4.3 times (95% CI: 3.90-4.78) lower odds of receiving hospital-based rehabilitation. However, when they did receive rehabilitation they achieved significant motor functional gain at discharge compared to admission assessed using the Functional Independence Measure ($p < 0.0001$), but to a lesser extent than individuals without dementia.

CONCLUSIONS: Within a population-based cohort, older individuals with dementia can benefit from access to, and participation in, rehabilitation activities following a hip fracture. This will ensure that they have the best chance of returning to their pre-fracture physical function and mobility.

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Hyponatremia, bone mineral density and falls in the elderly; results from AHAP study

Hosseini SR, Baghitabar N, Mirzapour A, Oliaei F, Nooreddini H, Bijani A, Mouodi S.

Rom. J. Intern. Med. 2017; ePub(ePub): ePub.

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DOI 10.1515/rjim-2017-0032 **PMID** 28865232

Abstract

BACKGROUND: Hyponatremia (HN) can be associated with osteoporosis, falls and bone fractures in the elderly. Recent researches demonstrated different results about the correlation of HN with bone mineral density and bone fractures.

METHODS: This analytic research came from the AHAP project in northern IRAN. All people aged 60 years and over were included in the study. Individuals with severe comorbidities and them who had concurrent conditions which could have impact on bone mineral densities (BMD) such as long-term use of steroids, calcium and/or vitamin D supplements, bisphosphonates, calcitonin, thiazides and hormonal medications were excluded.

RESULTS: One thousand and one hundred and thirteen older persons were entered in the study. More than 10 percent of the participants had HN (serum Na⁺ level \leq 137mEq/L). No significant difference has been observed between hyponatremic and nonhyponatremic individuals about their balance abilities; bone mineral density; incidence of falls and/or bone fracture during the previous 6 month; dependency in activities of daily living; and osteoporosis.

CONCLUSION: HN was not a prevalent problem in older adults who met the inclusion criteria of this research. No significant difference has been observed between HN and bone mineral density and falls in the elderly.

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Identification of fall predictors in the active elderly population from the routine medical records of general practitioners

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Prim. Health Care Res. Dev. 2017; ePub(ePub): ePub.

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DOI 10.1017/S146342361700055X **PMID** 28870275

Abstract

AIM: To evaluate the possibility of determining predictors of falls in the active community-dwelling elderly from the routine medical records of the general practitioners (GPs).

BACKGROUND: Time constraints and competing demands in the clinical encounters frequently undermine fall-risk evaluation. In the context of proactive primary healthcare, quick, and efficient tools for a preliminary fall-risk assessment are needed in order to overcome these barriers.

METHODS: The study included 1220 subjects of 65 years of age or older. Data were extracted from the GPs' patient records. For each subject, the following variables were considered: age, gender, diseases, and pharmacotherapy. Univariate and multivariable analyses have been conducted to identify the independent predictors of falls.

FINDINGS: The mean age of the study population was 77.8 \pm 8.7 years for women and 74.9 \pm 7.3 years for men. Of the sample, 11.6% had experienced one or more falls in the previous year. The risk of falling was found to increase significantly ($P < 0.05$) with age (OR=1.03; 95% CI=1.01-1.05), generalized osteoarthritis (OR=2.01; 95% CI=1.23-3.30), tinnitus (OR=4.14; 95% CI=1.25-13.74), cognitive impairment (OR=4.12; 95% CI=2.18-7.80), and two or more co-existing diseases (OR=5.4; 95% CI=1.68-17.39).

RESULTS: suggest that it is possible to identify patients at higher risk of falling by going through the current medical records, without adding extra workload on the health personnel. In the context of proactive primary healthcare, the analysis of fall predictors from routine medical records may allow

the identification of which of the several known and hypothesized risk factors may be more relevant for developing quick and efficient tools for a preliminary fall-risk assessment.

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Implementation of falls prevention of older people in the city of Lahti (Safety-2016 abstract #100)

Heinonen P, Salomaa I, Lehtinen T, Pajala S.

Inj. Prev. 2016; 22(Suppl 2): A38.

(Copyright © 2016, BMJ Publishing Group)

DOI 10.1136/injuryprev-2016-042156.100 **PMID** unavailable

Abstract

BACKGROUND: Falls and related injuries are a major public health concern in elderly people in Finland. Despite extensive knowledge base about prevention of falls, widespread and systematic falls prevention was insufficient at Lahti City Social and Health Care services. Along with the structural change of Social and Health Care services, starting in 2014, implementation of falls prevention and reducing the falls incidence was set into one of the strategic goals.

OBJECTIVE: IKINÄ - model was chosen as a framework for the implementation and developing local fall prevention practices. The emphasis is on organised and systematic multiprofessional fall risk assessment, risk-assessment-based planning and execution of necessary interventions.

Implementation was initiated with analysing the falls, practices of recording the falls and skills and competence of the health care staff.

RESULTS: One to two fall prevention and implementation champions have been trained from each nursing home units, home care and acute/rehabilitation wards (altogether 98 staff members). Head of each unit is liable for deployment of implementation in co-operation with the staff. Practices and scales for systematic fall risk factor assessment have been put into operation.

CONCLUSIONS: Target of the outcome and benefits of implementation are all citizens of Lahti and 1300 social and healthcare staff members. After two years, systematic fall risk assessment has become fixed procedure. Documentation of falls, risk factors, patient safety incident reporting and preventive work has improved. Daily physical activity and exercise has become a norm in units. The implementation is an ongoing process. Next follow-up survey will be done in spring 2016 and incident of falls and fall injuries are monitored regularly.

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Injurious falls and subsequent adverse drug events among elderly - a Swedish population-based matched case-control study

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BMC Geriatr. 2017; 17(1): e202.

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DOI 10.1186/s12877-017-0594-1 **PMID** 28870166

Abstract

BACKGROUND: Fall injuries are stressful and painful and they have a range of serious consequences for older people. While there is some clinical evidence of unintentional poisoning by medication following a severe fall injuries, population-based studies on that association are lacking. This is investigated in the current study, in which attention is also paid to different clinical conditions of the injured patients.

METHODS: We conducted a matched case-control study of Swedish residents 60 years and older from various Swedish population-based registers. Cases defined as adverse drug events (ADE) by unintentional poisoning leading to hospitalization or death were extracted from the National Patient Register (NPR) and the Cause of Death Register from January 2006 to December 2009 (n = 4418). To each case, four controls were matched by sex, age and residential area. Information on injurious falls leading to hospitalization six months prior to the date of hospital admission or death from ADE by unintentional poisoning, and corresponding date for the controls, was extracted from the NPR. Data on clinical conditions, such as dispensed medications, comorbidity and previous fall injuries were also extracted from the Swedish Prescribed Drug Register (SPDR) and NPR. Effect estimates were calculated using conditional logistic regression and presented as odds ratios (OR) and 95% confidence intervals (CI).

RESULTS: We found a three-fold increased risk of unintentional poisoning by medication in the six-month period after an injurious fall (OR 3.03; 95% CI, 2.54-3.74), with the most pronounced increase 1-3 weeks immediately after (OR, 7.66; 95% CI, 4.86-12.1). In that time window, from among those hospitalized for a fall (n = 92), those who sustained an unintentional poisoning (n = 60) tended to be in poorer health condition and receive more prescribed medications than those who did not, although this was not statistically significant. Age stratified analyses revealed a higher risk of poisoning among the younger (aged 60-79 years) than older elderly (80+ years).

CONCLUSION: Medication-related poisoning leading to hospitalization or death can be an ADE subsequent to an episode of hospitalization for a fall-related injury. Poisoning is more likely to occur closer to the injurious event and among the younger elderly. It cannot be ruled out that some of those falls are themselves ADE and early signs of greater vulnerability among certain patients.

PDF Y Endnote Y

Long-term Tai Chi exercise increases body stability of the elderly during stair ascent under high and low illumination

Song Q, Zhou J, Sun W, Zhang C, Gu H, Mao D.

Sports Biomech. 2017; ePub(ePub): ePub.

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DOI 10.1080/14763141.2017.1358761 **PMID** 28877658

Abstract

The effects of long-term Tai Chi exercise on body stability of the elderly during stair ascent under high and low illumination were investigated. Forty-five healthy elderly women were divided into three groups, namely, Tai Chi exercise group, brisk walking group and no-exercise control group. All the participants ascended a staircase, during which force platforms and a motion capture system collected the data. Under the high illumination, Tai Chi exercise participants exhibited higher loading rate and anteroposterior centre of pressure (COPap) displacement as well as a lower braking impulse than no-exercise group. Under the low illumination, Tai Chi exercise participants demonstrated higher COPap and mediolateral centre of pressure (COPml) displacements as well as lower braking

and lateral impulses compared with no-exercise participants. The centre of mass (COM) sway in Tai Chi and no exercise participants were higher, the loading rates in Tai Chi and walking participants were higher, and the lateral impulse in no exercise participants was higher under low illumination than under high illumination. Thus, low illumination increases the risk of falling. Tai Chi participants increased their foot clearance, head inclination angle and COPap displacement under low illumination to increase their stability during stair ascent.

PDF Y Endnote Y

Neighbourhood safety and injury prevention among older adults: a systematic literature review (Safety-2016 abstract #172)

Forjuoh SN, Won J, Ory MG, Lee C.

Inj. Prev. 2016; 22(Suppl 2): A63.

(Copyright © 2016, BMJ Publishing Group)

DOI 10.1136/injuryprev-2016-042156.172 PMID unavailable

Abstract

BACKGROUND: Neighbourhood safety is important for older adults' health, including injury prevention and safety promotion, but there is a dearth of information about this construct in the literature.

METHODS: During 2014, we conducted a systematic literature review on the associations among identifiable neighbourhood safety factors, health outcomes, and health behaviours of older adults (≥ 50) in the U.S. using MEDLINE, CINAHL, Embase, SportDis, and Transportation Databases.

RESULTS: Of 32 articles identified for our final review, 16 (50%) examined health outcomes, such as health status and the other 16 focused on health behaviours, such as physical activity. Five domains of neighbourhood safety were identified: general neighbourhood safety; crime-related safety; traffic-related safety; fall-related safety; and proxies for safety (e.g., vandalism, graffiti). Although falls are the leading cause of injuries in older adults, fall-related safety was the least frequently addressed safety domain. General neighbourhood safety, traffic-related safety, and proxies for safety appeared most relevant to health behaviours, while crime-related safety was most pertinent to health outcomes, such as mental health and physical function. Traffic-related safety showed more consistent associations for physical activity, while crime-related safety was more consistently associated with walking. We also found that specific measures or constructs of safety were not applied consistently across the different studies making it difficult to compare study findings.

CONCLUSIONS: This review identified several patterns as well as many important gaps in the existing studies dealing with neighbourhood safety-injury prevention among older adults. We recommend that multi-dimensional neighbourhood safety factors should be considered in establishing location interventions, particularly related to injury prevention and safety promotion, which require further attention in future studies in the U.S. as well as globally.

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Older adult fall prevention--getting to outcome measures in the clinical setting (Safety-2016 abstract #93)

Lee R, Parker E, Bergen G, Casey C, Eckstrom E, Floyd F, Dellinger A, Baldwin G.

Inj. Prev. 2016; 22(Suppl 2): A35.

(Copyright © 2016, BMJ Publishing Group)

DOI 10.1136/injuryprev-2016-042156.93 **PMID** unavailable

Abstract

BACKGROUND Worldwide falls are a threat to adults 65 and older. In the United States, one in three older adults will fall annually costing the health care system \$34 billion. With U.S. fall rates on the rise, and 10,000 older adults turning 65 each day, falls are a major health threat.

DESCRIPTION OF THE PROBLEM: Falls can be prevented by addressing modifiable risk factors (e.g., medication usage, vitamin D deficiency, vestibular disorders, vision deficits) with effective clinical interventions; however, few older adults talk to their health care provider about falls. Therefore, CDC launched the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) initiative. STEADI uses established clinical guidelines and evidence-based interventions to empower primary care providers to screen, assess, and treat elderly patients' modifiable fall risk factors. This session describes the STEADI implementation process, key implementation steps, and subsequent health outcomes.

RESULTS: STEADI was implemented in multiple health systems. Critical in implementing STEADI was the proactive leadership of clinical champions embedded within the clinical practice; the identification of relevant quality and financial drivers; the modification of electronic health record tools; and the adoption of a STEADI clinical workflow for patients, staff, and providers that aligned with existing workflows. Preliminary measures in one setting indicate providers have screened upwards of 70 per cent of their older adult patients, and hospitalizations and emergency department visits for fall-related injuries are declining.

CONCLUSION: Fall interventions offered in clinical settings can prevent falls among older adults, thereby improving their health, independence, and quality of life. These interventions can reduce medical costs associated with fall injuries, including hospitalisation costs for traumatic brain injuries and hip fractures. Using these data, CDC is disseminating the adoption of STEADI nationwide.

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PDF Y Endnote Y

Post-fall reporting in aged acute inpatient mental health units: an 18-month observational cohort study

Furness T, Mnatzaganian G, Garlick R, Ireland S, McKenna B, Hill KD.

Int. Psychogeriatr. 2017; ePub(ePub): ePub.

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DOI 10.1017/S1041610217001648 **PMID** 28866986

Abstract

BACKGROUND: Despite the high risk of falling for people with severe mental illness, there is limited falls research in mental health settings. Therefore, the objective of this observational cohort study was to conduct a focused post-fall review of fall episodes within aged acute inpatient mental health units at one of Australia's largest publicly funded mental health organizations.

METHODS: A post-fall reporting tool was developed to collect intrinsic and extrinsic fall risk factors among three aged acute mental health inpatient units over an 18-month period. Descriptive and inferential analyses were conducted to describe fall risk factors and predictors of fall risk.

RESULTS: There were a total of 115 falls, of which the tool was used for 93 (80.9%) episodes. Falls occurred most often in consumer's bedroom/bathroom and were unwitnessed. Intrinsic risk factors were most often attributed to postural drop and losing balance during walking. However, that was in contrast to consumer's who self-reported feeling dizzy as the reason of the fall.

CONCLUSIONS: Based on the cohort, future falls could be reduced by targeting those aged above 82 years, or with a diagnosis of dementia. Recurrent falls during admission could be reduced by targeting those with psychotic illness and males with a diagnosis of dementia. A clearer dialogue among consumers and clinical staff reporting about fall episodes may support future remedial interventions and inform programs to reduce fall risk and assist the challenge of describing unwitnessed falls in aged acute inpatient mental health settings.

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Quickstats: Age-adjusted death rates from unintentional falls among adults aged ≥ 65 years, by sex - National Vital Statistics System, United States, 2000-2015

MMWR Morb. Mortal. Wkly. Rep. 2017; 66(35): 943.

(Copyright © 2017, (in public domain), Publisher U.S. Centers for Disease Control and Prevention)

DOI 10.15585/mmwr.mm6635a6 **PMID** 28880859

Abstract [Abstract unavailable]

PDF Y Endnote Y

Relationship of visual dependence to age, balance, attention, and vertigo

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J. Phys. Ther. Sci. 2017; 29(8): 1318-1322.

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DOI 10.1589/jpts.29.1318 **PMID** 28878455 **PMCID** PMC5574361

Abstract

PURPOSE: The aim of this study was to investigate the relationship of increased visual dependence to age, balance, attention, and vertigo.

SUBJECTS AND METHODS: Twelve younger, 12 visually independent (VI) older and 12 visually dependent (VD) older adults were assessed for levels of visual dependence using Subjective Visual Vertical (SVV) tilt values, balance ability using the Clinical Test of Sensory Integration for Balance (CTSIB), and attentional requirements through the dual-task paradigm and experience of vertigo by completing the Situational Vertigo Questionnaire (SVQ).

RESULTS: VD older adults had higher SVV tilt values, greater postural sway in a scenario where visual and proprioceptive inputs were simultaneously altered, similar dual-task cost and lower SVQ scores compared with younger and VI older adults. No difference was observed between the latter two.

CONCLUSION: Visual dependence may not necessarily increase with age but affect balance in a sensory condition involving visual-proprioceptive conflict. There is a non-significant trend for elevated visual dependence with increased attentional demands. Greater visual dependence is not accompanied by more frequent symptoms of vertigo in visually complex environments.

PDF Y Endnote Y

Risk factors for falls in older patients with cancer

Zhang X, Sun M, Liu S, Leung CH, Pang L, Popat UR, Champlin R, Holmes HM, Valero V, Dinney CP, Tripathy D, Edwards BJ.

BMJ Support. Palliat. Care 2017; ePub(ePub): ePub.

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(Copyright © 2017, BMJ Publishing Group)

DOI 10.1136/bmjspcare-2017-001388 **PMID** 28860112

Abstract

OBJECTIVES: A rising number of patients with cancer are older adults (65 years of age and older), and this proportion will increase to 70% by the year 2020. Falls are a common condition in older adults. We sought to assess the prevalence and risk factors for falls in older patients with cancer.

METHODS: This is a single-site, retrospective cohort study. Patients who were receiving cancer care underwent a comprehensive geriatric assessments, including cognitive, functional, nutritional, physical, falls in the prior 6 months and comorbidity assessment. Vitamin D and bone densitometry were performed. **ANALYSIS:** Descriptive statistics and multivariable logistic regression.

RESULTS: A total of 304 patients aged 65 or above were enrolled in this study. The mean age was 78.4±6.9 years. They had haematological, gastrointestinal, urological, breast, lung and gynaecological cancers. A total of 215 patients with available information about falls within the past 6 months were included for final analysis. Seventy-seven (35.8%) patients had at least one fall in the preceding 6 months. Functional impairment ($p=0.048$), frailty ($p<0.001$), dementia ($p=0.021$), major depression ($p=0.010$) and low social support ($p=0.045$) were significantly associated with the fall status in the univariate analysis. Multivariate logistic regression analysis identified frailty and functional impairment to be independent risk factors for falls.

CONCLUSIONS: Falls are common in older patients with cancer and lead to adverse clinical outcomes. Major depression, functional impairment, frailty, dementia and low social support were risk factors for falls. Heightened awareness and targeted interventions can prevent falls in older patients with cancer.

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PDF Y Endnote Y**Smart clothing for falls protection and detection: user-centred co-design and feasibility study**

Easton K, Burton T, Ariss S, Bradburn M, Hawley M.

Stud. Health Technol. Inform. 2017; 242: 152-159.

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(Copyright © 2017, IOS Press)

DOI unavailable **PMID** 28873793

Abstract

The prevalence and impact of hip fractures on the health and wealth of nations is a global problem and source of health inequalities. This paper reports on the co-design and feasibility testing of a new range of protective, smart clothing. The feasibility of research in a population of older adults in supported living is explored, as are the conceptualisation and measurement of adherence.

PDF N Endnote Y

The association of falls with loneliness and social exclusion: evidence from the DEAS German Ageing Survey

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BMC Geriatr. 2017; 17(1): e204.

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(Copyright © 2017, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1186/s12877-017-0602-5 **PMID** 28874139

Abstract

BACKGROUND: It remains an open question whether falls are related with social relations, covering subjective (e.g., perceived loneliness) and more objective dimensions (e.g., number of important individuals in regular contact). Consequently, we aimed at examining the association between falls and social ties comprehensively, including loneliness, social exclusion and the number of important people in regular contact.

METHODS: Cross-sectional data were used from a population-based sample of community-dwelling individuals aged 40 and over ($n = 7808$) in Germany. Self-rated loneliness was quantified using a short version of the De Jong Gierveld Loneliness Scale. Perceived social exclusion was measured using a scale developed by Bude and Lantermann. Furthermore and in contrast to the subjective outcome measures, the more objective number of important people in regular contact was also used as outcome variable. The experience of a fall in the preceding 12 months (yes; no) was assessed.

RESULTS: Controlling for various possible confounding variables, linear regressions showed that experiencing a fall in the past 12 months was associated with higher social exclusion ($\beta = .08$, $p < .001$), and increased loneliness ($\beta = .08$, $p < .001$), whereas it was not associated with the number of important people in regular contact.

CONCLUSIONS: Findings stress the relation between falls and feelings of loneliness and social exclusion, whereas falls were unrelated to the more objective measure of number of important people in regular contact, suggesting that falls are particularly related to subjective measures of social ties and relations. This underlines the importance of interventions to prevent falls. Preventing falls in turn might help to prevent loneliness and social exclusion.

PDF Y Endnote Y

The circumstances, orientations, and impact locations of falls in community-dwelling older women

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Arch. Gerontol. Geriatr. 2017; 73: 240-247.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.archger.2017.07.011 **PMID** 28863352

Abstract

OBJECTIVE: We sought to characterize the circumstances, orientations, and impact locations of falls in community-dwelling, ambulatory, older women.

METHODS: For this longitudinal, observational study, 125 community-dwelling women age \geq 65years were recruited. Over 12-months of follow-up, fall details were recorded using twice-monthly questionnaires.

RESULTS: More than half (59%) of participants fell, with 30% of participants falling more than once (fall rate=1.3 falls per person-year). Slips (22%) and trips (33%) accounted for the majority of falls. Approximately 44% of falls were forward in direction, while backward falls accounted for 41% of falls. About a third of all falls were reported to have lateral (sideways) motion. Subjects reported taking a protective step in response to 82% of forward falls and 37% of backward falls. Of falls reporting lateral motion, a protective step was attempted in 70% of accounts. Common impact locations included the hip/pelvis (47% of falls) and the hand/wrist (27%). Backwards falls were most commonly reported with slips and when changing direction, and increased the risk of hip/pelvis impact (OR=12.6; 95% CI: 4.7-33.8). Forward falls were most commonly reported with trips and while hurrying, and increased the risk of impact to the hand/wrist (OR=2.6; 95% CI: 1.2-5.9).

CONCLUSION: Falls in older ambulatory women occur more frequently than previously reported, with the fall circumstance and direction dictating impact to common fracture locations. Stepping was a common protective recovery strategy and that may serve as an appropriate focus of interventions to reduce falls in this high risk population.

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The fall in older adults: physical and cognitive problems

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Curr. Aging Sci. 2017; 10(3): 185-200.

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(Copyright © 2017, Bentham Science Publishers)

DOI 10.2174/1874609809666160630124552 **PMID** 28874111

Abstract

BACKGROUND: The aging of posture and balance function alters the quality of life in older people and causes serious problems in terms of public health and socio-economic costs for our modern societies.

METHOD: This article reviews the various causes of imbalance and dizziness in the elderly, and considers how to prevent falls, and how to rehabilitate a faller subject in order to regain a good quality of life. Two effective ways of intervention are discussed, emphasizing the crucial role of physical activity and cognitive stimulation, classic or using the latest technical advances in virtual reality and video games.

RESULTS: Fall in the elderly result from aging mechanisms acting on both the sensorimotor and cognitive spheres. The structural and functional integrity of the peripheral sensory receptors and the musculoskeletal system deteriorate with age. The brain ages and the executive functions, memory, learning, cortical processing of information, sharing of attentional resources and concentration, are modified in the elderly. Psychological affective factors such as depression, anxiety and stress contribute also to speed up the sensorimotor and cognitive decline. The

rehabilitation of the postural balance in the elderly must take into account all of these components.

CONCLUSION: The aging of the population and the increased of lifespan are a challenge for our modern societies regarding the major health and socio-economic questions they raise. The fall in the elderly being one of the dramatic consequences of the aging equilibration function, it is therefore imperative to develop rehabilitation procedures of balance.

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The impact of mobility limitations on health outcomes among older adults

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Geriatr. Nurs. 2017; ePub(ePub): ePub.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.gerinurse.2017.08.002 **PMID** 28866316

Abstract

The purpose of this study was to stratify an older adult population for subsequent interventions based on functional ability, and to estimate prevalence, characteristics and impact of mobility limitations on health outcomes. In 2016, surveys were sent to a stratified random sample of AARP® Medicare Supplement insureds; mobility limitations were defined using two screening questions. Responses were stratified to three mobility limitation levels. Multivariate regression models determined characteristics and impact on health outcomes. Among weighted survey respondents (N = 15,989), severe, moderate and no limitation levels were 21.4%, 18.4% and 60.3%, respectively. The strongest predictors of increased limitations included pain and poor health. Individuals with more severe limitations had increased falls, decreased preventive services compliance and increased healthcare utilization and expenditures. Utilizing two screening questions stratified this population to three meaningful mobility limitation levels. Higher levels of mobility limitations were strongly associated with negative health outcomes. Mobility-enhancing interventions could promote successful aging.

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Trends and characteristics of emergency department visits for fall-related injuries in older adults, 2003-2010

Shankar KN, Liu SW, Ganz DA.

West. J. Emerg. Med. 2017; 18(5): 785-793.

Affiliation: VA Greater Los Angeles Healthcare System, Los Angeles, California.

(Copyright © 2017, California Chapter of the American Academy of Emergency Medicine)

DOI 10.5811/westjem.2017.5.33615 **PMID** 28874929 **PMCID** PMC5576613

Abstract

INTRODUCTION: One third of older adults fall each year, and falls are costly to both the patient in terms of morbidity and mortality and to the health system. Given that falls are a preventable cause of injury, our objective was to understand the characteristics and trends of emergency department (ED) fall-related visits among older adults. We hypothesize that falls among older adults are

increasing and examine potential factors associated with this rise, such as race, ethnicity, gender, insurance and geography.

METHODS: We conducted a secondary analysis of data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) to determine fall trends over time by examining changes in ED visit rates for falls in the United States between 2003 and 2010, detailing differences by gender, sociodemographic characteristics and geographic region.

RESULTS: Between 2003 and 2010, the visit rate for falls and fall-related injuries among people age ≥ 65 increased from 60.4 (95% confidence interval [CI][51.9-68.8]) to 68.8 (95% CI [57.8-79.8]) per 1,000 population ($p=0.03$ for annual trend). Among subgroups, visits by patients aged 75-84 years increased from 56.2 to 82.1 per 1,000 ($P < .01$), visits by women increased from 67.4 to 81.3 ($p = 0.04$), visits by non-Hispanic Whites increased from 63.1 to 73.4 ($p < 0.01$), and visits in the South increased from 54.4 to 71.1 ($p=0.03$).

CONCLUSION: ED visit rates for falls are increasing over time. There is a national movement to increase falls awareness and prevention. EDs are in a unique position to engage patients on future fall prevention and should consider ways they can also partake in such initiatives in a manner that is feasible and appropriate for the ED setting.

PDF Y Endnote Y

Clinical measures of balance in people with type two diabetes: a systematic literature review

Dixon CJ, Knight T, Binns E, Ihaka B, O'Brien D.

Gait Posture 2017; 58: 325-332.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2017.08.022 **PMID** 28865394

Abstract

Approximately 422 million people have diabetes mellitus worldwide, with the majority diagnosed with type 2 diabetes mellitus (T2DM). The complications of diabetes mellitus include diabetic peripheral neuropathy (DPN) and retinopathy, both of which can lead to balance impairments. Balance assessment is therefore an integral component of the clinical assessment of a person with T2DM. Although there are a variety of balance measures available, it is uncertain which measures are the most appropriate for this population. Therefore, the aim of this study was to conduct a systematic review on clinical balance measures used with people with T2DM and DPN. Databases searched included: CINAHL plus, MEDLINE, SPORTDiscus, Dentistry and Oral Sciences source, and SCOPUS. Key terms, inclusion and exclusion criteria were used to identify appropriate studies. Identified studies were critiqued using the Downs and Black appraisal tool. Eight studies were included, these studies incorporated a total of ten different clinical balance measures. The balance measures identified included the Dynamic Balance Test, balance walk, tandem and unipedal stance, Functional Reach Test, Clinical Test of Sensory Interaction and Balance, Berg Balance Scale, Tinetti Performance-Oriented Mobility Assessment, Activity-Specific Balance Confidence Scale, Timed Up and Go test, and the Dynamic Gait Index. Numerous clinical balance measures were used for people with T2DM. However, the identified balance measures did not assess all of the systems of balance, and most had not been validated in a T2DM population. Therefore, future research is needed to

identify the validity of a balance measure that assesses these systems in people with T2DM.

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Diabetic neuropathy and gait: a review

Alam U, Riley DR, Jugdey RS, Azmi S, Rajbhandari S, D'Août K, Malik RA.

Diabetes Ther. 2017; ePub(ePub): ePub.

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(Copyright © 2017, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s13300-017-0295-y **PMID** 28864841

Abstract

Diabetic peripheral neuropathy (DPN) is a major sequela of diabetes mellitus and may have a detrimental effect on the gait of people with this complication. DPN causes a disruption in the body's sensorimotor system and is believed to affect up to 50% of patients with diabetes mellitus, dependent on the duration of diabetes. It has a major effect on morbidity and mortality. The peripheral nervous system controls the complex series of events in gait through somatic and autonomic functions, careful balancing of eccentric and concentric muscle contractions and a reliance on the sensory information received from the planter surface. In this literature review focussing on kinetics, kinematics and posture during gait in DPN patients, we have identified an intimate link between DPN and abnormalities in gait and demonstrated an increased risk in falls for older patients with diabetes. As such, we have identified a need for further research on the role of gait abnormalities in the development of diabetic foot ulceration and subsequent amputations.

PDF N Endnote Y

Does fear of falling predict gait variability in multiple sclerosis?

Laidet M, Herrmann FR, Armand S, Assal F, Lalive PH, Allali G.

J. Neurol. Sci. 2017; 380: 212-214.

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DOI 10.1016/j.jns.2017.07.034 **PMID** 28870571

Abstract

BACKGROUND: Behavioural symptoms and gait disorders are very common in patients with multiple sclerosis.

OBJECTIVE: To evaluate the association between fear of falling and gait instability at one year in patients with multiple sclerosis.

METHODS: Thirty-five multiple sclerosis patients were included. Fear of falling was assessed by the Fall Efficacy Scale-International and gait variability with stride time variability under single and dual-task conditions at baseline and at one year.

RESULTS: Baseline fear of falling score was associated with increased stride time variability at one year during dual-task condition even after adjustment on covariates.

CONCLUSION: Fear of falling is associated with gait variability at one year, especially under dual-task condition.

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How can we influence the incidence of secondary fragility fractures? A review on current approaches

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Injury 2017; ePub(ePub): ePub.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.injury.2017.08.034 **PMID**28870622

Abstract

With the increasing number of elderly patients presenting with fragility fractures, their care has become a focus among trauma and orthopaedic surgeons. Protocols are ever evolving to improve the clinical pathways and treatment modalities targeting a more efficient and patient centred service. In this article, current approaches and their potential to reduce mortality and re-fracture in these patients are discussed.

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Telemedicine-guided education on secondary stroke and fall prevention following inpatient rehabilitation for Texas patients with stroke and their caregivers: a feasibility pilot study

Jhaveri MM, Benjamin-Garner R, Rianon N, Sherer M, Francisco G, Vahidy F, Kobayashi K, Gaber M, Shoemake P, Vu K, Trevino A, Grotta J, Savitz S.

BMJ Open 2017; 7(9): e017340.

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(Copyright © 2017, BMJ Publishing Group)

DOI 10.1136/bmjopen-2017-017340 **PMID** 28871024

Abstract

INTRODUCTION: The aftermath of stroke leaves many consequences including cognitive deficits and falls due to imbalance. Stroke survivors and families struggle to navigate the complex healthcare system with little assistance posthospital discharge, often leading to early hospital readmission and worse stroke outcomes. Telemedicine Guided Education on Secondary Stroke and Fall Prevention Following Inpatient Rehabilitation feasibility study examines whether stroke survivors and their caregivers find value in telerehabilitation (TR) home visits that provide individualised care and education by a multidisciplinary team after discharge from inpatient rehabilitation.

METHODS AND ANALYSIS: A prospective, single arm, pilot study is designed to evaluate the feasibility of weekly TR home visits initiated postdischarge from inpatient rehabilitation. Newly diagnosed patients with stroke are recruited from a Houston-based comprehensive stroke centre inpatient rehabilitation unit, loaned an iPad with data plan and trained to use information technology security-approved videoconferencing application. After hospital discharge, six weekly TR home visits are led by rotating specialists (pharmacist, physical/occupational therapist, speech therapist, rehabilitation physician, social worker, geriatrician specialised in fracture prevention)

followed by satisfaction survey on week 7. Specialists visually assess patients in real time, educate them on secondary stroke and fall prevention and suggest ways to improve function including direct medical interventions when indicated. Primary outcomes are proportion of eligible patients consenting to the study, participation rate in all six TR home visits and satisfaction score. The study started 31 December 2015 with plan to enrol up to 50 patients over 24 months. Feasibility study results will inform us as to whether a randomised controlled trial is warranted to determine efficacy of TR home visit intervention in improving stroke outcomes. ETHICS AND DISSEMINATION: Ethics approval obtained by the Institutional Review Board (IRB), Committee for the Protection of Human Subjects, IRB number: HSC-MS-14-0994. Study results will be submitted for publication in a peer-reviewed journal.

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The dual task effect on gait in adults with intellectual disabilities: is it predictive for falls?

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Disabil. Rehabil. 2017; ePub(ePub): ePub.

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(Copyright © 2017, Informa - Taylor and Francis Group)

DOI 10.1080/09638288.2017.1370730 **PMID** 28868921

Abstract

PURPOSE: Falling is an important health issue in adults with intellectual disabilities. Their cognitive and motor limitations may result in difficulties with dual tasking (walking and talking), which increases fall risk. Therefore, we assessed the dual task effect on gait in adults with intellectual disabilities, if this dual task effect is predictive for falls, and if this is more predictive than regular walking.

METHOD: Gait characteristics of 31 adults with intellectual disabilities without Down syndrome were assessed with the GAITRite at comfortable speed and during dual tasking (conversation). Falls were collected over a three-month follow-up period.

RESULTS: During dual tasking, participants walked slower, with a lower cadence, increased stride time, and shorter stride lengths. They spend less time in swing and single support phase than at comfortable speed. Also swing and single support time became more variable. The dual task effect and walking at comfortable speed were not predictive for falls, although medium effect sizes were found.

CONCLUSIONS: Dual tasking affects gait in adults with intellectual disabilities. This is an important finding for safe community participation, and must be considered while interacting with adults with intellectual disabilities during daily activities. Possible negative consequences of distractors should be kept in mind. More research is needed to better understand the predictive value of gait for falls. Implications for Rehabilitation Having a conversation while walking affects the gait pattern of adults with intellectual disabilities, possible negative consequences of distractors should be kept in mind. The dual task effect on the width of the gait pattern and stride time variability had the largest effect sizes with future falls, this potential relationship should be kept in mind in clinical practice. The dual task effect on gait is important to consider with regard to safe community participation. Future



studies are needed to better understand the predictive value of gait for falls, and for cutoff points to be used in clinical practice.

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