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Stroke

Current Awareness Bulletin

September 2025

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Book a session today at https://forms.office.com/e/HyiSXfDaYV (these sessions will be held on a monthly basis)

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1. **Optimizing non-invasive vagus nerve stimulation for treatment in stroke**

Authors: Baig, Sheharyar S.;Dorney, Samantha;Aziz, Mudasar;Bell, Simon M.;Ali, Ali N.;Su, Li;Redgrave, Jessica N. and Majid, Arshad

Publication Date: 2025

Journal: Neural Regeneration Research 20(12), pp. 3388–3399

Abstract: Stroke remains a leading cause of long-term disability worldwide. There is an unmet need for neuromodulatory therapies that can mitigate against neurovascular injury and potentially promote neurological recovery. Transcutaneous vagus nerve stimulation has been demonstrated to show potential therapeutic effects in both acute and chronic stroke. However, previously published research has only investigated a narrow range of stimulation settings and indications. In this review, we detail the ongoing studies of transcutaneous vagus nerve stimulation in stroke through systematic searches of registered clinical trials. We summarize the upcoming clinical trials of transcutaneous vagus nerve stimulation in stroke, highlighting their indications, parameter settings, scope, and limitations. We further explore the challenges and barriers associated with the implementation of transcutaneous vagus nerve stimulation in acute stroke and stroke rehabilitation, focusing on critical aspects such as stimulation settings, target groups, biomarkers, and integration with rehabilitation interventions. (Copyright © 2025 Neural Regeneration Research.)

2. **The 6-min step test elicits higher physiological responses than the 6-min walk test in people with stroke: A cross-sectional study**

Authors: Boening, Augusto;Aguiar, Larissa Tavares;Avance, Janayna and Nascimento, Lucas R.

Publication Date: 2025

Journal: Journal of Bodywork & Movement Therapies 44, pp. 802–807

Abstract: To investigate if the 6-min step test elicits the same or higher physiological responses and its adverse events in comparison with the 6-min walk test after stroke. A cross-sectional, exploratory study was performed. The 6-min step test and the 6-min walk test were performed by individuals with chronic stroke. Physiological parameters (i.e., systolic and diastolic blood pressure, dyspnea, leg fatigue, heart rate and peripheral oxygen saturation) and adverse events were examined. Fifty-seven individuals who have had a stroke (33 men), with a mean age of 58 years (SD 14) were included. The 6-min step test elicited higher levels of dyspnea (MD 1 point out of 10; 95 % CI 0.5 to 2) and leg fatigue (MD 2 points out of 10; 95 % CI 1 to 2) immediately after tests. In addition, heart rate was progressively higher (7–15 bpm) during the 6-min step test than the 6-min walk test. Immediately after the tests, heart rate was still higher for the 6-min step test (MD 17 bpm; 95 % CI 11 to 22). Two adverse events were reported during the 6-min step test. In conclusion, the 6-min step test demands more from the cardiovascular and musculoskeletal systems, as higher levels of heart rate, dyspnea and leg fatigue were achieved in comparison with the 6-min walk test after stroke.

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3. **Metabolic Intensity Of Gait Training In Patients With Stroke During Inpatient Rehabilitation: 353**

Author: Bosteder, Katelyn D., Sanchez, Belinda, Arnold, Dannae, Wynne, Lindsey, Gillespie, Jaime, Stevens, Ashley, Trammell, Molly, Patel, Helen Z., Dubiel, Randi, Driver, Simon and Swank, Chad

Publication Date: 2025

Publication Details: Medicine & Science in Sports & Exercise, 57, pp.111–112. , Baltimore, Maryland: Lippincott Williams & Wilkins.

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4. **The trajectory of depression-related symptom clusters following stroke: A network and latent class analysis**

Authors: Chen, Rong;Zhang, Jiali;Qu, Yingying and Zhang, Qi

Publication Date: 2025

Journal: Journal of Affective Disorders 389, pp. 119659

Abstract: Competing Interests: Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have

appeared to influence the work reported in this paper.; Background: Post-stroke depression (PSD) frequently co-occurs with other symptoms, such as anxiety, fatigue, sleep disturbances, and stigma, forming complex symptom clusters. While research has identified associations between PSD and specific symptoms, the intricate interrelationships within these clusters remain largely unexplored. This study aimed to examine the longitudinal trajectory of these symptoms, classify distinct symptom cluster profiles, uncover symptom interconnections, identify core symptoms, and explore associated factors.; Methods: Depressive symptoms, anxiety, fatigue, sleep disturbance, and stigma were assessed in 195 stroke survivors at baseline (T1), one (T2), three (T3), and six (T4) months post-stroke. Network analysis examined symptom relationships and identified core symptoms. Latent profile analysis was used to classify distinct symptom clusters.; Results: Network analysis revealed positive correlations among the five symptoms across four time points. "Anxiety" was the most central symptom within the symptom network at T1 (Strength = 2.134, EI = 2.134), while "depressive symptoms" held the central position at T2 (Strength = 2.595, EI = 2.595), T3 (Strength = 2.689, EI = 2.689), and T4 (Strength = 2.789, EI = 2.789). At T1, four clusters emerged: moderately affected, anxiety-insomnia, resilient, and severely affected. At T2, T3, and T4, a two-cluster solution was identified: resilient and symptomatic.; Conclusions: This study revealed a dynamic interplay of psychological symptoms following stroke. Depressive symptoms, anxiety, fatigue, sleep disturbance, and stigma exhibited a U-shaped trajectory, initially improving but subsequently worsening. Network analysis demonstrated a stable symptom cluster structure, with depressive symptoms and anxiety as core components. Symptom cluster profiles varied across time points.

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5. **Online neuropilates exercise classes for post stroke patients: A randomised feasibility study**

Authors: Cronin, Eimear;Burns, Richéal;Lynch, Peter;Hickey, Marion and Monaghan, Kenneth

Publication Date: 2025

Journal: Journal of Bodywork & Movement Therapies 44, pp. 200–210

Abstract: Stroke survivors are often sedentary, with known barriers to exercise including physical disabilities and transport issues. One innovative way to overcome barriers is to provide group exercise programmes via videoconferencing. Neuropilates, a programme of modified Pilates underpinned by neurological rehabilitation principles, may have benefits for stroke survivors but is under-researched. The aim of the study is to examine the feasibility and safety of an online neuropilates programme in stroke survivors. The design was a single-blinded randomised feasibility study with participants randomly allocated to one of three groups. The intervention group partook in a 6-week, once weekly, online, live neuropilates exercise class. Control Group 1 (CG1) partook in a 6-week, online, live general exercise class and control group 2 (CG2) were given an unsupervised home exercise programme (HEP). Primary feasibility outcomes were assessed. Gait speed, balance, balance confidence, functional strength, tone and quality of life were also assessed. A cost analysis was undertaken to understand resource utilisation implications. Twelve participants were enrolled to the study. The online neuropilates programme was well tolerated and accepted. There were no adverse events related to the exercise classes. The intervention was practical and conducted with ease apart from the issue of reduced visibility of the entire participants' bodies

on screen. The intervention group improved all clinical scores on average after the intervention except tone which increased slightly. CG1 experienced improvements in most outcomes except gait speed and tone. CG2 also experienced marginal within group improvements, except for functional lower limb strength. Most, but not all improvements were maintained at 3-month follow-up assessments across all groups. Costs per minute of patient contact were €0.44 in the intervention group, €0.33 in control group 1 and €0.65 in control group 2 over the trial period. Overall, an online neuropilates programme was sufficiently feasible, practical and safe. Based on these findings, a large-scale trial is warranted to definitively test an online neuropilates programme in the post stroke population with the use of multiple centres to improve recruitment. • Online neuropilates classes for post-stroke patients are feasible, safe, practical and cost effective. • Safety strategies, equipment and costs for online neuropilates classes aid physiotherapists in starting programmes. • Neuropilates works with 1:4 instructor ratio; tech support is helpful during the first class for troubleshooting.

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6. **Factors associated with upper extremity use after stroke: a scoping review of accelerometry studies**

Authors: Gagné-Pelletier, Léandre;Poitras, Isabelle;Roig, Marc and Mercier, Catherine

Publication Date: 2025

Journal: Journal of NeuroEngineering & Rehabilitation (JNER) 22(1), pp. 1–17

Abstract: Background: A discrepancy between the level of impairment at the upper extremity (UE) and its use in activities of daily life is frequently observed in individuals who have experienced a stroke. Wrist-worn accelerometers allow an objective and valid measure of UE use in everyday life. Accelerometer studies have shown that a wide range of factors beyond UE impairment can influence UE use. This scoping review aims to identify factors associated with UE use and to investigate the influence of different types of accelerometry metrics on these associations. Method: A search using CINHAL, Embase, MEDLINE, Compendex, and Web of Science Core Collection databases was performed. Studies that assessed the association between UE use quantified with accelerometers and factors related to the person or their environment in individuals with stroke were included. Data related to study design, participants characteristics, accelerometry methodology (absolute vs. relative UE use metrics), and associations with personal and environmental factors were extracted. Results: Fifty-four studies were included. Multiple studies consistently reported associations between relative UE use and stroke severity, UE motor impairment, unimanual capacity, bimanual capacity, and mobility. In contrast, there were inconsistent associations with factors such as neglect and concordance between dominance and side of paresis and a consistent lack of association between relative UE use and time since stroke, sex, and age. Metrics of absolute paretic UE use yielded different results regarding their association with personal and environmental factors, as they were more influenced by factors related to physical activity and less associated with factors related to UE capacity. Conclusion: Healthcare providers should recognize the complexity of the relationship between UE use and impairment and consider additional factors when selecting assessments during rehabilitation to identify patients at risk of underutilizing their paretic arm in daily life. Future research in this domain should preconize relative UE use metrics or multi-sensors method to control for the effect of physical activity.

7. **Effectiveness of interventions in increasing physical activity of inpatients after stroke: A systematic review and meta-analysis**

Authors: Hartley, Peter;Bond, Katie;Dance, Rachel;Kuhn, Isla;McPeake, Joanne and Forsyth, Faye

Publication Date: 2025

Journal: Clinical Rehabilitation 39(10), pp. 1277–1295

Abstract: Objective: To synthesise the evidence of the effectiveness of interventions to increase levels of physical activity or reduce levels of sedentary activity of inpatients after a new stroke. Data sources: Medline, PsychINFO, AMED and CINAHL were search between inception and June 2025 for randomised controlled studies of in-hospital interventions for adults after stroke which measured physical activity. Review methods: Interventions were grouped by common components. For each intervention group, the outcomes of physical activity (primary outcome), physical functional ability, and quality of life were analysed with meta-analysis. Adverse events were synthesised narratively. Results: Ten studies (696 participants) were included in the review. General activity feedback (SMD = 0.52, 95% CI: −0.07 to 1.10; I 2 = 76.7%, 4 trials, n = 272) and additional physiotherapy (SMD = 0.89, 95% CI: −0.02 to 0.99; I 2 = 94.2%, 4 trials, n = 246) may result in moderate to large increases of in-hospital physical activity (very low certainty). Patient-directed activity programmes (one study) may have no effect on physical activity (low certainty). Upper-limb activity feedback (one study) may increase upper-limb activity (very low certainty). The evidence regarding the secondary outcomes demonstrated no effect (very low to moderate certainty), with the exception that additional physiotherapy may increase the risk of falls (low certainty). Conclusions: Interventions incorporating activity feedback or additional physiotherapy are promising, but further evidence is required for all interventions to increase the certainty in their estimates of effect. PROSPERO ID: CRD42024611456

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8. **The Effect of Repetitive Transcranial Magnetic Stimulation With Different Stimulation Methods on Post-Stroke Dysphagia: A Network Meta-Analysis**

Authors: Jiayao, Li;Zejian, Liu;Henan, Zhao;Yuan, Chen;Hongjing, Qi;Jun, Zhang and Jie, Sun

Publication Date: 2025

Journal: Journal of Oral Rehabilitation 52(10), pp. 1865–1875

Abstract: Background: Multiple studies have substantiated that repetitive transcranial magnetic stimulation (rTMS) is effective in improving the swallowing function of patients with post-stroke dysphagia (PSD). Nevertheless, the choice of stimulation methods diverges, underpinned by different recovery theories. Among the distinct stimulation approaches currently in use, which one yields the most optimal therapeutic outcomes remains unexplored. Objective: To evaluate the rehabilitation efficacy of different rTMS methods on the swallowing function of PSD patients through network meta-analysis and traditional meta-analysis. Methods: We searched eight databases to identify articles on rTMS treatment for PSD from

inception to May 5, 2024, and screened them using EndNote 20.0. The quality of articles was evaluated by Cochrane risk bias assessment criteria, and Stata 17.0 was adopted for meta-analysis. Standardised swallowing assessment (SSA), penetration aspiration scale (PAS), and dysphagia outcome and severity scale (DOSS) served as the outcome measures of the study. Results: A total of 27 articles involving 1694 patients were selected. The studies encompassed five types of stimulation methods: high-frequency rTMS on the ipsilateral hemisphere (iHF-rTMS), low-frequency rTMS on the contralateral hemisphere (cLF-rTMS), high-frequency rTMS on the contralateral hemisphere (cHF-rTMS), high-frequency rTMS on the bilateral hemispheres (biHF-rTMS), and iHF-rTMS + cLF-rTMS (iHF-cLF-rTMS). Compared with placebo, iHF-cLF-rTMS mean difference (MD) = −11.34, 95% confidence interval (CI): −14.57 to −8.12], biHF-rTMS (MD = −6.52, 95% CI: −8.50 to −4.55), cHF-rTMS (MD = −2.84, 95% CI: −4.37 to −1.31), and iHF-rTMS (MD = −1.89, 95% CI: −2.82 to −0.96) showed significantly better effects on improving SSA of patients with PSD. According to traditional meta-analysis, for patients with post-stroke time < 1 month, iHF-rTMS (MD = −0.558, 95% CI: −0.966 to −0.150) demonstrated a superior therapeutic outcome of SSA, while for those with post-stroke time ≥ 1 month, SSA was more significantly improved in cHF-rTMS (MD = −0.760, 95% CI: −1.193 to −0.327) and iHF-rTMS (MD = −0.428, 95% CI: −0.665 to −0.129) groups, when compared with placebo. Conclusions: Bilateral stimulation protocols (biHF-rTMS and iHF-cLF-rTMS) confer superior efficacy over unilateral approaches. Early application of iHF-rTMS shows advantages. However, methodological limitations, including heterogeneity in stimulation parameters, small sample sizes in subgroup analyses, and insufficient long-term follow-up, warrant cautious interpretation. Future high-powered RCTs with standardised protocols are imperative to optimise rTMS-based precision rehabilitation.

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9. **The Association Between Experienced Discrimination and Pain in the REasons for Geographic and Racial Differences in Stroke (REGARDS) Study**

Authors: Kabangu, Jean-Luc K.;Bah, Momodou G.;Enogela, Ene M.;Judd, Suzanne E.;Hobson, Joanna M.;Levitan, Emily B. and Eden, Sonia V.

Publication Date: 2025

Journal: Journal of Racial & Ethnic Health Disparities 12(5), pp. 3269–3283

Abstract: Background: The relationship between experienced discrimination and its effects on pain interference and management among racial disparities is not well explored. This research investigated these associations among Black and White U.S. adults. Methods: The analysis involved 9369 Black and White adults in the REasons for Geographic and Racial Differences in Stroke (REGARDS), assessing experiences of discrimination, pain interference (SF-12), and pain treatment, incorporating factors like demographics, comorbidities, and stress. Results: Black participants experiencing moderate discrimination were found to have a 41% increased likelihood of pain interference (aOR 1.41, 95% CI 1.02–1.95), similaritythose facing high levels of discrimination also showed a 41% increase (aOR 1.41, 95% CI 1.06–1.86) compared to those without such experiences. White individuals reporting moderate discrimination also faced a heightened risk, with a 21% greater chance of pain interference (aOR 1.21, 95% CI 1.01–1.45). Notably, the presence of moderate discrimination among Black participants correlated with a 12% reduced probability of receiving pain treatment (aOR 0.88, 95% CI 0.56–1.37). Furthermore, Black, and White individuals who reported discrimination when seeking

employment had a 33% (aOR 0.67, 95% CI 0.45–0.98) and 32% (aOR 0.68, 95% CI 0.48–0.96) lower likelihood, respectively, of receiving treated pain. Conclusion: The study elucidates how discrimination exacerbates pain interference and restricts access to treatment, affecting Black and White individuals differently. These findings underscore an urgent need for strategies to counteract discrimination's negative effects on healthcare outcomes. Addressing these disparities is crucial for advancing health equity and improving the overall quality of care.

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10. **Differences in kinetics and kinematics of sit-to-stand between independent and dependent post-stroke individuals**

Authors: Motojima, Naoyuki;Yamamoto, Sumiko and Kohno, Toshiyuki

Publication Date: 2025

Journal: Clinical Biomechanics 129, pp. N.PAG

Abstract: The sit-to-stand movement is important for the rehabilitation of individuals with poststroke hemiplegia. This study aimed to clarify the variation in kinetic and kinematic characteristics of sit-to-stand movements according to differences in the ability of individuals with poststroke hemiplegia. Twenty five individuals in the subacute phase of stroke-induced hemiplegia, who needed assistance to practice the sit-to-stand movement (dependent group) and 25 individuals in the subacute phase of stroke-induced hemiplegia who could stand up independently (independent group) were selected for the study. To ensure a fair comparison, the two groups were matched for age, sex, body size, and the paretic side. The sit-to-stand movement was quantified using a three-dimensional motion-analysis system, and the resulting kinetics, kinematics of thorax, pelvis and lower limb, and weight bearing were compared. The dependent group exhibited significantly reduced hip flexion torque and significantly greater thoracic and pelvic anterior tilt prior to seat-off than the independent group. After seat-off, the dependent group exhibited significantly reduced paretic knee extension torque and significantly greater weight bearing on the nonparetic side, along with significantly elevated hip extension torque on the paretic and non-paretic sides, in comparison to the independent group. The kinetic and kinematic characteristics of the sit-to-stand maneuver before seat-off in the dependent group poststroke differ from those in the independent poststroke individuals, as previously reported. These findings also suggest that weight-bearing on the non- paretic side is key in the sit-to-stand movement of dependent individuals. • Sit-to-stand movement differs by motor ability in poststroke hemiplegia. • Dependent individuals show reduced hip flexion torque before seat-off. • They exhibit greater thoracic and pelvic anterior tilt before seat-off. • After seat-off, they rely more on the nonparetic side for weight-bearing.

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11. **More intensive versus conservative blood pressure lowering after endovascular therapy in stroke: a meta-analysis of randomised controlled trials**

Authors: Naji Mansoor, Ahmed;Choudhary, Vatsalya;Mohammad Nasser, Zain;Jain, Muskan;Dayanand Sharma, Dhruvikumari;Jaramillo Villegas, Mateo;Janarthanam, Sujaritha;Ayyan, Muhammad;Ravindra Nimal, Simran;Ahmad Cheema, Huzaifa;Ehsan, Muhammad;Rehman, Muhammad Aemaz Ur;Nashwan, Abdulqadir and Dani, Sourbha S.

Publication Date: 2025

Journal: Blood Pressure 34(1), pp. 2475314

Abstract: Background: The optimum systolic blood pressure (BP) after endovascular thrombectomy for acute ischaemic stroke is uncertain. We aimed to perform an updated meta-analysis of randomised controlled trials (RCTs) to evaluate the safety and efficacy of more intensive BP management compared to less intensive BP management.; Methods: We searched various electronic databases to retrieve relevant RCTs on the clinical effects of more intensive BP management after endovascular thrombectomy compared to the less intensive management. We calculated odds ratios (ORs) with 95% confidence intervals (CIs) for dichotomous outcomes.; Results: Our meta-analysis included four RCTs with a total of 1560 patients. More intensive BP management (<140 mmHg) was associated with a statistically significant decrease in the number of patients showing functional independence (modified Rankin scale mRS] score = 0-2) at 90 days (OR 0.69; CI = 0.51-0.94). Regarding 90-day mortality, our pooled results showed no statistically significant difference between the two groups (OR 1.21; CI = 0.89-1.65). There was no statistically significant difference between the two groups regarding the incidence of intracerebral haemorrhage (ICH) (OR 1.09; CI = 0.85-1.39) and the incidence of symptomatic intracerebral haemorrhage (sICH) (OR 1.11; CI = 0.75-1.65).; Conclusion: According to our meta-analysis, the intensive BP lowering group decreased the number of patients showing functional independence at 90 days. We found no benefit of the intensive lowering of BP on mortality rates and incidence of ICH compared to the conservative BP management. Future large-scale trials should focus on other interventions to improve prognosis in these patients.

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12. **Machine learning techniques for stroke prediction: A systematic review of algorithms, datasets, and regional gaps**

Authors: Soladoye, Afeez Adekunle;Aderinto, Nicholas;Popoola, Mayowa Racheal;Adeyanju, Ibrahim A.;Osonuga, Ayokunle and Olawade, David B.

Publication Date: 2025

Journal: International Journal of Medical Informatics 203, pp. 106041

Abstract: Competing Interests: Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.; Background: Stroke is a leading cause of mortality and disability worldwide, with approximately 15 million people suffering strokes annually. Machine learning (ML) techniques have emerged as powerful tools for stroke prediction, enabling early identification of risk factors through data-driven approaches. However, the clinical utility and performance characteristics of these approaches require systematic evaluation.; Objectives: To systematically review and analyze ML techniques used for stroke prediction, systematically synthesize performance metrics across different prediction targets and data sources, evaluate their clinical applicability, and identify research trends focusing on patient population characteristics and stroke prevalence patterns.; Methods: A systematic review was conducted following PRISMA guidelines. Five databases (Google Scholar, Lens, PubMed, ResearchGate, and Semantic Scholar) were searched for open-access publications on ML-based stroke prediction published between January 2013 and December 2024. Data were extracted on publication characteristics, datasets, ML

methodologies, evaluation metrics, prediction targets (stroke occurrence vs. outcomes), data sources (EHR, imaging, biosignals), patient demographics, and stroke prevalence. Descriptive synthesis was performed due to substantial heterogeneity precluding quantitative meta-analysis.; Results: Fifty-eight studies were included, with peak publication output in 2021 (21 articles). Studies targeted three main prediction objectives: stroke occurrence prediction (n = 52, 62.7 %), stroke outcome prediction (n = 19, 22.9 %), and stroke type classification (n = 12, 14.4 %). Data sources included electronic health records (n = 48, 57.8 %), medical imaging (n = 21, 25.3 %), and biosignals (n = 14, 16.9 %). Systematic analysis revealed ensemble methods consistently achieved highest accuracies for stroke occurrence prediction (range: 90.4-97.8 %), while deep learning excelled in imaging-based applications. African populations, despite highest stroke mortality rates globally, were represented in fewer than 4 studies.; Conclusion: ML techniques show promising results for stroke prediction. However, significant gaps exist in representation of high-risk populations and real-world clinical validation. Future research should prioritize population-specific model development and clinical implementation frameworks.

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13. **Association between dietary patterns, sleep disturbance and stroke: A large cross-sectional study in US adults**

Authors: Su, Kai;Dai, Yuwei;Yuan, Tianxiang;Yin, Qing;Wang, Dan and Yang, Li

Publication Date: 2025

Journal: Journal of Affective Disorders 390, pp. N.PAG

Abstract: Background: Sleep disturbance and stroke are closely linked to dietary patterns. But how nutritional patterns modulate the bidirectional relationship between sleep disturbance and stroke incidence remains to be investigated. This epidemiological investigation seeks to the tripartite associations among dietary patterns, sleep disturbance, and stroke of adults in united states. Methods: Our analysis included participants from the NHANES repositor during the 2005-2018 surveillance period. Healthy Eating Index (HEI)-2020 score, Alternate Mediterranean Diet Score (MED), and Dietary Approaches to Stop Hypertension Index (DASH) are three quantified scores, which rely on dietary data. To assess the relationships among dietary patterns, sleep disturbance, and stroke risk, we employed linear regression models, restricted cubic spline (RCS) analysis, mediation analyses, and weighted quartile sum (WQS) methods. Results: The findings of this study demonstrated that participants afflicted with stroke and/or sleep disturbance exhibited lower diet scores for three distinct dietary patterns when compared with those not experiencing stroke or sleep disturbance. Furthermore, the use of RCS models revealed a negative linear exposure-response gradient of diet quality scores in the odds of sleep disturbance and stroke. The WQS regression also demonstrated a beneficial impact of dietary composition on sleep disturbance and stroke, with high-quality protein, fish, nuts and fiber being the food groups that contributed most significantly to health across different dietary indices. Conclusion: Whichever dietary pattern is referred, low-quality diets are linked with a high odds of sleep disturbance and stroke. Changes in dietary composition are necessary to prevent sleep disturbance and stroke.

14. **Perceived barriers and facilitators to high-intensity gait training in stroke rehabilitation: A Delphi study**

Authors: Tapp, Annie;Griswold, David;Bent, Jennifer and Linder, Susan

Publication Date: 2025

Journal: Clinical Rehabilitation 39(10), pp. 1390–1401

Abstract: Objective: To identify common barriers and facilitators among physical therapists to implementing high-intensity gait training for patients post-stroke during inpatient rehabilitation. Design: A three-round Delphi study using free text responses and five-point Likert scales for agreement. Participants: 60 physical therapists with expertise treating patients with stroke in inpatient rehabilitation were invited. 33 participants completed all three rounds of surveys. Main Measures: Round 1 consisted of two free text questions. Qualitative responses from round one were coded using the Theoretical Domains Framework and used to generate Likert scale survey items for rounds two and three. Consensus was defined a priori as ≥75% agreement. Response stability was evaluated with the Wilcoxon rank sum test. Results: Analysis identified 24 themes (12 facilitators, 12 barriers). Seven facilitators reached consensus: access to equipment (84.9%), built environment (78.8%), administrative support (78.8%), peer support (75.8%), team commitment to evidence-based practice (75.8%), high-intensity gait training-specific training (75.8%), and observable patient improvement (75.8%). Only one barrier reached consensus: treatment time interruptions (97.9%), including delays from toileting, hygiene, and medication administration. Other themes ranged from 18.2% to 57.6% agreement. No significant change in responses was found between rounds ($p > 0.05$). Conclusions: More facilitators than barriers reached consensus, with treatment time interruptions as the primary agreed-upon barrier. Despite knowledge of high-intensity gait training and supportive factors, fewer than half of participants reported daily use. Targeted implementation strategies addressing time and workflow disruptions are needed to increase high-intensity gait training adoption in inpatient rehabilitation.

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15. **Effects of walking training with and without a robot and standard care on clinical and mobility outcomes: A randomized clinical trial in acute ischemic stroke patients**

Authors: Tollár, József;Kóra, Szilvia;Széphelyi, Klaudia;Drotár, István;Prukner, Péter;Törő, Blanka;Prontvai, Nándor;Csutorás, Bence;Haidegger, Tamás and Hortobágyi, Tibor

Publication Date: 2025

Journal: Experimental Gerontology 210, pp. 112882

Abstract: Competing Interests: Declaration of competing interest The other authors declare no competing interests.; Background: Stroke incidence rises with age. A stroke can severely affect walking ability, requiring therapy. Robot-assisted walking therapy (ROB) has been advocated as one form of walking rehabilitation in stroke patients. However, its comparative efficacy remains controversial and three-group comparisons are scant. We compared the effects of ROB, walking training therapy without a robot (WTT) and standard treatment therapy (STT) on clinical and mobility outcomes in acute ischemic stroke patients.; Methods:

Individuals (n = 45, 71 % males, age 64.4y ±6.34), who have recently experienced an ischemic stroke, were randomized to ROB, WTT or STT. Clinical and mobility outcomes were assessed before and after each intervention (3 weeks, 5 sessions/week) and after 5 weeks of no-intervention follow-up.; Results: Outcomes did not differ between groups at baseline ($p > 0.05$). Modified Rankin Scale (primary outcome), improved ($p < 0.05$) after ROB and WTT vs. STT. These improvements were retained relative to baseline ($p < 0.05$) after follow-up. Barthel index, Berg Balance Scale, 10-m walking speed, the distance while walking with and without the robot for six minutes, and center pressure velocity in standing improved most after ROB (all $p < 0.001$), exceeding the changes after WTT which in turn were greater than the changes after STT ($p \leq 0.040$).; Conclusion: Older adults shortly after an ischemic stroke can quickly learn to walk with a soft robot and retain substantial clinical and mobility improvements at follow-up.

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16. **Enhancing stroke recovery assessment: A machine learning approach to real-world hand function analysis**

Authors: Ukey, Janmesh;Rogers, Christian;Uhlrich, Scott;Akcakaya, Murat and Sethi, Amit

Publication Date: 2025

Journal: International Journal of Medical Informatics 204, pp. N.PAG

Abstract: Background: Hand weakness is a major contributor to long-term disability in stroke survivors, severely affecting daily function and quality of life. Although wrist-worn accelerometers offer an objective means of measuring upper limb (UL) use in daily life, traditional metrics such as movement duration and interlimb ratios provide only limited insight. When combined with unsupervised clustering, these heuristic measures often fail to capture meaningful clinical differences as the groupings frequently show substantial overlap on clinical scales like the Action Research Arm Test (ARAT). Purpose: To develop a machine learning-based method for categorizing post-stroke upper limb performance from 24-hour accelerometer recordings in a way that aligns with clinically validated ARAT scores. Methods: This study analyzed continuous 24-hour triaxial accelerometer data to capture real-world upper limb movement. A deep neural network was applied to extract features directly from the raw data. These learned features were then used to categorize participants into five performance groups based on ARAT scores, aiming to better reflect clinically meaningful functional recovery. Results: The proposed method produced non-overlapping groupings of upper limb performance aligned with ARAT-defined categories. It achieved a classification accuracy of 97%, significantly outperforming models based on demographics and heuristic accelerometry features, which reached only 66%. Conclusion: This study presents a machine learning framework that accurately classifies clinically relevant real-world upper limb function using accelerometer data. This approach offers a more precise and objective assessment of post-stroke hand use, with potential to support personalized rehabilitation planning and outcome monitoring.

17. **Endovascular therapy versus best medical care for acute ischemic stroke with distal medium vessel occlusion: a systematic review and meta-analysis**

Authors: Wang, Ziyue;Li, Jiacheng;Kong, Qianqian;Yan, Hao;Zhang, Yi;Zhou, Xirui;Yu, Zhiyuan;Huang, Hao and Luo, Xiang

Publication Date: 2025

Journal: Annals of Medicine 57(1), pp. 2447407

Abstract: Background: With the refinement of catheter technology, distal medium vessel occlusions (DMVOs) are now viewed as amenable to endovascular treatment (EVT) but its efficacy and safety remains unclear in AIS patients with DMVO.; Methods: We conducted a systematic search of PubMed, Embase databases and Cochrane Library up to December 2023 using keywords to identify studies comparing EVT versus BMT in AIS with DMVOs. The assessed clinical outcomes were excellent functional outcome, good functional outcome, 90-day mortality, symptomatic intracranial hemorrhage (sICH), and early neurological improvement (ENI) after treatment.; Results: Overall, 31 studies were included. There were no significant differences in excellent functional outcome (OR: 1.21, 95% CI: 0.99-1.47), good functional outcome (OR: 1.03, 95% CI: 0.82-1.30) and 90-day mortality (OR: 1.17, 95% CI: 0.84-1.62). Additionally, EVT led to higher sICH (OR: 1.64, 95% CI: 1.09-2.47) and better ENI (OR: 1.50, 95% CI: 1.02-2.19) compared to BMT. In individuals with M2 occlusion receiving EVT showed better excellent functional outcomes (OR: 1.48, 95% CI: 1.07-2.03). Those patients with PCA occlusion showed no significant difference in functional outcomes. In individuals with ACA occlusion, EVT resulted in reduced functional independence (OR: 0.55, 95% CI: 0.31-0.98). For NIHSS < 6, BMT achieved better functional independence compared to EVT (OR: 0.71, 95% CI: 0.51-0.98) and EVT showed higher sICH (OR: 3.44, 95% CI: 1.42-8.31).; Conclusion: For patients with AIS and DMVO occlusion, EVT fails to improve functional prognosis while increasing sICH incidence. More randomized controlled trials are needed in the future to confirm these results.

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18. **Research progress in the use of botulinum toxin type a for post-stroke spasticity rehabilitation: a narrative review**

Authors: Xu, Qianwen;Xiao, Hongbo;Zhu, Zongjun;Guan, Yuanyuan and Wang, Ya

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Abstract: Background: Stroke is a leading cause of long-term disability and death worldwide. Spasticity after stroke seriously affects patients' quality of life. If this state persists for a long time, it will lead to severe joint atrophy, reduced motor coordination, and even permanent disability. Therefore, clinical research has focused on the treatment of spasticity and the recovery of motor function after stroke.; Aim: The aim of this paper is to explore the use of botulinum toxin type A in the rehabilitation of spasticity after stroke and to provide a theoretical basis for optimizing rehabilitation strategies, highlighting its potential value in reducing spasticity and improving motor function.; Method: This article reviews the latest research

progress on the application of BTX-A in spasticity after stroke, discusses the potential and challenges of BTX-A in reducing spasticity and improving motor function in patients with stroke.; Result: Botulinum toxin type A (BTX-A) is a local muscle paralytic agent that has received extensive attention in recent years for its application in reducing muscle spasticity and promoting post-stroke rehabilitation.; Conclusion: This article confirms that botulinum toxin type A has a significant clinical effect in treating muscle spasticity after stroke and also helps improve motor function restoration in patients. Studies have shown that botulinum toxin type A injections are effective in reducing spasticity and, when combined with rehabilitation training, can facilitate the recovery of motor function in post-stroke patients. Therefore, botulinum toxin type A has a broad application prospect in the rehabilitation of post-stroke spasticity.

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19. **Stroke patients with obstructive sleep Apnea: Risk of cardiovascular diseases - A systematic review and meta-analysis**

Authors: Yang, Yuxin;Pan, Yourang;Cao, Feng;Chen, Hua and Wang, Lu

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Journal: Sleep Medicine 134, pp. N.PAG

Abstract: Background: There exists a significant pathogenic and epidemiological overlap among stroke, obstructive sleep apnea (OSA), and cardiovascular disease. This systematic review aimed to clarify the association between OSA and cardiovascular disease in stroke patients. Methods: The study protocol was prospectively registered with PROSPERO (registration number: CRD42024517766). A thorough literature search was conducted on February 6, 2024, across multiple databases including PubMed, Embase, Cochrane, and Web of Science. The search utilized a comprehensive set of keywords and their synonyms to identify relevant studies on obstructive sleep apnea (OSA), stroke, and cardiovascular disease (CVD), along with specific terms related to various cardiovascular conditions. Only observational studies reporting cardiovascular events in stroke patients, with and without OSA, were considered for inclusion. Quality assessment of the selected studies was performed using the Newcastle-Ottawa Scale and the Agency for Healthcare Research and Quality tool. Data synthesis and analysis were conducted using STATA 18.0, estimating pooled effect sizes via Odds Ratios and 95 % confidence intervals. Heterogeneity was assessed using the I2 statistic. Results: Fifteen studies, involving a total of 559,296 patients, met the eligibility criteria. The findings revealed that stroke patients with obstructive sleep apnea (OSA) exhibited a substantially higher risk of hypertension [2.26 (95 % CI: 1.71-2.97, P < 0.01)], arrhythmia [1.29 (95 % CI: 1.07-1.54, P < 0.01)], Coronary Artery Disease [1.28 (95 % CI: 1.08-1.52, P = 0.005)], heart failure [2.31 (95 % CI: 1.59-3.37, P < 0.01)], and vascular lesions [1.50 (95 % CI: 1.19-1.89, P < 0.01)]. However, the risk for other cardiovascular diseases did not exhibit a statistically significant increase. Conclusion: These results emphasize the increased susceptibility to cardiovascular diseases in stroke patients with coexisting obstructive sleep apnea (OSA). Timely identification and treatment of OSA in stroke patients could offer potential for reducing the risk of cardiovascular diseases and their related complications.

20. **Association between 24-hour blood pressure variability and mortality in acute ischemic stroke patients admitted in intensive care units: a MIMIC-IV study**

Authors: Yuan, Zhen;Zeng, Yunqing;Shi, Zhizhen;Chen, Aoli;Hou, Yangbo;Li, Guoyi and Cheng, Jiwei

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Journal: Blood Pressure 34(1), pp. 2507686

Abstract: Introduction: Acute ischaemic stroke (AIS) patients in the intensive care unit (ICU) face high mortality. This study examined the association between systolic blood pressure variability (SBPV), specifically average real variability (SBP-ARV), and short-term mortality in critically ill AIS patients.; Methods: We conducted a retrospective cohort study using the MIMIC-IV database. The primary outcomes were 28-day and 90-day all-cause mortality. Cox regression, Kaplan-Meier curves, restricted cubic spline (RCS) models, and subgroup analyses were used to assess associations.; Results: A total of 861 AIS patients were included. The 28-day and 90-day mortality rates were 20.9% and 23.3%, respectively. Higher SBP-ARV was independently associated with increased mortality. Compared with the lowest tertile, the highest tertile of SBP-ARV had significantly increased 28-day mortality (HR: 1.53; 95% CI: 1.03-2.27; p = 0.035). SBP-ARV as a continuous variable was also significantly associated with 28-day and 90-day mortality. RCS analysis showed that mortality risk increased when SBP-ARV exceeded 11.63.; Conclusion: Our findings suggest that elevated systolic blood pressure variability, particularly higher SBP-ARV within the first 24 h of ICU admission, is significantly associated with increased 28-day and 90-day mortality in AIS patients. SBP-ARV may serve as a valuable prognostic marker for risk stratification and early clinical intervention in critically ill stroke patients.