

SafetyLit June 10th 2018**A patellar bandage improves mobility but not static balance in elderly female fallers**

Scheicher ME, Fonseca LCS, Bortolloto TB, de Carvalho IF.

J. Bodyw. Mov. Ther. 2018; 22(2): 482-486.

Affiliation: Department of Physical Therapy and Occupational Therapy, São Paulo State University (UNESP), Marília, São Paulo, Brazil; 737 Hygino Muzzi Filho Avenue, 17.525-900 Marília, São Paulo, Brazil. Electronic address: isabelafeitosa.fisio@gmail.com.

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DOI 10.1016/j.jbmt.2017.05.012 **PMID** 29861254

Abstract

BACKGROUND: The deterioration in the somatosensory and motor systems observed with increasing age can cause balance problems. Studies have shown that the use of infrapatellar bandages can enhance proprioception and improve postural balance. **AIMS:** To evaluate the effect of an infrapatellar bandage on static balance and mobility in elderly female fallers and non-fallers.

METHODS: Forty older women (20 fallers and 20 non-fallers) were evaluated. Mobility (Timed Up and Go test) and balance (force platform) were measured in the presence and absence of additional sensory information (elastic infrapatellar bandage).

RESULTS: Mobility differed in fallers ($p = 0.0001$), but not in non-fallers ($p = 0.27$), when the patellar bandage was applied. Additional sensory information did not improve static balance in either group ($p > 0.05$), but a trend towards improvement was observed in fallers.

CONCLUSION: Additional sensory input from an infrapatellar bandage improves mobility but not bipedal stance in elderly fallers.

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PDF Y Endnote Y**Applying the consolidated framework for implementation research to identify barriers affecting implementation of an online frailty tool into primary health care: a qualitative study**

Warner G, Lawson B, Sampalli T, Burge F, Gibson R, Wood S.

BMC Health Serv. Res. 2018; 18(1): e395.

Affiliation: Primary Health Care, Nova Scotia Health Authority, Halifax, NS, Canada.

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Abstract

BACKGROUND: Frailty is associated with multi-system deterioration, and typically increases susceptibility to adverse events such as falls. Frailty can be better managed with early screening and intervention, ideally conducted in primary health care (PHC) settings. This study used the Consolidated Framework for Implementation Research (CFIR) as an evaluation framework during the second stage piloting of a novel web-based tool called the Frailty Portal, developed to aid in the screening, identification, and care planning of frail patients in community PHC.

METHODS: This qualitative study conducted semi-structured key informant interviews with a purposive sample of PHC providers (family physicians, nurse practitioners) and key PHC stakeholders who were administrators, decision makers and staff. The CFIR was used to guide data collection and

analysis. Framework Analysis was used to determine the relevance of the CFIR constructs to implementing the Frailty Portal.

RESULTS: A total of 17 interviews were conducted. The CFIR-inspired interview questions helped clarify critical aspects of implementation that need to be addressed at multiple levels if the Frailty Portal is to be successfully implemented in PHC. Findings were organized into three themes 1) PHC Practice Context, 2) Intervention attributes affecting implementation, and 3) Targeting providers with frail patients. At the intervention level the Frailty Portal was viewed positively, despite the multi-level challenges to implementing it in PHC practice settings. Provider participants perceived high opportunity costs to using the Frailty Portal due to changes they needed to make to their practice routines. However, those who had older patients, took the time to learn how to use the Frailty Portal, and created processes for sharing tasks with other PHC personnel became proficient at using the Frailty Portal.

CONCLUSIONS: Structuring our evaluation around the CFIR was instrumental in identifying multi-level factors that will affect large-scale adoption of the Frailty Portal in PHC practices. Incorporating CFIR constructs into evaluation instruments can flag factors likely to impede future implementation and impact the effectiveness of innovative practices. Future research is encouraged to identify how best to facilitate changes in PHC practices to address frailty and to use implementation frameworks that honor the complexity of implementing innovations in PHC.

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Dance for the rehabilitation of balance and gait in adults with neurological conditions other than Parkinson's disease: a systematic review

Patterson KK, Wong JS, Prout EC, Brooks D.

Heliyon 2018; 4(3): e00584.

Affiliation: Department of Respiratory Medicine, West Park Healthcare Centre, 82 Buttonwood Ave, Toronto, ON, M6M 2E6, Canada.

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DOI 10.1016/j.heliyon.2018.e00584 **PMID** 29862347 **PMCID** PMC5968140

Abstract

PURPOSE: To conduct a systematic review that examined the effect of dance interventions on balance, gait and functional mobility outcomes in adults with neurological conditions other than Parkinson's disease.

METHODS: A systematic search of relevant databases was conducted. Data extraction and methodological appraisal were performed by two independent authors.

RESULTS: Nine studies were included (4 pre-post studies with no control group, 3 case reports, and 2 controlled studies) and results of the methodological quality assessment ranged from poor to good. Study groups included stroke, multiple sclerosis, spinal cord injury, and Huntington's disease. Dance interventions varied in frequency, type and duration, and only 1 study reported intensity. Study dropout rates ranged from 20-44%, and 88-100% of dance classes were attended. Only 3 studies mentioned adverse events, of which there were none. A summary of results revealed significant changes in spatiotemporal gait parameters, Berg Balance Scale scores, Timed Up and Go test and six-minute walk test that were similar to or greater than those previously reported in a

review of dance for individuals with Parkinson's disease.

CONCLUSIONS: There is emerging evidence to support the use of dance as a feasible intervention for adults with neurological conditions. Further investigation of the effects of dance with randomized controlled trials using larger sample sizes and better reporting of the intervention, participant tolerance, and adverse events is warranted.

PDF Y Endnote Y

Exercise interventions reduce the risk of injurious falls among older adults

Hill AM.

Evid. Based Nurs. 2018; ePub(ePub): ePub.

Affiliation: School of Physiotherapy and Exercise Science, Curtin University, Perth, Western Australia, Australia.

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DOI 10.1136/eb-2018-102917 **PMID** 29860238

Abstract [Abstract unavailable]

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The impact of inpatient palliative care on end of life care among older trauma patients who die after hospital discharge

Lilley EJ, Lee KC, Scott JW, Krumrei NJ, Haider AH, Salim A, Gupta R, Cooper Z.

J. Trauma Acute Care Surg. 2018; ePub(ePub): ePub.

Affiliation: Center for Surgery and Public Health, Brigham and Women's Hospital, Boston, MA
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Abstract

BACKGROUND: Palliative care is associated with lower intensity treatment and better outcomes at the end of life. Trauma surgeons play a critical role in end-of-life (EOL) care, however the impact of PC on healthcare utilization at the end of life has yet to be characterized in older trauma patients. **METHODS:** This retrospective cohort study using 2006-2011 national Medicare claims included trauma patients ≥ 65 years who died within 180 days after discharge. The exposure of interest was inpatient palliative care during the trauma admission. A non-PC control group was developed by exact-matching for age, comorbidity, admission year, injury severity, length of stay, and post-discharge survival. We employed logistic regression to evaluate six EOL care outcomes: discharge to hospice, rehospitalization, skilled nursing facility (SNF) or long-term acute care hospital (LTACH) admission, death in an institutional setting, and intensive care unit (ICU) admission or receipt of life-sustaining treatments (LST) during a subsequent hospitalization.

RESULTS: Of 294,665 patients who died within 180 days after discharge, 2.1% received inpatient PC. Among 5,693 matched pairs, inpatient PC was associated with increased odds of discharge to hospice (odds ratio [95% confidence interval] = 3.80 [3.54-4.09]) and reduced odds of rehospitalization (0.17[0.15-0.20]), SNF/LTACH admission (0.43[0.39-0.47]), death in an institutional setting (0.34[0.30-0.39]), subsequent ICU admission (0.51[0.36-0.72]), or receiving LST (0.56[0.39-0.80]).

CONCLUSIONS: Inpatient palliative care is associated with lower intensity and less burdensome EOL care in the geriatric trauma population. Nonetheless, it remains underutilized among those who die within 6 months after discharge. LEVEL OF EVIDENCE: Level III STUDY TYPE: Prognostic.

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There is more to life than risk avoidance - elderly people's experiences of falls, fall-injuries and compliant flooring

Gustavsson J, Jernbro C, Nilson F.

Int. J. Qual. Stud. Health Well-Being 2018; 13(1): e1479586.

Affiliation Centre for Public Safety, Faculty of Health, Science and Technology , Karlstad University , Karlstad , Sweden.

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Abstract

PURPOSE: Falls are the most common cause of injury in all ages and are especially difficult to prevent among residential care residents. Compliant flooring that absorbs energy generated within the fall, has been proposed as a measure to prevent fall-injury, however little is known regarding the implementation aspects in clinical settings. The aim of this study is to explore the experiences of falls, the risk of fall-injury, prevention in general and specifically compliant flooring as an injury preventative measure amongst frail elderly people living in a residential care facility with compliant flooring. Through this, generate a theory that further explains the underlying barriers of active prevention amongst elderly people.

METHOD: We used the grounded theory method and conducted semi-structured in-depth interviews with eight elderly people in residential care (data collected between February and December 2017).

ESULTS: The identified categories were Falling as a part of life, Fearing the consequences and A wish to prevent falls and injuries. Through the results it was clear that There is more to life than risk avoidance, permeated the interviews, therefore forming the grounded theory. The interviewees viewed falls as something common and normal, and were uninterested in focusing on the risk of falls. Although they wanted to prevent falls, it was often difficult to integrate preventative measures into their everyday life. They embraced the idea of an injury-reducing compliant flooring, however their main interests lay elsewhere, preferring to focus on social interaction and issues concerning daily activities.

CONCLUSIONS: The theory generated in this paper proposes explanations on the obstacles of implementing fall prevention measures in an elderly frail population. The findings give insights as to why interest and compliance for active fall prevention measures are low. We conclude that complaint flooring, from the perspective of the residents, can work well in residential care.

PDF Y Endnote Y

Understanding disproportionate fear of falling in older adults: implications for intervention development

Stahl ST, Albert SM.

Am. J. Geriatr. Psychiatry 2018; ePub(ePub): ePub.



Affiliation: Department of Behavioral and Community Health Sciences, University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA.

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Abstract [Abstract unavailable]

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Whole-body vibration does not seem to affect postural control in healthy active older women

Gomes PSC, Campos MO, Oliveira LF, Mello RGT, Fernandes IA.

Rehabil. Res. Pract. 2018; 2018: e5798265.

Affiliation:Laboratory Crossbridges, Physical Education and Sport Institute, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brazil.

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Abstract

OBJECTIVE: This study investigated the acute residual effects induced by different frequencies of whole-body vibration (WBV) on postural control of elderly women.

DESIGN: Thirty physically active elderly women (67 ± 5 years) were randomly divided into three groups: two experimental groups (high WBV frequency: 45 Hz and 4 mm amplitude, $n = 10$; low WBV frequency: 30 Hz and 4 mm amplitude, $n = 10$) and one control group ($n = 10$), with no treatment. The participants were first subjected to stabilometry tests and were then guided through three sets of isometric partial squats for 60 s while the WBV stimulation was applied. The control group was subjected to the same conditions but without the WBV stimulation. The participants were again subjected to body balance tests immediately following the end of the intervention period and again at 8, 16, and 24 min. To measure body sway control, three 60 s tests were performed at 10 s intervals for each of the following experimental conditions: (1) eyes opened and (2) eyes closed. The following variables were investigated: the average velocity of the displacement of the centre of pressure in the anterior-posterior and medial-lateral planes as well as in the elliptical area.

RESULTS: A 3 (condition) \times 5 (test) two-way repeated-measures ANOVA did not identify significant differences in the stabilometric variables, regardless of group, time, or experimental condition.

CONCLUSIONS: The effect of WBV, regardless of the stimulation frequency, did not have a significant effect immediately after or up to 24 minutes after vibration cessation, on the variables involved in the control of postural stability in physically active elderly women.

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Can staff distinguish falls: experimental hypothesis verification using Japanese incident reports and natural language processing

Yokota S, Shinohara E, Ohe K.

Stud. Health Technol. Inform. 2018; 250: 159-163.

Affiliation: Department of Biomedical Informatics, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan.

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Abstract

Falls are generally classified into two groups in clinical settings in Japan: falls from the same level and falls from one level to another. We verified whether clinical staff could distinguish between these two types of falls by comparing 3,078 free-text incident reports about falls using a natural language processing technique and a machine learning technique. Common terms were used in reports for both types of falls, but the similarity score between the two types of reports was low, and the performance of identification based on the classification model constructed by support vector machine and deep learning was low. Although it is possible that adjustment of hyper parameters during construction of the classification model was required, we believe that clinical staff cannot distinguish between the two types of falls and do not record the distinction in incident reports.

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Dual-task walking in challenging environments in people with stroke: cognitive-motor interference and task prioritization

Timmermans C, Roerdink M, Janssen TWJ, Meskers CGM, Beek PJ.

Stroke Res. Treat. 2018; 2018: e7928597.

Affiliation: Department of Human Movement Sciences, Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Van der Boechorststraat 9, 1081 BT Amsterdam, Netherlands.

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Abstract

Cognitive-motor interference may contribute to the risk of falling in people with stroke, as may be the associated phenomenon of inappropriate task prioritization. Examining dual-task walking could provide valuable insights as to how to best evaluate and treat walking in people with stroke. This study aimed to examine the effect of different walking environments on cognitive-motor interference and task prioritization in dual-task walking in people with stroke. Using a repeated-measures design, cognitive-motor interference and task prioritization were assessed in 30 stroke survivors, while walking in a plain environment and in two challenging environments that were enriched with either stationary physical context or suddenly appearing projector-augmented context. All three walking environment conditions were performed with and without a concurrent serial-3 subtraction task. We found stronger cognitive-motor interference for the two challenging environments than for the plain walking environment. Cognitive-motor interference did not differ between challenging walking environments, but task prioritization did: motor performance was prioritized more in the environment with physical context than in the environment with projector-augmented context and vice versa for cognitive-task performance. In conclusion, walking environment strongly influenced cognitive-motor interference and task prioritization during dual-task walking in people with stroke.

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Feasibility of a smartphone-based balance assessment system for subjects with chronic stroke

Hou YR, Chiu YL, Chiang SL, Chen HY, Sung WH.

Comput. Methods Programs Biomed. 2018; 161: 191-195.

Affiliation: Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taipei, Taiwan. Electronic address: whsung@ym.edu.tw.

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Abstract

BACKGROUND: Stroke is a cerebral artery disease that may lead to long-term disabilities or death. Patients that survive a stroke usually suffer balance impairments, which affect their performance in activities of daily living (ADLs) and quality of life (QoL). In recent years, smartphones have become very popular and have many capabilities. Smartphone built-in sensors have shown their ability and potential in balance performance assessment. However, the feasibility of smartphones on subjects with chronic strokes remains to be proved. Therefore, the purpose of this study is to evaluate the feasibility of a smartphone-based balance assessment system for subjects with chronic stroke.

METHODS: Ten subjects with chronic stroke and thirteen healthy adults were recruited in the study. The smartphone HTC 10 (HTC Corporation, Taiwan) was used to perform the balance assessment, and its built-in accelerometer and gyroscope were used to record data from the subjects. Six postures were tested for thirty seconds each: shoulder-width stance (SWS) with eyes opened (E/O) and eyes closed (E/C), feet-together stance (FTS) with E/O and E/C, and semi-tandem stance (STS) with E/O and E/C. The smartphone was fixed to the back of subjects at the second sacral spine (S2) level. The changes registered in the accelerometer and gyroscope data were used to represent the balance performance, in which higher values indicate more instability. Data was analyzed using the independent t-test with the software SPSS 20, and the statistical significance level was set to $\alpha < 0.05$.

RESULTS AND DISCUSSION: Significant difference in the acceleration data was found among subjects with chronic stroke and healthy adults under four assessment postures: SWS with E/C ($p = 0.048$), FTS with E/O ($p = 0.027$), FTS with E/C ($p = 0.000$), and STS with E/C ($p = 0.048$). Furthermore, according to the gyroscope data, there were significant differences in how the two groups performed the postures. The results demonstrate that a smartphone with a built-in accelerometer and gyroscope can be used to classify balance performances between healthy adults and subjects with chronic stroke.

CONCLUSION: This study shows that smartphones are feasible to assess balance for subjects with chronic stroke.

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How are balance and mobility problems after stroke treated in England? An observational study of the content, dose and context of physiotherapy

Tyson SF, Woodward-Nutt K, Plant S.

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Affiliation: Manchester Academic Health Science Centre, Manchester, UK.



(Copyright © 2018, Sage Publications)

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Abstract

OBJECTIVE: To describe the dose, intensity and context of physiotherapy for balance and mobility problems after stroke.

DESIGN: Process mapping to describe the context and non-participant observation of therapy sessions to describe the dose and content of therapy. **SETTING:** Four inpatient stroke units in North-West England. **PARTICIPANTS:** Therapy staff and previously mobile stroke survivors who were treating, or receiving treatment for balance and mobility problems in the participating units.

RESULTS: Two units were stand-alone rehabilitation units; two offered a service at the weekends. One had no access to community-based rehabilitation. All had dedicated treatment facilities but often did not use them because of lack of space and difficulty transporting patients. Twenty-two patients participated and 100 treatment sessions were observed. Practising walking, sit-to-stand and transfers were the most frequent objectives and interventions usually with the therapist(s) physically facilitating the patient's movements. The dose of practise was low; mean repetitions of sit-to-stand per session was 5 (SD 6.4); mean time spent upright per session was 11.24 (SD = 7) minutes, and mean number of steps per session was 202 (SD 118). The mean number of staff per patient was 2.1 (SD = 0.6, mode = 2), usually involving two qualified therapists. Falls prevention or management, wheelchair skills and bed mobility were not practised.

CONCLUSION: Stroke physiotherapy for balance and mobility problems features low-dose, low-intensity therapist-led practice, mainly of walking and sit-to-stand. Staff:patient ratios were high. Therapists need to organize treatment sessions to maximize the intensity of functional task practice.

PDF Y Endnote Y

Motor affordance for grasping a safety handle

McDannald DW, Mansour M, Rydalch G, Bolton DAE.

Neurosci. Lett. 2018; ePub(ePub): ePub.

Affiliation: Department of Kinesiology & Health Science, Utah State University, United States.

Electronic address: dave.bolton@usu.edu.

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Abstract

Mere observation of objects in our surroundings can potentiate movement, a fact reflected by visually-primed activation of motor cortical networks. This mechanism holds potential value for reactive balance control where recovery actions of the arms or legs must be targeted to a new support base to avoid a fall. The present study was conducted to test if viewing a wall-mounted safety handle - the type of handle commonly used to regain balance - results in activation of motor cortical networks. We hypothesized that the hand area of the primary motor cortex would be facilitated shortly after visual access to a safety handle versus when no handle was visible. Here, we used transcranial magnetic stimulation (TMS) to measure corticospinal excitability in hand muscles directly following access to vision while participants performed a seated reach-grasp task. Vision was controlled using liquid crystal lenses and TMS pulses were time-locked to occur shortly after the

goggles opened but prior to any cue for movement. Between trials the response environment was unpredictably altered to present either a handle or no handle (i.e. covered). Our results demonstrated a rapid motor facilitation in muscles of the right hand when participants viewed a handle versus trials where this handle was covered. This effect was selective both in terms of the muscles activated and the timing at which it emerged. The First Dorsal Interosseus and Opponens Pollicis muscles (synergists in closing the hand) were facilitated 120 ms after viewing the handle. Interestingly, this effect was absent at earlier (80 ms) and later (160 ms) points. Conversely, Abductor Digiti Minimi, which moves the little finger out from the rest of the hand, tended to diminish when viewing the handle. These findings suggest a rapid engagement of muscles suitable for grasping a handle based on vision. This is consistent with the concept of affordances where vision automatically translates viewed objects into appropriate motor terms. The fact that this affordance effect was present for a wall-mounted safety handle commonly used to regain balance has implications for automatically priming recovery actions with upper limbs suited to our surroundings, even before postural perturbation is detected.

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Prevalence of fall injuries and risk factors for fall among hospitalized children in a specialized childrens hospital in Saudi Arabia

AlSowailmi BA, AlAkeely MH, AlJutaily HI, Alhasoon MA, Omair A, AlKhalaf HA.

Ann. Saudi Med. 2018; 38(3): 225-229.

Affiliation: Dr. Banan Abdullah AlSowailmi College of Medicine,, King Saud bin Abdulaziz University for Health Sciences,, PO Box 28602, Riyadh 11447,, Saudi Arabia, T: +966566180045, banan.alsowail-mi@gmail.com, ORCID: <http://orcid.org/0000-0002-9821-2030>.

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DOI 10.5144/0256.4947.2018.225 **PMID** 29848941

Abstract

BACKGROUND: Fall injuries among children during hospital stay is a major patient safety issue. Inpatient pediatric falls can lead to numerous negative consequences. In contrast to adults, there is a paucity of information on the prevalence and risk factors associated with children's falls during hospitalization.

OBJECTIVES: Identify the prevalence of fall injuries among hospitalized children and describe the demographic and environmental factors that could predict a higher risk of severe outcomes of fall.

DESIGN: Descriptive, cross-sectional prevalence study. **SETTING:** Specialized children's hospital.

PATIENTS AND METHODS: Data was obtained through the electronic Safety Reporting System (SRS). All reported fall events during hospitalization in children less than or equal 14 years of age for the period from 1 April 2015 to 30 April 2016 were included. Fall events that occurred in the day care unit and the outpatient clinic were excluded. **MAIN OUTCOME MEASURES:** Prevalence and possible risk factors for fall events. **SAMPLE SIZE:** 48.

RESULTS: The prevalence of falls among the 4860 admitted children was 9.9 (95% CI=7.5, 13.1) per 1000 patients (48/4860). A majority of the falls were among boys (n=26, 54%), in the age group from 1-5 years old (n=22, 46%), in children at high risk of falling (n=35, 73%), with normal mobility

status (n=21, 44%), and with no history of previous falls (n=33, 69%). Severe injuries accounted for 25% of falls (n=12). However, falls among the moderate risk category (n=9, 69%) were more often severe than falls among the high risk category of children (n=12, 34%) (P=.03).

CONCLUSION: Risk factor identification is required to prevent falls and their severe outcomes.

LIMITATIONS: Underreporting and single-centered study. **CONFLICT OF INTEREST:** None.

PDF Endnote

Sensi-steps: using patient-generated data to prevent post-stroke falls

Smith A, Ng A, Burgess ER, Weingarten N, Pacheco JA.

AMIA Annu. Symp. Proc. 2017; 2017: 2294-2298.

Affiliation: Northwestern University, Chicago, IL, USA.

(Copyright © 2017, American Medical Informatics Association)

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Abstract

We present Sensi-steps, an application using patient-generated data (PGD) to prevent falls for geriatric and especially poststroke patients. The Sensi-steps tool incorporates a wearable wrist device, pedometer, pressure and proximity sensors, and tablet. PGD collection occurs through Timed Up and Go (TUG) tests and collection of physiological data, which is integrated into the EHR. Fall risk factor active tracking encourages new ways of shared decision-making between patients, caregivers, and practitioners. PGD will be managed at the primary care nurse or Care Manager level (see 3-tier PGD service proposal), presenting a novel way to incorporate PGD into clinical decision-support systems. We expect our solution to be easier to use routinely by the patient at home than other fall risk tracking solutions. Sensi-steps has the potential to improve patient care, help patients make informed decisions, and help clinicians understand patient-generated, environmental, and lifestyle information to deliver personalized, preventative healthcare.

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