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Stroke

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September 2026

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1. **C-reactive protein as a universal prognosticator in hemorrhagic stroke: a meta-analysis of intracerebral and aneurysmal subarachnoid hemorrhage**

Authors: Juan, Chung-Hau;Lin, Chen;Su, Zhaoyin;Zhao, Jiarui;Liu, Yuqi;Chang, Hsiao-Cheng;Mo, Yifan;Liao, Shanhui;Zhang, Liang;Lin, Rubing and Ding, Daowei

Publication Date: 2027

Journal: Clinica Chimica Acta; International Journal of Clinical Chemistry 592, pp. 121201

Abstract: Background Systemic inflammatory response plays a pivotal role in secondary brain injury following hemorrhagic stroke, including spontaneous intracerebral hemorrhage (ICH) and aneurysmal subarachnoid hemorrhage (SAH). C-reactive protein (CRP) is a widely used biomarker of inflammation; however, a comprehensive meta-analysis directly comparing its prognostic utility across both major hemorrhagic stroke subtypes is lacking. This study aimed to quantitatively assess the common prognostic value of admission CRP levels for poor outcomes in patients with ICH and SAH. Methods Following PRISMA guidelines (PROSPERO: CRD42024510967), we systematically searched four databases up to January 1, 2026, for observational studies assessing CRP's association with outcomes in spontaneous ICH or SAH. Two investigators independently performed data extraction and quality assessment using the Newcastle-Ottawa Scale (NOS). Random-effects models were used to pool odds ratios (ORs) with 95% CIs. Prespecified subgroup analyses (hemorrhage type, geographic area, statistical model, etc.) and sensitivity analyses were conducted to explore heterogeneity and assess

robustness. Publication bias was assessed using a funnel plot and Egger's test. Results Meta-analysis of 30 studies (n = 17,103) showed elevated CRP increased poor outcomes (OR = 1.22, 95% CI 1.12-1.32, P < 0.001). Associations were consistent across ICH/SAH, regions, and follow-up times, etc. CRP increased risks of functional disability, mortality, DCI, and CVS. The link with OS and DIND warrants caution (n = 2 studies). Effect sizes were higher in multivariate models (P for interaction = 0.0013). While significant in single-center studies, the association was non-significant in multicenter studies (OR = 1.46, 95% CI 0.87-2.47). Sensitivity analysis confirmed stability, with Egger's test suggesting small-study effects. Conclusion Elevated admission CRP levels serve as a common and robust predictor of poor prognosis in both ICH and SAH patients. The consistency of this association across different hemorrhagic phenotypes underscores the universal impact of inflammation on secondary injury. Given its low cost and wide availability, CRP could serve as a valuable supplement to existing clinical scoring systems for early risk stratification, although causality remains to be established in future prospective studies.

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2. **Obstructive Sleep Apnea in Stroke Rehabilitation: A Physical Medicine and Rehabilitation Perspective**

Authors: Abdulsalam, Ahmad J.;Al-Hashel, Jasem;Abdulsalam, Mohammad and Özçakar, Levent

Publication Date: 2026

Journal: American Journal of Physical Medicine & Rehabilitation 105(10), pp. 971–981

Abstract: Obstructive sleep apnea (OSA) affects up to 70% of stroke survivors and is independently associated with poorer functional outcomes, stroke recurrence, and elevated mortality, yet remains systematically underdiagnosed in rehabilitation settings. This narrative review, conducted following SANRA guidelines using PubMed, Embase, CINAHL, and Web of Science through March 2026, examines the mechanisms by which OSA impairs stroke recovery and evaluates treatment evidence within the rehabilitation context. OSA disrupts neuroplasticity through intermittent hypoxia, fragments sleep architecture critical for motor consolidation, amplifies poststroke depression and fatigue, and curtails rehabilitation participation. Neuroimaging evidence suggests that OSA-related white matter damage is at least partially reversible with sustained CPAP therapy. CPAP reduces stroke recurrence risk and may improve cognitive and functional outcomes, though adherence remains challenging due to stroke-specific deficits. Oropharyngeal exercises represent a physiatrist-appropriate strategy that may simultaneously address OSA and dysphagia, while weight management and positional therapy offer additional modifiable targets. No PMR-specific OSA management pathway currently exists. This review argues that OSA management belongs within the clinical scope of PMR and proposes a physiatrist-led pathway from admission screening through discharge planning with tele-rehabilitation follow-up.

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3. **429 - Enhancing stroke rehabilitation through telerehabilitation and tDCS: physiotherapy-specific outcomes from a randomised controlled trial...Chartered Society of Physiotherapy (CSP) Annual Conference, November 20-22, 2025, Newport, Wales**

Authors: Adeniji, T.;Olagbegi, O.;Nadasan, T. and Dada, O.

Publication Date: 2026

Journal: Physiotherapy 132, pp. N.PAG

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4. **Association between stroke history, depression, and suicidal ideation: National health and nutrition examination survey, 2011-2018**

Authors: Akomaning, Edwin and Asaithambi, Ganesh

Publication Date: 2026

Journal: Clinical Neurology and Neurosurgery 271, pp. 109619

Abstract: Objective Stroke patients often have mental health comorbidities such as depression and suicidal ideation. Stroke is a leading cause of long-term disability and is associated with increased risk of death, with mental illness playing a large role in this relationship. However, the impact of stroke on suicidal ideation among individuals with co-morbid depression is not well understood. We aim to determine if stroke in combination with depression was associated with a higher prevalence and severity of suicidal ideation. Methods We performed a retrospective cross-sectional study using data from the National Health and Nutrition Examination Survey, 2011-2018. All respondents were divided into four mutually exclusive categories based on their diagnosis of stroke and depression. Weighted prevalence estimates and 95% confidence intervals (CI) were reported across clinical and demographic categories. Multivariable logistic regression models were used to identify the independent association between stroke, depression, and suicidal ideation. Adjusted odds ratios (AOR) and a p-value of < 0.05 were used to determine statistical significance. Results The analytic sample included 19,397 participants, of whom 863 (4%) had a history of stroke. Depression was present in 154 (0.7%) participants with stroke and 2709 (11.6%) participants without stroke. The mean age of participants with stroke and depression was 59 years. This group was more likely to be female (64%), non-Hispanic White (67.7%), have more than a high school education (38.9%), and be overrepresented among those living at or below the federal poverty level (69.8%). Stroke was independently associated with an increased risk of suicidal ideation in those with depression (adjusted odds ratio AOR] = 1.86; 95% CI: 1.21-2.85; p = 0.005) when compared to those with depression but without stroke. Living at or below the poverty level was also independently associated with increased suicidality risk (AOR = 1.39; 95% CI: 1.11-1.74; p = 0.005). Conclusion A history of stroke was found to significantly increase the odds of suicidal ideation in those with depression. These findings can help inform better integrative screening and treatment of mental health among stroke patients, especially those with co-morbid depression.

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5. **Effects of Telepharmacy in Post Ischemic Stroke Patients: A Randomized Controlled Trial**

Authors: Chaemkiri, Arworn;Thienpanja, Thutcha;Supapaan, Teeraporn Sadira and Kunawaradisai, Nonglek

Publication Date: 2026

Journal: Hospital Pharmacy 61(5), pp. 483–492

Abstract: Purpose: To compare pharmacist-led telepharmacy with standard pharmaceutical care on stroke and medication knowledge, medication adherence, and clinical outcomes (blood pressure BP], low-density lipoprotein cholesterol LDL-C], and glycated hemoglobin HbA1c]) in patients with post-ischemic stroke; and to characterize medication-related problems (MRPs) and their severity in the telepharmacy arm. Methods: In a randomized controlled trial, 126 hospitalized adults with ischemic stroke were assigned 1:1 to receive either standard pharmaceutical care alone or standard care plus structured telepharmacy follow-ups at 1 week, 1, and 2 months post-discharge (n = 63/arm). Outcomes were assessed using validated tools, including knowledge questionnaires; the Medication Adherence Scale for Thais (MAST); the Pharmaceutical Care Network Europe (PCNE); classification v9.1; and the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) severity index. Results: Compared with controls, telepharmacy improved post-discharge knowledge (11.75 ± 2.38 vs 9.79 ± 2.43; P <.001) and adherence (MAST 37.00 ± 3.45 vs 33.26 ± 3.76; P <.001). BP target attainment (<130/80 mmHg) was higher with telepharmacy (52.4% vs 30.2%; P =.011). Follow-up BP favored telepharmacy: systolic Δ −3.67 mmHg (95% CI −6.79 to −0.55; P =.041) and diastolic Δ −3.11 mmHg (95% CI −5.99 to −0.23; P =.040). Between-group differences were not significant for LDL-C or HbA1c. In the telepharmacy arm, 76 MRPs were identified; the most frequent problem was unnecessary drug treatment (38.16%), commonly due to patients' decision to use unnecessary drugs (28.93%). Patient counseling was the commonest intervention (40.00%); 83.64% were fully implemented and 92.10% of MRPs were completely resolved. An ~36.84% of MRPs were NCC MERP level E. Conclusions: Telepharmacy improved knowledge, medication adherence, and BP control after ischemic stroke, and enabled effective identification and resolution of MRPs. These findings support incorporating pharmacist-led telepharmacy into post-discharge transitional care pathways. The trial was retrospectively registered (TCTR20250401004).

https://www.thaiclinicaltrials.org/show/TCTR20250401004

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6. **Exploring experiences of loneliness among stroke survivors living in the community: a secondary qualitative analysis**

Authors: Chan, Mimi Wai Man;Sit, Janet Wing Hung and Lo, Suzanne Hoi Shan

Publication Date: 2026

Journal: International Journal of Qualitative Studies on Health and Well-Being 21(1), pp. 2707712

Abstract: Purpose To explore experiences of loneliness among community-dwelling stroke survivors through a secondary qualitative analysis. Method A secondary analysis of a qualitative dataset was conducted, including 26 transcripts from semi-structured interviews that originally aimed to explore psychosocial experience after stroke. Data relevant to loneliness were finally extracted from 20 transcripts. Thematic analysis was adopted for data analysis. Results Three themes and six subthemes were identified: (1) Disconnection from social belonging, including difficulty in engaging in social activities and perceived sense of difference from others. (2) Lack of closeness to familiar people or loved ones, including decline in meaningful interactions or relationships with friends and family members, and lack of understanding and empathy from social networks. (3) Loss of direction, hope, and meaning, including perceived sense of learned helplessness, and diminished expectations and purposes in life. Conclusion Loneliness after stroke is a complex experience. There is a clear need for designing tailored interventions to address loneliness following stroke. Addressing loneliness should be considered as a core issue of stroke recovery within both policy frameworks and practical guidelines. In addition, further research is needed to explore the pathways leading to social, emotional, and existential loneliness following stroke.

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7. **Rehabilitation needs of older adults with cognitive impairment following ischemic stroke: a qualitative study**

Authors: Feng, Pingping;Li, Xiang;Yao, Jue;Zhu, Wenjie;Luo, Xinyu;Liang, Jingyan;Wang, Yingge and Yuan, Yuan

Publication Date: 2026

Journal: Annals of Medicine 58(1), pp. 2715257

Abstract: Aim To explore the self-reported experiences of older adults with post-stroke cognitive impairment following ischemic stroke and their needs for cognitive and functional recovery, rehabilitation information, psychological support, daily-life assistance, and healthcare services. The study aimed to generate evidence for improving rehabilitation support and patient outcomes. Methods A qualitative descriptive study was conducted using semi-structured interviews. From May to July 2025, older adults with ischemic stroke and post-stroke cognitive impairment were recruited from the Departments of Neurology and Rehabilitation of a tertiary hospital in Jiangsu Province, China. The interviews explored participants' understanding of cognitive impairment and rehabilitation, psychological responses, difficulties encountered in daily life and treatment, experiences of seeking help, expectations of healthcare support, and hopes for future recovery. Results A total of 12 participants were interviewed and included in the final analysis. Data saturation was achieved during data collection. The participants had a mean age of 72.3 ± 5.6 years; 10 were male and 2 were female. Three themes were identified. The first theme was shared and supported rehabilitation goals, referring to needs recognized by both patients and healthcare professionals. The second theme was patient-identified needs beyond current support, describing needs expressed by patients but not routinely addressed. The third theme was undisclosed concerns and potential health risks, encompassing distressing concerns that participants hesitated or were unable to express openly. Conclusion Older adults with post-stroke cognitive impairment have multidimensional rehabilitation needs that may not always be expressed spontaneously or clearly. Rehabilitation should therefore adopt a patient-centred, holistic, and cognitively appropriate approach that integrates cognitive and physical recovery, symptom

management, health education, emotional support, family involvement, social participation, and identity adjustment. Coordinated support across hospital, community, home, and family settings is essential to ensure continuity of care and promote long-term independence and well-being.

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8. **Timing matters: early antiplatelet therapy optimizes alteplase treatment in acute ischemic stroke**

Authors: Gao, Yonglei;Wu, Yubin;Guo, Wei and Wang, Guoqing

Publication Date: 2026

Journal: Annals of Medicine 58(1), pp. 2610115

Abstract: Background The optimal timing for initiating antiplatelet therapy (APT) after intravenous alteplase in acute ischemic stroke (AIS) remains unclear, due to concerns about intracranial hemorrhage. This study evaluated the safety and efficacy of early APT (≤24 h post-alteplase) versus standard APT (>24 h) in AIS patients. Methods We conducted a retrospective analysis of 154 AIS patients treated with intravenous alteplase between May 2019 and December 2022. Patients were stratified into early APT (E-APT, *n* = 77) and standard APT (S-APT, *n* = 77) groups. Neurological and functional outcomes were assessed using the National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS) at discharge and at 3 months. Coagulation parameters and hemorrhagic events were monitored to evaluate safety. Results Baseline characteristics were comparable between groups. At 3 months, the E-APT group demonstrated significantly greater neurological improvement (ΔNIHSS: 4.31 ± 3.45 vs. 3.25 ± 3.49; *p* = 0.041) and better functional outcomes (mRS: 0.98 ± 1.12 vs. 1.35 ± 1.24; *p* = 0.030) than the S-APT group. Early APT was not associated with increased cerebral hemorrhage (0% vs. 2.6%, *p* = 0.155) or mortality (2.6% vs. 5.2%, *p* = 0.405). Spearman correlation confirmed that shorter intervals from alteplase to APT were associated with improved outcomes (ΔNIHSS: ρ = -0.28, *p* = 0.001; mRS: ρ = 0.24, *p* = 0.003). Subgroup analyses indicated that aspirin was the primary contributor to the observed benefits. Conclusions Initiating APT within 24 h after alteplase improves neurological and functional recovery in AIS without increasing hemorrhagic risk. These findings suggest that earlier APT may be considered in post-thrombolysis management, potentially informing revisions to current guideline recommendations.

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9. **510 - Implementation of NICE stroke guideline through service redesign: the Brent Neurorehabilitation Transformation (BNT) Project...Chartered Society of Physiotherapy (CSP) Annual Conference, November 20-22, 2025, Newport, Wales**

Authors: Gundapudi, K.;Venkatesan, K.;Talabi, T. T. and Ishaku, T.

Publication Date: 2026

Journal: Physiotherapy 132, pp. N.PAG

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10. **Digital health self-management support for stroke patients following discharge: A randomized controlled trial**

Authors: Jiang, Ning;Feng, Ling;Tian, Tian;Wu, Yating;Wang, Rui;Lai, Zhenli;Xiao, Yuling;Song, Rui;Zhou, Shisong;Chen, Xiangyu;Zhang, Ni and Jiang, Xiaolian

Publication Date: 2026

Journal: International Journal of Nursing Studies 182, pp. N.PAG

Abstract: Stroke is the leading cause of death and disability among adults in China. Effective self-management after hospital discharge can significantly improve patients' quality of life. However, the current level of self-management among stroke survivors in China remains suboptimal, highlighting an urgent need for innovative support strategies. To develop an individualized and dynamic self-

management support program based on wearable technology and the solution-focused model, evaluate its effectiveness, and provide new insights for advancing post-stroke care models. A total of 183 stroke patients scheduled for discharge were randomly assigned to one of three groups—smartwatch, wristband, or control—with 61 participants per group. Over an 8-week intervention period, participants in the smartwatch intervention group received support through a personalized cloud platform that integrated real-time data from smartwatches, patient-maintained self-management diaries, and semi-structured interviews, to identify dynamic issues and obtain tailored feedback. Outcome measures—including self-management behaviors, resilience, patient activation, social support, Barthel Index, depression, blood pressure, glucose concentration, and stroke recurrence—were assessed at baseline (T0) and at 2 (T1), 3 (T2), and 6 (T3) months post-discharge. Intervention effects were analyzed using linear mixed-effects models. The cloud platform comprised a smartwatch interface, HMS Core application software, and a WeChat mini-program. The intervention significantly improved: self-management behaviors (T1: $\beta = 27.496$, $p < 0.001$; T2: $\beta = 13.855$, $p = 0.004$; T3: $\beta = 10.649$, $p = 0.025$), resilience (T1: $\beta = 5.361$, $p < 0.001$; T2: $\beta = 3.498$, $p = 0.01$; T3: $\beta = 3.519$, $p = 0.01$), patient activation (T1: $\beta = 17.836$, $p < 0.001$; T2: $\beta = 14.302$, $p < 0.001$; T3: $\beta = 15.13$, $p < 0.001$), and Barthel Index (T1: $\beta = 5.225$, $p = 0.049$; T3: $\beta = 5.594$, $p = 0.035$). The individualized and dynamic self-management support program effectively enhanced self- management behaviors, resilience, and patient activation in stroke survivors. It also showed promising trends toward reducing post-stroke depression and recurrence, and may contribute to better control of blood pressure and glucose concentration. Registered at chictr.org.cn , ChiCTR2300070384, on April 11, 2023, https://www.chictr.org.cn/showproj.html?proj=193286. The protocol version is ESC 1.0.

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11. **Domain-specific functional outcome prediction in stroke rehabilitation: A multicenter artificial intelligence study**

Authors: Kim, Dong-Young;Shin, Seyoung;Moon, Junhyung;Kim, Yubin;Kim, Heegoo;Jeon, HyeongMin;Kim, Dae Hyun;Kim, Eun Joo;Jeong Ko, Eu;Kim, MinYoung and Cho, Baek Hwan

Publication Date: 2026

Journal: International Journal of Medical Informatics 220, pp. 106607

Abstract: Background Stroke is a leading cause of long-term disability worldwide, yet existing clinical decision support tools rely on global disability metrics, such as the modified Rankin Scale, which do not adequately reflect patient-centered rehabilitation or recovery goals. Objective We aimed to develop, validate, and implement artificial intelligence (AI)-based clinical support models for predicting domain-specific functional outcomes after stroke across multiple rehabilitation institutions and timepoints. Methods We utilized prospective and retrospective multicenter data collected from patients with stroke across four rehabilitation institutions in South Korea (2017-2024). Prognostic models were developed for three functional domains-ambulation, cognitive function, and activities of daily living-under two temporal scenarios: acute-to-subacute and acute-to-early-chronic prediction. Alignment-based regularization was applied to improve cross-institutional generalizability. Results The proposed framework achieved strong predictive performance in internal validation (AUROC up to 0.897 for ambulation and 0.864 for cognition) and favorable external validation performance, with AUROCs up to 0.924 (ADLs) and 0.892 (cognition), despite institution-specific differences in cohort size and variable availability across centers. The implemented web-based clinical decision support system provides real-time prediction of individualized recovery trajectory with intuitive visualization designed to support clinician-patient communication. Conclusions Our findings demonstrate the predictive feasibility of AI-based modeling for domain-specific stroke prognosis and present a prototype implementation illustrating the potential clinical applicability of the proposed framework across heterogeneous institutional settings. The use of routinely collected clinical variables and the preliminary cross-institutional validation results support further investigation of real-world rehabilitation practices, pending prospective clinical evaluation.

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12. **Effectiveness of a Personalized Robot-Assisted Trunk and Lower Limb Rehabilitation in Patients With Chronic Stroke: A Randomized Controlled Trial**

Authors: Kim, Justin;Chen, Philbert;Kim, Jacob and Kim, Kyoung Tae

Publication Date: 2026

Journal: American Journal of Physical Medicine & Rehabilitation 105(10), pp. 878–886

Abstract: Objective: To investigate the clinical effectiveness of a newly developed trunk-lower limb rehabilitation robot in patients with chronic stroke. Design: The study design involves a randomized controlled trial conducted at a rehabilitation center. Forty patients with chronic stroke (mean age: 59.48±7.63 y) were randomized to an intervention group (n=20) or a control group (n=20). The intervention group received individualized robotic trunk-lower limb training applying Jacob® (LDS Co., Ltd, Daegu, Korea) once daily, 5 times per week for 3 months, in addition to conventional rehabilitation. The control group received conventional rehabilitation only. The primary outcome was the change in Functional Ambulatory Category (FAC) from baseline to 3 months. Secondary outcomes included manual muscle testing, the Modified Ashworth Scale, Berg Balance Scale, the Mini-Mental State Examination, and robot-based multiple kinematic parameters. Results: Compared with the control group, the intervention group showed significant improvements in FAC. Multiple kinematic parameters, particularly lateral bending, forward bending, weight transfer, and gait ability, also significantly improved ($P < 0.05$). The control group exhibited no significant changes. Conclusions: Robot-assisted trunk-lower limb training combined with conventional rehabilitation significantly improved trunk control and ambulatory function in patients with chronic stroke, supporting its potential clinical utility.

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13. **The role of community during critical care transitions from hospital-to-home: a rapid review of evidence involving stroke caregivers**

Authors: Leighton, Jaylyn;Saragosa, Marianne;Ludwig-Prout, Brina;Walsh, Chris and Nelson, Michelle La

Publication Date: 2026

Journal: Journal of Integrated Care 34(5), pp. 90–113

Abstract: Purpose: Stroke care transitions, particularly from hospital to home, place significant demands on essential care partners (ECPs) (caregivers) – commonly family or friends – who provide unpaid support without adequate training or resources. Despite their critical role, few transitional care interventions adequately support ECPs. This rapid review aims to identify and synthesize community-involved and intersectoral care transition interventions that include stroke ECPs, in alignment with the Discharge Assistance and Supports at Home (DASH) model's principles of cross-sector collaboration, volunteerism and leisure as a modality of care. Design/methodology/approach: A rapid review was conducted following updated Cochrane guidance for effectiveness reviews and PRISMA-P reporting standards. Searches were conducted across multiple databases, and studies were screened, extracted and synthesized. Eligible studies included interventions that engaged ECPs in post-stroke care transitions and involved community-based organizations, volunteers or leisure-based approaches. Data were analysed thematically. Findings: The findings of the rapid review identified the settings and contexts of the interventions – including when, where, with whom and how they were implemented – as well as the nature of the interventions, key human factors such as facilitators, the involvement of community-based organizations, volunteers and leisure activities, and critical insights into what worked, for whom and why. Research limitations/implications: Three key insights emerged from this rapid review to inform better support for ECPs: first, a growing yet underdeveloped shift towards tailored, ECP-centred approaches as essential – not optional – components of stroke care; second, the reinforcing cycle between education, support and self-care; and third, the importance of embedding transitional interventions within broader intersectoral health system and community contexts. These insights from this rapid review will inform the development of a research agenda aimed at identifying and addressing the specific supports ECPs require during critical transition periods – particularly the shift from hospital to home. Originality/value: This rapid review offers a novel synthesis of stroke care transition interventions that meaningfully engage ECPs through community involvement, cross-sector collaboration and leisure-based approaches – an underexplored area in current literature. By aligning

findings with the DASH model, the review advances understanding of how volunteerism and community assets can support ECPs during hospital-to-home transitions. The study highlights a critical shift towards ECP-centred care, emphasizing the need for systemic, tailored supports. These insights contribute original value by informing future research and practice that recognize ECPs as essential stakeholders in post-stroke recovery, not merely as informal or peripheral caregivers.

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14. **Safety and efficacy of recombinant botulinum toxin type A (Eveotox®) in patients with post-stroke upper limb spasticity: Results from a Phase Ib/II clinical trial**

Authors: Lu, Rongrong;Jin, Lingjing;Xiong, Jianzhong;Zhang, Lixin;Liu, Yaling;Xu, Leilei;Wu, Rui;Tang, Jianhua;Zhao, Liandong;Dong, Lihua;Luo, Weifeng;Pan, Yu;Chen, Jun;Kong, Ying;Dong, Hongjuan;Xiong, Nian;Lu, Xiao;Wu, Wen;Guo, Yuanyuan;Zheng, Liayan, et al

Publication Date: 2026

Journal: Toxicon : Official Journal of the International Society on Toxinology 282, pp. 109225

Abstract: Upper limb spasticity is a common and disabling complication of stroke. Botulinum toxin type A (BoNT-A) is widely used for focal spasticity treatment, but naturally derived products may present limitations related to immunogenicity and manufacturing variability. Recombinant botulinum toxin type A, produced by genetic engineering without complexing proteins, may provide improved product consistency. This Ib/II study evaluated the safety, tolerability, and preliminary efficacy of recombinant botulinum toxin type A in adults with post-stroke upper limb spasticity. This multicenter, seamless Ib/II clinical study included an open-label dose-escalation Ib phase and a randomized, double-blind, placebo-controlled II phase. Adult patients with post-stroke upper limb spasticity received a single intramuscular injection of recombinant botulinum toxin type A or placebo. The primary endpoint in Phase II was the change from baseline in the Modified Ashworth Scale (MAS) score of the primary target muscle group at Week 4. Secondary endpoints included MAS and Tardieu scale changes in individual muscle groups, Disability Assessment Scale (DAS), Physician's Global Assessment (PGA), and immunogenicity. The Ib phase showed improvements in MAS, DAS, and PGA, indicating an early efficacy signal. In Phase II, recombinant botulinum toxin type A produced a significant reduction in MAS score of the primary target muscle group at Week 4 compared with placebo, with effects sustained through Week 12. At Week 4, the PGA score in the Eveotox® group showed a statistically significant improvement compared with the placebo group. While MAS and PGA scores showed significant improvement, DAS functional scores did not differ statistically from the placebo group at week 4. The treatment was generally well tolerated, and low incidence of antibodies were observed. Recombinant botulinum toxin type A was safe and effective in reducing post-stroke upper limb spasticity after a single administration. These results support further Phase III clinical evaluation.

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15. **Everyday reading in post-stroke aphasia: Effects and perceived helpfulness of advance linguistic context**

Authors: Nguyen, Hanh;Webster, Janet;Nickels, Lyndsey and Morris, Julie

Publication Date: 2026

Journal: Aphasiology 40(10), pp. 1930–1955

Abstract: Background: Advance provision of pictorial contextual information increases reading speed for everyday texts (i.e., short news articles) in typical adult readers and people with aphasia (PWA). However, little is known about whether advance linguistic context (e.g., titles) influences reading in aphasia. In addition, evidence regarding PWA's perception of whether context aids their reading is inconclusive. Aims: This study aimed to investigate the effect of titles on typical readers' and PWA's speed and comprehension for naturalistic everyday texts. It also aimed to examine if there was a correlation between their reading speed and their comprehension and their perceived helpfulness of titles. Methods & Procedures: Participants were 30 adult typical readers and 10 post-stroke PWA with varying reading ability. Participants read three matched sets of short news articles preceded by either a

related title, a filler (an unrelated title), or no title and followed by multiple-choice comprehension questions. Outcomes & Results: Mixed-effects regression analyses showed that related titles significantly increased reading speed of both typical readers and PWA, with a larger effect seen in PWA. Advance provision of titles did not affect comprehension accuracy in either group of participants. There was no significant correlation between participants' perceived title helpfulness and reading speed or comprehension accuracy. Conclusion: Advance linguistic context does not influence comprehension accuracy of everyday texts but increases reading speed in both adults who are typical readers and PWA. The evidence from this study supports the development of strategy-based approaches for PWA that encourage use of advance contextual information to improve reading speed.

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16. **Power Exercise for Stroke Recovery: The POWER Feasibility Trial**

Authors: Noguchi, Kenneth S.;Abreu, Juliano A.;Sanvido, Zoe M.;Bochnak, Paula;McQuarrie, Angelica;Elliott, Brad;Phillips, Stuart M.;Beauchamp, Marla K.;Thabane, Lehana;Bell, Kirsten E. and Tang, Ada

Publication Date: 2026

Journal: Journal of Neurologic Physical Therapy 50(4), pp. 212–222

Abstract: Background and Purpose: Strength training is recommended after stroke to retain strength and function. Muscle power is important for mobility, presenting an opportunity for power training programs. The objectives of this study were to (1) determine the feasibility and (2) effects of the power exercise for stroke recovery (POWER) intervention in people with mild to moderate chronic stroke. Methods: This was a single-group trial in people with mild to moderate chronic stroke (modified Rankin Scale < 4). The POWER intervention was delivered in a community-based gym over 3 phases: familiarization (week 1), strength (weeks 2–5), and power (weeks 6–10), where repetitions were performed as quickly as possible. Feasibility was the primary outcome, measured using preestablished indicators. Effects were measured with the timed up and go test, short physical performance battery, 30-second chair stand test, fast-paced walking speed, isokinetic strength, power, and the stroke impact scale. Results: Fifteen people (61.5 years, 4.9 years poststroke, n = 7 female) were recruited within 6 months. Attendance was high (96%), with minimal attrition (n = 1) and no serious adverse events or exaggerated blood pressure responses to exercise. Most (71%) exercise sets were adhered to. There were improvements in timed up and go performance (−1.6 seconds 95% confidence interval, CI: −0.6, −2.6]), short physical performance battery (+0.9, 95% CI: 0.1, 1.8), fast-paced walking (+0.1 m/s, 95% CI: 0.01, 0.2), and the 30-second chair stand test (+3.0, 95% CI: 1.7, 4.2). There were also moderate to large improvements in muscle strength, power, and health-related quality of life. Discussion and Conclusions: POWER was feasible and shows potential effects on muscle strength, power, physical function, and health-related quality of life in community-dwelling people with mild to moderate chronic stroke.

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17. **Day-of-the-week variation in ischemic stroke admissions in patients with atrial fibrillation**

Authors: Nuopponen, Kasperi;Langén, Ville;Airaksinen, K. E. J.;Jaakkola, Jussi;Jalli, Eero;Halminen, Olli;Haukka, Jari;Putaala, Jukka;Linna, Miika;Mustonen, Pirjo;Hartikainen, Juha;Lehto, Mika and Teppo, Konsta

Publication Date: 2026

Journal: Annals of Medicine 58(1), pp. 2667620

Abstract: Background No data exist on whether ischemic stroke admissions among patients with atrial fibrillation (AF) vary by day of the week. Methods The nationwide registry-linkage FinACAF study includes all patients with incident AF in Finland between 2007 and 2018. This analysis focused on patients who experienced their first-ever ischemic stroke. Hospital stroke admissions were categorized by day of the week, and a weekday-to-weekend ratio was calculated as the ratio of strokes on a weekday versus a weekend day. Results We identified 13 781 patients (mean age 79.2 years; 57.1%

women) with AF admitted for ischemic stroke. Stroke admissions varied significantly by day of the week ($p < 0.001$), with the highest number occurring on Mondays (16.1% of all strokes), followed by a progressive decline over the week. Admission rates were notably higher on Monday and Tuesday, remained relatively stable from Wednesday to Friday, and decreased on Saturday and Sunday (11-12% of all strokes per day). The overall weekday-to-weekend ratio was 1.31 (95% CI 1.26-1.37) and was more pronounced in men than in women, as well as during the first half of the study period (2007-2012) compared to the latter half (2013-2018). Conclusions This nationwide cohort study demonstrates a clear day-of-the-week variation in hospital admissions for ischemic stroke among patients with AF, with fewer admissions on weekends than on weekdays. Promoting awareness of stroke symptoms and the importance of seeking timely care regardless of the day may represent a modifiable target to improve outcomes in patients with AF who experience stroke

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18. **Association of toothbrushing, dental flossing, and interdental brushing with stroke risk**

Authors: Park, Sangwoo;Kim, Da Eun;Park, Sun Jae;Song, Jihun;Kim, Hye Jun;Lee, Su Kyoung;Shin, Hyun-Young;Cho, Hyun-Jae and Park, Sang Min

Publication Date: 2026

Journal: Journal of Dentistry 174, pp. 106882

Abstract: Objectives Stroke is the second leading cause of death globally. While daily toothbrushing is widely promoted for oral hygiene, the preventive impact of adjunctive oral hygiene practices, such as dental flossing and interdental brushing, on stroke risk remains unclear. This study aimed to investigate the association between comprehensive oral hygiene behaviors and the risk of stroke. Methods We conducted a population-based retrospective cohort study using data from the Korean National Health Insurance Service-Health Screening cohort. A total of 98,866 adults aged ≥40 years who underwent both general and oral health examinations during 2009-2010 were included. Participants were followed from January 2011 to December 2019. Individuals with pre-existing cardiovascular disease, death before baseline, or missing data were excluded. Oral hygiene behaviors, including daily toothbrushing frequency and weekly use of dental floss and interdental brushes, were self-reported. The primary outcome was incident stroke requiring hospitalization for ≥2 days and was classified as total, ischemic, or hemorrhagic stroke according to diagnostic codes. Multivariable Cox proportional hazards models were used to estimate adjusted hazard ratios (HRs) and 95% confidence intervals (CIs). Results During follow-up, participants with favorable oral hygiene behaviors showed a lower risk of stroke compared with those with poor oral hygiene practices. In multivariable-adjusted analyses, individuals who brushed their teeth at least twice daily and regularly used dental floss and interdental brushes had a 23% lower risk of ischemic stroke (adjusted hazard ratio aHR] 0.77, 95% CI 0.63-0.94). A significant dose-response relationship was observed across categories of oral hygiene behaviors. Conclusions Frequent toothbrushing combined with regular use of dental floss and interdental brushes was associated with a reduced risk of ischemic stroke. These findings suggest that comprehensive oral hygiene practices may provide additional benefits for stroke prevention. Clinical Significance Comprehensive oral hygiene behaviors, including regular toothbrushing, dental flossing, and interdental brushing, may contribute to stroke prevention beyond conventional vascular risk factor management. Promoting adjunctive oral hygiene practices could represent a simple, accessible, and population-based strategy for reducing ischemic stroke risk in middle-aged and older adults.

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19. **Care navigation for older adults after stroke - A systematic review and meta-analyses to guide social prescribing**

Authors: Parmar, Tamia;Kelly dos Santos, Isis;Soh, Sze-Ee;Eng, Janice J. and Ashe, Maureen C.

Publication Date: 2026

Journal: Archives of Gerontology & Geriatrics 149, pp. N.PAG

Abstract: • Stroke impacts many older adults, underscoring the need for recovery support. • Care

navigators help people recover and connect with community resources. • We conducted a review on care navigation and psychosocial outcomes post-stroke. • Depression outcomes were positive but not with sensitivity analyses; there was no difference for anxiety or quality of life. • More research should test navigation and consider social prescribing post-stroke. Stroke affects many older people worldwide, and patient navigation and social prescribing (e.g., care navigation) may help recovery. We aimed to synthesize evidence on the effect of care navigation for people living with the effects of a stroke (PLWS) on anxiety, depression, quality of life, and well-being. Our secondary focus was to explore these models in rural settings. We conducted a systematic review following guidelines, and searched for peer-reviewed randomized controlled trials for older adults (60 years+ or group mean age in this range) who had a stroke and received patient navigation or social prescribing. Two authors independently screened citations at Level 1 (title and abstract) and Level 2 (full text). The date of the last updated search was December 5, 2025. We synthesized data quantitatively using meta-analyses (random effects model and standard mean difference). We identified 11 studies using patient navigation, but no social prescribing interventions. The total number of PLWS participants at baseline was 7829 with an average mean age of 68 years (43% women). There were no differences between groups for anxiety or quality of life for PLWS, but there was a difference favouring the intervention for depression, although the findings were no longer significant with sensitivity analyses. Thus, results should be interpreted with caution. Only two studies provided data for caregivers, with mixed findings. No studies focused on well-being or rural settings. Care navigation for PLWS needs more research, including testing social prescribing within stroke rehabilitation in rural and urban locations. PROSPERO 2025 CRD420251077958

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20. **Closing the gaps in hyperacute stroke care: Pharmacologic and systems-level considerations**

Authors: Rech, Megan A.;DeWitt, Kyle and Ray, Lance C.

Publication Date: 2026

Journal: American Journal of Emergency Medicine 108, pp. 267–268

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21. **Efficacy of Physical Modalities for Hemiplegic Shoulder Pain After Stroke: A Systematic Review**

Authors: Spina, Stefania;Facciorusso, Salvatore;D'Ascanio, Milena Carmela;Filippetti, Mirko;Battaglia, Marco;Baricich, Alessio;Picelli, Alessandro and Santamato, Andrea

Publication Date: 2026

Journal: Journal of Neurologic Physical Therapy 50(4), pp. 260–273

Abstract: Background and Purpose: Hemiplegic shoulder pain (HSP) represents a common and disabling complication following stroke, which has multiple causes and important functional consequences. Physical modalities are frequently used to manage HSP, but evidence on their effectiveness remains inconsistent. Our aim is to systematically review the evidence from randomized controlled trials (RCTs) on the efficacy and safety of physical modalities, compared with sham or standard care, for improving pain and function in adults with poststroke HSP. Methods: This systematic review was conducted following the Cochrane Guidelines and Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement. We included RCTs assessing physical modalities versus sham or standard therapy in adult stroke survivors with HSP. The primary outcome was pain reduction; secondary outcomes included functional mobility, quality of life, and adverse events. A comprehensive search was conducted in MEDLINE, EMBASE, CENTRAL, PEDro, CINAHL, Web of Science, ClinicalTrials.gov, and World Health Organisation International Clinical Trials Registry Platform (WHO ICTRP) up to July 30, 2025. Risk of bias was assessed using the Cochrane Risk of Bias tool 2. Results: Twelve RCTs involving 567 participants were included. Interventions comprised electrotherapy (n = 6), shock wave therapy (n = 3), and laser therapy (n = 3). Most studies showed significant pain reduction compared with control. Electrotherapy provided sustained analgesia; extracorporeal shock wave

therapy improved structural abnormalities and pain; laser therapy enhanced both pain and functional outcomes. Adverse events were mostly mild. However, safety conclusions are limited by incomplete and inconsistent adverse event reporting. Heterogeneity in interventions and outcomes precluded meta-analysis. Discussion and Conclusions: Based on low to very low certainty evidence, physical modalities may offer benefit for HSP, but uncertainty remains regarding both long-term effectiveness and safety. Integration into multimodal rehabilitation protocols may be considered

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22. **Respiratory-swallow coordination training using bimodal signal biofeedback for patients with post-stroke dysphagia: a randomized controlled trial**

Authors: Wang, Lian;Qiao, Jia;Wei, Zhenhai;Liu, Xiaoqin;Wei, Xiaomei and Dou, Zulin

Publication Date: 2026

Journal: Annals of Medicine 58(1), pp. 2607218

Abstract: Objective The purpose was to investigate the effects of respiratory-swallow coordination training with bimodal signal biofeedback on swallowing function in patients with post-stroke dysphagia. Methods Post-stroke dysphagia Patients were randomly assigned to either the control group or the experimental group. The control group received conventional rehabilitation, while the experimental group underwent additional respiratory-swallow coordination training based on biofeedback. The training protocol consisted of three phases, conducted at an intensity of 30 min/day, 6 days/week, for two consecutive weeks. Outcome measures included the Functional Oral Intake Scale (FOIS) score, the Rosenbek Penetration-Aspiration Scale (PAS) score, respiratory-swallow coordination, and videofluoroscopic swallowing study temporal and kinematic parameter. Assessments were conducted at baseline, post-treatment, and at a one-month follow-up. Results Thirty patients were enrolled. Both groups showed significant improvement in FOIS scores from baseline to both two-week post-treatment and one-month follow-up (*p p a* ≥ 2-point increase in FOIS scores was significantly higher in the experimental group than in the control group at both post-treatment (*p p p p* < 0.001). Conclusion Bimodal signal biofeedback-based respiratory-swallow coordination training can effectively improve respiratory-swallow coordination and swallowing function in patients with post-stroke dysphagia.

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23. **516 - Effect of mirror therapy on upper extremity function in stroke survivors: overview of systematic reviews...Chartered Society of Physiotherapy (CSP) Annual Conference, November 20-22, 2025, Newport, Wales**

Authors: Wyber, R.;Jeldi, A.;Coulter, E.;Shanmugam, S.;Barclay, A.;Bajwa, E. and Bello, U. M.

Publication Date: 2026

Journal: Physiotherapy 132, pp. N.PAG

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24. **Efficacy of dry needling in reducing spasticity after stroke: A systematic review and meta-analysis**

Authors: Yuan, Xinyi;Wang, Ziwen;Zhang, Huiru;Li, Yongqiang and Meng, Dianhuai

Publication Date: 2026

Journal: Complementary Therapies in Medicine 101, pp. N.PAG

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25. **Frailty transitions and incident stroke in older adults: A comparative longitudinal cohort study between China and the UK**

Authors: Zhong, Senda;Hua, Xin;Li, Haorui and Liao, Siyu

Publication Date: 2026

Journal: Archives of Gerontology & Geriatrics 150, pp. N.PAG

Abstract: • First cross-national comparison of frailty transitions and stroke risk in China and England. • Frailty progression increases stroke risk, while improvement reduces it. • A higher cumulative frailty index shows a strong dose-response relationship with stroke. • The association between frailty and stroke was stronger in China than in England. • Dynamic frailty assessment, beyond baseline status, is crucial for stroke prevention. To examine the association between frailty status, its dynamic changes, and the risk of incident stroke among older adults in China and England. A total of 19,723 participants (CHARLS: n = 9048; ELSA: n = 10,675) were included in the baseline analysis. Among them, 14,682 participants (CHARLS: n = 6419; ELSA: n = 8236) with complete data for both baseline and the second survey (2-year interval) were included in the analysis of frailty transitions. Frailty was assessed using a 28-item frailty index (FI) and categorized as robust (FI ≤0.10), pre-frail (0.10<fi<="" 0.0001).="" sensitivity="" analyses="" using="" alternative="" thresholds="" yielded="" consistent="" results.="" its="" dynamic="" are="" predictors="" older="" adults.="" monitoring="" transitions="" may="" help="" identify="" individuals="" at="" high="" inform="" early="" intervention="" strategies.="" risks="" stroke.="" charls,="" china="" health="" retirement="" longitudinal="" study;="" elsa,="" english="" study="" ageing;="" hr,="" ratio;="" ci,="" interval.="" display="" omitted]

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26. **The role of physiotherapists in acute post-stroke neurorehabilitation: qualitative perspectives from clinicians and stroke unit managers.**

Authors: Pérez-De La Cruz, Sagrario

Publication Date: 2026

Journal: International journal of qualitative studies on health and well-being, 2026 Dec 31, volume 21, issue 1, page 2634880

Abstract: Purpose The aim of this study was to explore and compare the perspectives of both physiotherapists and medical managers regarding the professional role and clinical contributions of physiotherapy within stroke units. Method A qualitative study was conducted involving ten physiotherapists and five medical managers from stroke units. Participants shared their professional experiences concerning work performance and the perceived impact of physiotherapy on patient care. Results Thematic analysis identified four key areas for physiotherapists: specific training, professional functions, treatment modalities, and the relevance of professionalism and empathy. For medical managers, the analysis focused on their perception of physiotherapy work, their understanding of factors that enhance treatment, and assigned functions. The findings reveal a lack of standardized treatment protocols (non-heterogeneity) and emphasize the need for strong interpersonal professional relationships and high standards of professionalism. Conclusions The observed heterogeneity in practices leads to inconsistencies in patient care. Furthermore, there is a notable gap in medical managers' understanding of the specific clinical scope and technical interventions provided by physiotherapists. These findings highlight the need for coordinated rehabilitation programs and a clearer definition of the physiotherapist's role in acute stroke units to ensure equitable and comprehensive care