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Stroke

Current Awareness Bulletin

January 2026

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

1**. A clinical-AI correlation for integrating artificial intelligence into stroke care: a systematized literature review and practice framework**

Authors: Clares de Andrade, João Brainer;Carneiro, Thiago S.;Nunes Mendes, George N.;Nardari dos Santos, Joao Pedro and Lima, Jussie Correia

Publication Date: 2026

Journal: International Journal of Medical Informatics

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2. **Collaborative artificial intelligence for the diagnosis and management of acute ischemic stroke**

Authors: Fan, Zhiqiang;Chen, Qian;Lu, Wang;Yao, Zhu;Yang, Shijie;Zhao, Hongting and Cao, Hua

Publication Date: 2026

Journal: Annals of Medicine

Abstract: Background: Acute Ischemic Stroke (AIS) remains a critical global health challenge that requires continuous improvement in diagnostic strategies. Timely and accurate diagnosis is essential for effective reperfusion therapies such as intravenous thrombolysis and mechanical thrombectomy, whose clinical benefits rapidly diminish with treatment delays. Artificial Intelligence (AI) offers promising potential to enhance diagnostic accuracy and clinical

decision-making in AIS. However, data fragmentation and strict privacy regulations limit the development of robust AI systems. Objectives: We aim to provide a perspective-style review that explores how collaborative AI can reshape AIS diagnostics by overcoming data access barriers, fostering cross-institutional model development, and improving diagnostic equity.; Methods: We analysed current challenges in developing AIS-related AI tools, particularly the limitations caused by restricted data sharing across healthcare institutions. The study highlights collaborative AI approaches, such as federated learning and privacy-preserving computation, which enable decentralised model training while maintaining patient confidentiality. Relevant literature and recent developments in clinical AI collaboration were reviewed.; Results: Collaborative AI enables multiple institutions to contribute to model training without exposing raw patient data. This approach improves data diversity, model generalizability, and fairness across healthcare settings. Evidence from multi-centre studies suggests that collaborative AI frameworks can produce more accurate and ethically compliant diagnostic models compared to isolated development efforts.; Conclusions: Collaborative AI presents a transformative pathway for AIS management by balancing data utility and privacy protection. It supports the creation of trustworthy, scalable, and inclusive diagnostic systems. As healthcare systems increasingly adopt digital solutions, collaborative AI provides a foundation for equitable and privacy-conscious innovation in stroke care.

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3. **The impact of digital self-management programmes on stroke survivors: a systematic review of randomised controlled trials**

Authors: Guo, Weiwei;Soh, Kim Lam;Soh, Kim Geok and Saidi, Hasni Idayu

Publication Date: 2026

Journal: International Journal of Medical Informatics

Abstract: Purpose: To synthesise evidence on the effectiveness of digital self-management programmes for stroke survivors' health outcomes, self-efficacy, and quality of life.; Methods: Relevant English-language studies published between 2015 and 2025 were retrieved from PubMed, Embase, the Cochrane Library, Web of Science and Scopus databases. This systematic review was conducted in accordance with the PRISMA guidelines and registered with PROSPERO (CRD420251059348).Studies were included if they investigated digital self-management interventions for adult stroke survivors, with outcome measures including secondary prevention, self-efficacy, self-management ability, and quality of life. Study quality was assessed using the Cochrane Risk of Bias tool. Owing to substantial heterogeneity across digital platforms, intervention duration, and outcome measurement tools, a descriptive synthesis approach was adopted.; Results: A total of 12 randomised controlled trials (RCTs) involving 3,049 participants were included. Among these, all three studies assessing self-efficacy reported significant improvements in stroke survivors ($p < 0.05$), two out of three studies demonstrated enhanced self-management ability ($p < 0.05$), all six studies evaluating quality of life showed significant positive effects ($p < 0.05$), and all six studies assessing medication adherence reported improvement. However, effects on secondary prevention behaviours such as smoking, alcohol use, physical activity, and blood pressure control were inconsistent. Few studies assessed motor function or long-term outcomes. Intervention content, delivery platforms, and intensity varied widely.; Conclusion: Digital self-management

via technology shows positive impacts on self-efficacy, medication adherence, and quality of life in stroke survivors. The impact on motor rehabilitation remains unclear, indicating a need for further research. Digital self-management can enhance stroke survivors' self-efficacy and self-management abilities, promoting active rehabilitation. This intervention effectively improves medication adherence and quality of life but has limited impact on behaviour changes such as smoking cessation and alcohol reduction. It is important to consider integrating digital tools with conventional care while addressing patients' digital literacy and accessibility challenges. Further development and research are needed to evaluate the effects of digital self-management on stroke functional recovery and activity capacity.

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4. **Exploring people with stroke's perceptions of digital technologies in post-stroke rehabilitation – a qualitative study**

Authors: Hestetun-Mandrup, Ann;Hamre, Charlotta;Lund, Anne;Martinsen, Anne Catrine Trægde;He, Hong-Gu and Pikkarainen, Minna

Publication Date: 2026

Journal: Disability & Rehabilitation

Abstract: Purpose: Stroke survivors often report unmet rehabilitation needs. Digital care has become increasingly prevalent, but limited research has explored its role in stroke rehabilitation, particularly from perspectives of people with chronic stroke. This study aims to explore how people with stroke perceive the usage of digital technologies in post-stroke rehabilitation. Methods: A qualitative study was conducted from June 2022 to January 2023, encompassing semi-structured interviews with 17 stroke participants recruited from a Norwegian rehabilitation hospital. Reflexive thematic analysis was applied. Results: Two themes were generated 1) "Still digitally connected" Digitalisation and its impact on everyday life and rehabilitation services, and 2) "To bring people closer" The need for personal contact and responsibility in digital rehabilitation services. Participants continued using digital technologies in rehabilitation and recognised digital self-management tools as beneficial for exercising and gaining information in the stroke process. They used various technologies to stay connected to the rehabilitation network, such as video-consultations, apps and exergaming. Conclusions: This study highlights the importance of digital tools in managing the individuals' rehabilitation post-stroke. Digital technologies have the potential to deliver an interactive and person-centred rehabilitation service between healthcare professionals and people with stroke, but evaluation of technology use challenges after stroke is emphasised. IMPLICATIONS FOR REHABILITATION: People who have experienced a stroke often undergo an extensive rehabilitation process, and for some, using digital technologies can enhance the convenience of their rehabilitation and strengthen self-management during this process. The use of digital technologies can provide continued connection to their rehabilitation network, facilitate knowledge sharing and feedback, and document their rehabilitation progress. Insights from this study can be used in development of digital rehabilitation services, where a person-centred approach to needs and technology skills is essential.

5. **The effect of acupuncture treatment on sleep quality in post-stroke patients**

Authors: Kesiktaş, Nur;Kalaoğlu, Eser;Şirin Ahısha, Büşra;Günderci, Azad and Özarslan, Melek

Publication Date: 2026

Journal: Topics in Stroke Rehabilitation

Abstract: Background: Sleep problems are significant and common complications among patients who have experienced a stroke. Acupuncture is considered a potentially effective, low-risk, and cost-efficient therapeutic option for post-stroke insomnia.; Objectives: The aim of this study is to evaluate the effect of acupuncture therapy on sleep quality in patients experiencing insomnia in the early post-stroke period.; Methods: In this randomized, controlled, single-blind study, 70 ischemic stroke patients undergoing inpatient rehabilitation were included. Participants were randomly assigned to either the acupuncture group, which received acupuncture alongside standard rehabilitation, or the control group, which received standard rehabilitation alone. PSQI scores were evaluated at three time points: before treatment (baseline), at the end of treatment (week 4), and 4 weeks after the end of treatment (week 8).; Results: The acupuncture group showed significantly greater improvement in sleep quality compared to the control group. Significant differences were observed between the baseline PSQI scores and the PSQI scores at the 4th week in both the acupuncture and control groups ($p < 0.001$ and $p = 0.008$, respectively). The change between baseline and 8th-week PSQI scores was also significant ($p < 0.001$ for both groups). However, the decrease in PSQI scores was significantly greater in the acupuncture group compared to the control group. The addition of acupuncture therapy to standard rehabilitation resulted in a significant improvement in sleep quality. Additionally, baseline PSQI scores were found to correlate with the severity of depression.; Conclusions: This study suggests that acupuncture therapy can be an effective intervention for improving sleep quality in patients with early post-stroke insomnia.

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6. **Resistance training for gait rehabilitation in people with stroke. A systematic review and meta-analysis**

Authors: Lerín-Calvo, Alfredo;González-Carrasco, Enrique;Reina-Varona, Alvaro and Fernández-Pérez, Juan José

Publication Date: 2026

Journal: Disability & Rehabilitation

Abstract: Background and Purpose: Stroke is a leading cause of long-term disability, significantly impacts gait and mobility. Resistance training (RT) has shown promise in improving gait parameters, but the evidence remains mixed. Our aim was to assess the effectiveness of RT on walking function in people with stroke (PwS). Methods: A

comprehensive database search was conducted in June 2025 to find Randomized Controlled Trials (RCTs) on RT's effect on gait in PwS. Key search terms were: "resistance training", "stroke", and "gait". Included studies involved PwS with gait issues, comparing RT to controls examined walking speed and endurance. The review followed PRISMA guidelines and was registered in PROSPERO (ID: CRD42024505882). Results: Of 2341 studies, 12 RCTs in the meta-analysis. Results showed a significant improvement in comfortable walking speed (0.082 m/s, 95% CI 0.005, 0.160]) with RT. No significant changes in fast walking speed (0.040 m/s, 95% CI -0.041, 0.12 identified, 20 1]) or walking endurance (24,044 meters, 95% CI -0.685, 48.772]). Conclusions: Findings suggest RT can improve comfortable walking speed in PwS, but not fast speed or endurance. Variations in protocols and study designs may cause mixed results. Future research should standardize RT to optimize rehabilitation. IMPLICATIONS FOR REHABILITATION: Stroke is a leading cause of long-term disability, frequently resulting in gait impairments that limit mobility and independence. Resistance training (RT) shows potential for improving comfortable walking speed in people with stroke (PwS), although its effects on fast walking speed and endurance remain inconclusive. Future rehabilitation strategies should integrate RT with other training modalities to address multiple facets of gait and mobility in PwS.

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7. **Machine learning in stroke and its sequelae: a narrative review of clinical applications and emerging trends**

Authors: Liu, Hengjun;Meng, Tianwei and Qie, Rui

Publication Date: 2026

Journal: International Journal of Medical Informatics

Abstract: Objective: This narrative review synthesizes machine learning (ML) applications across the stroke and post-stroke continuum from acute imaging and diagnosis to long-term sequelae prognosis and rehabilitation.; Method: We searched PubMed, Embase, and WOS from inception to October 17, 2025, for a comprehensive review. We used a combination of search terms, including "machine learning," "deep learning," "post stroke." These terms were carefully selected to capture a wide range of relevant studies and articles related to stroke and ML.; Results: ML has been successfully deployed in six core domains: Image reading, where deep learning enables automated lesion segmentation on MRI/CT and prediction of tissue fate; Diagnosis, including etiology, atrial fibrillation screening; Overall prognosis, with high-accuracy models for functional outcome, mortality, and readmission; Sequelae prediction, such as cognitive impairment, motor dysfunction, aphasia, depression, fatigue, and organ diseases; Treatment response, including outcome prediction after thrombectomy and rehabilitation; Rehabilitation monitoring, using wearable sensors and robotics for objective, granular assessment of motor recovery. A clear trend toward multimodal data integration and model interpretability was observed, enhancing both predictive power and biological plausibility.; Conclusion: ML has evolved from a research tool into a transformative force in stroke care, enabling precise, individualized prediction and monitoring across the entire post-stroke trajectory. Future efforts must prioritize prospective validation, standardized reporting, and seamless integration into clinical workflows to realize its full potential for precision medicine.

8. **Stroke as a chronic health condition: a case for continued care**

Authors: Masel, Brent E.;Ashley, Mark J.;Howell, Stefanie N. and Griesbach, Grace S.

Publication Date: 2026

Journal: Brain Injury

Abstract: Background: Stroke affects multiple systems, resulting in new and lasting morbidities that impact life quality. Nevertheless, the health care industry approaches stroke as an acute transient event, with access to treatments limited by money, rather than the patient's recovery potential. Proper monitoring and treatment during the chronic period can decrease consequential disability and costs. Objective: We will present the disparity between stroke as a chronic health condition and the treatment limitations placed by the health care industry. The overall objective is to emphasize the need for a paradigm shift in post-stroke management with the realization that monitoring and treatments beyond the subacute period have not only a rationale but a potential therapeutic benefit on optimizing long-term recovery. Methods: Literature searches utilizing PubMed, Health Services Research and Google Scholar were performed to highlight health care limitations and present the main medical complications and concerns that are frequently reported during the chronic stroke period. Conclusions: Stroke is disease causative and disease accelerative. The importance of forward-looking comprehensive management guided by patient progress is key to mitigating stroke's impact and the cost to healthcare systems and society.

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9. **The effectiveness of physiotherapy sitting balance treatments on sitting balance outcomes in early sub-acute stroke. A systematic review and meta-analysis**

Authors: Rayner, Rebecca Louise;Walker, Kelly;Stephenson, John;Verheyden, Geert;Hancock, Nicola J. and Hartley-Palmer, Joseph

Publication Date: 2026

Journal: Physiotherapy

Abstract: Background: Difficulties with sitting balance are common after stroke. The ability to sit unsupported is imperative for many daily tasks and correlated to more positive outcomes. There is limited research on "sitting balance" therapeutic interventions and their impact. This systematic review and meta-analysis aims to investigate the effectiveness of physiotherapy sitting balance treatments on sitting balance outcomes in people up to 3-months post-stroke.; Methods: The PRISMA checklist was followed and the review registered on PROSPERO. Seven electronic databases were searched to October 2023 (updated in January 2025) for studies comparing treatments focussing on sitting balance in adults who had suffered a cerebral stroke in the last three months. Studies were included if treatment was predominantly completed in sitting postures and reported sitting balance outcomes. Studies were assessed for eligibility, and data extraction and risk of bias was completed by two independent

reviewers.; Results: Data from 16 studies (623 participants) was synthesised narratively. Sitting balance interventions were classified into four main categories: weight shift and reaching; core stability exercises; environmental modifications; and task practice. A random effects meta-analysis conducted on eight studies (342 participants) revealed interventions to be beneficial for sitting balance (primary outcome: mean difference Trunk Impairment Scale 3.02; 95% confidence interval 2.19 to 3.86). Four studies demonstrated low risk of bias; and four showed some concerns.; Conclusions: The current sitting balance treatments offered to early sub-acute stroke patients show significant improvements in sitting balance primary outcome. Sitting balance treatments can be categorised into four sub-types, helping to standardise clinical application and ensure consistency in future research.; Systematic Review Registration Number: PROSPERO CRD42023444050. CONTRIBUTION OF THE PAPER.

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10. **Long-Term Recovery, Morbidity, and Mortality After Maternal Ischemic Stroke**

Authors: Richardt, Anna;Verho, Liisa;Rantanen, Kirsi K.;Korhonen, Aino;Laivuori, Hannele;Tikkanen, Minna;Gissler, Mika;Aarnio, Karoliina and Ijäs, Petra Hannele

Publication Date: 2026

Journal: Neurology

Abstract: Background and Objectives: The long-term prognosis after maternal ischemic stroke (IS) remains understudied. The objectives were to examine if mortality and long-term morbidity are more frequent in women with prior maternal IS compared with women without a pregnancy-related stroke and to assess recovery in maternal IS patients based on functional outcomes and vocational status.; Methods: In this retrospective nationwide cohort study, maternal IS patients in Finland during years 1987-2016 were identified from national healthcare registers and verified from patient records. Three pregnant controls without a pregnancy-related stroke were selected for each case and matched by delivery year, age, parity, and geographical area. Deaths were acquired from the Causes-Of-Death Register until 2022. Morbidities (cardiovascular diseases and depression) were collected from Hospital Discharge Register and vocational status from Statistics Finland until 2016 for those who survived ≥1 year after stroke. Functional outcomes by modified Rankin scale (mRS) were estimated from patient records.; Results: There were 97 women with maternal IS, of whom 92 survived ≥1 year after stroke, and 265 matched controls (median age 30.6 years at index delivery in both groups). The median follow-up time was 17.4 years for mortality and 11.6 years for morbidity and vocational status. The overall mortality was higher in maternal IS patients than controls (8.3% vs 1.8%, age-adjusted odds ratio aOR] 4.96, 95% CI 1.58-15.60) but did not differ significantly after the first year. There were 5 (5.6%) recurrent strokes in maternal IS patients. Patients had more frequently major cardiovascular events (6.7% vs 0%, $p < 0.001$), cardiac diseases (aOR 8.57, 95% CI 2.22-33.08), and depression (aOR 3.92, 95% CI 1.86-8.24) than controls. Of the patients who survived until the end of follow-up, 92.1% had good functional outcomes (mRS 0-2). Still, employment was rarer (aOR 0.55, 95% CI 0.32-0.94) and retirement (aOR 4.55, 95% CI 2.03-10.17) more common in maternal IS patients than controls.; Discussion: Maternal IS patients had a significant cardiovascular burden and were retired more often than controls at the end of follow-up, although most patients had good

functional outcomes. Optimizing long-term prognosis in these young patients necessitates comprehensive management of vascular risk factors and targeted rehabilitation strategies to address residual neurologic deficits.

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11. **Canadian Stroke Best Practice Recommendations Rehabilitation, Recovery, and Community Participation Following Stroke, Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery, 7th Edition Update 2025**

Authors: Salbach, Nancy M.;Yao, Jennifer K.;Lindsay, M. P.;Nelson, Michelle L. A.;Shi, Jing;O'Connell, Colleen;Barclay, Ruth;Bastasi, Diana;Boulos, Mark I.;Boyce, Joy;Claveau, Geneviève;Flowers, Heather L.;Foley, Norine;Gopaul, Urvashy;Kim, Esther S.;Lo, Alto;McDonald, Alison M.;McIntyre, Amanda;O'Connor, Colleen and Patterson, Kara K.

Publication Date: 2026

Journal: American Journal of Physical Medicine & Rehabilitation

Abstract: The Canadian Stroke Best Practice Recommendations 7th edition update of the Rehabilitation, Recovery and Community Participation module is presented in three parts. This publication, Part Two of the series, reflects the growing and changing body of research evidence available to guide direct stroke rehabilitation therapies, screening, assessment, interventions, and strategies. Topics in this module include rehabilitation of upper and lower extremity, aerobic function, balance, mobility, activities of daily living, spasticity, fall risk, communication, dysphagia, nutrition, central pain, visual and visual-perceptual issues, and bladder and bowel function. This module provides guidance in the delivery of coordinated and seamless systems of care that support timely access to rehabilitation therapies, building on progress achieved during initial recovery, enabling people to achieve as much independence as possible and successfully resume social roles and leisure activities. Successful recovery, transitions and community participation require integrated and coordinated people-centered efforts by all members of care teams involved, and the broader community. These recommendations were developed with active involvement of people with lived experience of stroke throughout the care continuum. Evidence for effective rehabilitation therapies and support for individuals with stroke and their families continues to emerge and gaps in knowledge should drive future research.

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12. **Construction and verification of a nomogram model for predicting the risk of post-stroke spasticity: a retrospective study**

Authors: Xie, Qian;Zhu, Jingling;Cheng, Xuanling;Deng, Jianling;Song, Qing;Xue, Aiguo and Luo, Shuxiong

Publication Date: 2026

Journal: Annals of Medicine

Abstract: Results: LASSO-logistic regression analysis identified seven predictors associated

with PSS: C-reactive protein, albumin, creatine kinase, fasting blood glucose, hyperlipidemia, sleep disorders, and manual muscle testing (MMT) score at admission. The model had an area under the curve (AUC) of 0.844 (95% CI: 0.793-0.896) in the training set and 0.842 (95% CI: 0.765-0.920) in the validation set, which means it was good at making predictions. The calibration curves showed excellent agreement between predicted and observed probabilities in the training set. Good calibration was maintained in the validation set, indicating only minimal overestimation of risk. DCA and CIC both agreed that the nomogram model could be used in a wide range of therapeutic situations.; Conclusion: The nomogram based on routine clinical data in this study, after internal validation, can effectively predict the risk of PSS and provides a practical decision-making tool for clinicians. However, future multi-centre external validation is still required to confirm its broad applicability.

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13. **Solution-focused brief therapy combined with mindfulness-based cognitive therapy for post-stroke depression: a randomized controlled trial**

Authors: Xiong, Juan;Lin, Yan;Mao, Zhen Zhu;Luo, Wen Qin and Hu, Min

Publication Date: 2026

Journal: Topics in Stroke Rehabilitation

Abstract: Objective: To evaluate the efficacy of integrating Solution-Focused Brief Therapy (SFBT) and Mindfulness-Based Cognitive Therapy (MBCT) in alleviating psychological distress and improving functional outcomes in patients with post-stroke depression (PSD).; Methods: A controlled study enrolled 60 PSD patients from a tertiary hospital in Jiangxi. Participants were allocated to a control group (n = 29) or an intervention group (n = 27). Primary and secondary outcomes were assessed using the Hamilton Depression Rating Scale-17 (HAMD-17), Hamilton Anxiety Scale (HAMA), Five Facet Mindfulness Questionnaire (FFMQ), Stroke-Specific Quality of Life Scale (SS-QOL), and Barthel Index (BI). Data were analyzed using mixed linear models to examine group-by-time interactions.; Results: Mixed linear model analysis revealed significant group-by-time interaction effects favoring the intervention group across all outcomes: depression severity (HAMD-17: $F = 5.24$, $p < 0.001$), anxiety (HAMA: $F = 8.90$, $p < 0.05$), mindfulness (FFMQ: $F = 5.24$, $p < 0.05$), quality of life (SS-QOL: $F = 4.88$, $p < 0.005$), and functional independence (BI: $F = 6.12$, $p < 0.001$).; Conclusions: The combined SFBT-MBCT intervention significantly reduces depressive and anxiety symptoms while enhancing mindfulness, quality of life, and functional independence in PSD patients, demonstrating clinical value as an adjunct to routine post-stroke care.

14. **Electroacupuncture for the treatment of ischemic stroke: A preclinical meta-analysis and systematic review**

Authors: Yang, Guohui;Guan, Chong;Liu, Meixi;Lin, Yi;Xing, Ying;Feng, Yashuo;Li, Haozheng;Wu, Yi;Wang, Nianhong and Luo, Lu

Publication Date: 2026

Journal: Neural Regeneration Research

Abstract: Stroke remains a leading cause of death and disability worldwide, and electroacupuncture has a long history of use in stroke treatment. This meta-analysis and systematic review aimed to evaluate the efficacy of electroacupuncture and explore its potential mechanisms in animal models of ischemic stroke. The PubMed, EMBASE, Web of Science, CENTRAL, and CINAHL databases were comprehensively searched up to May 1, 2024. This review included articles on preclinical investigations of the efficacy and mechanisms of electroacupuncture in treating ischemic stroke. Data from 70 eligible studies were analyzed in Stata 18.0, using a random-effects model to calculate the standardized mean difference (Hedge's g). The risk of bias was assessed using RevMan 5.4 software, and the quality of evidence was rated according to the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system. Subgroup analyses were conducted to test the consistency of the results and sensitivity analyses were used to assess their robustness. The quality assessment revealed that most studies adequately handled incomplete data and selective reporting. However, several methodological limitations were identified: only 4 studies demonstrated a low risk of allocation concealment, 26 achieved a low risk of outcome assessment bias, and 9 had a high risk of randomization bias. Additionally, there was an unclear risk regarding participant blinding and other methodological aspects. The GRADE assessment rated 12 outcomes as moderate quality and 6 as low quality. The mechanisms of electroacupuncture treatment for ischemic stroke can be categorized as five primary pathways: (1) Electroacupuncture significantly reduced infarct volume and apoptotic cell death ($P < 0.01$) in ischemic stroke models; (2) electroacupuncture significantly decreased the levels of pro-inflammatory factors ($P < 0.01$) while increasing the levels of anti-inflammatory factors ($P = 0.02$); (3) electroacupuncture reduced the levels of oxidative stress indicators ($P < 0.01$) and enhanced the expression of antioxidant enzymes ($P < 0.01$); (4) electroacupuncture significantly promoted nerve regeneration ($P < 0.01$); and (5) electroacupuncture influenced blood flow remodeling ($P < 0.01$) and angiogenesis ($P < 0.01$). Subgroup analyses indicated that electroacupuncture was most effective in the transient middle cerebral artery occlusion model ($P < 0.01$) and in post-middle cerebral artery occlusion intervention ($P < 0.01$). Dispersive waves were found to outperform continuous waves with respect to neuroprotection and anti-inflammatory effects ($P < 0.01$), while scalp acupoints demonstrated greater efficacy than body acupoints ($P < 0.01$). The heterogeneity among the included studies was minimal, and sensitivity analyses indicated stable results. Their methodological quality was generally satisfactory. In conclusion, electroacupuncture is effective in treating cerebral ischemia by modulating cell apoptosis, oxidative stress, inflammation, stroke-induced nerve regeneration, blood flow remodeling, and angiogenesis. The efficacy of electroacupuncture may be influenced by factors such as the middle cerebral artery occlusion model, the timing of intervention onset, waveform, and acupoint selection. Despite the moderate to low quality of evidence, these findings suggest that electroacupuncture has clinical potential for improving

outcomes in ischemic stroke. (Copyright © 2025 Neural Regeneration Research.)

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15. **The mechanism of electroacupuncture treatment for post-stroke spasticity: A systematic review and Meta-analysis**

Authors: You, Lei;Hu, Mengwan;Li, Jingang;Tan, Jiahui;Guo, Fengmin and Kong, Ying

Publication Date: 2026

Journal: Behavioural Brain Research

Abstract: Objective: This study assesses whether electroacupuncture (EA) is an effective treatment for post-stroke spasticity (PSS) and examines the mechanisms by which it modulates PSS. Clinical and mechanistic evidence are analyzed to clarify its therapeutic value and biological basis.; Methods: A literature search was conducted in databases including PubMed, Web of Science (WOS), Embase, Medline and SinoMed. The quality was evaluated by the Systematic Review Centre for Laboratory Animal Experimentation (SYRCLE) bias risk assessment tool and Collaborative Approach to Meta-analysis and Review of Animal Data from Experimental Studies (CAMARADES) checklist. Meta-analyses were performed using Stata 15.0 and Rstudio software.; Results: Twenty studies involving 388 animals were included, with quality scores ranging from 4 to 8 (mean: 6.1). Zea Longa and Modified Ashworth Scale (MAS) were selected as primary outcomes, while secondary outcomes included Bederson score, electrophysiological tracing, balance beam walking, cerebral water content, cerebral infarction degree, Interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α), malondialdehyde (MDA), gamma-aminobutyric acid (GABA), glutamate (Glu), gamma-aminobutyric acid transaminase (GABA-T), glutamate decarboxylase 67 (GAD67), brain-derived neurotrophic factor (BDNF), tropomyosin receptor kinase B (TrkB), BDNF messenger RNA (BDNF mRNA), TrkB messenger RNA (TrkB mRNA), glutathione (GSH), solute carrier family 7 member 11 (SLC7A11), glutathione peroxidase 4 (GPX4), SLC7A11 messenger RNA (SLC7A11 mRNA), and GPX4 messenger RNA (GPX4 mRNA).Meta-analysis demonstrated significant improvements in primary outcomes: Zea Longa score MD = -1.05, 95 % CI (-1.30, -0.80), P < 0.001], MAS score: MD = -1.06, 95 % CI (-1.43, -0.69), P < 0.001]. EA therapy demonstrated significant efficacy in enhancing neurological recovery, alleviating limb spasticity, and improving postural balance. Furthermore, it effectively reduced cerebral infarct volume, mitigated cerebral edema severity, and modulated biochemical markers by decreasing serum levels of IL-6, TNF-α, MDA, Glu, and GABA-T (P < 0.05). Concurrently, therapeutic intervention upregulated multiple neuroprotective indicators including GSH, GABA, SLC7A11 mRNA, GPX4 (with its mRNA expression), GAD67, BDNF, TrkB (and its mRNA), along with enhancing GPX4 activity (P < 0.05). Heterogeneity analysis revealed publication bias in MAS assessments, while heterogeneity in intervention protocols (waveform parameters, acupoint selection, or treatment duration) potentially contributed to elevated heterogeneity across other outcome measures.; Conclusion: EA modulates neurotransmitter levels and associated enzymatic, while concurrently suppressing microglia-mediated neuroinflammatory responses. This intervention mitigates oxidative stress byproducts, maintains tissue redox homeostasis, and enhances synaptic plasticity while promoting neuronal development. Collectively, our findings underscore EA's therapeutic potential in PSS management, necessitating further

mechanistic investigations and optimization of clinical protocols.

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16. **Comparison of the effects of acupuncture and drug treatment for central post-stroke pain: A systematic review and network meta-analysis of randomized trials**

Authors: Zhang, Chun;Wu, Zhiping;Fan, Wenjing;Wei, Wei;Mutallip, Mihriya;Yang, Shuqun;Zhao, Wangyang;Sun, Yu and Chen, Xin

Publication Date: 2026

Journal: Behavioural Brain Research

Abstract: Background and Purpose: Central post-stroke pain (CPSP), a chronic neuropathic pain syndrome severely impairing quality of life, has no established optimal therapy, though randomized controlled trials have evaluated the effects of drug therapy, acupuncture, and their combination.; Methods: The primary outcomes were pain scores and the number of adverse reactions. The primary analyses involved network plotting to illustrate the structure of the network with P-scores to encapsulate the ranking of interventions. Results were obtained through direct comparisons within studies and indirect comparisons across studies. The Cochrane tool (ROB 2.0) was utilized to evaluate risk of bias.; Results: Bayesian ranking identified Xingnao Kaiqiao acupuncture combined with pregabalin (82.47 %) as the most effective, followed by carbamazepine with gabapentin (80.9 %), Xingnao Kaiqiao acupuncture (79.31 %), Tiaoshen Zhitong acupuncture (72.69 %) and pregabalin (69.2 %). Based on direct and indirect evidence from the NMA, Xingnao Kaiqiao acupuncture combined with pregabalin showed the greatest efficacy compared to placebo (-2.68, 95 % CI: -5.29 to -0.14). Tiaoshen Zhitong acupuncture outperformed carbamazepine (-1.74, 95 % CI: -3.20 to -0.23) and placebo (-2.06, 95 % CI: -4.05 to -0.03), while pregabalin demonstrated superior analgesic effects compared to carbamazepine (-1.54, 95 % CI: -2.40 to -0.64), gabapentin (-1.49, 95 % CI: -2.45 to -0.51), and placebo (-1.86, 95 % CI: -3.21 to -0.53).; Conclusion: For CPSP treatment, Xingnao Kaiqiao acupuncture combined with pregabalin was most effective, followed by Xingnao Kaiqiao acupuncture, Tiaoshen Zhitong acupuncture, and pregabalin. Treatment strategies may vary regionally; however, combining Xingnao Kaiqiao acupuncture with pregabalin could represent the most effective approach, providing clinical recommendations. (Copyright © 2025. Published by Elsevier B.V.)

17. **Relationship between social determinants of health and stroke, and the moderating and mediating effect of depression**

Authors: Zhang, YongYing;Zhang, Bin;Zhuang, Honghua and Yin, Yushan

Publication Date: 2026

Journal: Journal of Affective Disorders

Abstract: Background: Adverse social determinants of health (SDoH) and depression are risk factors for stroke, but whether depression mediates the link between SDoH and stroke remains unclarified. This study utilized NHANES data to characterize the link between SDoH and stroke, as well as the moderating and mediating roles of depression in this link.; Methods: This research analyzed NHANES data from 2005 to 2018. First, weighted logistic regression and subgroup analyses were implemented to study the link between SDoH and stroke. Weighted logistic regression and restricted cubic spline (RCS) analyses were utilized to discuss the potential nonlinear link between depression scores and stroke. The moderating and mediating effects of depressive factors on stroke occurrence were systematically examined.; Results: This paper enrolled 26,386 eligible participants, including 955 stroke patients. Compared with the low-SDoH burden group, the high-SDoH burden group exhibited a positive link with stroke (OR: 1.532, 95 % CI: 1.194-1.966). Participants with depression had a markedly higher stroke risk than participants without depression (OR: 1.832, 95 % CI: 1.393-2.410). RCS analysis revealed a marked nonlinear positive link between depression scores and stroke risk (p for nonlinear = 0.023). In the population without depression, SDoH was prominently associated with stroke. The mediating effect of depression with a mediation proportion of 11.15 % (p < 0.001).; Conclusion: A positive correlation exists between SDoH and stroke, with depression playing a moderating and mediating role. Depression and SDoH should be considered jointly when developing targeted stroke prevention intervention strategies. Future large-scale cohort studies and clinical trials are warranted for validation.

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18. **The effects of exercise modality and dose on improving executive function in stroke patients: A systematic review and Bayesian network dose-response meta-analysis**

Authors: Zheng, Shaoqi;Pan, Qiuxue and Chen, Liping

Publication Date: 2026

Journal: Archives of Gerontology & Geriatrics

Abstract: • A Bayesian network meta-analysis revealed a non-linear dose–response between exercise and executive function in stroke patients. • The peak cognitive benefit occurred at an optimal weekly dose of ∼1000 MET-minutes, forming an inverted U-shaped curve. • Exercise combined with cognitive training showed stable, significant effects across a broad dose range. • Moderate-dose exercise may enhance prefrontal activation and neuroplasticity, while excessive doses reduce gains. • Findings support precision rehabilitation by prescribing individualized optimal-dose, dual-task training programs. This Bayesian network meta-analysis

examined exercise effects on executive function in stroke patients, exploring dose-response relationships and comparing the efficacy of different modalities to identify the optimal rehabilitation protocol. A systematic search was conducted in PubMed, Embase, the Cochrane Library, Web of Science, and SPORTDiscus from inception to September 15, 2025. Twenty randomized controlled trials (RCTs) were included. Study quality was assessed using the PEDro scale. A Bayesian random-effects network meta-regression model examined the nonlinear dose–response relationship between exercise dosage (in Metabolic Equivalent of Task-minutes, MET-mins) and executive function, with heterogeneity, publication bias, and model robustness evaluated. The analysis demonstrated a significant inverted U-shaped relationship between weekly exercise dose and improvements in executive function, with the peak effect occurring at approximately 1000 MET-minutes per week (mean effect size = 0.65, 95 % credible interval: 0.34–1.00). Among different exercise modalities, exercise combined with cognitive training showed the most favorable and consistent association across a broad weekly dose range (approximately 170–1000 MET-minutes). Multicomponent exercise exhibited apparent benefits only at higher weekly doses (around 890–1000 MET-minutes), though with greater statistical uncertainty, whereas other modalities did not demonstrate clear or consistent effects. The association between exercise and executive function in stroke patients appears to follow an optimal weekly dose (∼1000 MET-minutes) rather than a maximal one. Exercise combined with cognitive training provides synergistic, stable benefits within this range. These findings offer moderate-quality evidence to guide individualized rehabilitation that optimizes cognitive recovery and improves quality of life after stroke.

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19. **Mode of nutrition as a reflection of swallowing ability in acute and sub-acute stroke: Validation of a bedside tool**

Authors: Wilkinson, G; Everton L F; Mphil K K; et al

Publication Date: 2025

Journal: Journal of Stroke and Cerebrovascular Diseases

Abstract : Background: The Feeding Status Scale (FSS) is a 7-point scale based on mode of nutrition in patients with swallowing impairment: normal diet, soft-diet, nasogastric-tube feeding, percutaneous endoscopic gastrostomy tube-feeding, parenteral fluids, no fluids/food and death. We assessed whether the FSS is a valid and reliable scale of feeding status.

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20. **Swallowing dysfunction in stroke: the role of nurses and rehabilitation strategies across recovery phases**

Authors: Ruqing, Z; Qin D

Publication Date: 2025

Journal: Rehabilitation Nursing Journal

In a nutshell: This review explores the role of nurses in the assessment, care, management and rehabilitation of swallowing disorders in stroke patients. The authors highlight the importance of interdisciplinary collaboration and use of emerging technologies to for personalised care.

21. **Treatment of apathy in stroke patients. A systematic review**

Authors: Ruiz-Franco, Maria Luisa; Amaya-Pascasio, Laura; Gil-Rodríguez, Mercedes; et al

Publication Date: 2025

Journal: Frontiers

In a nutshell: This article reviews the current evidence on therapies (pharmacological and non-pharmacological) for post-stroke apathy, a neuropsychiatric syndrome reported in up to one-third of stroke survivors. The findings suggest several interventions, including escitalopram, donepezil, motor relearning programs, strategy training, and rTMS, have demonstrated potential effectiveness in treating post-stroke apathy. However, the authors refer to the scarcity of evidence and heterogeneity of trials.

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22. **Evaluating the effectiveness of different prescriptions of sit-to-stand training in post-stroke rehabilitation: A systematic review and meta-analysis**

Author: Josop, Nancy Anne; Mohd Nordin, Nor Azlin;

Publication Date: 2025

Journal: Medicine

In a nutshell: The aim of this review was to examine the current evidence on different the prescriptions of sit-to-stand (STS) training and its effects on physical and functional outcomes in post-stroke survivors compared to conventional rehabilitation. 10 randomised controlled trials were included in the review with a combined total of 384 adults. Findings suggest STS training enhances balance and functional mobility when compared to conventional rehabilitation.

Sources Used:

A number of different databases and websites are used in the creation of this bulletin.

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