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Jason Ovens
Head of Library & Knowledge Services
Title: Therapists' perceptions of social media and video game technologies in upper limb rehabilitation.

Citation: JMIR Serious Games, 2015, vol./is. 3/1(e2), 2291-9279 (2015)

Abstract: BACKGROUND: The application of technologies, such as video gaming and social media for rehabilitation, is garnering interest in the medical field. However, little research has examined clinicians' perspectives regarding technology adoption by their clients.OBJECTIVE: The objective of our study was to explore therapists' perceptions of how young people and adults with hemiplegia use gaming and social media technologies in daily life and in rehabilitation, and to identify barriers to using these technologies in rehabilitation.METHODS: We conducted two focus groups comprised of ten occupational therapists/physiotherapists who provide neurorehabilitation to individuals with hemiplegia secondary to stroke or cerebral palsy. Data was analyzed using inductive thematic analysis. The diffusion of innovations theory provided a framework to interpret emerging themes.RESULTS: Therapists were using technology in a limited capacity. They identified barriers to using social media and gaming technology with their clients, including a lack of age appropriateness, privacy issues with social media, limited transfer of training, and a lack of accessibility of current systems. Therapists also questioned their role in the context of technology-based interventions. The opportunity for social interaction was perceived as a major benefit of integrated gaming and social media.CONCLUSIONS: This study reveals the complexities associated with adopting new technologies in clinical practice, including the need to consider both client and clinician factors. Despite reporting several challenges with applying gaming and social media technology with clinical populations, therapists identified opportunities for increased social interactions and were willing to help shape the development of an upper limb training system that could more readily meet the needs of clients with hemiplegia. By considering the needs of both therapists and clients, technology developers may increase the likelihood that clinicians will adopt innovative technologies.

Title: FACTORS SHAPING THE DELIVERY OF ACUTE INPATIENT STROKE THERAPY: A NARRATIVE SYNTHESIS.

Citation: Journal of Rehabilitation Medicine (Stiftelsen Rehabiliteringsinformation), 01 February 2015, vol./is. 47/2(107-119), 16501977
Author(s): Taylor, Elizabeth, McKevitt, Christopher, Jones, Fiona

Title: A systematic review of systematic reviews on interventions for caregivers of people with chronic conditions.

Citation: Journal of Advanced Nursing, 01 April 2015, vol./is. 71/4(718-734), 03092402
Author(s): Corry, Margarita, While, Alison, Neenan, Kathleen, Smith, Valerie

Abstract: Aim To evaluate the effectiveness of interventions to support caregivers of people with selected chronic conditions. Background Informal caregivers provide millions of care hours each week contributing to significant healthcare savings. Despite much research evaluating a range of interventions for caregivers, their impact remains unclear. Design A systematic review of systematic reviews of interventions to support caregivers of people with selected chronic conditions. Data sources The electronic databases of PubMed, CINAHL, British Nursing Index, Psyc INFO, Social Science Index (January 1990-May 2014) and The Cochrane Library (Issue 6, June 2014), were searched using Medical Subject Heading and index term combinations of the keywords caregiver, systematic review, intervention and named chronic conditions. Review methods Papers were included if they reported a systematic review of interventions for caregivers of people with chronic conditions. The methodological quality of the included reviews was independently assessed by two reviewers using R- AMSTAR. Data were independently extracted by two reviewers using a pre-designed data extraction form. Narrative synthesis of review findings was used to present the results. Results Eight systematic reviews were included. There was evidence that education and support programme interventions improved caregiver quality of life. Information-giving interventions improved
Title: Sleep Disturbance and Neurocognitive Function During the Recovery From a Sport-Related Concussion in Adolescents.

Citation: American Journal of Sports Medicine, 01 March 2015, vol./is. 43/3(633-640), 03635465
Author(s): Kostyun, Regina O., Milewski, Matthew D., Hafeez, Imran

Title: The Role of Occupational Therapy in Managing Post-Concussion Syndrome.

Citation: Physical Disabilities Special Interest Section Quarterly, 01 March 2015, vol./is. 38/1(1-4), 10937234
Author(s): Finn, Christina, Waskiewicz, Margaret A.

Full Text: Available from ProQuest in Physical Disabilities Special Interest Section Quarterly / American Occupational Therapy Association

Title: Clinical evolution of Parkinson's disease and prognostic factors affecting motor progression: 9-year follow-up study.

Citation: European Journal of Neurology, March 2015, vol./is. 22/3(457-463), 1351-5101;1468-1331 (Mar 2015)

Abstract: Background and purpose: There have been few long-term studies that have characterized and charted the clinical progression of Parkinson's disease (PD). This study was therefore undertaken to understand the natural clinical evolution of treated PD patients and to identify the variables that predict greater progression in these patients. Methods: A longitudinal linear mixed model analysis of motor score progression was performed on 576 PD patients derived from the National Neuroscience Institute Movement Disorders Database. Clinical and demographic variables were taken at baseline and formed the subgroups for comparison (gender, age at diagnosis, subtype, Mini-Mental State Examination score and baseline motor score). Motor score progression was calculated at each patient follow-up time point as the difference between Unified Parkinson's Disease Rating Scale (UPDRS) motor score at baseline and follow-up scores. Results: The overall annual motor score progression as measured by the change of UPDRS motor scores from baseline ranged from 0.62% to 3.67%. There are three distinct phases: improvement, stability, and steady progression. Patients returned to baseline score 2-2.5 years after diagnosis, with stability lasting to 7 years, followed by a period of steady progression. When analyzed longitudinally, male gender (P < 0.03), older age at diagnosis (P < 0.05), akinetic-rigid subtype (P < 0.04), cognitive impairment (P < 0.005) and lower baseline motor score (P < 0.04) were associated with greater progression of motor scores. Conclusions: Our results show that, when measured clinically, motor progression was non-linear and that it occurred in distinct phases, all of which were affected by baseline demographic and clinical variables such as gender, age at diagnosis, disease subtype, cognitive status and baseline motor score. (PsycINFO Database Record (c) 2015 APA, all rights reserved) (journal abstract)

Title: Doctor-How quickly will my Parkinson's progress?

Citation: European Journal of Neurology, March 2015, vol./is. 22/3(421-422), 1351-5101;1468-1331 (Mar 2015)
Author(s): Fox, S. H, Ceravolo, R
Abstract: Comment on an article by G. Reinoso et al. (see record 2015-06916-006). The current study by Reinoso et al. confirms this and overall suggests that earlier ‘protective’ factors are all eventually lost, as the final pattern and rate of progression appear to be the same regardless of the clinical feature measured. The study is important in showing the pattern of progression in a predominantly Chinese Parkinson’s disease (PD) population, as prior studies included predominantly non-Chinese. Genetic factors are often linked to disease expression. Young onset PD subjects with autosomal recessive genetic parkinsonism, e.g. parkin, Pink-1 or DJ-1 mutations, have slower progression; however, gene testing was not reported in this cohort. (PsycINFO Database Record (c) 2015 APA, all rights reserved)

Title: Falls Among Adults Aging With Disability.

Citation: Archives of Physical Medicine & Rehabilitation, 01 March 2015, vol./is. 96/3(464-471), 00039993
Author(s): Matsuda, Patricia Noritake, Verrall, Aimee M., Finlayson, Marcia L., Molton, Ivan R., Jensen, Mark P.

Abstract: Objective To investigate the prevalence of and risk factors for falling among individuals aging with multiple sclerosis (MS), muscular dystrophy (MD), postpolio syndrome (PPS), and spinal cord injury (SCI). Design Cross-sectional survey data from 2009 to 2010 were analyzed. We used forward logistic regression models to examine whether risk factors such as age, sex, mobility level, years since diagnosis, vision, balance, weakness, number of comorbid conditions, and physical activity could distinguish participants who reported falling from those who did not. Setting Surveys were mailed to community-dwelling individuals who had 1 of 4 diagnoses (MS, MD, PPS, or SCI). The survey response rate was 91%. Participants A convenience sample of community-dwelling individuals (N=1862; age, 18–94y) with MS, MD, PPS, or SCI in the United States. Interventions Not applicable. Main Outcome Measure Self-reported fall within the last 6 months. Results Fall prevalence for people with MS (54%), MD (70%), PPS (55%), and SCI (40%). Across all 4 groups, fall rates peaked in middle age (45–64y) and among people with moderate mobility limitations. Seven risk factors differentiated participants who fell from those who did not: mobility level, imbalance, age, curvilinear age (age 2 ), number of comorbid conditions, duration of diagnosis, and sex. The models differed across diagnostic groups. Conclusions People aging with long-term physical disabilities experience unique challenges that affect their risk of falls. A better understanding of the frequency, severity, and risk factors of falls across diagnostic groups is needed to design and implement customized, effective fall prevention and management programs for these individuals.

Title: Using Spaced Retrieval Training to Teach People With Dementia to Independently Use Their Walking Aids: Two Case Studies.

Citation: Clinical Gerontologist, 01 March 2015, vol./is. 38/2(170-178), 07317115
Author(s): Creighton, Alexandra S., Davison, Tanya E., van der Ploeg, Eva S., Camp, Cameron J., O’Connor, Daniel W.

Abstract: This article describes two case studies that used spaced retrieval training to teach two aged care facility residents diagnosed with dementia to independently use their walking aids. Each resident received five consecutive 1-hour sessions of spaced retrieval and was observed before and after intervention and at a 1-week follow-up. The results indicate the potential for this memory intervention to improve walker use and highlight several clinical aspects to consider when using this technique with demented people.

Title: Narrative therapy an evaluated intervention to improve stroke survivors’ social and emotional adaptation.

Citation: Clinical Rehabilitation, 01 April 2015, vol./is. 29/4(315-326), 02692155
Author(s): Chow, Esther OW

Title: Preserved Covert Cognition in Noncommunicative Patients With Severe Brain Injury?
**Title: Total and Differential White Blood Cell Counts in Late Life Predict 8-Year Incident Stroke: The Honolulu Heart Program.**

**Citation:** Journal of the American Geriatrics Society, 01 March 2015, vol./is. 63/3(439-446), 00028614

**Author(s):** Huh, Ji Young, Ross, George Webster, Chen, Randi, Abbott, Robert D., Bell, Christina, Willcox, Bradley, Launer, Lenore, Petrovitch, Helen, Kaya, Brock, Masaki, Kamal

**Abstract:** Objectives To study the association between total and differential white blood cell (WBC) count and incident stroke in an older Asian population. Design Prospective population-based study with 8 years of follow-up. Setting The Honolulu Heart Program, Oahu, Hawaii. Participants Japanese-American men aged 71 to 93 who were free of stroke and had baseline WBC counts measured in 1991-93 (N = 3,342). Measurements Participants were divided into quartiles of total and differential WBC count for analysis and were followed for incident stroke (thromboembolic and hemorrhagic (hemorrhagic)) for 8 years using data from a comprehensive hospital surveillance system. Results Age-adjusted incident stroke rates increased significantly with increasing WBC quartile (Q1, 7.68; Q2, 9.04; Q3, 9.26; Q4, 14.10 per 1,000 person-years of follow-up, P = .001). Hazard ratios (HRs) for stroke for each quartile of total and differential WBC count were obtained using Cox regression analysis, with the lowest quartile as the reference group. After full adjustment, including age; cardiovascular risk factors; fibrinogen; prevalent coronary heart disease, cancer, or chronic obstructive pulmonary disease, and nonsteroidal anti-inflammatory drug use, HRs were 1.62 (95% confidence interval (CI) = 1.04-2.52, P = .03) in the highest quartile of total WBC and 2.19 (95% CI = 1.41-3.39, P < .001) in the highest quartile of neutrophil counts. Significant associations were also seen for thromboembolic but not for hemorrhagic strokes. No significant associations were found between lymphocyte or monocyte counts and incident stroke or subtypes. Conclusion In elderly Japanese-American men, higher total WBC and neutrophil counts were independent predictors of overall stroke, as well as thromboembolic stroke.

**Full Text:** Available from Wiley in Journal of the American Geriatrics Society

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**Title: The Effect of Age on Rehabilitation Outcome After Traumatic Brain Injury Assessed by the Functional Independence Measure (FIM).**

**Citation:** Neurorehabilitation & Neural Repair, 01 May 2015, vol./is. 29/4(299-307), 15459683

**Author(s):** Pedersen, Asger R., Severinsen, Kaare, Nielsen, Jørgen F.

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**Title: Varied Overground Walking Training Versus Body-Weight-Supported Treadmill Training in Adults Within 1 Year of Stroke: A Randomized Controlled Trial.**

**Citation:** Neurorehabilitation & Neural Repair, 01 May 2015, vol./is. 29/4(329-340), 15459683

**Author(s):** DePaul, Vincent G., Wishart, Laurie R., Richardson, Julie, Thabane, Lehana, Ma, Jinhui, Lee, Timothy D.

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**Title: COPING STYLES OF PARENTS OF CHILDREN AND ADOLESCENTS WITH ACQUIRED BRAIN INJURY IN THE CHRONIC PHASE.**

**Citation:** Journal of Rehabilitation Medicine (Stiftelsen Rehabiliteringsinformation), 01 March 2015, vol./is. 47/3(210-215), 16501977

**Author(s):** Prihadi, Eunice J., Dings, Femke, van Heugten, Caroline M.

**Title: Relationship between the weight-bearing ratio on the affected lower extremity and gait ability using a portable electronic foot sensor shoe (Step Aid®) in hemiplegic stroke patients.**
Abstract: [Purpose] This study investigated the association between the weight-bearing ratio (WBR) and gait ability of a paretic lower limb while walking using a shoe-type load-measuring apparatus. [Subjects] The Subjects comprised 17 stroke patients who were classified into the following two groups: the independent walking group, and the non-independent walking group. [Methods] The 10-m walking time (inside and outside parallel bars) and the Berg Balance Scale (BBS) were measured. The WBR of the paretic lower limb was measured during static standing and while walking inside and outside parallel bars, and the coefficient of variation (CV) was calculated. WBR was evaluated using the Step Aid. [Results] The BBS and WBR were significantly decreased in the non-independent walking group, while the 10-m walking time and the C V were significantly increased in the non-independent walking group. [Conclusion] The C V and WBR of a paretic lower limb while walking appear to be important indices of achievement of independent gait in hemiplegic stroke patients, and they may be used in gait rehabilitation for diseases requiring weight-bearing training to follow the course of training using a shoe-type load-measuring apparatus.

Title: The effects of action observation gait training on the static balance and walking ability of stroke patients.

Abstract: [Purpose] The purpose of the study was to investigate the effects of action observation training on the static balance and walking ability of patients who had suffered a stroke. [Subjects] Forty patients with hemiplegia resulting from a stroke were divided into an action observation gait training group (AOGT group, n=20) and a general gait training group (GGT group, n=20). [Methods] The AOGT group watched a training video on flatland gait, slope gait, and stair gait. The GGT group watched a video on nature. Both groups watched their respective video for 10 minutes and then had gait training for 20 minutes per day, five times per week, for eight weeks. [Results] The static balance and gait ability of both groups significantly improved. Although there were significant differences between the groups, the AOTG group showed greater improvements in sway speed, limit of stability, and gait ability. [Conclusion] We recommend action observation training over general gait training for patients with hemiplegia. Action observational training had a positive effect on static balance and gait ability in stroke patients' static balance and gait ability. Further research is needed to generalize the results of this study.

Title: A comparison of at-home walking and 10-meter walking test parameters of individuals with post-stroke hemiparesis.

Abstract: [Purpose] The purpose of this study was to clarify the difference in gait parameters of at-home walking and the 10-meter walking test results of individuals with hemiparesis. [Subjects] A total of 14 hemiparetic stroke recovery patients participated in this study. Inclusion criteria were: living at home, the ability to walk independently, and demonstrated low extremity on recovery stages III-V on the Brunnstrom Approach. The average age of the subjects was 66 years. [Methods] We used video surveillance and the inked footprint technique to record usual walking speed and maximum speed patterns both in subjects' homes and during the 10-meter walking test. From these methods, walking speed, stride length, and step rate were calculated. [Results] While both usual and maximum walking speeds of the 10-meter walking test correlated with stride length and step rate, at-home walking speeds only significantly correlated with stride length. [Conclusion] Walking patterns of the 10-meter walking test are quantifiably distinct from those demonstrated in patients' homes, and this difference is mainly characterized by stride length. In order to enhance in-home walking ability, exercises that improve length of stride rather than step rate should be recommended.
Title: The effect of external cues with vibratory stimulation on spatiotemporal gait parameters in chronic stroke patients.

Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(377-381), 09155287
Author(s): Jae Myoung Park, Hee Sung Lim, Chang Ho Song

Abstract: [Purpose] The aim of current study was to investigate the effect of external cues using vibratory stimulation on spatiotemporal gait parameters in patients with chronic stroke. [Subjects] Thirty patients, who had suffered a stroke, were selected from general hospitals in Seoul, Republic of Korea. [Methods] Each participant was subjected to six walking trials: three trials with vibratory stimulation of the tibialis anterior muscle and three trials without any stimulation. The spatiotemporal gait parameters were measured with a GAITRite system. [Results] The global gait parameters--velocity and cadence--were significantly more increased, and the temporal parameters--step time, stride time, and double limb support--were significantly more decreased with vibratory stimulation of the tibialis anterior muscle than with no stimulation. While single limb support was increased under vibratory stimulation, the difference was not significant between the two groups. The spatial gait parameter--stride length--showed a significant improvement; however, there was no significant enhancement in gait symmetry with regard to step length and step time [Conclusion] These results indicate that the application of external cues using vibratory stimulation during gait may control gait parameters and improve gait performance. Thus, this intervention could be used for gait rehabilitation in chronic stroke patients.

Title: Effect of forced use of the lower extremity on gait performance and mobility of post-acute stroke patients.

Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(421-425), 09155287
Author(s): Wen-Hsiu Yu, Wen-Yu Liu, May-Kuen Wong, Alice, Tzu-Chi Wang, Yen-Chen Li, Hen-Yu Lien

Abstract: [Purpose] The purpose of this study was to investigate the effects of a forced-use training program on gait, mobility and quality of life of post-acute stroke patients. [Subjects] Twenty-one individuals with unilateral stroke participated in this study. All participants had suffered from first-ever stroke with time since onset of at least 3 months. [Methods] A single-blinded, non-equivalent, pre-post controlled design with 1-month follow-up was adopted. Participants received either a forced-use or a conventional physical therapy program for 2 weeks. The main outcomes assessed were preferred and fastest walking velocities, spatial and temporal symmetry indexes of gait, the timed up and go test, the Rivermead Mobility Index, and the Stroke-Specific Quality of Life Scale (Taiwan version). [Results] Forced-use training induced greater improvements in gait and mobility than conventional physical therapy. In addition, compared to pre-training, patients in the conventional physical therapy group walked faster but more asymmetrically after training. However, neither program effectively improved in-hospital quality of life. [Conclusion] The forced-use approach can be successfully applied to the lower extremities of stroke patients to improve mobility, walking speeds and symmetry of gait.

Title: The effect of chest expansion resistance exercise in chronic stroke patients: a randomized controlled trial.

Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(451-453), 09155287
Author(s): Chang-Beom Kim, Jun-Ho Shin, Jong-Duk Choi

Abstract: [Purpose] The aim of this study was to examine the initial effects of chest expansion resistance exercise (CERE) applied to chronic stroke patients on their pulmonary functions, chest expansion, and functional gait ability. [Subjects] Forty chronic stroke patients without any respiration-related rehabilitation program experience (21 men and 19 women; times elapsed since occurrence of stroke: 21.8 ± 5.3 months) were randomly and equally allocated to a CERE group (experimental group) and a control group. [Methods] An ordinary stroke rehabilitation program was performed on the subjects. While the experimental group received a CERE intervention, the control group performed passive range of motion exercise with automatic instruments. [Results] The CERE group's chest expansion significantly increased after the
intervention, whereas the control group did not see any significant difference. As regards VC (vital capacity), FVC (forced vital capacity), and FEV1 (forced expiratory volume in one second), there were no significant changes in either the CERE or control group. In the 10MTWT (10-meter timed walking test), there were no significant changes in either group, but in the 6MWT (6-minute walk test), while there were no significant differences in the control group, the CERE group saw significant changes. [Conclusion] The results of application of CERE to chronic stroke patients demonstrated the importance of respiratory exercise in an approach to stroke rehabilitation treatment intervention and the need to add respiratory exercise to a rehabilitation intervention program.

Title: Comparison of foot pressure in stretching exercises according to the type of ankle ramp.

Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(455-456), 09155287
Author(s): Tae-Keun Kim, Won-Gyu Yoo, Seung-Je Shin

Abstract: [Purpose] This study compared and analyzed use of an existing ankle ramp and a newly developed ankle ramp for stretching exercises. [Subjects] Fourteen subjects were included; they were stroke patients more than 6 months after onset, with no orthopedic or biological problems in the legs, so independent gait was possible. [Methods] The subjects performed stretching exercises for 5 min with an existing ankle ramp and a newly developed ankle ramp; foot pressure was then measured. [Results] The averaged percentage and kilopascal data for weight bearing and foot pressure on the affected side with the newly developed ankle ramp for stretching exercises were significantly higher than those with the existing ankle ramp. [Conclusion] Our results suggest that stretching exercises using the newly developed ankle ramp more effectively increase foot pressure than the existing ankle ramp.

Title: Influence of light touch using the fingertips on postural stability of poststroke patients.

Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(469-472), 09155287
Author(s): Se-Han Lee, Donggeon Lee, Yunbok Lee, Youngju Jee, Gyuchang Lee, Dong-Sik Park

Abstract: [Purpose] The purpose of this study was to investigate the influence of fingertip light touch on the postural control in poststroke patients. [Subjects] In the study, the subjects were recruited through a rehabilitation hospital, and 21 patients were screened from among 30 volunteers. [Methods] The subjects participated in an experiment that measured postural sway during the static standing posture without light touch and postural sway during the static standing posture with light touch as follows: visual information not blocked without light touch, visual information blocked without light touch, visual information blocked with light touch using fingertips, and visual information not blocked with light touch using fingertips. The measurements were performed using a force platform. The variables measured by the force platform included sway velocities of the COP in the anterior and posterior directions and, medial and lateral directions and sway velocity moments. [Results] In the results of the study, there were significant differences between the state without light touch and state with light touch in terms of the postural sway velocity and moment under all conditions. The rate of decease of the sway velocity and moment velocity under the eyes closed condition were higher compared with those under the eyes open condition. [Conclusion] Through this study, we confirmed the influence of fingertip light touch on the decrease in postural sway. The results show that active light touch may be supplemental means of improving postural sway in stroke patients.


Citation: Journal of Physical Therapy Science, 01 February 2015, vol./is. 27/2(513-516), 09155287
Author(s): Eunjung Chung, Sang-In Park, Yun-Yung Jang, Byoung-Hee Lee

Abstract: [Purpose] The purpose of this study was to determine the effects of brain-computer interface (BCI)-based functional electrical stimulation (FES) on balance and gait function in patients with stroke. [Subjects] Subjects were randomly allocated to a BCI-FES group (n=5) and a FES group (n=5). [Methods] The BCI-FES group received ankle dorsiflexion training with FES according to a BCI-based program for 30 minutes per day for 5 days. The FES group received ankle dorsiflexion training with FES for the same
duration. [Results] Following the intervention, the BCI-FES group showed significant differences in Timed Up and Go test value, cadence, and step length on the affected side. The FES group showed no significant differences after the intervention. However, there were no significant differences between the 2 groups after the intervention. [Conclusion] The results of this study suggest that BCI-based FES training is a more effective exercise for balance and gait function than FES training alone in patients with stroke.

Title: Examining the Effect of the Relationship Between Falls and Mild Cognitive Impairment on Mobility and Executive Functions in Community-Dwelling Older Adults.

Citation: Journal of the American Geriatrics Society, 01 March 2015, vol./is. 63/3(590-593), 00028614
Author(s): Davis, Jennifer C., Best, John, Hsu, Chun Liang, Nagamatsu, Lindsay S., Dao, Elizabeth, Liu-Ambrose, Teresa

Full Text: Available from Wiley in Journal of the American Geriatrics Society

Title: Relationship of Falls and Fear of Falling to Activity Limitations and Physical Inactivity in Parkinson's Disease.

Citation: Journal of Aging & Physical Activity, 01 April 2015, vol./is. 23/2(187-193), 10638652
Author(s): Bryant, Mon S., Rintala, Diana H., Jyh-Gong Hou, Protas, Elizabeth J.

Abstract: Aim: To investigate the relationships between falls, fear of falling, and activity limitations in individuals with Parkinson’s disease (PD). Design/methods: Cross-sectional study of individuals with mild to moderate PD (N = 83). Associations among demographic data, fall frequency, disease severity, motor impairment, ability to perform activities of daily living (ADL), Activities Balance Confidence Scale, Iowa Fatigue Scale, Comorbidity Index, and Physical Activity Scale for Elders were studied. Results: Frequent fallers had more ADL limitations than nonfallers (p < .001) and rare fallers (p = .004). Frequent fallers reported a lower percentage of ability to perform ADL than nonfallers (p = .003). Frequent fallers and rare fallers were less physically active than nonfallers (p = .015 and p = .040, respectively). Frequent fallers and rare fallers reported a higher level of fear of falling than nonfallers (p = .031 and p = .009, respectively). Conclusions: Falls and fear of falling were associated with more ADL limitations and less physical activity after adjusting for physical impairments.

Title: Is there a role for neck manipulation in elderly falls prevention? - An overview.

Citation: Journal of the Canadian Chiropractic Association, 01 March 2015, vol./is. 59/1(53-63), 00083194
Author(s): Kendall, Julie C., Hartvigsen, Jan, French, Simon D., Azari, Michael F.

Abstract: Many risk factors exist for falls in the elderly. Dizziness is an important risk factor for such falls. Spinal pain has also been identified as a risk factor for these falls. In this overview of the literature, we examine studies, including trials, of neck manipulation for neck pain, unsteadiness and falls risk relevant to the elderly. We also examine two related, but not mutually exclusive, mechanisms through which a putative beneficial effect may be mediated. These are the effects of neck manipulation on neck pain and on non-specific dizziness. We focus on the available evidence primarily in terms of clinical data rather than laboratory-based measures of balance. We conclude that chiropractors may have a role in falls prevention strategies in the subpopulation of the elderly that suffer from mechanical neck pain or dysfunction and non-specific dizziness. However, this role remains to be rigorously studied and properly defined.

Full Text: Available from EBSCOhost in Journal of the Canadian Chiropractic Association
Available from National Library of Medicine in Journal of the Canadian Chiropractic Association, The

Title: Role of Body-Worn Movement Monitor Technology for Balance and Gait Rehabilitation.
Abstract: This perspective article will discuss the potential role of body-worn movement monitors for balance and gait assessment and treatment in rehabilitation. Recent advances in inexpensive, wireless sensor technology and smart devices are resulting in an explosion of miniature, portable sensors that can quickly and accurately quantify body motion. Practical and useful movement monitoring systems are now becoming available. It is critical that therapists understand the potential advantages and limitations of such emerging technology. One important advantage of obtaining objective measures of balance and gait from body-worn sensors is impairment-level metrics characterizing how and why functional performance of balance and gait activities are impaired. Therapy can then be focused on the specific physiological reasons for difficulty in walking or balancing during specific tasks. A second advantage of using technology to measure balance and gait behavior is the increased sensitivity of the balance and gait measures to document mild disability and change with rehabilitation. A third advantage of measuring movement, such as postural sway and gait characteristics, with body-worn sensors is the opportunity for immediate biofeedback provided to patients that can focus attention and enhance performance. In the future, body-worn sensors may allow therapists to perform telerehabilitation to monitor compliance with home exercise programs and the quality of their natural mobility in the community. Therapists need technological systems that are quick to use and provide actionable information and useful reports for their patients and referring physicians. Therapists should look for systems that provide measures that have been validated with respect to gold standard accuracy and to clinically relevant outcomes such as fall risk and severity of disability.

Full Text: Available from EBSCOhost in Physical Therapy
Available from ProQuest in Physical Therapy

Title: Effectiveness, Usability, and Cost-Benefit of a Virtual Reality–Based Telerehabilitation Program for Balance Recovery After Stroke: A Randomized Controlled Trial.

Abstract: Objectives First, to evaluate the clinical effectiveness of a virtual reality (VR)–based telerehabilitation program in the balance recovery of individuals with hemiparesis after stroke in comparison with an in-clinic program; second, to compare the subjective experiences; and third, to contrast the costs of both programs. Design Single-blind, randomized, controlled trial. Setting Neurorehabilitation unit. Participants Chronic outpatients with stroke (N=30) with residual hemiparesis. Interventions Twenty 45-minute training sessions with the telerehabilitation system, conducted 3 times a week, in the clinic or in the home. Main Outcome Measures First, Berg Balance Scale for balance assessment. The Performance-Oriented Mobility Assessment balance and gait subscales, and the Brunel Balance Assessment were secondary outcome measures. Clinical assessments were conducted at baseline, 8 weeks (posttreatment), and 12 weeks (follow-up). Second, the System Usability Scale and the Intrinsic Motivation Inventory for subjective experiences. Third, cost (in dollars). Results Significant improvement in both groups (in-clinic group [control] and a home-based telerehabilitation group) from the initial to the final assessment in the Berg Balance Scale ( η p 2 =.68; P =.001), in the balance ( η p 2 =.24; P =.006) and gait ( η p 2 =.57, P =.001) subscales of the Tinetti Performance-Oriented Mobility Assessment, and in the Brunel Balance Assessment were secondary outcome measures. Clinical assessments were conducted at baseline, 8 weeks (posttreatment), and 12 weeks (follow-up). Second, the System Usability Scale and the Intrinsic Motivation Inventory for subjective experiences. Third, cost (in dollars). Results Significant improvement in both groups (in-clinic group [control] and a home-based telerehabilitation group) from the initial to the final assessment in the Berg Balance Scale ( η p 2 =.68; P =.001), in the balance ( η p 2 =.24; P =.006) and gait ( η p 2 =.57, P =.001) subscales of the Tinett
Title: Does the Frequency of Participation Change After Stroke and Is This Change Associated With the Subjective Experience of Participation?

Citation: Archives of Physical Medicine & Rehabilitation, 01 March 2015, vol./is. 96/3(456-463), 00039993
Author(s): Blömer, Anne-Marije V., van Mierlo, Maria L., Visser-Meily, Johanna M., van Heugten, Caroline M., Post, Marcel W.

Abstract: Objective To investigate changes in the frequency of participation 6 months poststroke compared with prestroke; and to establish whether the change is associated with participation restrictions and satisfaction with participation 6 months poststroke. Design Inception cohort study. Prestroke frequency of participation was measured retrospectively in the first week poststroke. Frequency, participation restrictions, and satisfaction with participation were assessed 6 months poststroke. Setting General hospitals and home residences. Participants Patients with stroke (N=325; 65.5% men; mean age, 66.9±12.2y) admitted to 1 of 6 participating general hospitals. Interventions Not applicable. Main Outcome Measure Utrecht Scale for Evaluation of Rehabilitation-Participation (0–100), which consists of 3 scales: frequency, restrictions, and satisfaction. The frequency scale consists of 2 parts: vocational activities (work, volunteer work, education, household activities) and leisure and social activities. Results Vocational activities showed a large decrease (effect size: 0.6) poststroke; leisure and social activities showed a small decrease (effect size: 0.13) poststroke. In multiple regression analyses, both the frequency of participation in vocational activities 6 months poststroke and the decrease in vocational activities compared with before the stroke were significantly associated with the participation restrictions experienced and satisfaction with participation after controlling for age, sex, level of education, dependency in activities of daily living, cognitive functioning, and presence of depressive symptoms. The presence of depressive symptoms showed the strongest association with the subjective experience of participation. Conclusions The frequency of participation decreased after a stroke, and this decrease was associated with participation restrictions experienced and satisfaction with participation. Resuming vocational activities and screening and, if applicable, treatment of depressive symptoms should be priorities in stroke rehabilitation.

Title: Physical Therapist Interventions for Parkinson Disease.

Citation: Physical Therapy, 01 March 2015, vol./is. 95/3(299-305), 00319023
Author(s): Gisbert, Robyn, Schenkman, Margaret

Full Text: Available from EBSCOhost in Physical Therapy
Available from ProQuest in Physical Therapy

Title: Safety and Feasibility of Transcranial Direct Current Stimulation in Pediatric Hemiparesis: Randomized Controlled Preliminary Study.

Citation: Physical Therapy, 01 March 2015, vol./is. 95/3(337-349), 00319023
Author(s): Gillick, Bernadette T., Feyma, Tim, Menk, Jeremiah, Usset, Michelle, Vaith, Amy, Wood, Teddi Jean, Worthington, Rebecca, Krach, Linda E.

Abstract: BACKGROUND: Transcranial direct current stimulation (tDCS) is a form of noninvasive brain stimulation that has shown improved adult stroke outcomes. Applying tDCS in children with congenital hemiparesis has not yet been explored. OBJECTIVE: The primary objective of this study was to explore the safety and feasibility of single-session tDCS through an adverse events profile and symptom assessment within a double-blind, randomized placebo-controlled preliminary study in children with congenital hemiparesis. A secondary objective was to assess the stability of hand and cognitive function. DESIGN: A double-blind, randomized placebo-controlled pretest/posttest-follow-up study was conducted. SETTING: The study was conducted in a university pediatric research laboratory. PARTICIPANTS: Thirteen children, ages 7 to 18 years, with congenital hemiparesis participated. MEASUREMENTS: Adverse events/safety assessment and hand function were measured. INTERVENTION: Participants were randomly assigned to either an intervention group or a control group, with safety and functional assessments at pretest, at posttest on the same day, and at a 1-week follow-up session. An intervention of 10 minutes of 0.7 mA tDCS was applied to bilateral primary motor cortices. The tDCS intervention was considered safe if there was no
individual decline of 25% or group decline of 2 standard deviations for motor evoked potentials (MEPs) and behavioral data and no report of adverse events. RESULTS: No major adverse events were found, including no seizures. Two participants did not complete the study due to lack of MEP and discomfort. For the 11 participants who completed the study, group differences in MEPs and behavioral data did not exceed 2 standard deviations in those who received the tDCS (n=5) and those in the control group (n=6). The study was completed without the need for stopping per medical monitor and biostatistical analysis. LIMITATIONS: A limitation of the study was the small sample size, with data available for 11 participants. CONCLUSIONS: Based on the results of this study, tDCS appears to be safe, feasible, and well tolerated in most children with hemiparesis. Future investigations of serial sessions of tDCS in conjunction with rehabilitation in pediatric hemiparesis are indicated to explore the benefit of a synergistic approach to improving hand function.

Full Text: Available from EBSCOhost in Physical Therapy
Available from ProQuest in Physical Therapy

Title: Patients' Use of a Home-Based Virtual Reality System to Provide Rehabilitation of the Upper Limb Following Stroke.

Citation: Physical Therapy, 01 March 2015, vol./is. 95/3(350-359), 00319023
Author(s): Standen, Penny J., Threapleton, Kate, Connell, Louise, Richardson, Andy, Brown, David J., Battersby, Steven, Sutton, Catherine Jane, Platts, Fran

Abstract: BACKGROUND: A low-cost virtual reality system that translates movements of the hand, fingers, and thumb into game play was designed to provide a flexible and motivating approach to increasing adherence to home-based rehabilitation. OBJECTIVE: Effectiveness depends on adherence, so did patients use the intervention to the recommended level? If not, what reasons did they give? The purpose of this study was to investigate these and related questions. DESIGN: A prospective cohort study, plus qualitative analysis of interviews, was conducted. METHODS: Seventeen patients recovering from stroke recruited to the intervention arm of a feasibility trial had the equipment left in their homes for 8 weeks and were advised to use it 3 times a day for periods of no more than 20 minutes. Frequency and duration of use were automatically recorded. At the end of the intervention, participants were interviewed to determine barriers to using it in the recommended way. RESULTS: Duration of use and how many days they used the equipment are presented for the 13 participants who successfully started the intervention. These figures were highly variable and could fall far short of our recommendations. There was a weak positive correlation between duration and baseline reported activities of daily living. Participants reported familiarity with technology and competing commitments as barriers to use, although they appreciated the flexibility of the intervention and found it motivating. LIMITATIONS: The small sample size limits the conclusions that can be drawn. CONCLUSIONS: Level of use is variable and can fall far short of recommendations. Competing commitments were a barrier to use of the equipment, but participants reported that the intervention was flexible and motivating. It will not suit everyone, but some participants recorded high levels of use. Implications for practice are discussed.

Full Text: Available from EBSCOhost in Physical Therapy
Available from ProQuest in Physical Therapy

Title: Emergence of Virtual Reality as a Tool for Upper Limb Rehabilitation: Incorporation of Motor Control and Motor Learning Principles.

Citation: Physical Therapy, 01 March 2015, vol./is. 95/3(415-425), 00319023
Author(s): Levin, Mindy F., Weiss, Patrice L., Keshner, Emily A.

Abstract: The primary focus of rehabilitation for individuals with loss of upper limb movement as a result of acquired brain injury is the relearning of specific motor skills and daily tasks. This relearning is essential because the loss of upper limb movement often results in a reduced quality of life. Although rehabilitation strives to take advantage of neuroplastic processes during recovery, results of traditional approaches to
upper limb rehabilitation have not entirely met this goal. In contrast, enriched training tasks, simulated with a wide range of low- to high-end virtual reality-based simulations, can be used to provide meaningful, repetitive practice together with salient feedback, thereby maximizing neuroplastic processes via motor learning and motor recovery. Such enriched virtual environments have the potential to optimize motor learning by manipulating practice conditions that explicitly engage motivational, cognitive, motor control, and sensory feedback-based learning mechanisms. The objectives of this article are to review motor control and motor learning principles, to discuss how they can be exploited by virtual reality training environments, and to provide evidence concerning current applications for upper limb motor recovery. The limitations of the current technologies with respect to their effectiveness and transfer of learning to daily life tasks also are discussed.

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**Title:** Considerations in the Efficacy and Effectiveness of Virtual Reality Interventions for Stroke Rehabilitation: Moving the Field Forward.

**Citation:** Physical Therapy, 01 March 2015, vol./is. 95/3(441-448), 00319023

**Author(s):** Proffitt, Rachel, Lange, Belinda

**Abstract:** In the past 2 decades, researchers have demonstrated the potential for virtual reality (VR) technologies to provide engaging and motivating environments for stroke rehabilitation interventions. Much of the research has been focused on the exploratory phase, and jumps to intervention efficacy trials and scale-up evaluation have been made with limited understanding of the active ingredients in a VR intervention for stroke. The rapid pace of technology development is an additional challenge for this emerging field, providing a moving target for researchers developing and evaluating potential VR technologies. Recent advances in customized games and cutting-edge technology used for VR are beginning to allow for researchers to understand and control aspects of the intervention related to motivation, engagement, and motor control and learning. This article argues for researchers to take a progressive, step-wise approach through the stages of intervention development using evidence-based principles, take advantage of the data that can be obtained, and utilize measurement tools to design effective VR interventions for stroke rehabilitation that can be assessed through carefully designed efficacy and effectiveness trials. This article is motivated by the recent calls in the field of rehabilitation clinical trials research for carefully structured clinical trials that have progressed through the phases of research.

**Full Text:**
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**Title:** Interdisciplinary Concepts for Design and Implementation of Mixed Reality Interactive Neurorehabilitation Systems for Stroke.

**Citation:** Physical Therapy, 01 March 2015, vol./is. 95/3(449-460), 00319023

**Author(s):** Baran, Michael, Lehrer, Nicole, Duff, Margaret, Venkataraman, Vinay, Turaga, Pavan, Ingalls, Todd, Rymer, W. Zev, Wolf, Steven L., Rikakis, Thanas

**Abstract:** Interactive neurorehabilitation (INR) systems provide therapy that can evaluate and deliver feedback on a patient's movement computationally. There are currently many approaches to INR design and implementation, without a clear indication of which methods to utilize best. This article presents key interactive computing, motor learning, and media arts concepts utilized by an interdisciplinary group to develop adaptive, mixed reality INR systems for upper extremity therapy of patients with stroke. Two INR
systems are used as examples to show how the concepts can be applied within: (1) a small-scale INR clinical study that achieved integrated improvement of movement quality and functionality through continuously supervised therapy and (2) a pilot study that achieved improvement of clinical scores with minimal supervision. The notion is proposed that some of the successful approaches developed and tested within these systems can form the basis of a scalable design methodology for other INR systems. A coherent approach to INR design is needed to facilitate the use of the systems by physical therapists, increase the number of successful INR studies, and generate rich clinical data that can inform the development of best practices for use of INR in physical therapy.

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