

Stroke

Current Awareness Bulletin

October 2025

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1. Impact of Direct Oral Anticoagulant Uptake on Hospitalizations for Stroke/Transient Ischemic Attack, Intracranial Hemorrhage, and Gastrointestinal Bleeding in Individuals With Atrial Fibrillation: A Population-Based Study

Authors: Antoniou, Tony;McCormack, Daniel;Wang, Tianru;Tadrous, Mina and Gomes, Tara

Publication Date: 2025

Journal: Fundamental & Clinical Pharmacology

Abstract: Background: Direct-acting oral anticoagulants (DOACs) have largely replaced warfarin for stroke prevention in patients with atrial fibrillation, yet their population-level impact on health outcomes and costs remains unclear. We examined whether the widespread uptake of DOACs was associated with changes in hospitalization rates and costs for stroke/transient ischemic attack (TIA), intracranial hemorrhage (ICH), and gastrointestinal bleeding among individuals with atrial fibrillation receiving publicly funded anticoagulation.; Methods: We conducted a population-based ecological time series study using administrative health data from Ontario, Canada, between 2003 and 2021. We used segmented negative binomial regression and generalized additive models to estimate immediate and post-DOAC uptake trends in hospitalization rates and costs following increased use of DOACs in 2012.; Results: We identified 12,134 hospitalizations for ICH, 59 946 for gastrointestinal bleeding, and 40 724 for stroke/TIA among anticoagulated individuals with atrial fibrillation. Following DOAC uptake, ICH rates (rate ratio RR]: 0.88; 95% CI: 0.86-0.90) and costs (RR: 0.74; 95% CI: 0.62-0.88) declined immediately, with continued quarterly declines. Gastrointestinal bleeding rates increased initially (RR: 1.17; 95% CI: 1.14-1.20) and declined over time (RR per quarter: 0.99; 95% CI: 0.99-0.99). Gastrointestinal bleeding-related costs did not change significantly.

Stroke/TIA rates remained stable, but hospitalization costs declined (\$366 per 1000 individuals per quarter; 95% CI: -\$562 to -\$170).; Conclusion: DOAC uptake was associated with reduced ICH rates and costs and an initial increase but subsequent decline in gastrointestinal bleeding rates. Despite stable stroke rates, reduced costs suggest potential long-term economic benefits. Our findings support the real-world effectiveness and safety of DOACs. (© 2025 The Author(s). Fundamental & Clinical Pharmacology published by John Wiley & Sons Ltd on behalf of Société Française de Pharmacologie et de Thérapeutique.)

2. Identification of Stroke Survivors' Perceived Quality of Life: A Latent Profile Analysis Study

Authors: Çetin, Binnur and Aran, Orkun Tahir

Publication Date: 2025

Journal: The American Journal of Occupational Therapy : Official Publication of the American Occupational Therapy Association

Abstract: Importance: Identifying quality-of-life (QoL) subgroups can optimize occupational therapy interventions for stroke survivors.; Objective: To identify clusters among stroke survivors on the basis of perceived QoL using latent profile analysis (LPA).; Design: Cross-sectional study using LPA to classify QoL levels among stroke survivors and multinomial logistic regression to identify predictors.; Setting: Hospital and university clinic.; Participants: A total of 696 adult stroke survivors age 18 yr or older. Eligible participants were literate and had a Mini-Mental State Examination score of 23 or higher, excluding those with speech disorders or additional chronic neurological, psychiatric, or cognitive conditions.; Outcomes and Measures: The participants were evaluated with the Stroke Impact Scale (SIS), Barthel Index, and the Impact on Participation and Autonomy Questionnaire (IPA). LPA was applied to the SIS data.; Results: Three latent classes were identified: high QoL (n = 232), moderate QoL (n = 322), and low QoL (n = 142). Participants in Class 2 (high QoL) demonstrated higher functional outcomes, whereas those in Class 3 (low QoL) displayed the lowest scores across all scales. Predictors of class membership included age, gender, social relationships, and education level.; Conclusions and Relevance: LPA effectively identified subgroups among stroke survivors, supporting tailored interventions in occupational therapy to improve rehabilitation outcomes. Further research is recommended to validate these findings in diverse populations. Plain-Language Summary: This study explored quality of life among stroke survivors. Three groups were identified: those with high, moderate, and low quality of life. Factors such as age, social relationships, and education level influenced quality of life after stroke. These findings can help occupational therapists create personalized care plans to support survivors in recovery, focusing on social connections, autonomy, and daily activities. (Copyright © 2025 by the American Occupational Therapy Association, Inc.)

3. Polypharmacy and deprescribing attitudes among stroke survivors: Opportunities for enhanced patient centered care

Authors: Chao, Alyssa K.;Burke, James F.;Bi, Ran;Lin, Chun Chieh and Skolarus, Lesli E.

Publication Date: 2025

Journal: Journal of Stroke and Cerebrovascular Diseases : The Official Journal of National Stroke Association

Abstract: Competing Interests: Declaration of competing interest The authors have no conflicts of interest to share.; Objective: This study aimed to 1) describe the burden of polypharmacy among stroke survivors compared to older adults without a history of stroke and 2) assess their attitudes towards deprescribing.; Methods: This is a cross-sectional study of US Medicare Beneficiaries aged ≥ 65 who participated in the National Health and Aging Trends Study. Polypharmacy was defined by the number of regular medications reported (no polypharmacy, ≤ 5 ; moderate, 6-10; severe, >10). Deprescribing attitudes were elicited from the Medication Attitudes Module. Ordinal and logistic regression assessed the associations between polypharmacy, history of stroke, and deprescribing attitudes, adjusting for falls and comorbidities.; Results: Of the 2073 respondents, 253 reported a prior stroke. Compared to older adults without a history of stroke, stroke survivors were more likely to report polypharmacy (moderate: 39.4 % vs 29.8 %; severe: 22.6 % vs 9.8 %; $p < 0.01$). Most stroke survivors (87.1 %) and older adults without stroke (89.0 %) would be willing to stop one or more medications. Polypharmacy had the strongest association with favorable attitudes toward deprescribing.; Conclusion: Stroke survivors report greater polypharmacy than older adults without a history of stroke. Both groups overwhelmingly favor deprescribing. Stroke survivors represent a key population that would welcome and benefit from efforts to deprescribe. (Copyright © 2025. Published by Elsevier Inc.)

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

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

Publication Date: 2025

Journal: Journal of Affective Disorders

Abstract: Competing Interests: Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.; Background: Post-stroke depression (PSD) frequently co-occurs with other symptoms, such as anxiety, fatigue, sleep disturbances, and stigma, forming complex symptom clusters. While research has identified associations between PSD and specific symptoms, the intricate interrelationships within these clusters remain largely unexplored. This study aimed to examine the longitudinal trajectory of these symptoms, classify distinct symptom cluster profiles, uncover symptom interconnections, identify core symptoms, and explore associated factors.; Methods: Depressive symptoms, anxiety, fatigue, sleep disturbance, and stigma were assessed in 195 stroke survivors at

baseline (T1), one (T2), three (T3), and six (T4) months post-stroke. Network analysis examined symptom relationships and identified core symptoms. Latent profile analysis was used to classify distinct symptom clusters.; Results: Network analysis revealed positive correlations among the five symptoms across four time points. "Anxiety" was the most central symptom within the symptom network at T1 (Strength = 2.134, EI = 2.134), while "depressive symptoms" held the central position at T2 (Strength = 2.595, EI = 2.595), T3 (Strength = 2.689, EI = 2.689), and T4 (Strength = 2.789, EI = 2.789). At T1, four clusters emerged: moderately affected, anxiety-insomnia, resilient, and severely affected. At T2, T3, and T4, a two-cluster solution was identified: resilient and symptomatic.; Conclusions: This study revealed a dynamic interplay of psychological symptoms following stroke. Depressive symptoms, anxiety, fatigue, sleep disturbance, and stigma exhibited a U-shaped trajectory, initially improving but subsequently worsening. Network analysis demonstrated a stable symptom cluster structure, with depressive symptoms and anxiety as core components. Symptom cluster profiles varied across time points. (Copyright © 2025 Elsevier B.V. All rights reserved.)

5. Mortality Predictors in Stroke Patients Requiring Mechanical Ventilation: A Multicenter Prospective Observational Study

Authors: Ershov, Vadim;Belkin, Andrey;Gorbachev, Vladimir;Gritsan, Alexey;Zabolotskikh, Igor;Lebedinsky, Konstantin;Leiderman, Ilya;Petrikov, Sergey;Protsenko, Denis;Solodov, Alexander;Shchegolev, Alexey;Silkin, Victor;Dobrynin, Alexey;Kuzovlev, Artem;Pisarev, Michail and Kulikov, Alexander

Publication Date: 2025

Journal: Journal of Intensive Care Medicine

Abstract: Competing Interests: Declaration of Conflicting InterestsThe authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.; Background: Patients with acute severe stroke requiring mechanical ventilation represent a significant clinical challenge. Identification of mortality predictors is necessary to improve outcomes. Methods: Fourteen hospitals located around Russia participated in this prospective multicenter observational clinical study. Patients admitted to ICU between November 1, 2017, and November 1, 2019 with confirmed cerebral stroke, aged 18 to 90 years, and requiring mechanical ventilation were included. The impact of various clinical factors on mortality during the 28-day period after stroke was assessed. Results: A total of 1289 patients were included in the registry, and 1144 met the study criteria. The 28-day mortality rate for stroke patients on mechanical ventilation was 64.3%. The most common indications for mechanical ventilation were impaired consciousness (75.7%) and hypoxemia (60.9%). In the cohort of strokes with NIHSS severity greater than 20 points, hypoxemia at the start of ventilation (OR 1.85 1.21; 2.81], $P = 0.004$) and the use of hyperventilation mode (OR 1.46 1.02; 2.06], $P = 0.0336$) were associated with increased mortality. Pressure-controlled mode as the primary ventilation method (OR 0.36 0.21; 0.60], $P < 0.001$) and ICP monitoring (OR 0.23 0.12; 0.44], $P < 0.001$) were associated with decreased mortality. Infectious complications were associated with longer mechanical ventilation and ICU stay ($P < 0.001$). The relationship between probable mortality and the severity of neurological deficit on the NIHSS scale at the start of mechanical ventilation is non-linear. A critical threshold was reached at 16 points NIHSS, where a trend of increasing probable mortality emerged.

Conclusion: The identified predictors of mortality in stroke patients requiring mechanical ventilation are essential for decision-making in this cohort. They include hypoxemia, hyperventilation (used to control intracranial hypertension), volume-controlled (VC) versus pressure-controlled (PC) initial ventilation, and the use of clinical methods for monitoring ICP alone versus invasive monitoring.

6. Exploring allied health professionals' perceptions and practice in Ireland regarding guideline recommendations for intensity of multidisciplinary therapy for stroke survivors: A qualitative study

Authors: Foley, Gemma; Galvin, Rose and Horgan, Frances

Publication Date: 2025

Journal: Clinical Rehabilitation

Abstract: Competing Interests: Declaration of Conflicting Interests The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.; Objective To explore the attitudes and practice of allied health professionals working in stroke care in Ireland regarding recommended amounts of therapy set out in the National Clinical Guideline for Stroke (2023). Design Qualitative descriptive study using one-to-one semi-structured interviews. Data were analysed using reflexive thematic analysis. Setting Five large acute teaching hospitals in Dublin, Ireland. Participants The 11 participants were allied health professionals working in acute and subacute stroke care in Dublin, and were recruited using a combination of purposive and snowball sampling. Results Two main themes emerged: 'Barriers and enablers to achieving guideline recommended therapy time' and 'Methods of increasing therapeutic time'. Patient factors and clinical resources impact on the provision of therapy post-stroke. Overall, participants felt positive about the recent guideline recommendation for increased therapeutic time. Various methods are employed to augment patient therapeutic time, including technology and semi-supervised practice. Participants perceived that Therapy Assistants play an important role in achieving greater amounts of therapy. Conclusions Allied health professionals view the new Stroke Guidelines recommendation for increased therapy intensity as challenging but are generally positive in trying to achieve it, citing the benefits of increased therapy time for patient outcomes. They utilise a wide range of methods to optimise therapeutic time for stroke survivors. The role of the therapy assistant in supporting the delivery of larger amounts of therapy time warrants further evaluation.

7. Association between dehydration and stroke, a retrospective cohort study of a large database

Authors: Hamrick, Irene;Tuan, Wen-Jan;Harker, Pablo;Adogwa, Owoicho and Hyacinth, Hyacinth I.

Publication Date: 2025

Journal: Journal of Stroke and Cerebrovascular Diseases : The Official Journal of National Stroke Association

Abstract: Competing Interests: Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Irene Hamrick reports a relationship with ProSelect Insurance that includes: paid expert testimony. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.; Background: Aging changes contribute to higher rates of dehydration in older adults. We searched a large database to see if there is an association between stroke and dehydration.; Methods: A retrospective cohort design utilizing TriNetX, an electronic health record database from 55 United States healthcare organizations with >85 million patients. The study population consisted of adults aged 80 years and older who had healthcare encounters between January 1, 2018 and December 31, 2019, before the pandemic. The dehydration cohort was identified using ICD-10 diagnosis codes and laboratory test results. Outcome measures included one of three stroke types: intracerebral hemorrhage, ischemic stroke, and transient ischemic attack, based on ICD-10 codes. A sub analysis of individuals with diabetes was undertaken.; Results: Of 3,125,610 adults, 80 and older, 563,476 were dehydrated. Individuals with diabetes numbered 443,450 and 101,661 were dehydrated. The dehydration cohorts in both populations had a greater percentage of females, non-Hispanic, white individuals, and were slightly older (82.7 vs. 82.4, $p < 0.001$). After controlling for common confounders in propensity score matching, individuals with dehydration were 1.98-3.99 times more likely to develop stroke: intracerebral hemorrhage (OR=3.99, 95% CI=3.41-4.67), ischemic stroke (OR=1.98, 95% CI=1.9-2.07), and TIA (OR=2.88, 95% CI=2.74-3.28). The diabetes group showed: intracerebral hemorrhage (OR=6.76, 95% CI=4-11.42), ischemic stroke (OR=1.97, 95% CI=1.81-2.16), and TIA (OR=2.81, 95% CI=2.33-3.39).; Conclusion: A strong association between dehydration and stroke was found. The largest association was with intracerebral hemorrhage. Both physiologic changes of normal aging and medications used to treat cardiovascular stroke risk factors increase older adults' risk for dehydration. The strength of this study is the propensity risk management of over 3 million older adults (≥ 80 years). Limitations of this study include the retrospective nature of database evaluation. Future studies should evaluate whether increased hydration status leads to decreased stroke. (Copyright © 2025 The Authors. Published by Elsevier Inc. All rights reserved.)

8. Analysis of factors influencing poor neurological outcomes in patients with acute ischemic stroke

Authors: Hong, Xian-Chai;Shu, Mei-Chun;Bao, Shao-Rui;Chen, Si-Yan;Weng, Yi-Xin and Lin, Sui-Li

Publication Date: 2025

Journal: Annals of Medicine

Abstract: Objective: There is a gap in understanding how post-stroke fatigue influences neurological function, motor skills, and the overall quality of life in different regions. This study aimed to investigate the association between post-stroke fatigue and poor prognosis of neurological function in patients with acute ischemic stroke (AIS).; Methods: This study conducted a retrospective investigation. A total of 242 acute ischemic stroke patients were admitted to the Department of Neurology of our hospital from January 2018 to December 2019. Clinical information upon patient admission was collected, including general patient information, Fatigue Severity Scale (FSS) score, National Institutes of Health Stroke Scale (NIHSS) score, modified Rankin Scale (mRS) score at discharge, and follow-up assessments of one-year post-discharge. The impact of post-stroke fatigue on functional recovery at discharge and one year after discharge was analyzed. Clinical data were analyzed using statistical methods, including the Mann-Whitney U test, nonparametric rank-sum tests, chi-square, Fisher's exact tests, and binary logistic regression.; Results: Binary logistic regression showed that per capita monthly income at discharge (≥ 5001 , OR = 0.064, 95%CI: 0.005-0.842), NIHSS score (OR = 26.676, 95%CI: 8.218-86.590), and FSS score (OR = 1.085, 95%CI: 1.023-1.185) had an impact on functional recovery ($p < 0.05$). One year after discharge, the NIHSS score (OR = 5.043, 95%CI: 3.252-7.820) and FSS score (OR = 1.106, 95%CI: 1.029-1.188) were also found to have an impact on functional recovery ($p < 0.05$).; Conclusion: The prevalence of fatigue in patients with acute ischemic stroke is high, and post-stroke fatigue affects the functional recovery of patients both at discharge and 1 year after discharge.

9. The Effects of Augmented Reality on Rehabilitation of Stroke Patients: A Systematic Review and Meta-Analysis With Trial Sequential Analysis

Authors: Jia, Chanyi;Liu, Xiaoxia;Ning, Lianzhen and Ge, Lina

Publication Date: 2025

Journal: Journal of Clinical Nursing

Abstract: Aims: Stroke incidence has increased recently, causing functional impairments in most patients. Augmented reality(AR) is frequently employed as an interactive and repetitive technology to facilitate functional rehabilitation. Therefore, this study aimed to examine the current evidence in the effect of AR for stroke rehabilitation.; Design: Systematic review with meta-analysis.; Data Sources: Seven electronic databases including PubMed, Medline, CINAHL, Web of Science, Scopus, Embase and Cochrane were searched by MeSH terms and keywords such as 'Stroke' 'Augmented reality' up to December 1, 2024.; Methods: The

Cochrane Risk of Bias tool was used to evaluate potential bias. Meta-analysis and Trial Sequence Analysis were used to analyse by the datastata15.0 software and TSA v0.9 software.; Results: We searched 11 studies in a systematic review and 8 in a meta-analysis. The AR training group exhibited a significantly superior Berg Balance Scale scores(BBS) to those of the traditional training group. The Z-value curve of the sixth study crossed the traditional and TSA boundary values. Subgroup analysis revealed that BBS was significantly influenced in the hospital compared to the home intervention. The Timed Up and Go Test scores(TUG) and the 10-Meter Walk Test scores(10MWT) were similar in the AR and traditional training groups.; Conclusion: AR technology is beneficial for the lower limb balance functional rehabilitation of stroke patients. However, further exploration and verification are necessary due to an insufficient number of trials.; Implications for the Profession And/or Patient Care: The findings provide clinical references for implementing AR in rehabilitation interventions for stroke patients.; Impact: This paper is helpful for nurses in the rehabilitation training process of stroke patients, to make personalised plans for their rehabilitation, implement rehabilitation, provide health education and address other aspects of efforts, to provide patients with comprehensive support and help, to promote the functional recovery of patients and improve the quality of life.; Reporting Method: PRISMA guidelines.; Trial and Protocol Registration: PROSPERO number: CRD42024533761.; Patient or Public Contribution: MJEditor (www.mjeditor.com) provided English editing services during the preparation of this manuscript. (© 2025 John Wiley & Sons Ltd.)

10. Ethnic Contrasts in Stroke Risk Factors and the Atrial Fibrillation Paradox in the United Kingdom: Population-Based Study and Meta-Analysis

Authors: Kamtchum-Tatuene, Joseph;Yiin, Gabriel S. C.;Li, Linxin and Rothwell, Peter M.

Publication Date: 2025

Journal: Neurology

Abstract: Background and Objectives: Studies in northern America report lower prevalence of atrial fibrillation (AF) in Black people than in White people despite higher vascular risk factor prevalence. However, it remains unclear whether these differences are driven by biology vs variations in health care access or alcohol use. We aimed to determine whether ethnic differences in AF persist in the United Kingdom, where the National Health Service provides equitable access to care, and whether they are robust to adjustment for deprivation and alcohol use and are also seen for covert paroxysmal AF on ambulatory screening.; Methods: We performed a systematic review of UK-based studies reporting AF and vascular risk factor prevalence across ethnic groups and pooled estimates by random-effects meta-analysis. Findings were validated in a prospective population-based cohort (Oxford Vascular Study, OxVasc) of patients with suspected TIA or stroke in Oxfordshire, United Kingdom (April 2002-March 2023), through logistic regression adjusted for deprivation and alcohol use, and in a subset of participants recruited after October 2010 who were systematically screened for left atrial dilatation and paroxysmal AF.; Results: Among UK-based studies of patients with stroke, Black and Asian people had lower prevalence of AF (pooled OR, 95% CI, number of studies: 0.25, 0.20-0.32, n = 3; 0.37, 0.28-0.49, n = 6), alcohol consumption (0.42, 0.36-0.49, n = 2; 0.26, 0.13-0.49, n = 3), and smoking (0.70, 0.50-0.97, n = 2; 0.57, 0.44-0.74, n = 5), but higher rates of hypertension (1.95, 1.47-2.60, n = 3; 1.47, 1.02-2.12, n = 6) and diabetes (2.78, 2.40-

3.22, n = 3; 4.15, 3.11-5.53, n = 6). In stroke-free populations, similar differences were observed, especially for AF (0.47, 0.12-1.86, n = 2; 0.34, 0.15-0.74, n = 5). Among 7,297 OxVasc participants (47.4% women, 71.0 ± 15.5 years, 335 non-White), AF prevalence was lower in non-White people even after adjustment for age, sex, vascular risk factors, deprivation, and alcohol consumption (adjusted odds ratio OR] = 0.52, 0.32-0.82, p = 0.005). Among 2,221 participants with routine cardiac investigation, non-White people had lower prevalence of paroxysmal AF (2.3% vs 9.1%, OR = 0.24, 0.07-0.75, p = 0.004) or atrial dilatation (17.7% vs 27.2%, OR = 0.58, 0.34-0.99, p = 0.04).; Discussion: An AF paradox exists in ethnic minority groups in the United Kingdom, for permanent and paroxysmal AF, which is independent of vascular risk factors, deprivation, and alcohol consumption, suggesting different biological susceptibilities.

11. Validity, safety, usability, and user experience of virtual reality gamified home-based exercises in stroke

Authors: Lazem, Hatem;Harris, David;Hall, Abi;Mansoubi, Maedeh;Pontes, Rodrigo Garcia;de Mello Monteiro, Carlos Bandeira;Vieira de Araújo, Luciano;Lamb, Sarah E. and Dawes, Helen

Publication Date: 2025

Journal: Clinical Rehabilitation

Abstract: Competing Interests: Declaration of conflicting interestsThe authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.; ObjectiveThis study adopted a novel approach to exploring the content validity, safety, usability, and user experiences of different games for telerehabilitation purposes from the perspective of physiotherapists and stroke survivors.DesignA cross-sectional content validity and usability study.SettingLab and online.Participants23 participants were recruited; 11 neuro-physiotherapists and 12 chronic stroke survivors.OutcomesContent validity and safety were assessed using a bespoke state evaluation questionnaire. The usability was evaluated using the system usability scale (SUS) and user experience questionnaire (UEQ). House of Quality analysis was conducted to identify the priority aspects for improvement.ResultsPhysiotherapists perceived the usability of the games as good to excellent for three games, median SUS = 80%, and poor for two games SUS 0.8, and all games were safe to be administrated at home; mean CVI-safety item = 0.90. Stroke survivors with Fugl-Meyer Assessment of Upper Extremity function mean (SD) = 41(19.4), and mild to moderate spasticity perceived usability as very good to excellent for four games (median SUS = 85%). UEQ scale showed good to excellent acceptance among most of the games. House of Quality analysis revealed that clear instructions, avatar quality, motivational exercise scenarios, and clinical assessment tools are important criteria that should be considered throughout the development.ConclusionThis study demonstrated the value of exploring patient and physiotherapist perspectives for better telerehabilitation interventions co-development. Clinical trials should be conducted after further refinement of the games to investigate their feasibility and potential efficacy as a telerehabilitation tool for arm and balance training.

12. Does Proprioceptive Neuromuscular Facilitation Approach Have an Effect on Swallowing Function, Muscle Morphology and Quality of Life in Dysphagic Stroke Patients? A Randomised Controlled Trial

Authors: Özcan, Esra Nur;Ünlüer, Nezehat Özgül;Öztürk, Mehmet and Erdur, Ömer

Publication Date: 2025

Journal: Journal of Oral Rehabilitation

Abstract: Objective: To investigate the effects of different exercise methods on swallowing function in dysphagic stroke patients.; Methods: Forty-two patients with dysphagia were divided into three groups: conventional swallowing exercises group; the proprioceptive neuromuscular facilitation (PNF) exercises + conventional swallowing exercises group and the Chin-tuck Against Resistance (CTAR) exercises + conventional swallowing exercises. Patients received swallowing rehabilitation twice a week for 8 weeks. Patients were evaluated for swallowing using Fiberoptic Endoscopic Evaluation of Swallowing (FEES) with the Penetration-Aspiration Scale. Suprahyoid muscle thickness, tongue root area and hyolaryngeal elevation were measured by ultrasound before and after treatment. Furthermore, scales such as the National Institutes of Health (NIH) swallowing safety scale, Functional Oral Intake Scale (FOIS), Eating Assessment Tool-10 (EAT-10) and Swallowing Quality of Life Scale (SWAL-QOL) were utilised.; Results: The clinical and demographic characteristics of all three groups were similar at baseline ($p > 0.05$). Positive improvements were identified following treatment in terms of muscle thickness, as determined by FEES evaluation of swallowing functions and ultrasound evaluations, in all groups ($p < 0.05$). In the PAS liquid food evaluation, the highest effect was found in the PNF group ($\eta^2 = 0.858$). All ultrasound evaluations showed greater improvement in the PNF and CTAR groups compared to the conventional group ($p < 0.05$). The SWAL QOL also showed significant improvements in all groups after treatment ($p < 0.05$).; Conclusion: In this study, all three groups contributed to swallowing rehabilitation, but the PNF group improved the most. PNF exercises, delivered by physical therapists without the need for specialised equipment, will make swallowing rehabilitation more effective.; Trial Registration: ClinicalTrials.gov identifier: NCT05678686. (© 2025 The Author(s). Journal of Oral Rehabilitation published by John Wiley & Sons Ltd.)

13. Persistent visual deficits in minor ischemic stroke

Authors: Qureshi, Humza;Saraiya, Raj G.;Koneru, Manisha;Bhatti, Karandeep S.;Khullar, Manurag;Dubinski, Michael J.;Penckofer, Mary;Khalife, Jane;Schumacher, Hermann C.;Hanafy, Khalid A.;Curran, Courtney;Siegler, James E.;Thon, Olga R. and Thon, Jesse M.

Publication Date: 2025

Journal: Journal of Stroke and Cerebrovascular Diseases : The Official Journal of National Stroke Association

Abstract: Competing Interests: Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.; Background: Compared to more severe

presentations, minor ischemic stroke (MIS) remains poorly characterized regarding predictors of long-term outcomes. Particularly there is a need to assess the impact of persistent visual deficits on functional disability in this population. This study aims to compare functional outcomes of MIS between patients with persistent visual deficits (PeVD) and patients without PeVD.; Methods: This retrospective single-center cohort study included adult acute ischemic stroke patients who presented to a comprehensive stroke center from 2019 to 2023. MIS was defined as a National Institutes of Health Stroke Scale (NIHSS) score ≤ 5 on admission and at 24 hours. PeVD was defined as a nonzero visual field NIHSS subscore at 24 hours. The primary outcome was the 90-day modified Rankin Scale (mRS) score.; Results: Among 1041 MIS patients, 108 (10.4%) had PeVD. Both median presenting (PeVD+: 2 IQR 1-4] v. PeVD-: 1 IQR 0-3], $p < 0.001$) and 24-hour NIHSS (PeVD+: 2 IQR 1-3] v. PeVD-: 1 IQR 0-2], $p < 0.001$) were higher in patients with PeVD than those without PeVD. At 90 days, patients with PeVD had higher mortality rate (14.3% vs. 7.8%, $p = 0.04$) and mRS scores ($p = 0.003$). After multivariable regression and sensitivity analyses, 24-hour NIHSS was associated with worse 90-day functional outcomes ($p < 0.001$) while PeVD was not ($p = 0.21$).; Conclusion: This study suggests a minority of MIS patients have PeVD, which is associated with stroke severity but not with 90-day functional outcomes. Future studies should evaluate alternative and impactful functional outcome measures not captured by mRS in MIS patients with PeVD. (Copyright © 2025 The Authors. Published by Elsevier Inc. All rights reserved.)

14. Effect of Mobile Stroke Unit Dispatch on Process Parameters and Functional Outcomes in Patients With Acute Stroke: The B_PROUD-2.0 Study

Authors: Rohmann, Jessica L.; Piccininni, Marco; Ebinger, Martin; Wendt, Matthias; Weber, Joachim E.; Schwabauer, Eugen; Freitag, Erik; Zuber, Martina; Bernhardt, Lydia; Lange, Julia; Erdur, Hebung; Behrens, Janina; Ganeshan, Ramanan; Schlemm, Ludwig; Harmel, Peter; Liman, Thomas G.; Lorenz-Meyer, Irina; Rohrpasser-Napierkowski, Ira; Hille, Annegret; Bohner, Georg, et al

Publication Date: 2025

Journal: Neurology

Abstract: Background and Objectives: Prehospital stroke management on mobile stroke units (MSUs) shortens time to IV thrombolysis (IVT) and improves functional outcomes. Because IVT effects are time-dependent, optimizing workflows and dispatch-related processes may enhance MSU benefits. The B_PROUD-2.0 study aimed to determine the effect of additional MSU dispatch on functional outcomes in acute stroke patients under optimized MSU organization and service delivery.; Methods: In the nonrandomized, controlled B_PROUD-2.0 study (May 2019-April 2021) conducted in Berlin, Germany, MSUs were simultaneously dispatched with conventional care ambulances for suspected stroke emergency calls, whenever available. We compared outcomes and process parameters between dispatch groups (additional MSU dispatch vs conventional care only) among patients with cerebral ischemia with disabling neurologic symptoms and no contraindications to reperfusion treatments. We used data from the Berlin dispatch center and records from the B_SPATIAL registry, consisting of 15 Berlin hospitals with stroke units. We performed pooled analyses with the B_PROUD-1.0 primary population (February 2017-April 2021) and with an extended cohort that also included patients with reperfusion treatment contraindications. The primary and co-

primary outcomes were 3-month modified Rankin Scale scores (0: no deficits to 6: death) and 3-tiered disability scale scores. Effect estimates for these outcomes were obtained from ordinal logistic regressions, adjusting for a priori selected covariates after multiple imputation for missing values.; Results: Coronavirus disease 2019 pandemic and limited funding hindered full implementation of procedural improvements. A total of 1,050 patients (mean age: 74 years, 46.7% female) were included in B_PROUD-2.0 (vs 1,500 planned). We found no statistically significant effect of MSU dispatch on primary (common odds ratio cOR] 0.90, 95% CI 0.72-1.14) or co-primary (cOR 0.86, 95% CI 0.63-1.17) outcomes in B_PROUD-2.0, and higher odds of IVT ≤ 1 hour of dispatch in the MSU group (OR 10.15, 95% CI 7.10-14.51). In pooled B_PROUD-1.0+2.0 primary population analyses (N = 2,666, mean age: 73 years, 46.8% female), we found a beneficial effect on primary (cOR 0.80, 95% CI 0.67-0.96) and co-primary (cOR 0.79, 95% CI 0.64-0.97) outcomes. The average effect on all stroke/TIA patients in the extended cohort (N = 4,336, mean age 75 years, 47.6% female) was also favorable (primary cOR 0.85, 95% CI 0.75-0.95; co-primary cOR 0.86, 95% CI 0.75-0.99).; Discussion: While we did not observe statistically significant differences in functional outcomes in the underpowered B_PROUD-2.0 study, we found beneficial effects considering both B_PROUD study periods, also when including all stroke/TIA patients.; Trial Registration Information: ClinicalTrials.gov: NCT03931616. Registered: April 26, 2019. First patient enrolled: May 9, 2019.; Classification of Evidence: The B_PROUD-2.0 study provides Class III evidence that the addition of MSUs to conventional care ambulances did not improve functional outcomes at 3 months compared with conventional care ambulances alone in patients with acute ischemic stroke.

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

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Journal: International Journal of Medical Informatics

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

sources (EHR, imaging, biosignals), patient demographics, and stroke prevalence. Descriptive synthesis was performed due to substantial heterogeneity precluding quantitative meta-analysis.; Results: Fifty-eight studies were included, with peak publication output in 2021 (21 articles). Studies targeted three main prediction objectives: stroke occurrence prediction (n = 52, 62.7 %), stroke outcome prediction (n = 19, 22.9 %), and stroke type classification (n = 12, 14.4 %). Data sources included electronic health records (n = 48, 57.8 %), medical imaging (n = 21, 25.3 %), and biosignals (n = 14, 16.9 %). Systematic analysis revealed ensemble methods consistently achieved highest accuracies for stroke occurrence prediction (range: 90.4-97.8 %), while deep learning excelled in imaging-based applications. African populations, despite highest stroke mortality rates globally, were represented in fewer than 4 studies.; Conclusion: ML techniques show promising results for stroke prediction. However, significant gaps exist in representation of high-risk populations and real-world clinical validation. Future research should prioritize population-specific model development and clinical implementation frameworks. (Copyright © 2025 The Authors. Published by Elsevier B.V. All rights reserved.)

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

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Journal: Annals of Medicine

Abstract: Background: Stroke is a leading cause of long-term disability and death worldwide. Spasticity after stroke seriously affects patients' quality of life. If this state persists for a long time, it will lead to severe joint atrophy, reduced motor coordination, and even permanent disability. Therefore, clinical research has focused on the treatment of spasticity and the recovery of motor function after stroke.; Aim: The aim of this paper is to explore the use of botulinum toxin type A in the rehabilitation of spasticity after stroke and to provide a theoretical basis for optimizing rehabilitation strategies, highlighting its potential value in reducing spasticity and improving motor function.; Method: This article reviews the latest research progress on the application of BTX-A in spasticity after stroke, discusses the potential and challenges of BTX-A in reducing spasticity and improving motor function in patients with stroke.; Result: Botulinum toxin type A (BTX-A) is a local muscle paralytic agent that has received extensive attention in recent years for its application in reducing muscle spasticity and promoting post-stroke rehabilitation.; Conclusion: This article confirms that botulinum toxin type A has a significant clinical effect in treating muscle spasticity after stroke and also helps improve motor function restoration in patients. Studies have shown that botulinum toxin type A injections are effective in reducing spasticity and, when combined with rehabilitation training, can facilitate the recovery of motor function in post-stroke patients. Therefore, botulinum toxin type A has a broad application prospect in the rehabilitation of post-stroke spasticity.

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