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Stroke
Current Awareness Bulletin

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Cochrane Systematic Reviews

New Reviews – October 2018

Action observation for upper limb rehabilitation after stroke Gamma aminobutyric acid (GABA) receptor agonists for acute stroke

Percutaneous vascular interventions versus intravenous thrombolytic treatment for acute ischaemic stroke

Swallowing therapy for dysphagia in acute and subacute stroke

Very early versus delayed mobilisation after stroke

Journal Articles:

Title: Circulating inflammatory biomarkers are related to cerebrovascular disease in older adults.

Citation: Neurology(R) neuroimmunology & neuroinflammation; Jan 2019; vol. 6 (no. 1); p. e521
Author(s): Gu, Yian; Gutierrez, Jose; Meier, Irene B; Guzman, Vanessa A; Manly, Jennifer J; Schupf, Nicole; Brickman, Adam M; Mayeux, Richard

Objective: This investigation aimed at examining whether circulating inflammatory biomarkers C-reactive protein (CRP), interleukin-6 (IL6), and alpha 1-antichymotrypsin (ACT) were related to cerebrovascular disease (CVD) assessed by MRI.
Methods: The study included nondemented elderly participants of a community-based, multiethnic cohort, who received baseline MRI scans and had CRP (n = 508), ACT (435), and IL6 (N = 357) measured by ELISA. Silent brain infarcts and white matter hyperintensities (WMH) were derived from all available MRI scans at baseline, approximately 4.4 years after blood sample collection for inflammatory biomarkers. Repeated assessments of infarcts and WMH, as well as microbleeds assessment, were performed at follow-up MRI visits around 4.5 years later. Cross-sectional and longitudinal relationship between inflammatory biomarkers and CVD were analyzed using appropriate logistic regression models, generalized linear models, or COX models.
Results: After adjusting for age, sex, ethnicity, education, APOE genotype, and intracranial volume, 1 SD increase in log10IL6 was associated with infarcts on MRI {odds ratio [OR] (95% confidence interval [CI]) = 1.28 [1.02-1.60], p = 0.033}, and 1 SD increase in log10CRP and log10ACT was associated with microbleeds (OR [95% CI] = 1.46 [1.02-2.09], p = 0.041; and 1.65 [1.11-2.46], p = 0.013; respectively). One SD increase in log10ACT was also associated with larger WMH at the follow-up MRI (b = 0.103, p = 0.012) and increased accumulation of WMH volume (b = 0.062, p = 0.041) during follow-up. The associations remained significant after additional adjustment of vascular risk factors and excluding participants with clinical stroke.
Conclusions: Among older adults, increased circulating inflammatory biomarkers were associated with the presence of infarcts and microbleeds, WMH burden, and progression of WMH.

Title: Comparisons of readmissions and mortality based on post-discharge ambulatory follow-up services received by stroke patients discharged home: a register-based study.

Citation: BMC Health Services Research; Jan 2019; vol. 19 (no. 1)
Author(s): Swanson, Jayson O.; Moger, Tron Anders

Abstract: Few studies have focused on post-discharge ambulatory care for stroke patients and subsequent differences in readmission and mortality rates. Identifying groups at higher risk according to services received is important when planning post-discharge follow-up in ambulatory care. According to a recent Whitepaper by the Norwegian Government, patients receiving ambulatory care should have follow-up with a general practitioner (GP) within 14 days of hospital discharge.

Methods: All home discharged stroke cases occurring in Oslo from 2009 to 2014 were included. 90- and 365-day all-cause readmissions and mortality were compared separately for patients categorized based on services received (no services, home nursing, ambulatory rehabilitation and home nursing with ambulatory rehabilitation) and early GP follow-up within 14 days following discharge. Variables used to adjust for differences in health status and demographics at admission included inpatient days and comorbidities the year prior to admission, calendar year, sex, age, income, education and functional score. Cox regression reporting hazard ratios (HR) was used.
Results: There were no significant differences in readmission rates for early GP follow-up. Patients receiving home nursing and/or rehabilitation had higher unadjusted 90- and 365-day readmission rates than those without services (HR from 1.87 to 2.63 depending on analysis, $p < 0.001$), but the 90-day differences disappeared after risk adjustment, except for patients receiving only rehabilitation. There were no significant differences in mortality rates according to GP follow-up after risk adjustment. Patients receiving rehabilitation had higher mortality than those without services, even after adjustment (HR from 2.20 to 2.69, $p < 0.001$), whereas the mortality of patients receiving only home nursing did not differ from those without services.
Conclusions: Our results indicate that the observed differences in unadjusted readmission and mortality rates according to GP follow-up and home nursing were largely due to differences in health status at admission, likely unrelated to the stroke. On the other hand, mortality for patients receiving ambulatory rehabilitation was twice as high compared to those without, even after adjustment and irrespective of also receiving home nursing. Hence, assessing the needs of these patients during discharge planning and providing careful follow-up after discharge seems important.

Title: Dynamic balance and instrumented gait variables are independent predictors of falls following stroke.

Citation: Journal of neuroengineering and rehabilitation; Jan 2019; vol. 16 (no. 1); p. 3
Author(s): Bower, Kelly; Thilarajah, Shamala; Pua, Yong-Hao; Williams, Gavin; Tan, Dawn; Mentiplay, Benjamin; Denehy, Linda; Clark, Ross

Abstract: Falls are common following stroke and are frequently related to deficits in balance and mobility. This study aimed to investigate the predictive strength of gait and balance variables for evaluating post-stroke falls risk over 12 months following rehabilitation discharge.
Methods: A prospective cohort study was undertaken in inpatient rehabilitation centres based in Australia and Singapore. A consecutive sample of 81 individuals (mean age 63 years; median 24 days post stroke) was assessed within one week prior to discharge. In addition to comfortable gait speed over six metres (6mWT), a depth-sensing camera (Kinect) was used to obtain fast-paced gait speed, stride length, cadence, step width, step length asymmetry, gait speed variability, and mediolateral and vertical pelvic displacement. Balance variables were the step test, timed up and go (TUG), dual-task TUG, and Wii Balance Board-derived centre of pressure velocity during static standing. Falls data were collected using monthly calendars.
Results: Over 12 months, 28% of individuals fell at least once. The faller group had increased TUG time and reduced stride length, gait speed variability, mediolateral and vertical pelvic displacement, and step test scores ($P < 0.001$-0.048). Significant predictors, when adjusted for country, prior falls and assistance (i.e., physical assistance and/or gait aid use) were stride length, step length asymmetry, mediolateral pelvic displacement, step test and TUG scores ($P < 0.040$; IQR-odds ratio(OR) = 1.37-7.85). With comfortable gait speed as an additional covariate, to determine the additive benefit over standard clinical assessment, only mediolateral pelvic displacement, TUG and step test scores remained significant ($P = 0.001$- 0.018; IQR-OR = 5.28-10.29).
Conclusions: Reduced displacement of the pelvis in the mediolateral direction during walking was the strongest predictor of post-stroke falls compared with other gait variables. Dynamic balance measures, such as the TUG and step test, may better predict falls than gait speed or static balance measures.

Title: Early Magnetic Resonance Imaging Decreases Hospital Length of Stay in Patients with Ischemic Stroke.

Citation: Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association; Feb 2019; vol. 28 (no. 2); p. 425-429
Author(s): Manwani, Bharti; Rath, Subhendu; Lee, Nora S; Staff, Ilene; Stretz, Christoph; Modak, Janhavi; Finelli, Pasquale F

Objective: Imaging modalities are important part of stroke evaluation. Noncontrast head computed tomography (CT) is the initial imaging modality in acute stroke and although important to rule out acute hemorrhage and making a decision on thrombolytic treatment, ischemic changes may not be visible on CT for up to 24 hours. Magnetic resonance imaging (MRI) brain is an invaluable tool to confirm an ischemic stroke and facilitates stroke evaluation. The objective of this study was to investigate the correlation between time to MRI and length of hospital stay.
Methods: A total of 432 patients admitted to Hartford Hospital (Comprehensive Stroke Center) with a focal neurological deficit in the year 2014 and got a CT head and MRI brain were enrolled in the study. Data collection was done via stroke database and retrospective chart review. Patients with any hemorrhage or age <18 years were excluded from the study. Patients were categorized as having had an early (within 12 hours) or a late (more than 12 hours) MRI. We used chi-square and Wilcoxon ranked sum test to compare time from arrival to MRI and length of stay in the hospital.
Results: There was a statistically significant difference in hospital length of stay between patients who obtained MRI within 12 hours, as compared with patients who had MRI greater than 12 hours after admission, early MRI group 3 days (1.8, 4.9) versus 4 days (2.6, 7.0), $P < .001$.
Conclusions: Our study suggests that brain MRI performed within 12 hours of admission facilitates stroke evaluation and decreases hospital length of stay. It provides evidence for cost effectiveness of MRI in ischemic stroke.

Title: Effect of Stride Management Assist Gait Training for Poststroke Hemiplegia: A Single Center, Open-Label, Randomized Controlled Trial.

Citation: Journal of Stroke & Cerebrovascular Diseases; Feb 2019; vol. 28 (no. 2); p. 477-486
Author(s): Tanaka, Naojiro; Matsushita, Shinro; Sonoda, Yasushi; Maruta, Yoshikatsu; Fujitaka, Yuta; Sato, Masashi; Simomori, Miki; Onaka, Rhyuki; Harada, Keiji; Hirata, Takashi; Kinoshita, Shoji; Okamoto, Takatsugu; Okamura, Hitoshi

Objective: Poststroke gait disorders negatively impact activities of daily living. Rehabilitation for stroke patients is aimed at improving their walking ability, balance, and quality of life. Robot-assisted gait training (RAGT) is associated with an increased number of task-specific exercises, which may benefit poststroke motor learning. We investigated the effects of RAGT using Stride Management Assist (SMA, which increases walk ratio by inducing hip-joint flexion and extension) in subacute stroke patients with hemiplegia.
Methods: We conducted a single center, open-label randomized controlled trial in hemiplegia patients who experienced a first ever stroke and were admitted to the convalescent rehabilitation ward. A total of 41 were divided into the control (20 patients) and experimental group (21 patients). A 10-day, conventional gait training program was carried out for the control group; and RAGT with SMA was used for the experimental group. The maximum walking speed and other gait parameters were compared preintervention and postintervention. The intergroup differences in the improvement ratio were compared using an intention-to-treat analysis.
Results: Ten-day intervention was completed by 36 patients. There was no difference between the 2 groups regarding gait parameters at intervention initiation. The improvement ratio of the maximum walking speed was significantly higher for the experimental group. Significant improvements were observed postintervention for maximum walking speed, paralysis-side step length, symmetry, and cadence in the experimental group. No adverse events attributable to the SMA were observed.
Conclusions: Ten days of RAGT with the SMA was effective for improving gait disorders of subacute stroke patients.

Title: Effective Reserve: A Latent Variable to Improve Outcome Prediction in Stroke.

Citation: Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association; Jan 2019; vol. 28 (no. 1); p. 63-69
Author(s): Schirmer, Markus D; Etherton Md PhD, Mark R; Dalca PhD, Adrian V; Giese Md, Anne-Katrin; Cloonan MSc, Lisa; Wu PhD, Ona; Golland PhD, Polina; Rost Md Mph Faan, Natalia S

Abstract: Prediction of functional outcome after stroke based on initial presentation remains an open challenge, suggesting that an important aspect is missing from these prediction models. There exists the notion of a protective mechanism called brain reserve, which may be utilized to understand variations in disease outcome. In this work, we expand the concept of brain reserve (effective reserve) to improve prediction models of functional outcome after acute ischemic stroke (AIS). Consecutive AIS patients with acute brain magnetic resonance imaging (<48 hours) were eligible for this study. White matter hyperintensity and acute infarct volume were determined on T2 fluid attenuated inversion recovery and diffusion weighted images, respectively. Modified Rankin Scale scores were obtained at 90days poststroke. Effective reserve was defined as a latent variable using structural equation modeling by including age, systolic blood pressure, and intracranial volume measurements. Of 453 AIS patients (mean age 66.6 ± 14.7 years), 36% were male and 311 hypertensive. There was inverse association between effective reserve and 90-day modified Rankin Scale scores (path coefficient -0.18 ± 0.01, P < .01). Compared to a model without effective reserve, correlation between predicted and observed modified Rankin Scale scores improved in the effective-reserve-based model (Spearman's ρ 0.29 ± 0.18 versus 0.15 ± 0.17, P <.001). Furthermore, hypertensive patients exhibited lower effective reserve (P < 10-6). Using effective reserve in prediction models of stroke outcome is feasible and leads to better model performance. Furthermore, higher effective reserve is associated with more favorable functional poststoke outcome and might correspond to an overall better vascular health.

Title: Effects of Nutrition Therapy in Older Stroke Patients Undergoing Rehabilitation: A Systematic Review and Meta-Analysis.

Citation: The journal of nutrition, health & aging; 2019; vol. 23 (no. 1); p. 21-26
Author(s): Sakai, K; Kinoshita, S; Tsuboi, M; Fukui, R; Momosaki, R; Wakabayashi, H

Objective: To systematically review evidence on the effects of nutrition therapy in older stroke patients undergoing rehabilitation and identify its effectiveness using meta-analysis.
Methods: PubMed (MEDLINE), EMBASE (via Dialog), Cochrane Central Register of Controlled Trial, World Health Organization International Clinical Trials Registry Platform and Ichu-shi Web were searched for relevant articles. Randomized controlled trials investigating the effects of nutrition therapy compared to control interventions in older stroke patients undergoing rehabilitation were considered eligible. The primary outcome was activities of daily living (ADL), and secondary outcomes were all-cause mortality, infections, pneumonia incidence, disability level, walking ability, fall, stroke recurrence, and quality of life. The risk of bias of each trial was assessed using the Cochrane Collaboration Tool, and the quality of the body of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation approach.
Results: Eight randomized controlled trials with a total of 5484 participants were included in the meta-analysis. The meta-analysis for ADL showed no significant effects (mean difference, 4.16; 95% confidence interval [CI], -0.88 to 9.20; I2=53%, low-quality evidence). The meta-analyses for secondary outcomes revealed a significant effect of reduced infections (risk ratio, 0.65; 95% CI, 0.51 to 0.84; I2=0%; low-quality evidence), with no significant effects on the other outcomes.
Conclusion: Nutrition therapy had no statistically significant effect on ADL. However, it reduced the incidence of infections. More high-quality trials are warranted to clarify the effects of nutrition therapy in older stroke patients undergoing rehabilitation.

Title: Efficacy of home-based visuomotor feedback training in stroke patients with chronic hemispatial neglect.

Citation: Neuropsychological Rehabilitation; Mar 2019; vol. 29 (no. 2); p. 251-272
Author(s): Rossit, Stéphanie; Benwell, Christopher S. Y.; Szymanek, Larissa; Learmonth, Gemma; McKernan-Ward, Laura; Corrigan, Elaine; Muir, Keith; Reeves, Ian; Duncan, George; Birschel, Philip; Roberts, Margaret; Livingstone, Katrina; Jackson, Hazel; Castle, Pauline; Harvey, Monika

Abstract: Hemispatial neglect is a severe cognitive condition frequently observed after a stroke, associated with unawareness of one side of space, disability and poor long-term outcome. Visuomotor feedback training (VFT) is a neglect rehabilitation technique that involves a simple, inexpensive and feasible training of grasping-to-lift rods at the centre. We compared the immediate and long-term effects of VFT vs. a control training when delivered in a home-based setting. Twenty participants were randomly allocated to an intervention (who received VFT) or a control group (n = 10 each). Training was delivered for two sessions by an experimenter and then patients self-administered it for 10 sessions over two weeks. Outcome measures included the Behavioural Inattention Test (BIT), line bisection, Balloons Test, Landmark task, room description task, subjective straight-ahead pointing task and the Stroke Impact Scale. The measures were obtained before, immediately after the training sessions and after four-months post-training. Significantly greater short and long-term improvements were obtained after VFT when compared to control training in line bisection, BIT and spatial bias in cancellation. VFT also produced improvements on activities of daily living. We conclude that VFT is a feasible, effective, home-based rehabilitation method for neglect patients that warrants further investigation with well-designed randomised controlled trials on a large sample of patients.

Title: Features of Patients Aged 80 Years or Older with Embolic Stroke of Undetermined Source.

Citation: Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association; Feb 2019; vol. 28 (no. 2); p. 251-255
Author(s): Iwata, Tomonori; Honma, Kazunari; Hanano, Hideyuki; Kadokura, Ayana; Nagata, Eiichiro; Takizawa, Shunya

Objective: Embolic stroke of undetermined source has not been thoroughly investigated in older patients. In this study, we investigated the features of this condition in patients greater than or equal to 80 years of age. METHODS: All patients with acute ischemic stroke in our hospital underwent diffusion-weighted imaging, magnetic resonance angiography, T2-weighted imaging, and fluid-attenuated inversion recovery sequence imaging. Embolic stroke of undetermined source was defined as a radiologically confirmed nonlacunar brain infarct on diffusion-weighted imaging without (1) extracranial or intracranial atherosclerosis causing greater than or equal to 50% luminal stenosis in arteries supplying the ischemic area, (2) major-risk cardioembolic source, and any other specific cause of stroke. We retrospectively identified consecutive patients hospitalized for acute ischemic stroke who met the embolic stroke of undetermined source diagnostic criteria and investigated patients' baseline and diagnostic findings.
Results: We divided 122 consecutive embolic stroke of undetermined source patients (median age: 73 years; 49 men, 73 women) into 2 groups by age at admission. Patients aged greater than or equal to 80 years had higher D-dimer and brain natriuretic peptide levels, more frequent premature atrial complexes/day in 24-hour Holter electrocardiography, and thicker maximum intima media thickness on ultrasound compared with patients aged less than 80 years ($P < .05$, U test).
Conclusions: Our results suggest that high admission D-dimer and brain natriuretic peptide levels are associated with age of onset in patients with embolic stroke of undetermined source. Patients aged greater than or equal to 80 years tended to have more frequent premature atrial complexes and thicker maximum intima media thickness compared with patients aged less than 80 years.

Title: How can stroke care be improved for younger service users? A qualitative study on the unmet needs of younger adults in inpatient and outpatient stroke care in Australia.

Citation: Disability and rehabilitation; Jan 2019; p. 1-8
Author(s): Shipley, Jessica; Luker, Julie; Thijs, Vincent; Bernhardt, Julie

Objective: The incidence of young stroke is increasing worldwide. However, young adults are inadequately supported in their recovery by a system of stroke care in which the older patient is the majority consumer. This study aimed to examine the unmet needs of younger stroke survivors in inpatient and outpatient healthcare settings and identify opportunities for improved service delivery.
Materials and methods: In-depth semi-structured interviews were undertaken with 19 participants aged 18-55 at the time of their first-ever stroke and inductively analysed using a rigorous qualitative descriptive approach.
Results: Many unmet care needs were identified within three emergent themes: inadequately addressed psycho-emotional and cognitive needs after young stroke; isolation from lack of information and structured support; and failure to deliver age-relevant patient-centred care. These themes were further divided into sub-themes and the sub-themes were named in a manner to signpost the way forward for young stroke care.
Conclusions: This study provides new insights into the experience of inpatient and outpatient stroke care by younger stroke survivors and outlines possible improvements for clinical practice. Future research should evaluate the effect of targeted strategies to support younger adults after stroke. Implications for rehabilitation Post-stroke rehabilitation might be improved by providing more support for the non-physical effects of stroke (e.g., psycho-emotional support, cognitive rehabilitation). Younger stroke survivors may also benefit from a long-term community care plan and longer-term rehabilitation. Patient-centered rehabilitation and education about self-management interventions appear to be important areas for further development. Future research is required to evaluate the effect of targeted strategies to support younger stroke survivors, as well as identify the needs of younger adults with post-stroke communication impairment.

Title: Hydrogen as a complementary therapy against ischemic stroke: A review of the evidence.

Citation: Journal of the neurological sciences; Jan 2019; vol. 396; p. 240-246
Author(s): Li, He; Luo, Yin; Yang, Pengfei; Liu, Jianmin

Abstract: Ischemic stroke is one of the most common sources of mortality in the world. Researchers have been trying to find a complementary therapy to treat ischemic stroke in order to improve its prognosis and expand the therapeutic window for reperfusion treatment. For this reason, many experimental and clinical trials studying the effects of hydrogen against ischemic stroke have been published. Hydrogen gas has been found to eliminate hydroxyl free radical and peroxynitrite anions as well as producing therapeutic effect in patients with ischemic stroke. Many studies have been published illustrating its anti-oxidative, anti-inflammatory and anti-apoptotic effects. The purpose of this article is to review the literature concerning treatment of cerebral I/R injury or ischemic stroke with hydrogen therapy. Specifically, we will examine the appropriate laboratory methods, mechanisms of hydrogen therapy, and outcomes of relevant clinical trials. We conclude this review with a discussion on future investigations of hydrogen therapy to treat ischemic stroke.

Title: Magnetic Resonance Imaging Versus Computed Tomography Angiography Based Selection for Endovascular Therapy in Patients With Acute Ischemic Stroke.

Citation: Stroke; Jan 2019; p. STROKEAHA118023173
Author(s): Kim, Joon-Tae; Cho, Bang-Hoon; Choi, Kang-Ho; Park, Man-Seok; Kim, Beom Joon; Park, Jong-Moo; Kang, Kyusik; Lee, Soo Joo; Kim, Jae Guk; Cha, Jae-Kwan; Kim, Dae-Hyun; Nah, Hyun-Wook; Park, Tai Hwan; Park, Sang-Soon; Lee, Kyung Bok; Lee, Jun; Hong, Keun-Sik; Cho, Yong-Jin; Park, Hong-Kyun; Lee, Byung-Chul; Yu, Kyung-Ho; Oh, Mi Sun; Kim, Dong-Eog; Ryu, Wi-Sun; Choi, Jay Chol; Kwon, Jee-Hyun; Kim, Wook-Joo; Shin, Dong-Ick; Yeo, Min-Ju; Sohn, Sung Il; Hong, Jeong-Ho; Lee, Ji Sung; Lee, Juneyoung; Bae, Hee-Joon; Cho, Ki-Hyun

Objective: Randomized trials comparing the use of multimodal magnetic resonance imaging (MRI) to multimodal computed tomography (CT)/ CT angiography (CTA) for selecting candidates for endovascular therapy (EVT) have not been reported. This study aimed to elucidate whether MRI-based selection for EVT is safe and effective within and after a 6-hour time window compared with conventional CTA-based selection.
Methods: Data from a prospective, nationwide, multicenter stroke registry were analyzed. Workflow timelines were compared between patients selected for EVT based on MRI (the MRI group) and CTA (the CTA group). Multivariable ordinal and binary logistic regression analyses were performed to explore the relationships between decision imaging for EVT and clinical outcomes, including good and

excellent outcomes (modified Rankin Scale scores of 0-2 and 0-1, respectively) at 3-month, modified Rankin Scale score distributions and safety outcomes (symptomatic intracranial hemorrhage [SICH] and mortality).
Results: Ultimately, 1265 patients (age, 69±12 yrs; men, 55%) were enrolled in this study. The median National Institutes of Health Stroke Scale score was 15 (11-19). All workflow time metrics were significantly delayed in the MRI group compared with the CTA group. There was no difference in good 3-month outcomes in patients arriving within 6 hours of onset between the MRI and CTA groups (38.1% versus 38.5%), but SICH and mortality rates were lower in the MRI group than the CTA group (3.8% versus 7.7%, P=0.01 for SICH; 15.4% versus 20.9%, P=0.04 for mortality). In the multivariable analysis, decision imaging was not significantly associated with 3-month functional outcomes (all P>0.1) or mortality (P=0.051); however, the MRI group was less likely to develop SICH than the CTA group (P=0.01; odds ratio, 0.34 [95% CI, 0.17-0.77]).
Conclusions: Our study found MRI-based selection for EVT was not associated with improving functional outcome compared with CT-based selection, but may be better at reducing the risk of SICH, despite the delays in all workflow time metrics.

Title: Music as a Therapy to Alleviate Anxiety during Inpatient Rehabilitation for Stroke.

Citation: Rehabilitation nursing: the official journal of the Association of Rehabilitation Nurses; vol. 44 (no. 1); p. 29-34
Author(s): Le Danseur, Maureen; Crow, April D; Stutzman, Sonja E; Villarreal, Marcos D; Olson, DaiWai M

Objective: The aim of the study was to determine if listening to music may reduce anxiety experienced by stroke patients during acute rehabilitation.
Design: A prospective, nonblinded, randomized study in an inpatient rehabilitation setting.
Methods: Fifty participants were randomized into two groups: (1) 1 hour of music (intervention) or (2) no music (control). All participants completed pretest anxiety and depression screening and 44 completed the posttest anxiety screening. Differences between groups were determined using chi-square and t tests.
Findings: After listening to music for 1 hour, participants who completed the posttest (n = 44) reported significantly less anxiety (p < .0001) compared to before the intervention. The control group showed no difference in their pre- and posttest anxiety scores (p = .84). No differences were determined among age, gender, or diagnostic groups.
Conclusions: These findings demonstrate that music intervention may help lessen anxiety in rehabilitation patients poststroke.
Clinical relevance: Offering musical intervention to stroke patients in rehabilitation may lessen symptoms of anxiety.

Title: Sex differences in trajectories of depression symptoms and associations with 10-year mortality in stroke patients: The South London Stroke Register.

Citation: European journal of neurology; Jan 2019
Author(s): Ayis, Salma A; Rudd, Anthony G; Ayerbe, Luis; Wolfe, Charles D A

Objective: Depression is a common neuropsychiatric consequence of stroke. We identified trajectories of depression symptoms in men and women and examined their associations with 10-year all-cause mortality.
Methods: Data were obtained from the South London Stroke Register (1998-2016). Socio-demographic, stroke severity and clinical measures were collected during the acute phase. The Hospital Anxiety and Depression Scale (HADS) was used to screen for depression at 3 months after stroke then annually. We used Group Based Trajectory Models (GBTMs) to identify trajectories of depression, and Cox proportional hazards models to study the risk of mortality in these.
Results: We studied 1275 men and 1038 women. Three trajectories of depression symptoms were identified in men: I-M (42.12%) low and stable symptoms, II-M (46.51%) moderate increasing, and III-M (11.37%) severe persistent. In women four trajectories were identified (I-F to IV-F); 29.09% with low symptoms, 49.81% moderate, 16.28% severe, and 4.82% with very severe symptoms. Ten-year mortality hazard ratios (HRs) in men were: 1.68 (95% CI:1.38-2.04) and 2.62 (1.97-3.48) for the trajectories II-M, and III-M respectively, compared to I-M. In women these were: 1.38 (1.09 - 1.75), 1.65 (1.23 - 2.20) and 2.81 (1.90 - 4.16), for trajectories II-F, III-F, and IV-F respectively compared to I-F.

Conclusions: Depression trajectories varied independent of sex. Severe symptoms in women are double these in men. Moderate symptoms in men get worse overtime. Increased symptoms of depression are associated with higher mortality rates. Data on symptoms progression may help a better long-term management of stroke patients.

Title: Skiing Associated Stroke: Causes, Treatment, and Outcome.

Citation: Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association; Feb 2019; vol. 28 (no. 2); p. 288-294
Author(s): Strambo, Davide; Sirimarco, Gaia; Inácio, Nuno; Eskandari, Ashraf; Michel, Patrick

Objective: Previous studies have described ischemic stroke temporally related to specific triggers, but only 1 series collected patients with acute ischemic stroke (AIS) following downhill skiing and all caused by cervical artery dissections. Here we describe our series of AIS temporally associated to ski practice, focusing on the frequency, pathogenesis, clinical presentation, and prognosis.
Methods: We maintained a prospective list of Skiing Associated Strokes (SASs) from 2003 to 2017. From all AIS patients included in our stroke registry Acute Stroke Registry and Analysis of Lausanne (ASTRAL) over the same period, we identified a comparison group of non-SAS patients, matched for age and gender.
Results: In the 12-year observation period, we identified 17 SASs (4 females, median age 51 years) and 51 matched control patients with nonski-associated strokes. Vascular risk factors, stroke features, and outcome were similar between the 2 groups. Stroke mechanism was arterial dissection in 11 of 17 SASs (65%) and in 7 of 51 control patients (14%, chi-square test: P 50% in 1 patient, and undetermined in 3. Among the 11 patients with SAS caused by dissection, 8 reported minor falls while skiing, 1 had a major head trauma without loss of consciousness, and 2 had no traumatism (compared to preceding trauma in 29 of 147 [20%] of all other AIS caused by arterial dissection in ASTRAL, P < .01).
Conclusions: Arterial dissection was a significantly more frequent stroke mechanism in SAS compared to matched controls, but other mechanisms occurred as well. Minor or moderate skiing-related trauma preceded most SAS with dissections.

Title: Systematic development of practice guidelines for psychological interventions in stroke rehabilitation.

Citation: Disability and rehabilitation; Jan 2019; p. 1-7
Author(s): Kampling, Hanna; Reese, Christina; Küst, Jutta; Mittag, Oskar

Objective: We aimed to develop evidence-based practice guidelines that can support decision-making in individual cases and be used by a multidisciplinary team in stroke rehabilitation.
Materials and methods: We conducted a literature search (step 1), and a survey of all neurological rehabilitation facilities in Germany concerning their structural working conditions and current practices (step 2). Based on this information, we drafted a first version of the practice guidelines, and discussed them with a group of experts (step 3). We also consulted concurrently with senior psychologists, head physicians (step 4), and patients after stroke (step 5). We revised the guidelines until consensus on the final version was reached (step 6). RESULTS Referring to the ICF for guidance, the practice guidelines comprise of psychological recommendations in five problem areas ("Participation - Major Aims of Rehabilitation", "Cognition", "Affect & Behavior", "Risk Factors", and "Specific Problems & Aspects"), and provide preliminary remarks on general frame conditions and procedural requirements. The practice guidelines were widely accepted by head psychologists and physicians of in- and outpatient neurological rehabilitation with an average agreement of 97% (range: 88-100%).
Conclusions: Our practice guidelines include detailed recommendations for psychological interventions that can guide individual decision-making by a multidisciplinary team. Specific aspects to foster implementation were considered, and attempts were made to promote their dissemination. Implications for Rehabilitation We developed practice guidelines for psychological interventions in rehabilitation after stroke based on the best available evidence. The practice guidelines include detailed recommendations for psychological interventions that can guide individual decisions by a multidisciplinary team. The practice guidelines are highly specific, and have been widely agreed upon by a group of experts from different professions as well as by researchers, patients, and clinicians (average agreement: 97%). The practice guidelines offer knowledge on different areas of psychological

impairment, can help guide diagnostic and therapeutic procedures for individual patients, and thus, improve standard care in neurological rehabilitation.

Title: The comparative efficacy of theta burst stimulation or functional electrical stimulation when combined with physical therapy after stroke: a randomized controlled trial.

Citation: Clinical rehabilitation; Jan 2019; p. 269215518820896
Author(s): Khan, Fayaz; Rathore, Chaturbhuj; Kate, Mahesh; Joy, Josy; Zachariah, George; Vincent, P C; Varma, Ravi Prasad; Radhakrishnan, Kurupath

Objective: To study the long-term effectiveness of Theta Burst Stimulation (TBS) or Functional Electrical Stimulation (FES) combined with Physical therapy (PT) as compared to PT alone for improving arm functions in patients with acute stroke.
Design: Single blind randomized controlled trial.
Setting: Outpatient clinics and inpatient wards at tertiary care neurology center.
Subjects: Adult patients with acute middle cerebral artery territory ischemic stroke.
Interventions: 60 patients were randomized into three groups of 20 each: TBS+PT; FES+PT; and PT alone. TBS group received intermittent TBS of ipsilesional hemisphere and continuous TBS of contralesional hemisphere while FES group received FES of paretic limb, both for four weeks. All groups received supervised physical therapy for four weeks followed by home physiotherapy for one year.
Outcome measures: Fugl Meyer Assessment upper limb score (FMA-UL) was primary outcome measure. Patients were evaluated at baseline and subsequently at one, three and six months and one year. RESULTS: Compared to PT group, mean FMA-UL scores were higher in TBS and FES groups at all follow-ups ($P < 0.001$). From baseline to one year, mean (SD) FMA-UL scores increased from 14.9(2.1) to 55.55(2.46) in TBS group, 15.5(1.99) to 55.85(2.46) in FES group, and 14.3(2.2) to 43.3(4.22) in PT group indicating an increase of 273%, 260%, and 203% respectively. There was no difference between FES and TBS groups.
Conclusion: A four-week intervention with TBS or FES combined with PT produces better long-term arm functions as compared to PT alone in patients with acute stroke.

Title: The Efficacy of Lower Extremity Mirror Therapy for Improving Balance, Gait, and Motor Function Poststroke: A Systematic Review and Meta-Analysis.

Citation: Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association; Jan 2019; vol. 28 (no. 1); p. 107-120
Author(s): Louie, Dennis R; Lim, Shannon B; Eng, Janice J

Abstract: Mirror therapy is less commonly used to target the lower extremity after stroke to improve outcomes but is simple to perform. This review and meta-analysis aimed to evaluate the efficacy of lower extremity mirror therapy in improving balance, gait, and motor function for individuals with stroke.

Methods: PubMed, Cochrane Central Register of Controlled Trials, MEDLINE, Embase, Cumulative Index to Nursing and Allied Health Literature, Physiotherapy Evidence Database, and PsychINFO were searched from inception to May 2018 for randomized controlled trials (RCTs) comparing lower extremity mirror therapy to a control intervention for people with stroke. Pooled effects were determined by separate meta-analyses of gait speed, mobility, balance, and motor recovery.
Results: Seventeen RCTs involving 633 participants were included. Thirteen studies reported a significant between-group difference favoring mirror therapy in at least one lower extremity outcome. In a meta-analysis of 6 trials that reported change in gait speed, a large beneficial effect was observed following mirror therapy training (standardized mean differences [SMD] = 1.04 [95% confidence interval [CI] = .43, 1.66], $I2 = 73\%$, and $P < .001$). Lower extremity mirror therapy also had a positive effect on mobility (5 studies, SMD = .46 [95% CI = .01, .90], $I2 = 43\%$, and $P = .05$) and motor recovery (7 studies, SMD = .47 [95% CI = .21, .74], $I2 = 0\%$, and $P < .001$). A significant pooled effect was not found for balance capacity.
Conclusions: Mirror therapy for the lower extremity has a large effect for gait speed improvement. This review also found a small positive effect of mirror therapy for mobility and lower extremity motor recovery after stroke.

Title: The frequency, characteristics and aetiology of stroke mimic presentations: a narrative review.

Citation: European journal of emergency medicine: official journal of the European Society for Emergency Medicine; Feb 2019; vol. 26 (no. 1); p. 2-8
Author(s): McClelland, Graham; Rodgers, Helen; Flynn, Darren; Price, Christopher

Abstract: A significant proportion of patients with acute stroke symptoms have an alternative 'mimic' diagnosis. A narrative review was carried out to explore the frequency, characteristics and aetiology of stroke mimics. Prehospital and thrombolysis-treated patients were described separately. Overall, 9972 studies were identified from the initial search and 79 studies were included with a median stroke mimic rate of 19% (range: 1-64%). The prehospital median was 27% (range: 4-43%) and the thrombolysis median 10% (range: 1-25%). Seizures, migraines and psychiatric disorders are the most frequently reported causes of stroke mimics. Several characteristics are consistently associated with stroke mimics; however, they do not fully exclude the possibility of stroke. Nineteen per cent of suspected stroke patients had a mimic condition. Stroke mimics were more common with younger age and female sex. The range of mimic diagnoses, a lack of clear differentiating characteristics and the short treatment window for ischaemic stroke create challenges for early identification.

Title: The Role of Personalized Virtual Reality in Education for Patients Post Stroke-A Qualitative Case Series.

Citation: Journal of Stroke & Cerebrovascular Diseases; Feb 2019; vol. 28 (no. 2); p. 450-457
Author(s): Thompson-Butel, Angelica G; Shiner, Christine T; McGhee, John; Bailey, Benjamin John; Bou-Haidar, Pascal; McCorriston, Michael; Faux, Steven G

Objective: Education is essential to promote prevention of recurrent stroke and maximize rehabilitation; however, current techniques are limited and many patients remain dissatisfied. Virtual reality (VR) may provide an alternative way of conveying complex information through a more universal language. This study aims to develop and conduct preliminary assessments on the use of a guided and personalized 3D visualization education session via VR, for stroke survivors and primary caregivers.
Methods: Four poststroke patients and their 4 primary caregivers completed the 3D visualization education session as well as pre- and postintervention interviews. Each patient had a different stroke etiology (i.e., ischemic thrombotic stroke, ischemic embolic stroke, hemorrhagic stroke, and transient ischemic attack followed by ischemic stroke, respectively). This new approach uses preintervention interview responses, patient MRI and CT datasets, VR head mounted displays, 3D computer modeling, and game development software to develop the visualization. Pre- and postintervention interview responses were analyzed using a qualitative phenomenological methodology approach.
Results: All participants safely completed the study and were highly satisfied with the education session. In this subset of participants, prior formal stroke education provision was limited. All participants demonstrated varied improvements in knowledge areas including brain anatomy and physiology, brain damage and repair, and stroke-specific information such as individual stroke risk factors and acute treatment benefits. These improvements were accompanied by feelings of closure, acceptance, and a greater motivation to manage their stroke risk.
Conclusions: Preliminary results suggest this approach provides a safe and promising educational tool to promote understanding of individualized stroke experiences.

Title: Using a checklist to facilitate management of long-term care needs after stroke: insights from focus groups and a feasibility study.

Citation: BMC family practice; Jan 2019; vol. 20 (no. 1); p. 2
Author(s): Turner, Grace M; Mullis, Ricky; Lim, Lisa; Kreit, Lizzie; Mant, Jonathan

Objective: Long-term needs of stroke survivors are often not adequately addressed and many patients are dissatisfied with care post-discharge from hospital. Primary care could play an important role in identifying need in people with stroke. We aimed to explore, refine and test the feasibility and acceptability of a post-stroke checklist for stroke reviews in primary care.

Design and setting: Focus groups (using a generic qualitative approach) and a single-centre feasibility study.
Method: Five focus groups were conducted; three with healthcare providers and two with stroke survivors/carers. The focus groups discussed acceptability of a checklist approach and the content of an existing checklist. The checklist was then modified and piloted in one general practice surgery in the East of England.
Results: The qualitative data found the concept of a checklist was considered valuable to standardise stroke reviews and prevent post-stroke problems being missed. Items were identified that were missing from the original checklist: return to work, fatigue, intimate relationships and social activities. Time constraints were the main concern from healthcare professionals and pre-completion of the checklist was suggested to address this. Thirteen stroke survivors were recruited to the feasibility study. The modified checklist was found to be feasible and acceptable to patients and primary care clinicians and resulted in agreed action plans.
Conclusion: The modified post-stroke checklist is a pragmatic and feasible approach to identify problems post-stroke and facilitate referral to appropriate support services. The checklist is a potentially valuable tool to structure stroke reviews using a patient-centred approach.