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Clinical Characteristics of Strokes that occur while Driving

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Background and aims: Blood pressure fluctuates during driving due to tension, which may be related to the onset of stroke. The characteristics of strokes that occur while driving vehicles were examined.

Methods: Of 11,285 acute stroke cases within 7 days of onset registered in the Saiseikai Stroke Database over a 3-year period from April 2018 to March 2021, 68 occurred while driving. The clinical features of these cases were compared with those of 6,626 cases that occurred during daily activities other than driving.

Results: The strokes consisted of TIA, cerebral infarction, cerebral hemorrhage, and subarachnoid hemorrhage in 2.9%, 35.3%, 50.0%, and 11.8% of patients, respectively, in the driving-onset group, and 4.9%, 61.6%, 25.7%, and 7.7% of patients in the other activity group ($p < 0.0001$). The driving-onset group included more males (76.5 vs 57.2%), was younger (64.9 vs 73.1 years old), and had a lower incidence of previous stroke (11.8 vs 24.3%). There were non-significantly fewer lacunar infarctions among cerebral infarctions, fewer cerebellar hemorrhages, and more brainstem hemorrhages among cerebral hemorrhages, with no differences in clinical outcomes at discharge. Nineteen patients had traffic accidents at onset; compared to the 43 patients who did not have traffic accidents, they had more consciousness disturbance and worse clinical outcomes, and subcortical hemorrhage and cardioembolism were more common.

Conclusions: Rates of cerebral and subarachnoid hemorrhages were higher in cases of stroke while driving. Cardioembolism and subcortical hemorrhage were more common in driving-onset patients with traffic accidents, with poor outcomes.

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A Phase I, double-blind, randomised, placebo-controlled, sequential-group study to assess the safety, tolerability and pharmacokinetics of single ascending doses of ARG-007 in healthy participants

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Background: ARG-007 is a cationic poly-arginine peptide consisting of 18 D-arginine residues developed by Argenica Therapeutics, with the goal of neuroprotection in ischaemic stroke and other neurological conditions. Pre-clinical studies with ARG-007 have demonstrated reduced infarct expansion compared with controls, no adverse effects in a model of intracerebral haemorrhage, and resistance to degradation by thrombolytic enzymes. Immunotoxicity studies showed no adverse immune responses. These data allowed for this first-in human study.

Aims:

1. Evaluate the safety and tolerability of escalating doses of ARG-007, by analysing incidence and severity of serious adverse (SAEs), adverse events (AEs), and clinically significant changes from baseline in clinical and laboratory parameters.
2. Determine the pharmacokinetic profile.
3. Assess immune reactivity.

Methods: Phase I, double blind, randomised, placebo controlled trial in healthy adult volunteers. Four cohorts were randomly assigned to ARG-007 (0.03, 0.1, 0.2, and 0.3mg/kg) or placebo 3:1, administered by intravenous infusion over 10 minutes, then 48 hours of inpatient observation. The safety review committee reviewed safety data before proceeding to the next dose.

Results: 17 females, 15 males, mean age of 36.2 years participated. There were no SAEs. 13/24 (54.2%) subjects given ARG-007 reported at least one treatment emergent AE, compared to 5/8 (62.5%) given placebo; headache being the most common. AEs were not dose dependent. Routine blood tests and vital signs showed no dose-related trend in changes over time.

Pharmacokinetic analysis revealed quantifiable seem levels from 5 minutes to 48 hours after the onset of the infusion, with a median half life of 12.4 to 15.8 hours. There were no notable trends in changes from baseline cytokine levels over time.

Conclusion: ARG-007 appears to be safe, have predictable pharmacokinetics, and no significant immunogenic response in healthy volunteers. A phase II study in large vessel occlusion stroke is planned.

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Socioeconomic Status and Health-related Quality of Life after Stroke: a Systematic Review and Meta-analysis

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Background: Socioeconomic status (SES) is associated with stroke occurrence and survival following stroke but its association with health-related quality of life (HRQoL) following stroke remains uncertain.

Aim: We performed a systematic review and meta-analysis to examine the association between SES and HRQoL after stroke.

Methods: PubMed, SCOPUS, EMBASE, and Web of Science were searched to identify relevant cohort and case-control studies between January 2000 and May 2022. Two authors screened titles, abstracts and full text articles. One author extracted data from all included studies. Meta-analyses were performed for studies with comparable measurements of SES and HRQoL. Random effects models were used to estimate pooled summary standardised mean differences in HRQoL by SES.

Results: Out of 1,876 citations, 39 studies incorporated measurement of overall HRQoL following stroke and were included in the systematic review, with 17 studies included in the meta-analyses. Overall, reports including education, income, occupation and work status effects on HRQoL after stroke were inconsistent among all included 39 studies. In the global meta-analysis of 17 studies, HRQoL among survivors of stroke was lower in the low SES group than in the high SES group (standardised mean difference (SMD) -0.36, 95% CI -0.52, -0.20, $p < 0.0001$). When using education and income indicators separately, summary effects were similar to those of the global analysis (low versus high education SMD -0.38, 95% CI -0.57, -0.18, $p < 0.0001$; low versus high income SMD -0.39, 95% CI -0.59, -0.19, $p < 0.0001$).

Conclusions: Across all SES indicators, people with stroke who have lower SES have poorer overall HRQoL than those with higher SES. Accessibility and affordability of poststroke support services should be taken into consideration when planning and delivering services to people with low SES.

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An International Perspective of Incidence and Risk factors of Young Stroke: a Scoping Review

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Background: Stroke within younger age groups is increasing globally. While there is focus on research conducted on people under 65 years who have had a stroke, there is a paucity of data on the incidence and risk factors of stroke among younger people (≤ 30 years) who are sociodemographically unique.

Aims: To examine evidence on incidence and risk factors for perinatal, childhood and young adult stroke in different countries.

Methods: A systematic search was conducted on 23rd March 2022 and included articles published in the last ten years across Medline Ovid, Embase, PsycINFO and CINAHL databases.

Results: A total of 5750 articles were identified. After screening, 471 articles were included (224 cohort studies (47.6%), 164 case studies/case series (34.8%), 35 reviews, 30 case-control and 18 combination of designs). We had data from 50 different countries; 199 studies were from high-income countries, 3 were from low-income countries, and a further 185 did not state the country of research. Most (63.0%) of studies focused on

risk factors, while incidence constituted 37.0%. Incidence data was reported heterogeneously across studies, leading to an inability to synthesise data. The three most frequently reported risk factors for perinatal stroke were infections, cardiac conditions, and intrapartum factors. Vasculopathies, infection and cardiac conditions were the most reported risk factors for paediatric stroke, while chronic conditions (e.g. diabetes), vasculopathies and cardiac conditions mostly accounted for stroke among young people.

Conclusion: This review has highlighted different risk factors for age cohorts of people under 30 years who have had a stroke. A large proportion of data from this cohort are reported in case studies, indicating that more robust methodological study designs are needed to improve the certainty of this data. A standardised reporting of age groupings of incidence data is imperative to enable the comparison of data from geographical locations.

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i-REBOUND after stroke - The consumer perspective

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Background: Consumer input is recommended for all research projects but achieving genuine and productive consumer engagement takes commitment and time. Collaborative relationships between survivors of stroke and researchers are essential to achieving “fit for purpose” outcomes.

Aim: Outline steps to achieve authentic consumer engagement during the design and co-creation of content for the i-REBOUND ‘after stroke’ website aimed to help survivors of stroke to ‘move more’ and ‘eat well’ after their stroke.

Methods: An integrated knowledge translation (iKT) approach was used during this project. The iKT approach involved consumers as equal partners. A consumer advisory group (CAG) was formed to guide the project team on key criteria for the i-REBOUND website. Workshops were held with other survivors of stroke to ensure broad views and necessary elements were captured. A prototype was developed, and pilot tested by members of the CAG ($n=7$). Feedback was actioned before prototype was put into production. Website content was created by members of the CAG ($n=6$) and other survivors of stroke ($n=9$).

Results: The i-REBOUND after stroke website was successfully launched in November 2022. Key elements for consumers were for i-REBOUND to be accessible, easy to navigate, motivating and feature survivors of stroke. The “secret sauce” to consumers and researchers working together was mutual respect, opportunities to consider draft material before scheduled meetings and shared decision making through the life of the project. Created content included exercise routines ($n=33$), step by step recipes ($n=24$) and ‘hints and hacks’ featuring survivors of stroke ($n=117$). Consumers felt valued, respected, and appreciated for contributing their lived experience.

Conclusion: Meaningful consumer partnerships have enabled the creation of a website which survivors of stroke find engaging, motivating and contributing to their daily life. Evidence based resources on the i-REBOUND website: www.irebound.enableme.org.au are easy to navigate, accessible and feature survivors of stroke.

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The Role of Decompressive Craniectomy Following Microsurgical Repair of a Ruptured Aneurysm: Analysis of a South Australian Cerebrovascular Registry

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Background: Decompressive craniectomy (DC) remains a controversial intervention for established or anticipated intracranial hypertension among patients with aneurysmal subarachnoid haemorrhage (aSAH).

Aims: We aimed to describe the outcome of patients undergoing this procedure, compare their outcomes with a propensity matched cohort who did not undergo decompression and identify predictors of patient outcome.

Methods: We identified aSAH patients who underwent DC following microsurgical aneurysm repair from a prospectively maintained cerebrovascular registry and compared their outcomes with a propensity-matched cohort who did not. Logistic regression was used to identify predictors of undergoing DC and post-operative outcome. The outcomes of interest were inpatient mortality, unfavourable outcome (mRS ≥ 4) and NIS-Subarachnoid Hemorrhage Outcome Measure at first and final follow-up.

Results: A total of 246 consecutive patients with aSAH underwent microsurgical clipping of the culprit aneurysm between 01/09/2011 and 20/07/2020. Of these, 46 patients underwent DC and were included in the final analysis. Unsurprisingly, patients treated with DC had a greater chance of unfavourable outcome ($p < 0.001$) and higher median mRS ($p < 0.001$) compared with those who did not at final follow-up. Despite this, almost two-thirds (64.10%) of patients undergoing a DC had a favourable outcome at this time-point. When compared with a propensity-matched cohort who did not, patients treated with DC fared worse at all endpoints. Multivariable logistic regression revealed that increased pre-operative mid-line shift was predictive of undergoing DC, and age ≥ 65 and WFNS grade ≥ 4 were associated with unfavourable outcome.

Conclusion: Our data suggest that DC can be performed with acceptable rates of morbidity and mortality, particularly among younger patients who present with lower grade aSAH. Further research is required to determine the superiority, or otherwise, of DC compared with structured medical management of intracranial hypertension in this context, and to identify predictors of requiring decompressive surgery and patient outcome.

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Understanding Barriers and Enablers to Delivering Vocational Rehabilitation Interventions with Adults with Stroke using the Theoretical Domains Framework

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Background: Despite acknowledging the important role that vocational rehabilitation programs play in supporting people to return to working after stroke, there are gaps in the literature regarding how to best

support clinicians to deliver vocational rehabilitation as part of a comprehensive stroke rehabilitation program. To address this gap, we sought to understand the implementation behaviours of clinicians who are currently delivering vocational rehabilitation within this context.

Aims: To identify the factors influencing delivery of vocational rehabilitation in clinical rehabilitation using the Theoretical Domains Framework (TDF) to inform development of a behaviour change intervention.

Methods: We administered the Theoretical Domains Framework Questionnaire (TDFQ) online to 17 allied health professionals who had a role providing vocational rehabilitation within government-funded, clinical rehabilitation settings in Victoria. All responding clinicians were experienced in stroke rehabilitation.

Results: On average, clinicians reported 30% (5-100%) of their case-load involved vocational rehabilitation. All theoretical domains were identified as being relevant to supporting clinicians to deliver vocational rehabilitation with personal ratings varying across clinicians. There was an overall high level of belief in the value of vocational rehabilitation for supporting return-to-work after stroke, and strong beliefs that providing vocational rehabilitation interventions formed an important part of the rehabilitation clinician role. While 'Motivation' for delivering vocational rehabilitation was high, significant 'Capability' and 'Opportunity' issues were identified. Respondents identified both knowledge and skill concerns. And, the ability to deliver vocational rehabilitation interventions was seen to be limited by availability of resources, lack of support from management, insufficient time, and lack of opportunity for training.

Conclusion: Implementation supports should be tailored to address Capability and Opportunity issues that influence delivery of vocational rehabilitation interventions within the clinical setting. Using the TDF allowed for the identification of a range of factors influencing clinicians that could be targeted in a future education and training intervention.

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In Search of a Gold Standard Stroke Knowledge Assessment Tool: Preliminary data from a COSMIN Systematic Review

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Background: Stroke knowledge includes an understanding of risk factors, signs of stroke, and the need for prompt medical care. Assessment of stroke knowledge may assist with evaluation of targeted education programs to prevent stroke, but this requires valid and reliable knowledge assessment tools.

Aims: To systematically review contemporary stroke knowledge assessment tools and appraise their psychometric properties.

Methods: The protocol was registered in Prospero (CRD42023403566). Electronic databases (MEDLINE, PsycInfo, CINAHL, Embase, Scopus and Web of Science) were searched to identify articles published between 1 January 2015 and 1 March 2023. Eligible articles were those in which stroke knowledge was assessed using a validated stroke knowledge assessment tool. Two reviewers independently screened the titles and abstracts using Covidence. Agreement was measured using the Kappa (k) statistic. Discrepancies were resolved by a third reviewer.

Prior to exclusion at full text review, authors of identified articles were contacted to obtain a copy of the tool (where not publicly available). Psychometric properties of the tools will be appraised using the COSMIN checklist.

Results: After removing duplicates, titles and abstracts of 715 articles were screened for eligibility, with 90% agreement between reviewers ($k=0.79$). Of 320 articles that were reviewed in full, 259 were excluded (97% agreement between reviewers; $k=0.90$). Of the articles excluded, 181 (70%) did not use a validated tool to assess stroke knowledge, 40 (15%) had no assessment of stroke knowledge, and 21 (8%) were an ineligible type of article (e.g. conference abstract). From 61 articles pending inclusion (author contact required), 16 validated tools have been obtained. This review is currently in progress. The appraisal of psychometric properties of included tools will be provided at the conference.

Conclusion: This review will inform the appropriate use of current tools or the need to develop a gold-standard stroke knowledge assessment tool for the Australian context.

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Participation in Meaningful Activities may be More Important than Functional Independence After Severe Stroke: A Cohort Study of Working-aged Adults

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Background: Community participation and engagement are core determinants of health and well-being. Despite this, stroke rehabilitation continues to focus on functional independence, with little focus on community re-integration.

Aims: To identify factors affecting health related quality of life (HRQoL) after severe stroke in working age adults, with particular focus on participation, self-care, mobility, cognition, communication and continence.

Methods: This longitudinal study was conducted with the OutcomeABI, a severe, mixed-brain injury cohort. Participants' data were included if they had experienced a stroke, were of working age (18-67 years inclusive) and had complete a 2-year follow-up assessment. Standardised assessments were administered at discharge and 2-years post-stroke included: EQ-5Dvisual analogue scale (HRQoL), Functional Independence Measure, Functional Autonomy Measurement System subscales (mobility, cognition, communication and continence), and Mayo-Portland Adaptability Inventory (participation).

Results: 28 participants were included, with a mean age of 48 years (SD 12.7). The average length of stay in inpatient rehabilitation was 156 days (SD 85). At discharge 68% experienced hemiplegia and 39% experienced aphasia. Most were living in the community at 2 years (although 29% experienced a change in accommodation post-discharge). On discharge, 21% described themselves as unemployed / not looking for work, but at 2 years this had increased to 83%. 2-year HRQoL was best predicted by a person's participation levels (β -0.651, 95% CI -3.216 to -0.419, $p=0.013$), while functional independence and individual clinical abilities (such as mobility) were not associated. The overall model explained 26% of variance in EQ5Dvisual analogue scale scores. Findings suggest that participation in meaningful activities has a stronger association with HRQoL than functional independence in working-age stroke survivors.

Conclusion: This study extends the importance of improving community participation to enhance long-term HRQoL up to 2-years post-stroke and consistent with earlier research, suggests a need to both evaluate and support HRQoL after young stroke.

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Socioeconomic status is associated with health-related quality of life after stroke—an Australian state-wide record linkage study

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Background: Health-related quality of life (HRQoL) after stroke is an important patient reported outcome. This study aimed to investigate the association between socio-economic status (SES) and HRQoL after first-ever stroke.

Methods: The Admitted Patient Care Episode (APC) and the Death Registry of Tasmania were used to identify first-ever stroke cases. The Australian Stroke Clinical Registry (AuSCR) was used to obtain stroke severity, processes of care (stroke unit, discharge on anti-hypertensive and discharge care plan) and HRQoL. The AuSCR monitors stroke care from the hospitals and self-reported outcomes at 90-180-day follow-up. The Emergency Department data and the APC were used to obtain comorbidities. SES was determined by the Index of Relative Socio-economic Advantage and Disadvantage from the Socio-Economic Indexes for Areas 2016 by quintile (high, medium-high, medium, low-medium, low), and, remoteness, by the Accessibility and Remoteness Index of Australia. HRQoL was measured by EQ-5D (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) three level scale, utility index and visual analogue scale (VAS). Tobit regression and generalised linear regression models were constructed to estimate the associations between SES and EQ-5D utility index and the VAS score.

Results: Between 2015 and 2019, 1051 cases were identified. The mean utility index and the VAS score were 0.68 (SD, 0.33) and 68.10 (SD, 21.32). Usual activity was the most frequently (58%) reported issue. Compared to the high SES group, the low SES group had 0.07 (95% CI -0.14, -0.001) lower in utility score after adjusting for age, sex, remoteness, comorbidities and processes of care. Individuals with low SES were also showed lower VAS score (β -3.10, 95% CI -6.94, 0.74).

Conclusion: Stroke survivors in low SES group are more likely to report a lower HRQoL. Multifaceted approach that includes access to support services and patient education should be taken into consideration when delivering services.

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Do patient and service factors influence medication management of patients with acute stroke in a regional Emergency Department?

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Background: Regional hospitals have less access to stroke specialists and lower compliance with stroke clinical guidelines compared to metropolitan hospitals. Previous stroke studies in Emergency Departments (EDs) have focused on reperfusion treatments (thrombolysis and thrombectomy) for acute ischaemic stroke. Arrival to hospital by

ambulance, arriving sooner after onset and being in a metropolitan hospital are associated with receiving reperfusion treatments.

Aims: To determine the extent to which patients with acute stroke in a regional ED receive optimal management (hyperacute or secondary prevention medication management) compared to stroke clinical guidelines. To explore patient and service factors associated with optimal management in ED.

Methods: Medical records of 304 consecutive patients presenting with acute stroke from 2019-2021 were included. Data regarding optimal management were compared to stroke clinical guidelines. Relationships between patient and service factors and optimal management were explored using logistic regression.

Results: Fourteen people presented with haemorrhagic stroke (5%), 88 with ischaemic stroke (29%) and 202 with suspected ischaemic stroke/transient ischaemic attack (TIA) (66%). Optimal management was achieved for 86% of haemorrhagic, 86% of ischaemic, 64% of suspected ischaemic stroke/TIA. Telehealth input from a stroke specialist was the strongest predictor in achieving optimal management (adjusted odds ratio (aOR) (95% confidence interval (95% CI)): 4.95 (2.45-10.32)). Longer to attend ED (aOR (95%CI): 3.76 (1.43-10.11), presenting during 2021 (aOR (95%CI): 1.50 (1.06-2.13)), or having a suspected ischaemic stroke/TIA (aOR (95%CI): 2.28 (1.02-5.35)) were associated with suboptimal management.

Conclusion: Optimal management was achieved for a high proportion of patients with haemorrhagic and ischaemic stroke. The strongest predictor for receiving optimal medication management was receiving acute telehealth input from a stroke specialist. This was true for the small number of patients who received reperfusion treatments and also for patients who received guideline-recommended secondary prevention medication management in ED.

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Atrial Fibrillation and Anticoagulation in Patients Hospitalised for Stroke in the REGIONS Care Study

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Background: Oral anticoagulants decrease the risk of stroke associated with atrial fibrillation (AF). ARCOS IV reported a 26.5% anticoagulant rate among AF related stroke admissions, but this data is nearly 10 years old. Little is known about potential ethnic and regional differences in anticoagulation patterns for AF in Aotearoa New Zealand.

Aims: To describe AF patient characteristics and anticoagulation patterns in Aotearoa.

Methods: REGIONS Care is a prospective, nationwide, observational study of consecutive adult stroke patients admitted to hospital between 1 May and 31 October 2018. AF and anticoagulation prescribing, intracerebral haemorrhage (ICH), and differences by Māori ethnicity and hospital location are described.

Results: Of 2379 patients, 807 (34.3%) had a diagnosis of AF. AF patients were older than non-AF patients (mean 79.9 (SD 11) versus 72.5 (14.2), $P < 0.0001$). AF was diagnosed before stroke in 666 patients (82.5%) and of these 442 (66.4%) were taking an anticoagulant at the time of their stroke. The most common documented reasons for non-anticoagulation were prior bleeding (20.5%), patient preference (18.1%), frailty, comorbidities, or side effects (13.2%), and falls (6.8%). The ICH rate was similar for AF patients on versus not on an anticoagulant (aOR 0.99, 95% CI 0.55-1.80). Anticoagulant use was not associated with a higher rate of ICH. Rates and reasons for anticoagulation non-prescribing were similar

for Māori, non-Māori, urban, and non-urban populations although Māori were younger (68.7(13.2) vs 81.1(10.1)).

Discussion: Although anticoagulation prescribing in AF has improved over the past decade, one third of stroke patients with known AF were not taking an anticoagulant prior to admission requiring further efforts to optimize stroke prevention. The lack of increased ICH rate with anticoagulation is reassuring. There were no significant ethnic or geographic differences in anticoagulant prescribing although Māori stroke patients with AF were younger indicating a high priority population.

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Co-design of Processes to Assist Research Dissemination to People with Aphasia

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Background: Aphasia WA is a consumer organisation that supports people with aphasia in Western Australia. Frequently, researchers contact Aphasia WA to advertise for participant recruitment. Collecting pre and post therapy outcome measures to determine treatment efficacy is a mainstay of the scientific method. Aphasia WA community group members expressed consistent and persistent dissatisfaction with the complete lack of research feedback. Members stated individual participant performance and overall study results are often absent, sporadic, untimely (at trial completion) and not in aphasia friendly format.

Aim: This co-designed project provides a process guide to assist researchers to feedback participant and study results to people with aphasia.

Method: Using an iterative process in several group discussions, we listened to community group members' experiences of research participation and their expectations of committing their time to research. These data formed the basis of the Aphasia WA research engagement policy and process guide. An aphasia friendly participant results template (baseline and re-assessment results) was co-designed and piloted with the Upper limb and Language Impairment and Functional Training (UPLIFT) lived experience group.

Result: We present the co-designed research engagement process and participant results template together with our implementation process used in a clinical trial. This ongoing work will continue to be revised by participants in the trial.

Conclusion: Our co-designed resources address current consumer concerns about their research participation. A resource package for future research will be freely available from October 2023. We acknowledge the contribution of Aphasia WA, the UPLIFT executive and Graeme Hankey.

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Stroke Care Barriers Faced by Rural Māori With Stroke: Foundations for Co-Designing Improvements

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Background: The REGIONS Care study found that rural Māori experience the worst stroke outcomes in Aotearoa New Zealand.

Aims: To identify key barriers to quality stroke care for Māori with stroke residing in rural areas and to support co-designed improvement strategies.

Methods: Mixed methods study including rural Māori health worker questionnaire and focus groups involving health providers (n=5) and Māori with lived experience of stroke (n=4). The predominantly free-text survey responses and focus group transcripts underwent a narrative thematic analysis and quantitative survey data was summarized using a descriptive statistics approach.

Results: Of 19 (21% response rate) health worker survey responses 73.6% were Māori and 90% cared for >50% Māori patients. Questionnaire themes included “transportation and isolation,” “connecting with whānau (family),” “health literacy,” “whānau wellbeing,” and “competing priorities.” These themes were then presented to health workers to identify implementation priorities resulting in five updated themes: “health literacy and education for whānau,” “relatable information,” “addressing reluctance in asking for help,” and “local faces.” Lived experience focus group discussions confirmed the theme of “relatable information” extending to “real support and information from doctors,” but also strongly highlighted the need for “rural health worker upskilling” and “respect” in light of all attendees reporting delayed stroke diagnosis and being initially “dismissed” despite seeking care promptly and eventual stroke confirmation. “Education on healthy eating” by people who “look like us” and are known to the community (e.g., again “local faces”) constituted a final theme.

Conclusions: Health education represented a key theme across all activities with a major divergence between health workers who primarily emphasized the need for patient education compared with people with lived experience who stressed education of health workers to aptly and respectfully identify stroke symptoms and optimize management. Provision of care by known and trusted community members was also highlighted as important.

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Evaluation of the health service delivered secondary prevention program: Supporting Lifestyle and Activity Modification after TIA (SLAM-TIA)

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Background: Recurrent stroke risk is high after a transient ischemic attack (TIA). Self-management of modifiable risk factors can contribute to significant improvements in cardiovascular health and reduce this risk.

Aim: Determine the effect of participation in a health service delivered secondary prevention program on measures of TIA (& minor stroke) patients' cardiovascular health.

Methods: Non-randomised controlled trial where intervention group received 6 weeks of twice-weekly face-to-face education and exercise in a community gym followed by 12 weeks of telehealth health coaching. The control group received no treatment. Co-primary outcomes of (i) daily minutes in moderate-to-vigorous physical activity (MVPA) and (ii) systolic blood pressure (SBP) and secondary outcomes of cardiovascular health (e.g., blood sugar, cortisol and inflammation levels, lipid profile, waist-to-hip ratio, cognitive function, emotional distress, fatigue and quality of life) were measured at 6, 18 and 30 weeks. Differences were tested using generalized linear mixed models adjusting for age, gender and time post-stroke.

Results: Participants (n=90) were recruited between 2017 and 2021. COVID related service restrictions prevented intervention delivery twice and contributed to an early trial close-out. Median time post-stroke event (intervention 121 days (83,209) vs control 1134 days (555, 2196) and male gender (62% vs 48%) differed between groups, but age (66.5 (12,0) vs 65.7 (11,3)) was similar. There was no difference at 6 weeks between groups in MVPA (24.2 min [95%CI, 13.3-61.3]) or SBP (-0.4mmHg [95% CI, 4.2-3.3]). The intervention group reported a significant reduction in stress on the Depression, Anxiety and Stress Scale at 18 weeks (-2.9, [95% CI -5.7 - -0.2]) with a trend towards a reduction at 30 weeks (-3.7 [95%CI -7.4-0]).

Conclusion: This study is one of few evaluating the effects of a health service delivered secondary stroke prevention program. Results of this pandemic disrupted trial will inform future health service delivered face-to-face and virtual post-stroke prevention and self-management programs.

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Capturing the Neuroscience Drivers of Upper-Limb Motor Recovery Post-Stroke: An International Qualitative Study of Perspectives from Bench to Bedside

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Background: Interventions that drive post-stroke upper-limb motor recovery are not fully conceptualised. Those invested in improving such interventions include researchers conducting preclinical research and clinical research, clinicians working in clinical practice, and people with lived experience. These perspectives have not previously been captured and synthesised to identify the essential elements of post-stroke upper-limb motor interventions and their neuroscientific rationale.

Aims: To investigate neuroscience concepts that are important to drive upper-limb post-stroke motor recovery from the perspective of people with expertise in preclinical research, clinical research, clinical practice, and lived experience.

Methods: Semi-structured interviews were conducted with four international participant groups targeted through purposive sampling. Preclinical research and clinical research participants were selected from top

published authors using group-specific keywords in SCOPUS. Clinical practice participants had >7 years of experience treating post-stroke upper-limb impairment. Lived experience participants had lived with post-stroke upper-limb impairment for >6 months. Interviews were transcribed verbatim and content analysis was performed to develop themes. Thematic saturation, defined as three consecutive interviews yielding no new themes, signalled the end of recruitment to a participant group.

Results: Thirty-seven participants from eight countries (preclinical research n=9, clinical research n=9, clinical practice n=9, lived experience n=10) were interviewed. Three themes were identified. Theme 1, 'Relevant, answerable questions in stroke recovery research', included two subthemes: 'Dismantle research silos' and 'Assimilation and operationalisation of the research pipeline'. Theme 2, 'Recovery in practice and in principle', included three subthemes: 'Restitution', 'Optimisation', and 'Stroke heterogeneity'. Theme 3, 'Interventions to drive optimal stroke recovery', included three subthemes: 'Complex interventions', 'Personalised interventions', and 'Neuroscience foundations'.

Conclusion: Collectively, participants identified that interventions need to be complex and reflect the heterogeneity of stroke. The challenge that remains is to develop personalised interventions that balance what to do in principle (neuroscience of recovery) with what is possible in practice.

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"Well, I may as well go home because I felt no one was listening to me": Yarning with people living with stroke about their recovery experience. A qualitative study

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Background: We acknowledge the burden and risk of stroke in Aboriginal and/or Torres Strait Islander* populations in regional Australia is significant. Access to culturally safe stroke recovery care tools and services is important in optimising quality of life after stroke.

Aims: To understand the recovery experience and challenges of Aboriginal people living with stroke on Gamilaroi country of regional NSW, Australia.

Methods: Under the leadership of the Gamilaroi community, community participatory action research methods were undertaken incorporating individual and group yarn-ups with Aboriginal people in the community living with stroke and their family. This relational approach was continued throughout the qualitative analytic process, with a non-Aboriginal qualitative researcher undertaking inductive narrative analysis of the emergent themes in the yarns, with frequent review and input from Aboriginal and non-Aboriginal clinician researchers and our cultural advisory group. Thematic analysis was performed using NVivo 12 software.

Results: Yarns were completed with (i) people living with stroke (n=5, 60% female), (ii) and their family and carers (n=5, 80% female) and a (iii) community group (n=6, 100% female). The four themes were: (i) The role of family in stroke recovery, (ii) Trusted relationships with people aware of stroke and support options, (iii) Importance of culturally appropriate interactions with health service, and (iv) Disrespect and racism impacts stroke care access.

Conclusion: The role of family, trusted relationships, cultural safety and respect must be considered in improving the post-stroke quality of life for Aboriginal people on Gamilaroi country. These learnings can be used as a framework to inform future work with other regional Australian Aboriginal communities. We will use these and other stakeholder learnings to inform the co-design of culturally safe stroke recovery tools (i.e., a yarnng tool) and services with and for the Gamilaroi community.

*We recognise the diversity of Aboriginal and Torres Strait Islander people. Recognising this we have used the preferred term 'Aboriginal people'.

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Cerebral haemodynamics and orthostatic response to upright position in acute ischaemic stroke: the CHORUS study

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Background: The effects of upright positions on cerebral haemodynamics in acute ischaemic stroke are not well understood. A potential mechanism for harm is that upright activity (sitting, standing, walking) could worsen cerebral perfusion early post ischaemic stroke.

Aims: To estimate the effects of early upright positions (sitting, standing) on cerebral haemodynamics in people with acute ischaemic stroke, with and without occlusive disease.

Methods: We recruited ischaemic stroke (<48h onset) participants with and without occlusive disease, and controls. We investigated MCA mean velocity using transcranial Doppler in 0° head position then 30°, 70°, 90° sitting, and 90° standing, at both <48h and 3-7 days post-stroke. A blinded assessor determined mean velocities. We used mixed effect linear regression to analyse orthostatic changes in mean velocity from 0° to other head positions. Logistic regression was used to explore associations between mean velocity and 30-day mRS.

Results: Forty-two stroke participants (13 with occlusive disease, 29 without) and 22 controls were recruited. Stroke participants' median age was 67.5 years (IQR 59-77), controls 61 years (IQR 44-69). Affected hemisphere mean velocity decreased in stroke with occlusive disease (<48h): from 0° to sitting (-9.9cm/s, 95% CI [-16.4,-3.4]) and standing (-7.1cm/s, 95% CI [-14.3,-0.1]); and in stroke without occlusive disease from 0° to sitting (-3.3cm/s, 95% CI [-5.6,-1.1]) and standing (-3.6cm/s, 95% CI [-5.9,-1.3]) (p-value interaction=0.07). Similar changes were observed in controls (0° to sitting -3.8cm/s, 95%CI [-6.0,-1.63] and standing -3cm/s, 95% CI [-5.2,-0.81]) (no significant interaction stroke vs controls). Orthostatic changes in mean velocity in stroke <48h were similar to 3-7 days. No association between orthostatic changes in velocity <48h and 30-day mRS was found.

Conclusion: Moving to more upright positions in the first 2 days post-stroke does reduce mean velocity, but these changes were not significantly different for people with stroke with and without occlusive disease.

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Creating “a safe place to go”: Yarning with health workers about stroke recovery care for Aboriginal people living with stroke. A qualitative study

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Background: Understanding the experience of accessing culturally safe stroke care is important to optimise the quality of life of regional Aboriginal and/or Torres Strait Islander* people living with stroke. Health workers providing care to Aboriginal people living with stroke provide important insights.

Aims: Understand the experiences and opinions of health workers providing stroke recovery care to Aboriginal people living on the Gamilaroi country of regional New South Wales, Australia.

Methods: Under Gamilaroi community leadership, community participatory action research methods were undertaken incorporating individual and small group yarn-ups with health workers providing care to Aboriginal people and families living with stroke on Gamilaroi country. This relational approach was continued throughout the qualitative analytic process with a non-Aboriginal qualitative researcher undertaking an inductive narrative analysis of the emergent themes in the yarns, with frequent review and input from Aboriginal and non-Aboriginal researchers and our cultural advisory group. Thematic analysis was performed using NVivo 12 software.

Results: Yarning with six different health services (Public Health Service, n = 6, Home & Community Service, n = 1 and Aboriginal Medical Service, n = 2) involving nine health workers (90% female) revealed four themes: (i) Culturally safe health services for patients, family and staff, (ii) Complicated systems and limited resources, (iii) Culturally appropriate coordinated care reflecting people's circumstance and preferences, (iv) Impacts of disrespect and racism on help-seeking behaviour and (v) Collaborative discharge planning to prevent people 'falling through the cracks'.

Conclusion: These learnings will be used in a collaborative process of co-design with Aboriginal community members and partners, health workers and researchers to develop and test culturally appropriate recovery strategies and tools (e.g., a yarning tool) to optimise the quality of life of Aboriginal people living with stroke on Gamilaroi country.

*We recognise the diversity of Aboriginal and Torres Strait Islander people. Recognising this we have used the preferred term 'Aboriginal people'.

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Transdisciplinary Stroke Assessment: Improving Allied Health Clinician Compliance with National Stroke Guidelines

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Background: The burden of stroke is increasing, but resources to provide care are limited. Redesigning healthcare systems can better support clinicians in providing high quality care to people with stroke. Transdisciplinary approaches can streamline work processes by embracing overlapping clinical skills and integrating roles to better use clinician time, skills, and knowledge.

Aims: The aim of this study was to evaluate the effectiveness of implementing a new co-designed transdisciplinary stroke assessment program (assessment tool and clinical protocol) to improve the quality of acute stroke care provided by allied health clinicians, measured by compliance to the national stroke guidelines and patient reported outcomes.

Methods: The single site pre-/post- observational study was carried out in an acute stroke unit over 22-months from February 2021. Data from retrospective chart audits were merged with patient reported outcome quality-of-life data (EQ-5D-3L) available from the Australian Stroke Clinical Registry (AuSCR) 90-180 days after admission. Descriptive analyses are presented.

Results: Data were collected for 179 participants with stroke (pre-phase N=63). Participants were similar in gender (males: pre-phase 46%, post-phase 53%) and age (pre-phase 64±16.38 years, post-phase 67±17.29 years). When the transdisciplinary assessment was used, 98% patients were assessed within 48 hours of admission (mean 23.66±8.77 hours), patients commenced rehabilitation sooner (mean 43.32±16.76 hours), and a communication screening tool was completed with 25% more patients. Episodes of adverse events such as patients falls did not increase, and quality-of-life on the EQ-5D-3L health utility scores were similar (pre-phase N=39, 0.79; post-phase N=69, 0.83). The transdisciplinary stroke assessment and associated improvements have been sustained for 19-months to date.

Conclusion: Implementing the transdisciplinary assessment improved compliance of allied health professionals with national stroke guidelines. Clinicians streamlined work processes and were better able to provide high quality stroke care. Next steps are to evaluate the transdisciplinary stroke assessment at other sites.

Reference

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Lifestyle change to reduce stroke recurrence risk. Results of the telehealth-delivered ENABLE Pilot Trial

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Background: A healthy lifestyle after stroke is critical to reducing stroke recurrence risk. Education alone is not sufficient to create this lifestyle change.

Aim: To evaluate two co-designed telehealth-delivered lifestyle interventions (diet and physical activity) of 6-month duration for potential of effect and feasibility.

Methods: Randomised pilot trial with four arms (physical activity alone; diet alone; physical activity+ diet; control). Participants were 3-months to 10-years post-stroke or TIA. Feasibility outcomes included measures of safety and attrition. Potential for effect was evaluated by systolic blood pressure (SBP), self-report physical activity (International Physical Activity Questionnaire) and diet quality (Australian Recommended Food Score). Between-group differences were analysed using linear mixed models.

Results: Forty participants were randomised (10 to each arm), 40% female, mean age 59 years, mean SBP 129.6mmHg at baseline. No serious adverse events were definitely related to the intervention. Two people (20%) from the physical activity, one (10%) from the control and one (10%) from the combined intervention were lost to follow-up at 6-months. Group differences in physical activity and SBP favoured participants undertaking the physical activity intervention when compared with those who did not at 3 and 6-months, but only reached statistical significance for physical activity levels at 3-months (estimated effect [95% confidence interval] 3-month 744(73 to 1415) METmin/wk and -4.1(-9.1 to 1.0) mmHg respectively, at 6-month 550(-32 to 1421) METmin/wk and -0.9(-3.8 to 1.9) mmHg respectively).

Diet quality was significantly better for those receiving the diet intervention compared to those who did not at 3 and 6-months (Australian Recommended Food Score 6.8[6.7 to 10.9] and 4.6[0.5 to 8.8] respectively). The improvements in SBP between groups favoured diet participants but did not reach significance -1.8(-6.8 to 3.3)mmHg and -2.3(-7.5 to 3.0)mmHg respectively.

Conclusion: Both telehealth-delivered lifestyle interventions show potential for effect and were feasible to implement as part of a 4-arm trial.

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Dogs Offering Support after Stroke (DOgSS) - Animal Assisted Intervention Action Research at the Royal Adelaide Hospital's Stroke Unit

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Background: Acute stroke can have devastating emotional impacts and Animal Assisted Intervention has been reported as improving stroke patients' mood, enhancing life quality. DOgSS is a study to discover if dog-visiting makes a difference to stroke patients' expressed mood and, with a One Welfare approach, also monitors the dog's wellbeing.

Aims: To determine if dog-visiting makes a difference to the expressed mood of patients engaging with the dog, how dog-visits impact on informal patient supports present during the visit, along with staff, volunteers, dog handler and the dog's wellbeing.

Methods: We developed a protocol for our three-cycle Action Research, collecting wellbeing data from stroke patients before and after receiving dog-visits, comments from their informal supports (carers/family/friends) visiting at the time, associated staff, volunteers, dog-handler (using Smiley Faces (McNemar test), Likert mood scales (paired t-test)) and the dog (biomarker and ethographic data) for multi-faceted information about the study's impact.

Results: Twenty-four post-stroke Stroke Unit patients who consented to participate were visited by the dog and handler in Cycle 1. Preliminary analysis showed that there was a significant positive effect of the dog-visit on the patient's mood ($p < 0.05$). Comments from patients, visiting informal supports, staff, volunteers and the dog handler were positive and encouraging, e.g., "Amazing to see the improved mood during the dog's visit. Pt much more interactive and smiling. Nice for the staff to see such a positive moment. . ." and "My mother's face lit up upon seeing the dog, and her mood improved after the visit. Therapy dogs should be available more often." Our results will be used to inform amendment of our project description to enhance Cycle 2.

Conclusion: We completed Cycle 1 and report improved expressed participant mood and helpful feedback to improve Cycle 2, part of continuous quality improvement.

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Fatigue After STroke Educational Recovery (FASTER) programme: a Prospective, Multi-centre, Single-blinded, Phase 3 Randomized Controlled Trial

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Background: Post-stroke fatigue (PSF) affects up to 92% of stroke patients, causing significant personal, societal, and economic burden. Global stroke guidelines recommend education and strategies to manage PSF, yet there are no proven treatments. Group-based cognitive behaviour therapy interventions for fatigue have had positive results in other health conditions (i.e., multiple sclerosis, traumatic brain injury), however, there is no evidence for post-stroke.

Aims: In FASTER (Fatigue After STroke Educational Recovery), we assessed a group-based, educational intervention for PSF compared to general stroke education alone.

Methods: FASTER was a prospective, multi-centre, two-arm, single-blinded, phase III (parallel, superiority) randomized control trial. Participants were randomized to general stroke education/control (EC; $n = 100$) or a fatigue management group (FMG; $n = 100$) intervention and assessed at baseline, 6-weeks, and 3-months. The FMG involved 60-minute weekly psychoeducation sessions over six weeks. Participants were adults with stroke in the past 3-24 months and clinically significant fatigue. Co-primary outcomes were Fatigue Severity Scale (FSS) and Multi-dimensional Fatigue Inventory-20 (MFI-20) total scores.

Results: When adjusted for significant confounders, 6-week FSS and MFI-20 group score differences were -0.13 [95% CI, -2.93-2.67], $p = 0.93$, and 0.64 [95% CI, -0.84- 2.12], $p = 0.40$, respectively. Across all participants, every week post-stroke was associated with a significant decrease in FSS (0.4 points, SE 0.2, $p = 0.02$), with greater decreases in the FMG group. Every week post-stroke was associated with marginally significant increases in MFI-20 (0.2 points, SE 0.1, $p = 0.07$), with greater increases in EC group. Both groups had similar secondary outcomes at 6-weeks and 3-months.

Conclusion: We found no evidence of significant group-level benefits of FMG over and above general stroke education, though fatigue outcomes were in the direction of a treatment effect. Educational, group-based

interventions for PSF should continue to be refined and examined, including consideration of potential impacts at an individual-level.

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Evaluation of a physical activity and diet intervention delivered by telehealth for the secondary prevention of stroke: A Process evaluation of the ENABLE Pilot Trial using the RE-AIM framework

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Background: Process evaluation of pilot trials are an important step in translating findings to both definitive trials and clinical practice.

Aims: To conduct a process evaluation of the ENABLE pilot: a 6-month, telehealth delivered physical activity and diet randomised controlled trial.

Methods: Mixed methods using the RE-AIM framework to assess the reach, effect, adoption, implementation, and maintenance of the ENABLE pilot. Data sources included recruitment and session data, clinical outcomes, session audit, participant survey, interview, and intervention therapist focus groups. Quantitative data were analysed using descriptive statistics and linear regression models adjusted for time. Qualitative data were thematically analysed using nVivo software.

Results: Reach: Participants (n = 40) differed from the Australian stroke survivor population (were younger, walked independently, lived in major centres, and were not affected by speech or communication disorders). Effect: Significant between group estimated effects in self-reported physical activity [744 minutes (95% CI: 73 to 1415)], Mediterranean diet score [3.2 points (95% CI: 2.0 to 4.4 points)] and diet quality [4.6 points (95% CI: 0.5 to 8.8 points)] during the intervention. Blood pressure improved but did not reach significance. Quality of life was mostly unchanged.

Adoption: Intervention acceptability and completion rates were high (n = 36, 90%) suggested modifications were a comprehensive platform, workflow and training prior and support post-intervention. **Implementation:** Session fidelity was high (88% - 100%) with high frequency/variety of behaviour change techniques. **Maintenance:** Significant improvements in self-reported physical activity and Mediterranean diet score remained at 12-months however, effect was diluted across most other variables.

Conclusion: The ENABLE pilot is an acceptable, feasible, and effective program for engaging stroke survivors in activities designed to lower recurrent stroke risk. Participants and trial staff suggest modification to sustain effect and move the program into a larger powered trial.

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Making Research Summaries Accessible to People with Aphasia Following Stroke: An International Co-design Study

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Background: To ensure that research is disseminated widely, agencies such as the National Health and Medical Research Council (NHMRC) require that research outputs be accessible to consumers, including those with communication disabilities such as aphasia (NHMRC, 2016).

Aims: 1) To establish the preferences of people with aphasia regarding content and format of research summaries. 2) To co-design technology that supports communication-accessible research reporting.

Methods: A consumer and community involvement process guided the conceptualisation and planning of this project. An online, multi-modal, multi-lingual international survey was conducted with a convenience sample of 70 people with aphasia. Descriptive statistics were calculated, and qualitative content analysis was used to establish priorities for research summary content. A series of co-design workshops were held to iteratively design and develop a technology-based solution to the production of communication-accessible research summaries.

Results: An international online forum of >30 people with aphasia confirmed the need for improved access to information about stroke and aphasia research. Attendees discussed how and why they would use a research summary and identified key content areas. This informed development of an international survey completed by 70 people with aphasia (15 countries, 11 languages). Respondents indicated that the research title, rationale, design, aims, and results, should always be included in a research summary, whereas limitations, location, and funding source are less important. Five people living with aphasia attended three online workshops and iteratively co-designed an online template and searchable database. This technology-based solution supports information access and scientific literacy by generating research summaries that reflect individual content preferences and communication strengths.

Conclusion: We present a co-developed template and searchable web-based database for communication-accessible research reporting. Researchers in the field of stroke who are committed to disseminating their research findings to all stakeholders should use and promote this resource.

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Does Requiring an Interpreter Influence Acute Care and Outcomes for People with Post-stroke Aphasia?

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Background: People with communication differences, including aphasia, and those from culturally and linguistically diverse backgrounds are known

to have poorer hospital outcomes than their peers. However, the combined impact of aphasia and cultural/linguistic differences on care and outcomes remains unknown.

Aims: To investigate the association between cultural/linguistic differences, defined as those requiring an interpreter, and the provision of acute evidence-based stroke care and in-hospital outcomes for people with aphasia.

Methods: Cross-sectional, patient-level data from hospitals participating in the Stroke Foundation National Audit of Acute Services (2017, 2019, 2021) were aggregated. For people with aphasia, multivariable regression models were used to compare adherence to processes of care and outcomes (e.g. length of stay, independence on discharge [modified Rankin Scale 0-2], discharge destination) by interpreter status. Outcome models were adjusted for sex, stroke type, hospital site and stroke severity factors (e.g. incontinence, arm or mobility impairment.).

Results: Overall, 3122 people with aphasia were identified (median age 78, 51% male) from 126 participating hospitals: 193 (6.2%) required an interpreter (median age 78, 45% male). Compared to people with aphasia who did not require an interpreter, those requiring an interpreter were less likely to have their mood assessed (OR 0.50, 95% CI 0.32, 0.76), but more likely to have a physiotherapy assessment (OR 2.34, 95% CI 1.06, 5.19). People who required an interpreter had a 2 day longer median length of stay (8 days vs 6 days, $p=0.003$), and were less likely to be independent on discharge (OR 0.54, 95% CI 0.33, 0.89) compared to those who did not require an interpreter.

Conclusion: Differences exist in acute care provision and outcomes for people with aphasia who require an interpreter. Further research is required to explore their needs, the practice needs of their clinicians, and the systems underpinning their clinical pathways.

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Understanding the Experience of Returning to Driving or Not for People with Aphasia Post-Stroke: A Qualitative Study using Patient Journey Mapping

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Background: Return to driving is pivotal to community reintegration post-stroke. People with aphasia, their caregivers and clinicians have identified return to driving post-stroke as a top ten research priority; however, people with aphasia have largely been excluded from current research. Little is known about whether language impairment impacts driving performance, and to date no research has considered the impact of aphasia on the process of returning to driving or not.

Aims: To understand the lived experience of people with aphasia who return to driving or not post-stroke.

Methods: A qualitative descriptive study reported in line with the Standards for Reporting Qualitative Research (2014). Fifteen people with aphasia participated in semi-structured interviews over Zoom, using patient journey mapping as a framework to explore "touch points" with services and emotional experiences relating to returning to driving or not post-stroke. Video data were transcribed for speech and non-speech communication and analysed using inductive qualitative content analysis.

Results: Preliminary analysis has identified the following themes: (1) "Too much paperwork": Communication requirements in navigating return to driving and driving cessation; (2) "They should have warned me": Poor communication with people with aphasia; (3) "I will just keep on asking you": The onus is on people with aphasia to instigate and pursue return to driving; (4) "What happens to those who don't have an Anna?": People with aphasia need support to navigate return to driving and driving cessation and; (5) "If I had my car, I'll be able to actually start to have a life": The importance of driving for people with aphasia.

Conclusion: People with aphasia experience unique barriers in returning to driving and navigating driving cessation post-stroke. Increased awareness of these barriers is urgently needed to ensure that communication difficulties do not unduly disadvantage people with aphasia who seek to resume driving post-stroke.

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Fever, Hyperglycaemia (Sugar) and Swallowing (FeSS) Management in Stroke Unit and Non-stroke Unit Hospitals: A sub study of the QASC Europe Project

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Background: Stroke unit care reduces patient morbidity and mortality. The Quality in Acute Stroke Care (QASC) Europe Project achieved significant large-scale translation of nurse-initiated protocols to manage Fever, hyperglycaemia (Sugar) and Swallowing (FeSS) in 64 hospitals across 17 European countries. However, FeSS management in stroke unit and non-stroke unit European hospitals requires examination.

Aim: To compare FeSS Protocol adherence in stroke unit versus non-stroke unit European hospitals.

Methods: An observational study using the QASC Europe Project post-implementation audit data was undertaken. Stroke unit and non-stroke unit hospitals were categorised using the four National Acute Stroke Services Framework criteria, collected from an organisational survey. Differences in FeSS Protocol adherence between stroke unit and non-stroke unit hospitals were investigated using mixed-effects logistic regression, adjusting for age, sex and NIHSS.

Results: Of the 56 hospitals from 16 countries providing organisational survey data, 34 (61%) met all stroke unit criteria, contributing data for 1825 (64%) of 2871 patients. Of the remaining 22 (39%) hospitals, 17 (77%) met three of the four stroke unit criteria. There were no differences between hospitals with a stroke unit and those without for post-implementation adherence to: Fever (49% stroke unit vs 57% non-stroke unit, OR:0.400, 95%CI: 0.087, 1.844, $P=0.240$); Hyperglycaemia (50% stroke unit vs 57% non-stroke unit, OR:0.403, 95%CI: 0.087, 1.856, $P=0.243$); Swallow (75% stroke unit vs 60% non-stroke unit, OR:1.702, 95%CI: 0.643, 4.502, $P=0.284$) or overall FeSS Protocol (36% stroke unit vs 36% non-stroke unit, OR:0.466, 95%CI: 0.106, 2.043, $P=0.311$).

Conclusion: FeSS Protocol adherence was similar in stroke unit and non-stroke unit hospitals, likely due to most non-stroke unit hospitals meeting some stroke unit criteria and their ease of use. While stroke unit care is the gold standard, application of these protocols by all hospitals regardless of stroke unit status, extends the reach for improving stroke care quality.

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Co-design of a multicomponent digital Care Assistant and support Program for people after Stroke or transient ischaemic attack (CAPS)

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Background: Evidence-based secondary prevention programs for survivors of stroke using digital health are lacking. In our prior user needs research with 78 clinicians and 112 people with stroke, there was strong support and intention to use digital health programs for secondary stroke prevention.

Aims: To co-design a novel digital health platform for secondary stroke prevention (CAPS), comprising a mobile app and a clinical portal with lifestyle and health data collected through wearable sensors.

Methods: The CAPS prototype was based on our mobile health cardiac rehabilitation platform augmented with text messages. Two rounds of user experience workshops were conducted. Audio recordings of the workshops were transcribed and analysed by content, with a focus on design needs and user preferences. In the first-round of workshops we validated the outcomes of our prior user needs research and completed the initial design for a user-facing app and clinical portal. The designs were then evaluated in the second-round.

Results: Seven consumers (5 male) and 9 clinicians (3 male) participated in the workshops. During the workshops, consumers indicated priorities for capturing health data on an app (especially blood pressure) to track their own progress, and to share information with their doctors. Clinicians additionally wanted the app to capture fatigue and social isolation information. Feedback on the app prototype included simplifying the design, using more icons/pictures, and easier instructions to complete a daily health check-in. The final CAPS platform includes the updated mobile app (available in iOS and Android) and integrates wearable activity trackers and smart devices (e.g. Fitbit or Apple watches). Data collected from wearable devices are synchronised via Bluetooth to the app. The app uploads information to the clinical portal and text messages to support goal-attainment are issued.

Conclusion: The CAPS digital health program has been iteratively co-designed, and is ready for feasibility testing.

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Developing a Home-based, Carer-Supported Exercise Program in Australia; Perceptions of People After Stroke and Carers on the Features of Acceptability

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Background: Exercise participation, on returning home after stroke, can assist with continuing functional recovery as well as providing a structured way to increase physical activity levels. Both are important for overall health. Despite this, exercise participation and physical activity levels remain low for people after stroke. A carer-supported program, delivered

in the home, may address some of the barriers stroke survivors face to ongoing exercise participation.

Aims: To investigate the acceptability of carer-supported home-based exercise, to inform development of a future program.

Methods: The acceptability questionnaire was developed using the Theoretical Framework of Acceptability and delivered online to people after stroke and carers. It covered the domains of; affective attitude, burden, ethicality, intervention coherence, opportunity costs, perceived effectiveness and self-efficacy.

Results: Responses were received from 26 people after stroke and 12 carers. The respondents provided details of preferred features of a home-based, carer-supported exercise program. The majority reported this type of program would fit with their own values (n=23, 88.5% of people after stroke; n=12, 100% of carers) and felt it would have a perceived benefit (n=21, 80.8% of people after stroke; n=11, 91.7% of carers). A large number of participants reported they would be able to complete this type of program (n=22, 84.6% of people after stroke; n=10, 83.3% of carers). Only 3 participants (all carers) reported a perceived significant cost to them, related to potentially needing to take time off work to implement this type of program.

Conclusion: The majority of participants in both groups reported positively on this type of program, indicating it would be an acceptable option for increasing exercise and physical activity participation. Attributes of this program warrant further exploration as an option for increasing exercise participation for people after stroke living at home.

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Evidence for the use of co-design with Aboriginal and/or Torres Strait Islander People to strengthen cardiovascular health: A scoping review

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Background: Developing culturally safe and effective strategies to strengthen the cardiovascular health of Aboriginal and/or Torres Strait Islander* Peoples is achieved through culturally appropriate and evidenced-based co-design. The co-design must have Aboriginal leadership, inclusive partnerships, methods grounded in cultural and respectful ways and be of benefit to Aboriginal communities.

Aims: To summarise and describe the evidence of (i) the use of culturally appropriate co-design and (ii) strategies shown to be effective when working with Aboriginal communities to prevent or support recovery following a cardiovascular event.

Methods: Aboriginal researchers and community members with expertise in public, cardio-cerebrovascular and community health and rehabilitation medicine were joined by non-Aboriginal researchers in all study processes. Five electronic databases (CINAHL, PsycINFO, EMBASE, MEDLINE and Web of Science) were searched (March 2022) using a search strategy checked and finalised by an expert librarian. Included studies (i) utilised culturally appropriate co-design and (ii) evaluated the effect of strategies to either prevent primary/secondary cardiovascular events, or support recovery from same.

Results: Title screening (n=2652) resulted in 551 full text reviews where 5 studies met inclusion criteria and reported results from strategies applied in cardiac rehabilitation (n=2), and for managing diabetes (n=2) and weight loss (n=1). All applied participatory action research methods including engagement with Community Elders/members and Aboriginal Medical Services. There were reported significant improvements in cardiovascular health outcomes. Certainty around these results for all but one study (n=575) was limited by small sample sizes and/or absence of a control group.

Conclusion: Emerging evidence of the benefits gained when Aboriginal communities and researchers work together in the development and testing of strategies to strengthen cardiovascular health highlights the need for larger community-led studies. The Yarning up After Stroke Collaborative Group is applying learnings from this study and led by Aboriginal communities on Gamilaroi Country will develop culturally safe stroke recovery tools which incorporate yarning.

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Evaluating Staff Perceptions of a Nurse Led Multidisciplinary Harm Prevention 'Huddle' Program Within an Acute Stroke Service

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Background: Hospital-acquired complications including falls, infections, delirium, shoulder-injuries, pressure-injuries, and malnutrition are common in hospitalised acute stroke patients. Implementation of prevention strategies are integral for patient safety and avoiding catastrophic outcomes, warranting their inclusion in Australia's national stroke clinical care recommendations. Patient safety huddles have been identified as effective intervention in other settings. However, nurse-led multidisciplinary patient safety huddles addressing aggregated patient risk have not been trialled on acute stroke units. Assessing staff perceptions of implementing a patient safety huddle intervention are important as these form a strong predictor of staff engagement and longevity of successful implementation.

Aims: To evaluate staff perceptions of a nurse-led acute stroke unit multidisciplinary patient safety huddle 'Risk Assessment and Management Plan' (RAMP) implementation.

Methods: A pre-and post-trial evaluation questionnaire involving staff demographics, the modified Hospital Survey on Patient Safety Culture (mHSOPS) Likert questionnaire and open-ended questions. The multidisciplinary stroke team consisted of nursing, dietitian, occupational therapy, physiotherapy, speech pathology, allied health assistants, and medical staff.

Results: From 82-questionnaire responses (pre-trial n=32, post-trial n=50), nursing was the largest professional group 67% (n=55), undergraduate degree was the highest level of education for 90% (n=74), and clinical-experience ranged from 2-months to 25-years (median 3.5-years). The mHSOPS evaluated staff perception /25 in each domain pre-and post-trial; (i) implementing patient safety strategies (IPSS) (pre-14, post-19 p=<0.0001), (ii) consistent approach to assessing for IPSS (pre-14, post-19 p=<0.0001), (iii) culture of IPSS (pre-13, post-19 p=<0.0001), (iv) standardised documenting of IPSS (pre-12, post-19 p=<0.0001), (v) positive communication of IPSS (pre-12, post-19 p=<0.0001), and (vi) team work opportunity to evaluate performance (pre-12, post-19 p=<0.0001).

Conclusion: The results of this real-world nurse-led multidisciplinary patient safety quality improvement trial are highly encouraging. Demonstrating a significant improved patient safety culture through building capacity of multidisciplinary teamwork and IPSS completion. Further evaluation of the patient impact of RAMP on acute stroke units is now warranted.

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A Qualitative Study of General Practitioner Perspectives of Discharge Communication and Continuity of Care for Stroke Survivors in Australia

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Background: Embedded in our stroke clinical practice guidelines, a written discharge summary should transfer care and information from a hospital team to a general practitioner (GP) to support continuity of stroke care. However, stroke survivors and caregivers report insufficient post-discharge support and reduced participation in meaningful activities. It is not known if current discharge communication practices sufficiently support the continuity of care after stroke.

Aims: To understand GPs' perspectives of discharge communication supporting continuity of stroke care.

Methods: A qualitative descriptive study was completed. Semi-structured telephone interviews were conducted with n=40 GPs from 15 of 31 Australian Primary Health Networks between April-September 2020. Data were analysed using a six-step thematic analysis approach, with double coding and member-checking for increased rigor.

Results: GPs described written discharge summaries as inadequate to convey an understanding of ongoing rehabilitation needed to support continuity of stroke care. As discharge communication processes were seen as disconnected, GPs suggested a multidisciplinary team approach across care settings as a potential solution. Challenges in accessing discharge care plans were noted barriers, whereas shared understandings of care needs and recovery goals were identified enablers.

Conclusion: Collaboration between stroke survivors, caregivers, allied health, and GPs is essential to share an understanding of care needs and recovery priorities. The study findings suggest that team-based care planning across care settings and the provision of team-based care in the community may improve continuity of care post-discharge.

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Patients', therapists' and caregivers' experiences of a group education programme for the management of post-stroke fatigue: A qualitative sub-study of the FASTER randomized controlled trial

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Background: Post-stroke fatigue (PSF) is a common symptom after a stroke. Global stroke guidelines recommend the provision of education to manage PSF. However, there are no proven PSF treatments, to date. FASTER (Fatigue After Stroke Educational Recovery) quantitatively assessed a group-based, educational intervention for PSF. This study aimed to complement FASTER by using qualitative methods to uncover richer detail of stroke patients', caregivers' and therapists' perceptions of the intervention, thereby extending understanding.

Methods: A qualitative study using focus groups to collect data. A purposeful sample of six stroke patients, their informal caregivers, and three therapists experienced in delivering the intervention participated in one of three online focus groups. Stroke patients were aged ≥ 18 years with stroke in the past 3-24 months and clinically significant fatigue. Focus groups were audio-recorded, with transcribed data analysed using thematic analysis.

Results: Analysis revealed four key themes: group membership; gaining new understanding and strategies; challenges; and moving forward. Participants highlighted the benefits of the group programme such as education, normalization, cohesion and emotional support. The intervention was considered to provide new learning about PSF and its management. Challenges during the group programme included differing levels of PSF among group members and learning to use new technology due to the COVID-19 pandemic. Follow-up sessions and combined online and in-person were suggested as improvements.

Conclusion: This study highlights the perceived value of group-based interventions within the community setting to provide new learning to manage PSF for those affected and their caregivers. The qualitative approach revealed benefits not captured by quantitative measures, which could be considered a valuable addition to future trials.

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Sex Differences in Prescribing and Dispensing of Antihypertensive Medications After Stroke: A Linked Registry Study

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Background: Antihypertensive medications are recommended for long-term secondary prevention of stroke, irrespective of sex.

Aims: To examine differences in prescribing and dispensing of antihypertensive medications after stroke between men and women.

Methods: Retrospective cohort study using patient-level data from the Australian Stroke Clinical Registry (AuSCR) 2012-2016, Victoria and Queensland), linked with national pharmaceutical and death records until 2018 (PRECISE project). To minimise confounding by indication, the analysis was limited to people with first-ever stroke who were alive at 90 days. AuSCR data were used to determine patient characteristics (e.g. sex) and prescription of antihypertensive medications at hospital discharge. Linked pharmaceutical claims data were used to investigate dispensing of antihypertensive medications in the community within 90 days post-discharge. Sex differences in prescribing and dispensing were assessed using multivariable logistic regression models, adjusted for age, comorbidities, stroke severity, year, and hospital clustering.

Results: Of 13,448 people with first-ever stroke who survived to 90 days, 43% were women. Compared with men, women were older (74 vs 70 years; $p=0.001$) and more likely to have experienced a severe stroke (unable to walk on admission 54% vs 50%; $p=0.001$). In adjusted models, women were less often prescribed antihypertensive medications after stroke than men (adjusted odds ratio [aOR] 0.87 [95% CI: 0.80–0.95]). Within 90 days, women were also less often dispensed antihypertensive medications in the community than men (aOR 0.85 [95% CI: 0.79–0.92]). Of those dispensed antihypertensives within 90 days, women were more likely to receive dual or triple antihypertensive therapy than men (aOR 1.20 [95% CI: 1.10–1.30]).

Conclusion: Although women were less likely to be prescribed or dispensed antihypertensive medications after stroke, they were more likely to receive combination therapy. Efforts to reduce these sex disparities in prescribing and dispensing of antihypertensive medications are needed to ensure equitable secondary prevention of stroke.

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TACTICS VR: Multi-audience Virtual Reality Workflow Training for Hyper-Acute Stroke Care

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Background: Significant variability in stroke management exists, in part due to workflow complexity and requirements for effective coordination across multi-disciplinary teams. We hypothesised that new workflow training using virtual reality could reduce process variability and improve patient outcomes.

Aims: We developed TACTICS VR, a portable training application to upskill healthcare staff in best-practice stroke workflow. Trainees work through a real-world case, making active decisions and receiving real-time feedback. We assessed the usability, acceptability, utility and feasibility of multiple TACTICS VR modules in real-world clinical contexts specifically targeting 1) doctors, 2) telestroke, 3) nurses and 4) paramedics.

Methods: Four modules for TACTICS VR have been developed in partnership with multiple local health districts, including the Agency for Clinical Innovation and NSW Ambulance. The first focused on Hyper-acute Stroke Management and created as part of a package intervention within the TACTICS implementation trial (Ryan et al. 2022 BMJ Open). A Telestroke module supported the state-wide roll-out of NSW Telestroke Service. The third module supports in-hospital stroke nursing and the most recent module supports pre-hospital paramedic training in relation to stroke care processes.

Results: TACTICS VR has now been used in 50+ hospitals in NSW, QLD and SA, including >700 sessions totalling >240 training hours. Trainee feedback indicates high levels of usability, acceptability and utility in multiple clinical contexts. Specifically, after completing TACTICS VR

trainees report increased confidence to make improvements in stroke management and confidence in understanding stroke workflow practices and believe VR is effective to teach / transfer knowledge for acute stroke.

Conclusion: TACTICS VR is a fit-for-purpose, evidence-based training application for stroke workflow optimisation that can be readily deployed in a clinical setting. We continue to explore approaches to sustain training and expand modules both within stroke and in other hyper-acute clinical contexts.

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A Scoping Review of Acute Specialist Nursing Roles and Their Impact on Patient Outcomes

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Background: Complex health care and doctor shortages have been identified as adversely affecting health care delivery in Australia. The Australian College of Nursing's White Paper 'A new horizon for health service: optimising advanced practice nursing' proposes the use of specialist nurses working to full scope of practice as a partial solution. To date, the impact of specialist nursing roles on care of adult acute hospital patients is yet to be examined.

Aims: To characterise the impact of specialist nursing roles on improving outcomes for patients in Emergency Departments or acute inpatient areas and identify evidence gaps through a scoping review.

Methods: A search of studies published in English between 1 January 2009 to 31 December 2022 was conducted. Systematic reviews, randomised controlled trials (RCTs) and observational studies (cohort and cross-sectional) evaluating specialist nursing roles in treating adult patients with any condition in acute hospital settings were included. Qualitative synthesis of the data then was conducted.

Results: 27 articles were eligible (two systematic reviews, six RCTs and 19 observational studies) which included nurse practitioners, clinical nurse specialist and registered nurse roles.

Nine outcome measures were reported in evaluation of specialist nursing roles: length of stay (reported in n=15; 55.5% of studies), time to assessment (n=8; 30.8%), time to treatment (n=7; 26.9%), mortality (n=6; 23.1%), readmission (n=5; 19.2%), patient satisfaction (n=5; 19.2%), direct healthcare cost (n=3; 11.5%), diagnostic accuracy (n=3; 11.5%), complications (n=4; 15.4%) and documentation of assessment (n=1; 3.8%). Apart from documentation of assessment, all outcomes demonstrated improvement with specialist nurse roles.

Conclusion: Specialist nursing roles improve a range of outcome measures in adult acute care settings without adversely affecting mortality and complications. Specialist nurses are uniquely placed to meet the demands of increasingly complex health care and provide a safe alternative for medically led health care models.

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Post-stroke Lateropulsion: Pushing for Greater Understanding of the Role of Lesion Location

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Background: Post-stroke lateropulsion is prevalent and associated with poor rehabilitation outcomes, independent of stroke severity. Prior smaller studies have shown associations between lateropulsion presence and a variety of stroke lesion locations.

Aims: This study aimed to investigate the association between neuroimaging data and the presence of lateropulsion on admission to inpatient rehabilitation.

Methods: This prospective study conformed to the STROBE statement for observational studies and included participants aged ≥65 years admitted for inpatient stroke rehabilitation. Stroke lesion location and size were reported by a neuroradiologist, with findings verified by a second neuroradiologist. Lateropulsion presence (Four Point Pusher Score – 4PPS) was assessed at rehabilitation admission.

Results: Of 144 included participants, 82 (56.9%) had lateropulsion (4PPS ≥ 1) on admission. Lateropulsion presence was univariately associated with haemorrhagic stroke ($p=0.002$), frontal cortical involvement ($OR=2.17$, 95%CI 1.02-6.46) and white matter involvement ($OR=2.45$, 95%CI 1.24-4.85), particularly frontal white matter ($p=0.021$). Associations between lateropulsion presence and lesions in the internal capsule ($OR=2.16$, 95%CI 0.99-4.70) and thalamus ($OR=2.16$, 95%CI 0.99-4.70) approached significance. When stratified by stroke type, no specific location was significantly associated with lateropulsion presence in haemorrhagic strokes. Among participants with ischaemic stroke, frontal cortical involvement ($OR=3.67$, 95%CI 1.61-8.37), particularly pre-central gyrus ($OR=2.45$, 95%CI 1.05-5.76) and parietal cortical involvement ($OR=2.54$, 95%CI 1.15-5.61), particularly post-central gyrus ($OR=2.76$, 95%CI 1.15-6.60), inferior parietal cortex ($OR=3.95$, 95%CI 1.43-10.90) and supramarginal gyrus ($OR=3.73$, 95%CI 1.25-11.13) were associated with lateropulsion presence. White matter involvement ($OR=2.22$, 95%CI 1.04-4.74) was associated with lateropulsion presence in ischaemic strokes, but no specific area of white matter involvement significantly predicted lateropulsion presence. Side of stroke and lesion volume were not significantly associated with lateropulsion presence.

Conclusion: While haemorrhagic stroke was associated with lateropulsion presence, lateropulsion was associated with specific cortical and sub-cortical areas only in ischaemic strokes. Future lesion-network mapping studies including greater numbers of participants are recommended.

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Promoting Adherence to Stroke Secondary Prevention Behaviours Through Behaviour Change Skills Training: Protocol for a Pilot Trial of Living Well After Stroke

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Background: Survivors of stroke have an elevated risk of recurrent stroke. Prompt intervention to support healthy lifestyle modification following an initial stroke is crucial for effective secondary prevention of stroke. However, many patients do not receive adequate post-discharge support for secondary prevention, particularly if not referred to inpatient rehabilitation. Living Well After Stroke (Living Well After Stroke) has been developed by National Stroke Foundation, in collaboration with experts from CSIRO and Griffith University, to address this service gap.

Aims: Living Well After Stroke is a health promotion programme based on the Health Action Process Approach (HAPA), which aims to support this underserved group to improve and self-manage secondary prevention behavioural performance (eg. diet, exercise, medication-adherence) by equipping participants with a toolkit of theory-and evidence-based behaviour change strategies and techniques that are transferable to different behavioural contexts.

Methods: Participants will be Australian adults with stroke not referred to inpatient rehabilitation. Adopting a prospective single-arm trial design, the intervention comprises five behaviour change sessions based on the HAPA framework over 8-weeks, delivered via telehealth. Measures of primary (behaviour) and secondary outcomes (intention, outcome expectancy, risk perception, self-efficacy, planning, action control, subjective well-being) will be taken at baseline, 4-weeks, 8-weeks and 16-weeks.

Results: The intervention is expected to lead to improved performance of secondary prevention behaviour, and transference of behaviour change skills to a new behaviour, at 16-weeks. For this presentation, the authors will share on their observations, insights and experiences developing Living Well After Stroke, and its implementation to-date.

Conclusion: Living Well After Stroke, which has a strong theoretical basis and uses an innovative approach of imparting behaviour change skills to support long-term self-management of secondary prevention behaviours, has significant potential to improve secondary prevention of stroke and transform models of care for people who have had a stroke in Australia.

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Do Social Determinants of Health Influence Post-Stroke Aphasia Outcomes? A Scoping Review

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Background: Factors known to influence language outcomes post-stroke include lesion factors, age, severity, cognition, and overall health. These factors account for 51% of the variance in language outcomes. Little is known about what else contributes to language outcomes and what might predict other post-stroke aphasia outcomes such as

participation and quality of life. Social Determinants of Health (SDoHs) are the conditions in which people are born, grow, work, and live. Recent research indicates that SDoHs influence incidence of stroke and may influence post-stroke rehabilitation outcomes. The role of SDoHs on post-stroke aphasia outcomes is unknown.

Aims: To examine the literature on five individual SDoHs (gender, education, ethnicity, socioeconomic status, and social support) on post-stroke aphasia outcomes (language, participation, environmental factors, personal factors, and quality of life).

Methods: A scoping review was conducted according to PRISMA-Scoping Review guidelines. Terms were searched across five databases: PubMed, Scopus, PsychINFO, CINAHL and Embase in August 2020 and again in February 2022. Studies were included if they were published in French or English, included adults with post-stroke aphasia, and examined the relationship between any individual SDoH and any aphasia outcome.

Results: Twenty-five studies were identified that explored relationships between SDoHs and aphasia recovery (n=20) and SDoHs and aphasia treatment outcomes (n=5). Most research investigated the relationship between gender and education and language recovery. Very little research was identified on SDoHs and other aphasia outcomes. Statistically significant relationships between SDoHs and recovery or outcomes were only identified at or beyond 12 months post-stroke.

Conclusion: Research is needed on SDoHs and aphasia recovery and outcomes, particularly at and beyond 12 months post-stroke. Understanding the role of SDoHs on aphasia recovery and outcomes will be important to ensure optimal care for all stroke survivors with aphasia long term.

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Cost-effectiveness simulation modelling of chronic disease management plans among survivors of stroke

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Background: There is limited evidence of the cost-effectiveness of chronic disease management plans (CDMPs) funded by the Australian government in the long-term after stroke.

Aims: To estimate the potential cost-effectiveness of CDMPs over a lifetime in people who survived the first 6 months after stroke/TIA.

Methods: A Markov model was developed to simulate costs and benefits of CDMPs over a time horizon of 30 years. Three health states were modelled (stable, hospitalised, dead) with one-year cycles. Model inputs were obtained from studies that included community-dwelling survivors of stroke/TIA. Transition probabilities and costs of resource utilisation from an Australian government funded health system perspective were obtained from the PRECISE study, a data linkage of the Australian Stroke Clinical Registry (cohort n=12,368) with government administrative

datasets (hospital, Medicare claims, and pharmaceutical claims data). Quality-adjusted life years (QALYs), according to receipt of CDMP claims, were obtained from a cohort of survivors of stroke/TIA from a complementary randomised controlled trial (STANDFIRM, n=563 linked with Medicare claims and death data). A 3% discount rate was applied to costs in Australian dollars (\$) and QALYs beyond 12 months. Probabilistic sensitivity analyses, with 10,000 iterations, were used to describe uncertainty around the incremental cost-effectiveness ratio (ICER).

Results: Compared to not having a CDMP claim, estimated average total lifetime costs (\$124,752 vs. \$89,080 per patient) and average total QALYs (7.241 vs. 6.835 per patient) were greater in the CDMP claim group, resulting in an ICER of \$87,739 per QALY gained. Assuming a willingness-to-pay threshold of \$50,000/QALY gained, there was a 42.41% probability of CDMPs being cost-effective.

Conclusion: It did not appear that the current use of CDMPs was cost-effective for survivors of stroke/TIA compared to care provided in general practices without a CDMP. Further research to optimise the use of CDMPs for this cohort is warranted.

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Implementation of Evidence-informed Discharge Planning in Inpatient Rehabilitation

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Background: Transition to the community is a critical phase for stroke survivors, yet effective discharge planning is often marred by poor communication, lack of patient participation and disorganised support services. High level evidence exists for achieving timely, patient-centred and interdisciplinary discharge planning however these approaches are not implemented consistently in inpatient clinical settings.

Aims: To determine discharge planning barriers in an inpatient rehabilitation setting for those with severe stroke and other non-progressive brain injuries and co-design solutions to improve discharge experiences for patients and families.

Methods: A problem analysis of discharge planning processes was conducted guided by the health services evaluation model PRECEDE-PROCEED. Participants were healthcare professionals working in inpatient rehabilitation and external stakeholders working with patients post-discharge. Data were obtained through medical file audit, a 30-item questionnaire, staff focus groups and a review of discharge policy documents. Quantitative data were analysed descriptively and qualitative data were analysed deductively using the National Safety and Quality Health Service (NSQHS) Standards for hospital discharge planning.

Results: Questionnaires were completed by forty-nine rehabilitation staff members (72% female) and fourteen external stakeholders (71% female). Focus group interviews (n=6) were completed with twenty-six staff members. Barriers to evidence-based and timely discharge included a lack of appropriate accommodation options and an inconsistent approach to discharge planning across team members. Suggested facilitators for coordinated discharge were clear and consistent communication and support for patient-family emotional adjustment. Gaps were identified in documentation to support discharge planning.

Conclusion: A theory-informed approach can guide the investigation of implementation issues in discharge planning practice. Establishment of a discharge pathway and checklist is a priority to improve discharge processes for patients and families.

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Co-design of a tailored follow-up intervention package for people living with stroke who report extreme unmet needs: a two stage, three-round modified Delphi study

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Background: After stroke, people with ongoing health problems may be readmitted to hospital and have decreased quality-of-life. The Australian Stroke Clinical Registry collects patient-reported outcomes between 90-180 days after stroke. This provides an opportunity to identify people reporting health-related problems that could be addressed with additional support.

Aims: To co-design a registry-based, hospital-initiated follow-up intervention for people with stroke reporting health-related problems between 90-180 days after stroke.

Methods: A two-stage, sequential mixed methods design using a modified Delphi approach to establish eligibility and the intervention components (clinical protocol and training manual). Stage 1 comprised: i) online scoping survey distributed to a broad stakeholder group (clinicians, researchers and consumers i.e., those with lived experience); ii) two workshops involving an interdisciplinary working group (n=17) (Delphi round 1); and iii) survey-based evaluation by an independent review group (n=6) (Delphi round 2). Stage 2: draft intervention package piloted in one hospital (n=6 participants). Pilot feedback incorporated and final survey review by working group to approve final edits (Delphi round 3).

Results: Stage 1: Eight consumers and 33 researchers/clinicians completed the online survey; 38% response rate. Overall, 13/17 (77%) working group members attended at least one workshop. In Delphi round 1, the survey generated 35 recommended intervention amendments (e.g., referral letter contents). The independent review group provided 11 additional recommendations with high content agreement (92%) (Delphi round 2). Stage 2: Thirteen changes were made to the intervention package following the pilot testing phase (e.g. two new protocol pathways). The final survey (Delphi round 3) was completed by 16/17 (94%) working group members with high agreement (94%).

Conclusion: We have co-designed a novel, registry-based, follow-up service that can be tailored for people living with stroke in the community with ongoing health-related problems. The intervention is now ready for testing in a feasibility randomised controlled trial.

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Championing stroke care: Insights from the Australian Stroke Clinical Registry on priority areas of Acute Stroke Care

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Background: The Australian Stroke Clinical Registry collects information on national acute stroke care standards. Variation in care between hospitals impacts patient outcomes.

Aims: To illustrate hospital performance in four priority areas of acute stroke care (stroke unit treatment, time to neuroimaging, thrombolysis door-to-needle time (DTNT), and swallowing assessments).

Methods: Across 7 states/territories, 60 adult public hospitals provided 2021 data. Adherence was determined as the percentage of eligible patients treated. Funnel plots were used identify exceptional (>3 standard deviations above national average) and poor (>3 standard deviations below national average) performance. For continuous outcomes (neuroimaging timing or DTNT), we described hospitals with performance outside of the national interquartile range.

Results: Overall, 16,458 episodes of stroke were analysed (median age 75 years, 43% female, 81% ischaemic). There were 27 hospitals with exceptional adherence to stroke unit care, 13 with poor adherence and 3 with no episodes treated in a stroke unit. Stroke unit treatment was less common in regional hospitals (68% vs metropolitan 80%, $p < 0.001$). Median time from arrival to neuroimaging was 41 minutes, 2 hospitals were above the 75th percentile (>87 minutes) and 5 hospitals were below the 25th percentile (<20 minutes). Among 1320 patients with ischaemic stroke who received intravenous thrombolysis, the median DTNT was 77 minutes. Only 5 (8%) hospitals had a median DTNT ≤60 minutes, 4 (7%) below the 25th percentile (56.5 minutes), while 18 (30%) had DTNT above the 75th percentile (107 minutes). Only 58% of all patients had their swallowing screened/assessed prior to oral intake; and 29% within 4 hours of arrival (9 hospitals with exceptional adherence; 12 with poor adherence).

Conclusion: Despite strong evidence for recommended acute stroke care practices, there remains significant variation between Australian hospitals. The standardised registry data are essential to identifying areas for improvement against national benchmarks and to support stroke unit certification.

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Estimating Stroke Prevalence from Linked Data Sources

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Background: Stroke prevalence is an important cross-sectional measure of disease burden for a population. However, most stroke prevalence analyses rely on self-report to identify prevalent cases. Linked

administrative data may be a pragmatic means of obtaining such estimates, but the optimal methodology has not been developed.

Aims: To compare different definitions of stroke prevalence.

Methods: This study utilised linked Western Australian cardiovascular disease hospitalisation and mortality data. All strokes were identified between 01/01/1985 and 30/06/2018 from any diagnosis field (ICD-10-AM I60, I61, I62.9, I63, I64 and I69, and equivalent ICD-9-CM codes). For the standard definition, prevalent cases of stroke were identified as all people admitted to hospital for stroke in the 33-year lookback period and still alive at 30/06/2018. Alternative definitions compared shorter lookback periods and other modified parameters including a subset of ICD-10-AM codes.

Results: Using the standard prevalence definition, 26,058 prevalent cases were identified. Reducing the lookback period resulted in a decrease in prevalent cases (1.7% with a 30-year lookback, 32.9% with a 10-year lookback and 87.8% using a 1-year lookback). The reductions were similar irrespective of age and sex. Compared to the standard stroke definition, the exclusion of I69 codes (stroke sequelae) resulted in an average prevalence case loss of 7.2% for lookback periods ranging 33 to 10 years, and between 8.8% to 20.7% for lookback periods ranging 10 to 1 year. Alternative stroke definitions showed consistent results compared to the standard definition for lookback periods of at least 10 years, however, a greater/lesser loss of cases were seen for shorter lookback periods.

Conclusion: Modifications to the definition of stroke have an impact on the identification of prevalent cases. Lookback periods of less than 10 years are suboptimal for identifying stroke prevalence within a linked administrative dataset. Stroke sequelae should be included in case identification.

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The TiDieR-Rehab Checklist: Enhancing the reporting quality of rehabilitation interventions and dosage parameters through an extension of the Template for Intervention Description and Replication (TiDieR)

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Background: Beyond hyperacute care, rehabilitation is the primary mechanism for promoting stroke recovery. The development, evaluation, and implementation of evidence-based stroke rehabilitation requires comprehensive reporting of interventions, particularly intervention delivery methods and dosage parameters such as duration, frequency, length and difficulty¹. Poor descriptions of stroke rehabilitation interventions pose a significant barrier to their replication in clinical practice and analysis of dosage parameters which directly influence outcomes¹.

Aim: To develop the TiDieR-Rehab checklist – an extension of the original TiDieR² – which critiques the reporting of rehabilitation interventions.

Methods: A modified Delphi process was used to develop the TiDieR-Rehab checklist, and was guided by an interdisciplinary steering committee. Drafts of the TiDieR-Rehab checklist and supplementary manual were distributed using an online survey to interdisciplinary rehabilitation experts (n=35). Quantitative (Likert scales) and qualitative (free-text comments) data was descriptively analysed and triangulated to inform iterative revisions of the checklist and supplementary manual until consensus was achieved.

Results: Two rounds of the modified Delphi process were needed to achieve consensus on the items within the TiDieR-Rehab checklist and supplementary manual. Consensus was demonstrated by high levels of agreement in quantitative data and qualitative feedback that consistently supported the inclusion of items and a shared desire for better reporting. Key feedback and revisions reflected current tensions in stroke

rehabilitation, including differentiated understandings of key concepts and terms, and the challenge of reporting highly individualised interventions.

Conclusion: The TIDieR-Rehab checklist and supplementary manual were successfully developed through consultation with interdisciplinary rehabilitation experts. The implementation of this tool has the potential to advance stroke rehabilitation research and practice through better reporting, replication, evaluation, and optimisation of dosage parameters, and subsequently, improved outcomes for people with stroke.

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What physical environment factors influence stroke survivor experience and preference? A controlled experiment using virtual reality

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Background: The hospital physical environment can influence care experience and outcomes. Understanding the modifiable physical design variables potentially important for stroke survivors could help future design.

Aims: We aimed to examine the affective and choice-preference responses of stroke participants to selected physical design variables related to hospital patient rooms. The secondary objectives were to examine the feasibility and safety of use of virtual reality (VR) in stroke.

Methods: A factorial experimental approach employed a novel VR simulation of hospital patient rooms (single, multi-patient) experienced by stroke participants under controlled conditions (16 x 2 (day, night, respectively)), followed by a semi-structured interview. In each VR simulation, randomised single and multi-patient room designs were shown for <3 minutes, in the context of additional physical design variables (present/absent) i.e., social connectivity, night-time noise, spaciousness, and outdoor greenery outlook. Primary measures: Pick-A-Mood Scale (PAMS) and choice-preference on a visual analogue scale completed in each VR simulation. Feasibility and safety were measured throughout. Analysis used regression analyses. Experience of the physical design variables was illuminated by interview and thematic analysis.

Results: Forty-four stroke participants, median (IQR) age=67years (57.25- 73.75years, 61.4% male, completed the study (43/44 all VR

conditions: 701 daytime responses, 686 night-time)). PAMS: Being 'relaxed' or 'calm' were the most frequent affective states in day and night conditions. Regression analyses estimated differences in affective and choice-preference responses attributed to certain combinations of physical design variables and showed that affective responses changed in response to different variables (e.g., greenery, noise). There were no adverse events. Three qualitative themes described how the physical design variables aligned with quantitative outcomes.

Conclusion Findings indicate certainty of magnitude and direction (high, low affect) and choice-preference responses. Combining physical design variables, beyond single patient room type only, should now be targeted in real-world prototype, controlled trials.

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How can the Benefits of Post-stroke Memory Rehabilitation be Maintained over Time? Findings from the Memory-SuSTAIN Pilot Randomised Controlled Trial

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Background: Addressing memory problems post-stroke is a priority because of considerable unmet needs. Compensatory memory skills programs can result in short-term benefits, but difficulties establishing new strategies into everyday routines can reduce longer-term effectiveness.

Aims: To evaluate the acceptability, feasibility, costs, and potential effectiveness of two eHealth maintenance interventions to sustain the effects of a memory skills group program compared to usual care.

Methods: An observer-blinded pilot randomised controlled trial was conducted with community-dwelling stroke survivors experiencing everyday memory problems. Following a 6-week memory skills group program, participants were randomly allocated into one of the three maintenance conditions: i) booster sessions delivered via telehealth, ii) electronic (SMS/email) reminders prompting strategy use, or iii) no active maintenance (usual care). Outcome measures included participant acceptability ratings, participant retention, costs (intervention delivery and health services used), Goal Attainment Scaling (GAS) and Everyday Memory Questionnaire-Revised (EMQ-R). GAS and EMQ-R were assessed post-memory group (baseline), post-waiting-period-1 (6 weeks), post-maintenance intervention (12 weeks), and post-waiting-period-2 (18 weeks). Within-group and between-group changes were modelled using generalised linear mixed effects regressions.

Results: 38 participants were randomised (56% female, median age 53 years, median time-since-stroke 13 months). Acceptability ratings were equally high for the three maintenance conditions (7.7-9.2/10); 92% of participants retained post-randomisation. Intervention delivery costs were greatest for booster sessions, but total costs were greatest for electronic reminders due to more health service utilisation. GAS t-scores improved and EMQ-R memory complaints decreased between baseline and 18 weeks for all conditions ($p < .01$), with no between-group differences. Within-group differences indicated the highest effect size for booster sessions for both GAS ($d = 2.86$) and EMQ-R ($d = 2.02$).

Conclusion: Maintenance interventions appear acceptable and feasible. Booster sessions may have the greatest effect without increasing total costs. Participants receiving usual care also unexpectedly sustained gains, possibly due to regular monitoring. A definitive trial is justified.

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Interventions to Improve the Delivery of Evidence-Based Practices in Acute Stroke Units – a Cochrane Systematic Review

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Background: The delivery of evidence-based practices by health professionals in acute stroke units is inconsistent.

Aims: To assess the effect of implementation interventions on adherence to evidence-based practices in acute stroke units.

Methods: Systematic review using Cochrane methodology. Participants were health professionals providing care to patients in acute stroke units; implementation interventions were compared to no intervention or another implementation intervention. Two authors independently selected studies for inclusion, extracted data and assessed risk of bias and certainty of evidence using GRADE.

Results: Seven cluster-randomised trials (23,460 patient participants from 129 hospitals) were included, conducted in Australia, the United Kingdom, China, and the Netherlands. Health professional participants were nursing, medical and allied health professionals.

Five trials compared multifaceted implementation interventions to no intervention, two trials compared different multifaceted implementation interventions.

There is uncertainty whether multifaceted implementation interventions lead to changes in delivery of evidence-based practices compared with no intervention (Risk ratio [RR] 1.73; 95% CI 0.83-3.61; very low certainty evidence). There is moderate certainty evidence that multifaceted implementation interventions compared to no intervention lead to little/no difference in the proportion of patients with ischaemic stroke who received thrombolysis (RR 1.14, 95% CI 0.94-1.37) or in reducing the risk of death, disability or dependency (RR 0.93, 95% CI 0.85-1.02); but probably increase the proportion of patients with ischaemic stroke treated with thrombolysis who are admitted within 4-hours of symptom onset (adjusted MD 1.58%, 95% CI 1.11-2.27) and the proportion of patients who receive a swallow screen within 24-hours of admission (RR 6.76, 95% CI 4.44-10.76).

The two trials that compared different multifaceted implementation interventions were too disparate to warrant meta-analysis.

Conclusion: The certainty of evidence regarding the effect of implementation interventions on the delivery of evidence-based practices in acute stroke units is very low. Future well-conducted studies will have an important impact on the effect estimate and our confidence in the findings.

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Evidence-Based Information Provision to Carers of Survivors of Stroke? Exploring how Information is Provided to Carers during Inpatient Stroke Rehabilitation

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Background: Carers of survivors of stroke report struggling to find the information they need, which can have a negative impact on their ability and confidence to support the person with stroke. Adult learning principles provide guidance on how to create learning encounters that enhance an individual's ability to understand, remember and use information.

Aim: To explore how health professionals provide information to carers during inpatient stroke rehabilitation and whether these practices align with adult learning principles.

Methods: Semi-structured interviews with carers and people with stroke who had completed inpatient rehabilitation, and health professionals working in inpatient stroke rehabilitation. Directed qualitative content analysis using two adult learning models to determine how closely reported practices aligned to adult learning principles.

Results: 12 carers, 5 survivors of stroke and 17 health professionals participated. Carers (92% female, 50% spouse/partner) reported having incomplete knowledge during rehabilitation, lacking information about mechanisms of stroke recovery, rehabilitation processes, long-term effects of stroke, and navigating post-discharge services. Carers reported struggling to take in information early after stroke. Carers' self-directed actions, such as identifying what information they wanted, approaching staff with questions and asking to attend therapy sessions, largely fulfilled previously described "learner roles". Health professionals applied adult learning principles to support carers to address their information needs in one particular field: safety in caring for survivors of stroke. In contrast, when information needs were identified by carers, health professionals routinely provided written or verbal information, but this was usually provided only once, carers' understanding of the information was not checked, and carers were not invited to discuss the presented information.

Conclusions: Adult learning principles are not routinely applied by health professionals when providing information to carers during inpatient stroke rehabilitation. Strategies that foster adult learning may improve preparedness of carers to support stroke survivors after discharge from inpatient rehabilitation.

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Investigating Stroke Care and Outcomes for People with Aphasia to Drive Quality Improvement Initiatives in Australian Hospitals

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Background: Aphasia is an acquired language disorder experienced by one in three people with stroke. Aphasia impairs the ability to communicate and negatively impacts quality of life. Little is known about whether the presence of aphasia influences aspects of stroke care and outcomes in Australian hospitals.

Aims: To investigate whether the presence of aphasia is associated with differences in the quality of acute stroke care and outcomes.

Methods: Observational study of cross-sectional data from the Stroke Foundation National Acute Services Audit conducted in 2017, 2019 and 2021 in Australia. Hospitals submit ~40 consecutive retrospective medical record audits. Processes of care analysed aligned with the Stroke Clinical Guidelines and the Acute Stroke Clinical Care Standards.

In-hospital outcomes included complications, independence at discharge and discharge destination. Descriptive statistics and multivariable logistic regression were used to examine associations between aphasia status, processes of care, and patient outcomes (adjusted for age, sex, stroke type, prior function, severity, and hospital).

Results: Of the 11,613 audited patients, 3122 (26.9%) had aphasia (aphasia 51% male; median age 78 years IQR; no aphasia 58% male; median age 74 years IQR). Patients with aphasia had their mood assessed less often (23% versus 30%), received thrombolysis more often (17% versus 8%), and received risk factor education less often (59% versus 70%). There was no difference in being treated in a stroke unit (68% versus 72%). Patients with aphasia were more likely to experience one or more complication (aOR 1.46 95% CI 1.30, 1.63), were less independent at discharge (aOR 0.48 95% CI 0.42, 0.56) and were more likely to access inpatient rehabilitation (aOR 1.15 95% CI 1.01, 1.30).

Conclusion: Variations in stroke management and outcomes exist for people with aphasia post stroke. This study highlights the need for quality improvement initiatives and guideline recommendations to address potential inequities in care.

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Is It Feasible to Codesign Implementation Strategies with People with Lived Experience of Stroke to Improve Evidence-based Stroke Rehabilitation?

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Background: People with lived experience are rarely involved in implementation science research.

Aim: We designed this study to assess the feasibility of codesigning implementation strategies with people with lived experience of stroke and health professionals to improve evidence-based stroke rehabilitation.

Methods: Experience-Based CoDesign was used to codesign and deliver strategies over 6-months to implement 2 Stroke Clinical Guideline recommendations (information provision and amount of therapy) at one stroke rehabilitation unit. Workgroups were formed with health professionals working on the unit and people with lived experience of stroke (survivors and carers) who had completed inpatient rehabilitation at the unit in the previous 6-12 months. Feasibility of the codesign process (focusing on acceptability, implementation fidelity, signal of promise) was evaluated using data from interviews, observations and inpatient self-reported outcomes before and after the implementation period.

Results: We invited 18 people with stroke to join the lived experience workgroup but only 8 (44%) agreed. All disciplines with ≥1 full-time staff members on the stroke unit were represented on the health professional workgroup.

Median workgroup attendance over 6-months was n=8 health professionals, n=4 survivors of stroke, n=1 carers. Workgroup members indicated that the project was enjoyable and facilitated effective partnerships between health professional and lived experience workgroup members. Both cohorts reported contributing valuable input throughout the project, with responsibility shifting between groups at different project stages.

The codesigned strategies signalled promise for improving aspects of information provision and creating additional opportunities for therapy. We could not compare patient-reported outcomes before and after the implementation period due to high variability between the pre-implementation and post-implementation patient cohorts.

Conclusion: It is feasible to codesign implementation strategies in inpatient rehabilitation with people with lived experience of stroke and health professionals. More research is required to determine the effect of the codesigned strategies on patient and service outcomes.

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Biochemical and Enzymatic Comparison of Metalyse (Tenecteplase) and Generic rh-TNK-tPA

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Background: Tenecteplase (TNK) is a variant of tissue-type plasminogen activator (tPA; "alteplase") that differs at only 6 amino acids. TNK has a longer plasma half-life than tPA and clinical studies have indicated that TNK is non-inferior to tPA as a thrombolytic for patients with acute ischaemic stroke (AIS). TNK, like tPA exists in a single chain (intact) form and as a two-chain form after cleavage by plasmin although both forms are catalytically active. A generic form of TNK (rhTNK-tPA) has been compared against alteplase in Chinese patients with AIS and was found to be non-inferior¹. However, direct comparison of generic rhTNK-tPA with TNK has not been undertaken.

Aims: To undertake a biochemical and enzymatic comparison of TNK with generic rhTNK-tPA.

Methods: Generic rhTNK-tPA was provided by the China Shijiazhuang Pharmaceutical Company Recomgen Pharmaceutical (Guangzhou) Co. Ltd. The company had no role in this study. Tenecteplase was obtained from Victorian hospitals remaining after thrombolysis for patients with AIS. Equimolar concentration of TNK and rhTNK-tPA were compared for fibrinolytic and plasminogen activating capacity by fibrin zymography and amidolytic assays, respectively. The protein constituents of each formulation were compared by sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE) and Coomassie staining under reduced and non-reduced conditions.

Results: Fibrin zymographic analysis revealed that both forms of TNK possessed fibrinolytic activity that migrated at the same molecular weight and had similar dose-dependent activity. Similarly, the amidolytic activity of each formulation did not significantly vary. Coomassie staining after SDS-PAGE under non-reduced conditions showed the identical pattern for both formulations. However, under reduced conditions, rhTNK-tPA appeared to be more homogeneous having a greater percentage of single-chain v two-chain-rhTNK-tPA compared to tenecteplase.

Conclusion: TNK and rhTNK-tPA are essentially indistinguishable in relation to fibrinolytic and plasminogen activating capacity.

Reference

1. Wang et al. (2023) Lancet 401(10377) 645-654

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Large Vessel Occlusion with Milder Severity associated with Better Collaterals and Less Harm From Thrombectomy Transfer Delays

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Background: Inter-hospital transfer delays for endovascular thrombectomy are associated with poorer outcomes but the harmful effects may be different for patients with milder baseline severity due to potentially better collateral circulation.

Aims: We examined whether patients with large vessel occlusion (LVO) and milder baseline severity had differences in 1) markers of collateral circulation and 2) the relative harm of transfer delays on outcome, compared to patients with clinically more severe baseline deficits.

Methods: We used in-hospital registry data from The Royal Melbourne and Royal Adelaide Hospitals to identify all directly presenting and transferred LVO patients undergoing endovascular thrombectomy, divided into those with milder baseline deficits (NIHSS <10) and severe baseline deficits (NIHSS ≥10). Baseline CT-perfusion markers of collateral circulation and the association between transfer status and functional outcome (using the 90-day modified Rankin Scale) were analysed.

Results: A total of 1210 LVO patients were included of which 273 (22.6%) had milder severity. Milder LVO patients showed smaller median ischemic core volumes (12.6 [IQR 0.0-17.9] vs 27.5 [IQR 6.5-37.1] mL, $p < 0.001$), higher median perfusion mismatch ratio (148.3 [IQR 5.0-500.0] vs 66.2 [IQR 3.6-17.2], $p < 0.001$) and lower median hypoperfusion intensity ratio (0.25 [IQR 0.18-0.38] vs 0.40 [IQR 0.22-0.57], $p < 0.001$). Transferred patients had a lower odd of excellent outcome than primary presenters, when deficits were severe deficits (aOR 0.759 [95% CI 0.576-0.999]) but not when deficits were milder (aOR 1.357 [95% CI 0.764-2.409], p -interaction=0.122).

Conclusion: Patients with LVO and milder baseline severity showed better imaging markers of collateral circulation. Secondary transfer delays for thrombectomy were only associated with poorer 90-day functional outcomes in higher-severity patients. Our results have implications for pre-hospital LVO screening tools where failure to detect lower severity LVO may not deleteriously affect outcome.

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Psychological Factors and Return to Work After Stroke: The Unseen Challenges of an Unmet Need

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Background: Many stroke survivors experience significant difficulty returning to work. Vocational rehabilitation programs are designed to enable stroke survivors to re-engage in meaningful work. Existing programs appear to place emphasis on physical and environmental factors associated with vocational re-engagement, whereas psychological and psychosocial characteristics receive less attention.

Aims: To characterise the psychological and psychosocial factors in a cohort of stroke survivors, prior to their engagement in a vocational intervention program.

Methods: Stroke survivors who were within four months post-stroke and identified an unmet need relating to work were recruited into a pilot randomised controlled trial (Work Trial). Participants were recruited from acute, rehabilitation and community programs at Alfred Health in Victoria, Australia. At baseline, psychological and psychosocial factors were evaluated: anxiety and depressive symptoms were measured using the Hospital Anxiety and Depression Scale (HADS), and self-estimated work and social functioning were assessed using the Work and Social Adjustment Scale (WSAS). Univariate analyses were conducted on psychological and psychosocial data collected at recruitment into the trial.

Results: Thirty-four stroke survivors (male: $n = 20$; age: mean = 49.7, SD = 12.7, median = 52.5, IQR = 19, range: 21 to 69 years) were recruited. At trial commencement, almost half of the participants (14 of 32, 44%) experienced depressive symptoms and one-third (11 of 32, 34%) demonstrated anxiety, as indicated by a score ≥ 8 on the HADS-D and HADS-A respectively. More than half of the participants (21 of 34, 62%) recorded a greater difficulty when returning, or attempting to return, to previous occupations, activities and roles post-stroke, as indicated by a score ≥ 16 on the WSAS.

Conclusion: In the Work Trial, stroke survivors commonly reported depressive symptoms, anxiety and increased difficulty in work and social functioning, prior to undertaking a vocational rehabilitation program. Psychological and psychosocial factors should be considered alongside physical and environmental factors within vocational rehabilitation programs for stroke survivors.

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Evaluating Health Care Professionals' and Patients' Perceptions of Digital Solutions for Stroke Prevention: A Mixed Methods Study of Usability and Satisfaction Levels

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Background: Stroke is a leading cause of death and long-term disability that affects people of all ages, ethnicities, and socioeconomic backgrounds. Evidence-based health-related digital technologies have been identified as critical tools for enhancing interventions to prevent stroke, but few such tools are available. The PreventS-MD software is a validated digital tool that enables healthcare professionals (HCPs) to assess patients' 5- and 10-year risk of stroke and provide patient-centred, evidence-based recommendations, empowering and motivating patients to control their risk factors.

Aims: To determine the satisfaction and usability of PreventS-MD software for stroke prevention from both patient and HCP perspectives.

Methods: A mixed methods design was used for this international study of 100 HCPs from 27 countries (from high- and low- to middle-income countries) with diverse demographic and specialties and 10 people with stroke admitted to a public hospital in Auckland, New Zealand. All 100 international HCPs and ten people with stroke completed the System Usability Survey (SUS) to determine the usability of PreventS-MD software for primary and secondary stroke. In-depth qualitative interviews were conducted with two New Zealand-based doctors (from the international sample) and 10 people with stroke. Interviews were thematically analysed using NVivo software.

Results: SUS scores from HCPs demonstrated excellent software usability ($M=81.7$; 95% CI [79.1-84.3]), with usefulness response rates ranging from 88% to 98%. Qualitative findings suggested that clinicians found the software was convenient, tailored to the patient's needs and could help save time. People with stroke reported that the recommendations were easy to understand, could be easily adhered to and were ready to improve their lifestyles.

Conclusion: PreventS-MD is a usable tool for potentially bridging the gap between current stroke prevention knowledge and community awareness. Further studies are needed to determine its efficacy for stroke prevention.

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Outcomes of Patients Presenting to Emergency Departments with Suspected Transient Ischaemic Attack while on Direct Oral Anticoagulants

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Background: Current Transient Ischaemic Attack (TIA) management in the Emergency Department (ED) is largely informed by studies conducted prior to the era of Direct Oral Anticoagulants (DOACs). The outcome of patients suspected of TIA presenting to ED while on a DOAC is poorly understood.

Aims: To examine the working diagnosis at first TIA clinic attendance in patients on a DOAC presenting with suspected TIA to the ED.

Methods: Retrospective study of all patients who presented to the emergency departments at our health service with the principal diagnosis coded as a transient ischaemic attack between December 2020 and November 2021.

Results: Of 599 presentations, 352 were followed up in the public TIA clinic and included in analysis, (median age 73y [IQR 63-80], 50% male). Median time from ED to clinic review was 26 days (IQR 15-45), with 167 (47%) having MRI post discharge from ED (median days to imaging 30 [IQR 9-56]). Of 352 patients, 35 were on a DOAC at the time of presentation. For these patients, 12, 6, 5 and 12 patients had a working diagnosis of TIA, stroke, migraine and "others" at clinic review respectively. This compares to 104, 32, 74 and 104 in the same diagnostic categories respectively in those not on a DOAC ($n=314$) ($\chi^2 = 2.62$; $df = 3$; $p = 0.45$). There were 3/352 patients on warfarin and excluded from comparison.

Conclusion: Initial clinic diagnosis was TIA/Stroke in 51% of DOAC patients coded with TIA as a primary diagnosis in ED, compared to 43% in those not on a DOAC. Further effort is needed to investigate the heightened stroke risk and decrease the stroke burden in DOAC patients.

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Disparities in General Practice Management of Stroke by Dementia Status: Linked Registry and General Practice Study

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Background: Clinical management of survivors of stroke with dementia is challenging considering considerable impairments often experienced.

Aims: To evaluate whether stroke management in Australian general practices differs for patients with dementia.

Methods: A retrospective observational study of adults with acute stroke/TIA (2014-2018). Participants were identified through the

Australian Stroke Clinical Registry, and linked with de-identified general practice data from three Victorian Primary Health Networks (2013-2020). Patients were eligible if discharged home or to rehabilitation, and had ≥ 2 encounters with general practice within 7-18 months post-index stroke/TIA (chronic stroke phase). Dementia status was determined based on historical recordings of dementia diagnosis or prescription of cholinesterase inhibitors, up to 6 months post-index event. Stroke/TIA management was evaluated within 7-18 post-index event, and included: assessment of cardiometabolic risk factors (blood pressure [BP], serum lipids, blood glucose, serum proteins, body weight); prescription of prevention medications (BP-, lipid-, glucose-lowering, antithrombotic agents); and attainment of targets for the cardiometabolic risk factors. Association between dementia and the quality of care and outcomes were determined using regression models.

Results: Of 3,528 eligible patients (median age 74 years, 44% females, 22% TIA), 147 (4%) had dementia. Adjusted for covariates (e.g. sociodemographic variables, other comorbidities), having dementia was significantly associated with not being assessed for BP (odds ratio [OR] 0.57, 95% confidence interval [CI] 0.38-0.86), serum lipids (OR 0.52, 95% CI 0.36-0.78), or body weight (OR 0.61, 95% CI 0.38-0.97). Similarly, patients with dementia were less often prescribed BP-lowering agents (OR 0.67, 95% CI 0.45-0.99) or lipid-lowering medications (OR 0.61, 95% CI 0.42-0.89); or less often attained targets for blood glucose (OR 0.54, 95% CI 0.31-0.94).

Conclusion: General practices may need support with managing people with stroke and dementia. Findings should be interpreted in the context that information on any specialist care received is not captured in general practice data.

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Age and Sex Disparities in the Primary Prevention of Stroke or TIA in Australian General Practice: Linked Registry and General Practice Data

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Background: Little is known about the primary prevention of stroke in Australian general practices.

Aims: To describe the primary prevention of stroke/TIA in Australian general practices, and investigate whether there are any demographic disparities.

Methods: Analysis of adults with acute stroke/TIA (2014-2018), using linked de-identified data from the Australian Stroke Clinical Registry and general practices from three Victorian Primary Health Networks. Patients were eligible if they had ≥ 2 encounters with general practice within 12 months immediately before the index stroke/TIA. Primary stroke prevention was evaluated based on the provision of two guideline-recommended processes: 1) assessment of cardiometabolic risk factors (blood pressure, serum lipids, blood glucose, body weight), and 2) prescription of prevention medications among those clinically indicated (antihypertensive, lipid-lowering, glucose-lowering, antithrombotic agents). Outcomes included attainment of risk factor targets. Multivariable regression models were used to determine associations of age and sex with receiving recommended care processes or attaining risk factor targets.

Results: A total of 3,041 patients from 348 general practices were included (23.8% aged ≥ 85 years; 47% women). Patients were assessed for a median two risk factors within 12 months immediately before stroke/TIA, mostly blood pressure (79.8%) and serum lipids (49.0%). The most commonly prescribed prevention medications were antihypertensive agents (63.1%) and lipid-lowering medications (40.7%). In multivariable models, there was a significant non-linear (U-shaped) association between age and care processes received or outcomes ($p < 0.001$). Compared to patients aged 65-85 years, those aged < 65 years or ≥ 85 years had fewer risk factors assessed, fewer classes of medications prescribed, and were less likely to attain risk factor targets. This non-linear association was more pronounced among women, with those aged ≥ 85 years having more sub-optimal outcomes.

Conclusion: Primary prevention of stroke in Australian general practices differs by age and sex. Older women with stroke may require more support to ensure equitable care.

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Stroke Management in Australian General Practices: a Data Linkage Study

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Background: Little is known about the management of stroke in Australian general practices.

Aims: To evaluate the quality of care and outcomes of patients with stroke/TIA in Australian general practices.

Methods: A retrospective analysis of adults with acute stroke/TIA (2014-2018) using Australian Stroke Clinical Registry data linked with de-identified general practice data (2013-2020) from three Victorian Primary Health Networks (Eastern Melbourne, Gippsland, South Eastern Melbourne). Eligibility included being discharged home or to rehabilitation, and having ≥ 2 general practice encounters within 7-18 months post-stroke/TIA. General practice management within 7-18 months post-stroke/TIA was evaluated based on: assessment of five cardiometabolic risk factors (blood pressure [BP], serum lipids, blood glucose, serum proteins, body weight); and prescription of prevention medication (BP-, lipid-, glucose-lowering, and antithrombotic agents). Outcomes included attainment of guideline-recommended targets for the cardiometabolic risk factors. Quality of care and patient outcomes were summarised using descriptive statistics, and associated factors determined using stepwise multivariable regression.

Results: A total of 3,528 people were eligible (median age 74 years, 44% females, 22% TIA, 383 general practices). Within 7-18 months post-stroke/TIA, there was a median 10 encounters with general practice, 3,027 patients (86%) with records of risk factors (median three risk factors assessed), and 1,380 (39%) prescribed all of BP-lowering, lipid-lowering, and antithrombotic medications. BP was the most commonly assessed risk factor (79%). Factors most strongly associated with having fewer risk factors assessed, or fewer medication classes prescribed, included younger or older age (reference 61-80 years) and being female. Risk factor targets were most commonly achieved for blood glucose (78%), and least commonly for serum proteins (27%).

Conclusions: We identified gaps that could inform quality improvement efforts for managing stroke/TIA in Australian general practices. Findings

may be limited by the quality of data captured in practices, and completeness of health information transferred (e.g. pathology) to practices.

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Developing a Desirability of Outcome Ranking Measure for the Melbourne Mobile Stroke Unit Telemedicine Trial

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Background: The majority of modern acute stroke trials utilize trial designs that require the prioritization of a single primary outcome over other, potentially equally important, outcomes.

Aims: To demonstrate how a Desirability of Outcome Ranking (DOOR) design can facilitate comparison of a telemedicine neurological assessment to an onboard assessment whilst evaluating multiple outcomes simultaneously, within the upcoming Melbourne Mobile Stroke Unit (MSU) Telemedicine Trial.

Methods: A DOOR design combines multiple ranked measures into an overall outcome. All participants within each arm of the trial will be compared to those in the other using a Win Odds method, resulting in a "win, loss, or draw" for telemedicine, compared with the onboard arm. Our primary study endpoint will be the odds that a random participant treated through a MSU telemedicine assessment will have a more desirable DOOR scale outcome than a random participant treated by an onboard MSU neurologist. Recruiting 242 participants (121 per arm) would yield a power of 0.8 to observe such treatment effect against the null hypothesis (Win Odds = 1; 2-sided alpha level=0.05).

Results: The design evaluates, in order of importance: safety, scene-to-decision time metrics, and resource utilization. If a participant in one treatment arm is achieving better safety than the comparator, this is defined as a "win" for that participant and a "loss" for the comparator. If there is no difference in safety, time to treatment decision is compared. If no clinically meaningful difference is observed, then resource utilization is compared. If there is no difference in resource utilization, the two participants are declared as tied for the overall outcome.

Conclusion: A DOOR design clearly articulates the relative importance of multiple critical variables included in a primary outcome measure, whilst allowing for the development of a trial with a feasible sample size.

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Sex-differences in Acute Stroke In-hospital Mortality in Chile: Data from a Multicenter Nationwide Hospital-Based Registry

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Background: Understanding sex-differences in stroke outcomes is important for improving stroke care and reducing the global burden of stroke. Sex-differences in stroke mortality in Chile have been poorly reported.

Aims: Investigate sex-differences in acute stroke in-hospital mortality (IHM) during 2019, using a nationwide database from Chile.

Methods: A retrospective analysis was conducted on the Chilean Diagnosis Related Group (DRG), which included information on all discharges from 65 hospitals across the country between January 1st and

December 31st, 2019. Acute stroke was defined as main diagnosis with corresponding ICD-10 codification (I60, I61, I62, I63, I64). Severity of stroke was not included in the analysis due to limited data availability. Multiple logistic regression was performed to analyse the association between sex and IHM, adjusting for available potential confounders. Data were analysed with STATA v17.1.

Results: Among 1,048,575 hospital events registered in the DRG, we identified 15,535 stroke patients, of whom 7,074 (45.5%) were women and 2,438 patients (15.6%) were reported dead during hospitalization. Between all stroke patients, 67.2% corresponded to ischemic stroke (4,659/10,440[44.6%] women), 23.6% to intracerebral hemorrhage (ICH, 1,568/3,680[42.6%] women) and 6.7% to subarachnoid hemorrhage (675/1,049[64.3%] women). Compared to men, women were found to be older (70.36±14.76 versus 67.03±13.45, P<0.001) and belong to a lower socioeconomic status (81.75% versus 68.56%, P<0.001). After adjusting for covariates, IHM in all stroke was independently associated with sex (women [OR=1.10;95%CI:1.01-1.21]), older people (≥65years [OR=1.35; 95%CI:1.22-1.49]), lowest socioeconomic status ([OR=1.14;95%CI: 1.00-1.31]), admission to a hospital without stroke care unit ([OR=1.26;95%CI:1.15-1.39]) and complications during hospitalization ([OR=3.14;95%CI:2.87-3.44]). Regarding sex-differences by stroke subtype, only ICH showed statistically significant association (women OR=1.22, 95%CI 1.06-1.41).

Conclusion: Sex-differences in mortality rates after acute stroke vary according to stroke type. Further research can provide new insights into additional factors that contribute to sex-differences in stroke mortality.

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Changes in stroke incidence among major ethnic groups in New Zealand between 1981- 2021

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Background: Previous studies have provided evidence of ethnic disparities in stroke incidence in New Zealand (NZ). Continued surveillance in changes in stroke burden among major ethnic groups is crucial for informing tailored prevention and management guidelines.

Aims: We aimed to compare changes in stroke incidence over four decades among major ethnic groups from the Auckland Regional Community Stroke (ARCOS) studies.

Methods: The ARCOS studies are population-based studies conducted in Auckland, NZ, every decade since 1981 (ARCOS I-V). Stroke cases were identified with hot and cold pursuit through multiple case ascertainment methods. Prioritized ethnicity (self-identified) was used to obtain a

single ethnicity with participants grouped as Europeans, Māori, Pacific, or Asian/other.

Results: In ARCOS V (2021), in absolute numbers, Europeans represented the highest proportion of stroke (56%), followed by Asian (22%), Pacific (13%) and Māori (8%). The average age (years) of stroke onset was youngest in Māori (60.7), and greatest in Europeans (75.1), similar to the gap seen since 1981. The overall age-standardised incidence of stroke (per 100,000 person-years [95% CI]) was 161 [152, 171]; 109 [102, 116] in Europeans, 176 [151, 205] for Māori, 190 [169, 213] in Pacific and 153 [140, 168] in Asian/other. Since 1981, stroke incidence increased 1.3-fold in Māori and Pacific peoples and reduced 0.7-fold in Europeans and 0.4-fold in Asians. However, in the last decade stroke incidence as well as absolute numbers more than doubled in Asian/other, while a trend towards decrease in incidence was seen in Pacific people.

Conclusion: Despite improved acute stroke care, ethnic disparities have persisted in NZ. Improved and tailored strategies specific to different ethnic groups are needed for primary prevention. The current ARCOS V results are preliminary and will be updated with 2023 Census data when available.

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STOPstroke - A community-based research priority setting project for stroke prevention

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Background: As part of Synergies TO Prevent stroke (STOPstroke), a NHMRC Synergy Grant focused on stroke prevention, we did a consumer-led research priority setting project to guide our program of research.

Aim: To create priorities for stroke prevention research identified by the community.

Methods: The project had four parts: (i) online survey asking 'What 3 questions about preventing stroke would you like to see answered by researchers?'; (ii) checking responses against evidence (systematic reviews, meta-analyses, clinical guidelines) to identify research gaps; (iii) second online survey for interim prioritisation of questions (1 [not important] to 5 [very important]); (iv) online workshop to determine top 10 priorities.

Results: Across Australia and New Zealand, 375 people submitted ~750 questions in the first survey (September–November 2021). From this, n=134 summary questions were checked against evidence with 47 questions identified as research gaps. Most of the 600 excluded questions were about stroke risk factors for which there is substantial evidence – blood pressure, physical activity, diet and lifestyle. The second online prioritisation survey (May–June 2022, n=97 responses) resulted in 24 highly-rated questions. The online workshop (August 2022) was attended by 14 participants (four with lived experience of stroke, four general community members, four health professionals, two researchers). Consensus was reached on the top question, namely 'In people that have not had a stroke, how we can improve the early detection and measurement of stroke risk?'. No consensus was reached on the remaining 'top 9' due to diverse priorities across breakout groups. Participants suggested a thematic grouping of all questions, resulting in 22 questions

under behavioural, pharmacological/clinical, structural, policy, individual or population themes. To encompass the many priorities identified about specific target groups, we recommend that future research explore the role of age, gender, geography, and ethnicity.

Conclusion: These priorities will be disseminated to ensure future stroke prevention research meets the needs of the community.

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The Effects of Biofeedback Gait Training on Minimum Foot Clearance in Stroke Survivors

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Background: Compared to age-matched controls the risk of falling is significantly higher in people with chronic stroke. It is, therefore, important to improve mobility in stroke survivors and decrease their risk of falling. Trips are a leading cause of falls. Tripping risk is greater when Minimum Foot Clearance (MFC) is reduced, and MFC variability increased.

Aim: To determine the effects of biofeedback-augmented gait training on the MFC clearance in stroke survivors using an RCT design.

Methods: We recruited 46 stroke survivors; 42 were randomised either to a group that received biofeedback (n = 21) or no biofeedback (n = 21). Both groups completed 10 treadmill-walking sessions. Participants in the biofeedback group received real-time feedback on MFC. An infrared marker attached to the front of the shoe was tracked in real-time, with swing foot vertical displacement displayed continuously on a computer monitor. A target increased-MFC range was determined, and participants instructed to maintain MFC within that range. Affected limb's MFC was recorded at baseline and after completing the training sessions (post-training) via 3D motion capture during 5–10 minutes of treadmill walking at self-selected speed. Change in MFC between baseline and post training was calculated as a percentage and compared between groups.

Results: Post-training data was available for 40 participants (biofeedback n = 19, no biofeedback n = 21). A significantly greater percentage change was detected in the biofeedback group (32.1% +/- 45.6) compared to the control group (6.2% +/- 30.2); p = .045.

Conclusion: Treadmill gait training with real-time visual feedback of foot trajectory is effective in increasing MFC height. Real-time augmented biofeedback training can help in gait rehabilitation post-stroke and may reduce trip and falls risk.

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Access to mood screening and psychological services after stroke in Australian acute and rehabilitation services: 2011–2021

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Background: Approximately one-third of stroke survivors will experience a mood impairment (such as depression, anxiety, or emotional lability) within 6 months of their stroke. Timely diagnosis of mood impairment is essential for facilitating early access to treatment.

Aims: To describe the trends over time in access to mood screening and management in Australian acute and rehabilitation hospitals from 2011-2021.

Methods: Cross-sectional data were used from the Stroke Foundation Audit program of inpatient services that alternates each year between Acute Services (2011/2013/2015/2017/2019/2021) and Rehabilitation Services (2010/2012/2014/2016/2018/2020). The Audit program includes a self-reported organisational survey of services (e.g., access to psychologists) and retrospective clinical audit of 40 consecutive medical records from each hospital including processes of care indicators (e.g., mood screening). Multivariable, multilevel logistic regression was used to estimate proportions in each year with adjustment for age, sex, and stroke severity. Cochrane Armitage tests for trends (p_{trend}) were used to compare results from each cycle.

Results: Between 2011-2021, 142 acute hospitals participated. Access to a psychologist involved in stroke care increased from 18% to 45% ($p_{\text{trend}}=0.002$). The adjusted proportion of patients with stroke who had their mood screened increased from 16% to 33% ($p_{\text{trend}}<0.001$). However, the adjusted proportion of mood impaired patients seen by a psychologist did not increase (2011 7%, 2021 9%, $p_{\text{trend}}=0.24$).

Between 2012-2020, 130 rehabilitation hospitals participated. Access to a psychologist involved in stroke rehabilitation increased over time (2012 38%; 2020 68%, $p_{\text{trend}}<0.001$), and more patients had their mood screened (adjusted proportion 2012 35%, 2020 61%, $p_{\text{trend}}<0.001$). The adjusted proportion of mood impaired patients seen by a psychologist also increased from 31% to 50% ($p_{\text{trend}}<0.001$).

Conclusion: Although clinical processes of care around in-patient management of mood improved over the 10 years within acute and rehabilitation services, gaps in care still exist. Revised pathways to increase access to mood screening and the detection of mood impairments are needed.

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Early, Minimally Invasive Intracerebral Haemorrhage Evacuation: a Phase 2a Feasibility, Safety and Promise of Surgical Efficacy Study

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Background: Surgical treatment of intracerebral haemorrhage (ICH) is unproven, although meta-analyses suggest that both early conventional surgery with craniotomy, and minimally-invasive surgery (MIS) may be beneficial. We aimed to demonstrate the safety, feasibility and promise of efficacy of early MIS for ICH using the Aurora Surgiscope and Evacuator.

Methods: We performed a prospective, single-arm phase IIa Simon's Two-Stage design study at two stroke centres (10 patients with supratentorial ICH volumes $\geq 20\text{mL}$ and NIHSS ≥ 6 , surgery commencing <12 hours post-onset). Positive outcome was defined as $\geq 50\%$ 24-hour ICH volume reduction, with the safety outcome lack of significant ICH reaccumulation.

Results: From December 2019-July 2020 we enrolled 10 patients at two Australian Comprehensive Stroke Centres, median age 70 (interquartile range(IQR) 65-74), National Institute of Health Stroke Scale(NIHSS)

score 19(IQR 19-29), ICH volume 59mL(IQR 25-77), at a median 227 minutes(IQR 175-377) post-onset. MIS was commenced at a median 531 minutes(IQR 437-628) post-onset, was of 98 minutes median duration(IQR 77-110) with median immediate post-operative haematoma evacuation of 70%(IQR 67-80%).

A positive outcome was achieved in 5/5 first-stage patients and in 4/5 second-stage patients. One patient developed significant 24-hour ICH reaccumulation; otherwise 24-hour stability was observed (median reduction 71%(IQR 61-80), 5/9 patients $<15\text{mL}$ residual)).

Three patients died, unrelated to surgery. There were no surgical safety concerns. At six months the median modified Rankin score was 4(IQR 3-6) with 30% achieving mRS 0-3.

Conclusion: Early ICH MIS using the Aurora Surgiscope and Evacuator appears feasible and safe, warranting further exploration.

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What are the Highest Priority Challenges for People with Communication Disability after Discharge?

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Background: More than 140,000 Australians live with communication disability resulting from stroke. This group is particularly susceptible to mental health issues, social isolation, and poor health outcomes. Communication Connect is an NHMRC-funded project that is co-designing and developing a comprehensive and technology-enabled multidisciplinary programme of post-discharge care together with people with lived experience of communication disability, caregivers and clinicians.

Aims: The objective of phase one of Communication Connect is to identify the most significant short- and long-term challenges following discharge, as raised by people with communication disability, their caregivers and healthcare professionals. In phase two, solutions to these challenges are co-designed.

Methods: An Experience Based Co-Design method, adapted to be communicatively accessible, was utilised to understand and prioritise challenges faced by consumers (n=6), caregivers (n=3) and healthcare professionals (n=12) at two sites (rural Victoria and metro Queensland). Collaborative teams are developing solutions to the highest priority challenges.

Results: From 30 challenges, ten were voted by consumers and healthcare staff as highest priority for the solution development phase: (1) Lack of person-centred timing, duration, and delivery of services; (2) Services are difficult to access and navigate; (3) Loss of identity; (4) Lack of advocates to effectively manage care; (5) Carers need information and support; (6) Impact on family, parenting, and income; (7) Poor use of resources to enable communication; (8) Mental health and wellbeing; (9) Barriers to utilising technology; (10) Limited options in rural areas.

Conclusion: People with communication disability and their caregivers face a large range of challenges in adjusting to life after stroke. Communication Connect is purposefully working with consumers and healthcare staff to maximise the probability of successful implementation of co-designed solutions. The co-designed solutions to these challenges will be described, including an AI-enabled, aphasia-friendly web app that guides users to solutions and provides accessible mood monitoring.

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Evaluation of the Melbourne Mobile Stroke Unit Using Data Linkage

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Background: The use of mobile stroke ambulances will be expanded in Australia, requiring information on their costs and benefits.

Aims: To assess the hospital costs and outcomes associated with the Melbourne Mobile Stroke Unit (MSU).

Methods: Data from the Australian Stroke Clinical Registry (Victoria) and Melbourne MSU were linked to the Victorian Emergency, Admitted Episodes, cost and deaths datasets, and Ambulance Victoria for the calendar year of 2018. The linkage resulted in 6,355 patient records with ambulance transport. Propensity score matching using age, sex, diagnosis (ischaemic stroke, haemorrhagic stroke or transient ischaemic attack), treating hospital, and postcode identified 202 patients with attendance/transport by the MSU (intervention) and 202 patients transported by standard ambulance services (control). Multiple imputation was used for missing values for costs and the modified Rankin Scale (mRS). Cox proportional hazards regression was used to assess differences in survival.

Results: The mean age of the matched cohort was 78 years, 54% were male, and 71% were ischaemic strokes. Among MSU-attended patients, 75% arrived at hospital in 4.5 hours from onset of symptoms and 27% received thrombolysis. In the control group, 62% arrived at hospital in 4.5 hours and 18% received thrombolysis. The mean cost of hospitalisations within 6 months post-event was \$36,457 (95% CI: \$28,651, \$44,263) in the control group and \$38,212 (95% CI: \$31,706, \$44,718) in the intervention group ($p=0.727$). At 180 days of follow-up, 151 (75%) of MSU-attended patients and 51 (25%) in the control group were free from disability (mRS scores 0-1, $p<0.001$). The mortality rate for MSU-attended patients was 51% lower than the control group (hazard ratio: 0.49, 95% CI: 0.30-0.78).

Conclusion: MSU attendance was associated with improved outcomes and lower mortality without a significant increase in overall hospital costs in this preliminary analysis. Future research will include other considerations such as operational costs.

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Reported Versus Measured Weight in Patients Treated with Thrombolysis - an Audit from Box Hill Hospital Stroke Unit

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Background: Intravenous thrombolysis is a high risk first line reperfusion therapy for acute ischaemic stroke. Recommended weight-based doses have been carefully selected to balance recanalization rates against the risk of intracranial haemorrhage. The literature suggests variable accuracy in the weight used to calculate thrombolysis dose, but Australian studies are lacking.

Aims: To evaluate weight acquisition methods for thrombolysis, compare the reported weight to in-hospital measurements, and assess whether weight overestimation correlates with haemorrhagic transformation.

Methods: Consecutive patients who received intravenous thrombolysis from January 2019 to June 2022 were identified from Box Hill Hospital's stroke database. Variables including weight used, pre and post thrombolysis blood pressure were extracted from electronic records. A paired t-test was used to compare weight used acutely with measured weight. Multivariable regression was used to explore weight discrepancy associations with CT-proven intracranial haemorrhage at 24 hours. Patients who were transferred for endovascular clot retrieval were excluded from the haemorrhagic transformation analysis.

Results: Of 354 patients (median age 77, IQR 66-84; 54.8% male), patient or family-reported weight was used for thrombolysis dosing in 34 cases, and stroke team estimates in 153 cases. In 174 cases it was unknown if the weight was reported or estimated. Measured weight was missing in 92 patients. Although there was no statistical difference between weight used acutely and measured weight ($N = 262$, $p=0.38$), 74 patients had discrepancies over ± 5 kg. No association was found between weight overestimation or blood pressure with haemorrhagic transformation ($N = 44$, missing radiology data = 21).

Conclusion: Documentation of patient's weight can be improved, including methods of weight acquisition for thrombolysis dosing and post-admission measurements. Withstanding these limitations, 72% of patients were thrombolysed with weight within 5kg of their measured weight.

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Developing Miniaturised Carbon Nanotube Brain Scanners for Standard Road and World-First Air Ambulances

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Background: Mobile Stroke Units have been shown to improve stroke outcomes by bringing neuroimaging to the patient, reducing time-to-treatment. However, associated costs limit their use to densely populated metropolitan areas, further widening the gap between rural and urban stroke outcomes. The Australian Stroke Alliance, a national collaboration aiming to reshape prehospital stroke care, has partnered with Micro-X Ltd to develop a lightweight, portable, and affordable brain scanner. The scanner, based on a compact arrangement of 31 carbon nanotube x-ray sources and a curved x-ray detector, will weigh less than 100kg (Neurologica CereTom™ weighs approximately 500kg) and be sufficiently compact to be installed in standard road and world-first air ambulances.

Aims: We aim to determine if this novel brain scanner will sensitively detect simulated small-volume intracerebral haemorrhage.

Methods: Scanner geometry, including source radius, detector radius, angular span, and rotational indexing, were optimised using high-fidelity simulations and validated using an eight degrees-of-freedom x-ray test bench. Initial artifact correction included truncation correction by modification of statistical weights in reconstruction, and scatter correction using Monte-Carlo simulation.

Results: Contrast-to-noise ratio and uniformity were maximized when source and detector radius were approximately equal, and angular span was maximized. The inclusion of a 45° rotational indexing minimized artifacts from limited-angular range. Truncation artifacts were greatly reduced using statistical weight modification, and initial scatter correction significantly reduced the cupping artifact, resulting in improved simulated ICH detection. Simulated intracerebral haemorrhage of 115 Hounsfield units contrast, and 33.5mm³ were detected in physical phantom scans.

Conclusion: We demonstrate feasibility of a compact, lightweight multi-source computed tomography for stroke assessment. Ongoing algorithmic improvement, including artifact correction, is expected to detect intracerebral haemorrhage reliably. These scanners would facilitate mobile stroke imaging and reperfusion therapy in rural and remote areas, improving equity in acute stroke treatment.

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When the Word is Too Big, it's Just Too Hard: How can Clinicians Support Patients' Health Literacy to Improve Recovery after Stroke?

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Background: Health literacy, the ability to access, understand and utilise health information, strongly influences health outcomes, including hospital readmission post-stroke.

Aims: To examine the health literacy, information needs and preferences of adults with stroke.

Methods: Inclusion: community-dwelling adults, attending St Vincent's (Melbourne) stroke clinic.

Mixed-methods using modified intervention mapping approach 'Ophelia' (OPTimising HEalth Literacy and Access). Stage 1: interview: Brief Health Literacy Screener, Health Literacy Questionnaire, information needs. Researchers then wrote patient vignettes representing these data.

Stage 2: focus groups (video-conference) or telephone interviews discussing how stroke services could support the information needs of the vignette 'characters'.

Descriptive statistics characterised participants' demographics and health literacy. Using thematic analysis, codes were identified, then grouped into themes.

Results: 19 participants (10 female, median age 65Yr (IQR 49,69), mRS 2 (IQR 1,2), 10 months post-stroke (IQR 6,14), 8 born outside Australia, 5 used interpreters. Seven (37%) had adequate functional health literacy (i.e., reading and comprehending patient materials). Ten (53%) usually/always found it easy to talk with healthcare professionals, and 11 (58%) usually/always found it easy to navigate the healthcare system.

Ten participated in Stage 2 focus groups/interview.

Four themes and one subtheme described participants' health literacy needs and preferences: 1. "Individual knowledge, capacity and beliefs about stroke and health services" 1.1 "Systemic and societal context influencing individual stroke literacy"; 2. "Tailoring and personalisation of

information delivery"; 3. "Having a support network to rely on"; and 4. "Feeling like I'm in safe hands", which refers to the services stroke survivors receive, and the clinicians who deliver those services.

Participants provided suggestions about tailoring, personalisation and method of information delivery, considering individuals' abilities and available supports.

Conclusion: Participants highlighted that understanding, recall and implementation of healthcare information is underpinned by information delivery that is tailored to a patient's individual knowledge and capabilities, supported by broader family and social networks, and delivered with demonstrable care by practitioners and services.

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The New South Wales Telestroke Service: Access, Treatment and Outcomes

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Background: The NSW Statewide Telestroke (NSW TSS) service was established to improve access to acute stroke reperfusion therapies in regional NSW. Unique aspects of the service include standardised online screening, prospective data collection incorporated into clinical workflow and continuous Quality Improvement (QI) based on weekly state-wide multidisciplinary review.

Aims: Our primary aim was to evaluate the impact of the NSW TSS on reperfusion therapy frequency and speed of delivery.

Methods: Staggered service implementation began March 16, 2020, progressing from 2 to 23 regional primary stroke centres (10 of which previously did not offer acute stroke treatment) by June 15, 2022. Baseline clinical data, reperfusion therapy times and final diagnosis were prospectively collected and evaluated regularly. Treatment metrics were compared to data collected at 7 NSW TSS sites offering thrombolysis during the 3 years immediately prior to NSW TSS implementation.

Results: In the first 3 years of operation, 11840 patients with stroke symptoms were screened using the online Acute Stroke Assessment Protocol, resulting in 3388 telestroke consultations. A total of 2448 patients were diagnosed with an acute cerebrovascular syndrome (1900 ischaemic stroke, 291 intracranial haemorrhage, 257 Transient Ischaemic Attack), 698 of whom received reperfusion therapy (thrombolysis n=320, endovascular thrombectomy (EVT) n=168, EVT+thrombolysis n=206). The proportion of acute ischaemic stroke patients treated (698/1900, 36.7%) was significantly higher than that in the 3-year period prior to NSW TSS implementation (77/494, 15.6%, p<0.0001).

Median (IQR) Door-Needle-Time (DNT) for thrombolysis was 65 (26) minutes, which was significantly shorter than pre-implementation (95 (38) minutes; p<0.0001). Median (IQR) DNT ranged from 67 (28) in year

1 to 63 (27) minutes in year 3 ($p=0.291$), when 96/220 (43.6%) of DNTs were <60 minutes. Symptomatic haemorrhagic transformation rates were 0.3% (spontaneous), 2.5% (alteplase), 4.8% (EVT) and 2.9% (EVT + thrombolysis).

Conclusion: Telestroke significantly increased the proportion of regional ischaemic stroke patients receiving reperfusion therapies and decreased time to treatment initiation.

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What Influences the Adoption and Sustained Use of Rehabilitation Technologies? A Scoping Review

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Background: In recent years, there has been significant growth in the development of rehabilitation technologies (RT) which aim to assist in the assessment and rehabilitation of clinical populations. Despite their potential benefits, evidence indicates that therapists and patients have been slow to adopt RT, and that those adopted are often abandoned in favour of more traditional approaches.

Aim: This scoping review sought to investigate the factors influencing the adoption and sustained use of RT.

Method: The scoping review followed Arksey and O'Malley's five-stage framework. Eight electronic databases were systematically searched. Articles that met the eligibility criteria were analysed in two phases. In Phase 1, literature reviews exploring adoption of RT were analysed using a six-step inductive thematic analysis approach. A thematic map was developed. In Phase 2, data pertaining to sustained use was analysed using an abductive approach where codes were mapped onto the themes developed in Phase 1.

Results: A total of 5486 papers were screened. Of the 36 studies included, 28 explored factors influencing adoption, six looked at factors influencing both adoption and sustained, and two focused solely on sustained use. In Phase 1, four key themes were identified as influencing the adoption of RT in clinical practice: "knowledge", "device design", "patients' and therapists' characteristics" and "person-centred approach". In Phase 2, subthemes in existing four themes were modified, expanded, or added, and an additional theme, "wider systemic conditions" was identified.

Conclusion: This scoping review provides valuable insights into the key factors that influence the adoption and sustained use of RT from the perspectives of patients and therapists. These findings can inform the development, evaluation, and implementation of RT by designers and developers, as well as guide decision-making by management and funders. Further research is needed to understand how to effectively support the sustained use of RT and to maximize their potential benefits for patients.

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Improving Communication Partner Training of Carers of People with Aphasia: Preliminary Results of a Stepped Wedge Implementation Trial

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Background: Carer burden is a significant issue for partners of people with aphasia (1). Although Communication Partner Training (CPT) improves outcomes (2) and is recommended by the Stroke Foundation Living Guidelines (3), fewer than half of speech pathologists provide this training (4). A feasible and effective implementation strategy is required to close this evidence-practice gap.

Aims: To evaluate the feasibility and preliminary effectiveness of a novel implementation package on speech pathologists' practice in providing CPT to carers of people with aphasia in rehabilitation and community settings.

Methods: Pilot stepped wedged cluster randomised controlled trial conducted with three health services over 12 months (2020-2021). All sites received the intervention: one-hour online module and half-day interactive workshop, resource provision and Site Champion training. Audit data was collected at 4 time-points and analysed with a generalised linear mixed model. Focus groups were conducted post implementation, analysed using qualitative content analysis (5).

Results: Thirty-six clinicians (speech pathologists, allied health assistants) participated; 106 patient files were audited. More carers were offered CPT with implementation (Odds ratio: 1.93), but there was no evidence of an intervention effect on CPT offers (CI: 0.36; 12.5, p -value = 0.84). There were small improvements in carers receiving CPT for two health services following the workshop (8% absolute percent increase), but small patient and site numbers did not allow estimation of intervention effect. Clinicians identified that while they valued and intended to implement CPT routinely, organisational barriers (e.g., workforce instability; COVID-19) and complex patient-carer relationships impacted implementation.

Conclusion: Our implementation package was feasible and may have led to more carers being offered CPT, however effects on CPT provision were unclear due to site-specific factors (e.g. COVID-19; carer readiness) confounding the time period analysis. Our preliminary findings suggest greater organisational support is necessary for clinicians to champion complex changes in CPT practice effectively, and that tiered CPT implementation may be required.

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Stage 4-5 Chronic Kidney Disease is not Associated with Hyperacute Stroke Management Delays in South Australia

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Background: Historically, renal dysfunction has contraindicated multimodal CT stroke imaging, due to fears of contrast nephropathy. However, guided by recent evidence demonstrating a lack of significant harm, current guidelines no longer preclude iodinated contrast administration in this setting. While all South Australian Stroke centres explicitly recommend expedited multimodal CTP in patients with Chronic Kidney Disease (CKD), it is uncertain whether contrast nephropathy concerns may still delay stroke multimodal imaging and treatments.

Aims: This study aimed to determine whether patients with CKD suffered delay in stroke reperfusion assessment and therapy.

Methods: This retrospective study included 2,960 stroke patients retrieved by ambulance from 2017 to 2022 to all three metropolitan stroke centres in South Australia. Initial eGFR was dichotomised as ≥ 30 or < 30 ml/min (stage 4-5 (CKD)). Hyperacute stroke management timing was dichotomised based on local guideline targets and national key performance indicators. Multivariable logistic regression was conducted to evaluate for associations between the presence of renal disease and time parameters of interest.

Results: Of 2960 patients, 155 (5.2%) had Stage 4-5 CKD. This was not significantly associated with the likelihood of symptom-onset-to-door time > 90 minutes (OR 0.792, 95%CI 0.563 to 1.116, $P = 0.183$), door-to-scan time > 30 minutes (OR 1.201, 95%CI 0.407 to 3.542, $P = 0.741$), door-to-needle time < 60 minutes (OR 0.502, 95%CI 0.131 to 1.919, $P = 0.314$) or door-to-groin puncture time < 90 minutes (OR 0.694, 95%CI 0.135 to 3.577, $P = 0.663$).

Conclusion: This study demonstrated that South Australian metropolitan stroke patients with stage 4-5 CKD did not experience significant delays in hyperacute stroke management. Protocolised care may abrogate potential treatment delays in patients with advanced CKD.

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Lower Limb Motor-evoked Potentials do not Predict Walking Outcomes Post-stroke

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Background: There is increasing interest in biomarkers for predicting motor outcomes after stroke.

Aims: This study examined whether lower limb (LL) motor-evoked potentials (MEPs) 1-week post-stroke predict recovery of independent walking, use of an ankle-foot orthosis (AFO), or use of walking aids 3- and 6-months post-stroke.

Methods: Participants unable to walk independently were recruited 5 days post-stroke. Transcranial magnetic stimulation (TMS) was used to determine tibialis anterior MEP status and clinical assessments (age, National Institutes of Health Stroke Scale (NIHSS), ankle dorsiflexion strength, LL motricity index and Berg Balance Test) were completed 1-week post-stroke. Functional Ambulation Category (FAC), use of AFO and walking aid were assessed 3- and 6-months post-stroke. MEP status, alone and combined with clinical measures, and walking outcomes at 3- and 6-months were analysed with Pearson Chi-Square and multivariate binary logistic regression.

Results: Ninety participants were included (median age 72y (38 – 97y)). Most participants (81%) walked independently (FAC ≥ 4), 17% used AFO, and 49% used a walking aid at 3-months post-stroke with similar findings at 6-months. Independent walking was better predicted by age, LL strength and Berg Balance Test (accuracy 92%, 95% CI 85 – 97%) than by MEP status (accuracy 73%, 95% CI 63 – 83%). AFO use was better predicted by NIHSS and MEP status (accuracy 88%, 95%CI 79 – 94) than

MEP status alone (accuracy 76%, 95% CI 65 – 84%). No variables predicted use of walking aids.

Conclusion: MEP status 1-week post-stroke predicts independent walking but combining age, balance and LL strength is more accurate. MEP status and NIHSS combined are stronger predictors of AFO use than MEP status alone. LL MEP status adds little value as a biomarker for walking outcomes.

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The Effect of Ischemic Core Volume on Functional Outcomes in the SELECT-2 Randomised Trial of Thrombectomy for Large Ischemic Stroke

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Background: Endovascular thrombectomy eligibility is expanding to patients with more extensive ischemic injury based on the results of randomised trials.

Aims: We aimed to investigate the effect of ischemic core volume on functional outcomes with endovascular thrombectomy versus medical management in the SELECT-2 randomised trial.

Methods: SELECT-2 randomised 352 patients with > 50 mL ischemic core on CT-perfusion and/or ASPECTS 3-5 on non-contrast CT to endovascular thrombectomy versus medical management 0-24h after stroke onset. CT-perfusion was processed with RAPID software using a relative cerebral blood flow threshold $< 30\%$ of normal brain to estimate ischemic core. The region of pre-treatment non-contrast CT hypodensity was also manually outlined. Follow-up infarct lesions on diffusion MRI or CT scans were also outlined. The treatment effect of thrombectomy on the ordinal modified Rankin scale (mRS) and mRS 0-2/0-3 dichotomies will be analysed in subgroups of ischemic core volume categorised as < 70 mL, 70-100 mL, 100-150 mL and > 150 mL using CT-perfusion, non-contrast CT or the larger of the two. The probability of mRS 0-2 and 0-3 with successful endovascular reperfusion across a spectrum of core volume, age and time to treatment will be presented using heat-map plots to assist clinical prognostication. Infarct growth and the rates of overestimation of baseline ischemic core volumes will be reported.

Results: Data have been collated and re-processed. Late-breaking results will be ready for presentation at the conference.

Conclusion: The decision to treat patients with very large ischemic core volumes can be challenging. These data will clarify the effect of thrombectomy in the larger range of ischemic core volumes.

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Reducing the Burden and Strain on Informal Stroke Caregivers: A Systematic Review and Meta-analysis

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Background: Informal caregivers provide ongoing practical and emotional support to meet the needs of stroke survivors. Over time, caregiving demands, stress, and lack of time for their own health and social activities can result in caregiver burden and impact the care and institutionalisation of the stroke survivor. Despite recently published reviews, the optimal length and type of intervention to reduce caregiver burden and strain remains unclear.

Aims: To understand the nature and effectiveness of interventions aimed at improving informal stroke caregiver outcomes (burden and strain).

Methods: This systematic review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis. A search of CINHAL, MEDLINE, Embase, APA PsycInfo, and Web of Science was conducted, and studies were eligible if they included a health and wellbeing intervention targeting informal caregivers of stroke survivors, reported on caregiver burden or strain, were published in English, and used a Randomised Controlled Trial (RCT) design. The RoB2 was used to appraise methodological quality of included studies.

Results: This systematic review included 17 RCTs that qualified for meta-analysis, with six dyad and 11 caregiver only interventions. Interventions ranged from 4 days to 12 months, and sessions ranged from 3 to 24. The majority of studies incorporated an educational and/or support component ($n=7$). Other studies delivered psychoeducational programs ($n=4$), relaxation exercises ($n=3$), problem solving techniques ($n=2$), or reminiscence therapy ($n=1$). Notably, meta-analysis found no statistically significant effects on caregiver burden ($d = 0.02$, 95% CI $[-0.36$ to $0.39]$, $p = 0.93$) or strain ($d = -0.07$, 95% CI $[-0.23$ to $0.09]$, $p = 0.41$).

Conclusion: The limited number of studies, small sample sizes, and heterogeneity of studies made it difficult to determine the intervention efficacy on caregiver outcomes. Further high-quality research is required to identify the optimal format, content, and frequency for improving caregiver outcomes.

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Utility of the Call-taker FAST Screen for Patients Receiving Reperfusion Therapy

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Background: Emergency 000 call-taker algorithms screen for suspected stroke that requires a priority lights and sirens ambulance dispatch. One component is an orally directed face/arm/speech test (FAST) that is weighted to create an ordinal scale ranging from "no test evidence" (all domains normal) to "clear test evidence" (severe abnormality in ≥ 1 domain). No literature exists to determine the utility of this test against need for time-critical reperfusion therapy.

Aims: We aimed to examine the utility of the 000 call-taker FAST to patients receiving reperfusion therapy (thrombolysis and/or thrombectomy) in consecutive Melbourne Mobile Stroke Unit (MSU) dispatches.

Methods: We linked clinical information from consecutive Melbourne MSU dispatches from 2017-2022 to call-taker information from Ambulance Victoria to determine 000 FAST accuracy against reperfusion therapy need. Additionally, we performed in-depth content analysis on 49 selected 000 call-taker recordings to understand real-world scoring.

Results: We linked 3701 cases with recorded FAST results, of which 304 (8%) received reperfusion therapy. There was a clear increase in the proportion of patients receiving any reperfusion therapy with higher weights for thrombolysis (no evidence 1.5% $\rightarrow$ clear evidence 7.6%, $p < 0.001$) and thrombectomy (no evidence 0.6% $\rightarrow$ clear evidence 3.7%, $p < 0.001$). Content analysis of call-taker recordings showed that abnormality of all FAST domains was highly associated with need for thrombectomy compared to all other patients (100% vs 24%, $p < 0.05$).

Conclusion: Lack of abnormalities on the 000 call-taker FAST predicted a low need for reperfusion therapies, but treatment rates were still relatively poor with the highest weighting of the FAST. Severe abnormalities in all FAST domains seemed to carry additional diagnostic utility, being found in all thrombectomy cases but only a minority of other cases. As such, there exists the potential to re-weight the test to address low specificity and improve usefulness for ambulance services and MSUs.

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Bridging the urban and regional divide in stroke care (BUILDS) – a novel Tele-Stroke Unit Care model for regional Australia

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Background: The majority of stroke patients admitted to regional hospitals have no access to bona fide stroke unit care despite the recent uptake of acute tele-stroke programs.

Aims: To describe the results of a 12-month, novel tele-stroke unit pilot at Echuca Regional Health.

Methods: Consultation data and admission episode variables were extracted. The variables analysed include age, sex, initial diagnosis, final working diagnosis, and other interventions provided by the BUILDS stroke neurologist.

Results: 120 consultations (71 video, 49 telephone) were conducted on 85 patients. Median age was 73 (IQR 65 – 92); youngest 38, oldest 98 years. The median time for pre-consultation discussion was 10 minutes (IQR 10 – 15). 78% (66/85) of initial consultations included a clinical review of the patient at the bedside using Zoom technology. The median time for the patient consult was 10 minutes (IQR 0-15).

A majority of clinical consultations were conducted with at least two local clinicians, typically the stroke coordinator and medical resident. Imaging was reviewed within the clinical context along with acute stroke education in 88% (106/120) of pre-consultation discussions. Patient centred counselling was provided by the stroke neurologist in 51% (61/120) of consultations at the bedside. 31% (26/85) of initial, and 20% (7/35) of follow-up consultations resulted in a diagnosis revision respectively. Medications were revised in 56 of 120 consultations (47%). 7 MRIs were requested and 10 cancelled. 4 hospital transfers were avoided, and 1 urgent transfer facilitated post consultation. Median length of stay was 3 days (IQR 2-5).

Conclusion: BUILDS Tele-stroke Unit Care improved diagnostic accuracy and reduced unnecessary resource use leading to potential cost savings for the local health service. It is a viable model that can be used to improve access to stroke unit care in regional areas. Our vision is that this simple model is expanded Australia-wide to ensure all patients receive evidence-based Stroke Unit Care.

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Generation of Synthetic MR Images from CT Scans for Stroke Patients Using Deep Learning

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Background: Patients who present with suspected stroke most commonly receive a CT scan for initial evaluation, due to lower cost and shorter acquisition time compared to MRI. However, MRI has been shown to be more accurate than CT for diagnosing stroke and can provide additional information that can be useful for have other advantages over CT scans for the purpose of diagnosis, treatment, and prognosis of stroke.

Aims: The purpose of this study was to investigate the use of deep learning to generate a synthetic MRI from a patient's CT scan which could be used in a clinical setting of suspected stroke.

Methods: Eight deep learning models were implemented including 7 UNet based models, and a CycleGAN model. These models were trained on a dataset of 181 stroke patients who underwent both CT and MRI scans. The performance of these models was evaluated both visually and using quantitative metrics to assess their ability to generate synthetic MRIs. The synthetic MRIs were further evaluated on three clinical tasks: lesion segmentation, brain tissue segmentation, and registration to an MRI.

Results: All eight models were capable of generating synthetic MRIs that showed similarities to the true MRIs. The base 3D UNet model outperformed the other models in terms of quantitative metrics and most clinical tasks, while the CycleGAN model had the weakest performance. Several models were able to accurately translate CT lesions to synthetic MRIs, a pre-trained segmentation model could automatically segment these lesions.

Conclusion: The use of deep learning to generate synthetic MRIs for stroke patients appears to offer a viable means of obtaining the benefits of an MRI scan for those who only receive a CT scan. However, further research is required to evaluate the feasibility of synthetic MRIs in clinical practice.

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Detection of Patent Foramen Ovale with Transcranial Doppler Ultrasound versus Bubble-enhanced Transthoracic Echocardiogram: an Implementation Audit

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Background: Embolic stroke of undetermined source (ESUS) comprises a large ischaemic stroke diagnostic subgroup, especially in patients aged under 65 years. Embolic stroke workup involves screening blood tests, cardiac monitoring and often a bubble-enhanced Transthoracic Echocardiogram (TTE) to exclude a patent foramen ovale (PFO). A PFO is present in 25% of the general population, but present in up to 50% of young ESUS patients, and causal in many. Transcranial Doppler for detection of PFO has been studied previously but has not been widely protocolised in Australia in ESUS diagnostic workup.

Aims: We investigated in an Australian context, the role of TCD versus bubble-enhanced TTE in ESUS patients aged under 65 years. Our aim was to compare the sensitivity and specificity of both tests against gold-standard transoesophageal echocardiogram (TOE) and review our algorithm for ESUS investigation.

Methods: 54 ESUS patients were screened with both TCD and bubble-enhanced TTE from September 2022 – March 2023 (median age 55 (inter-quartile range 19)). All cases without an alternate clear cause also underwent TOE (n=52).

Results: 25 of 52 patients had evidence of a PFO on TOE. TCD had a higher sensitivity (100% [95% confidence interval (CI): 87-100]) than TTE (88% [95%CI: 69-98]), and higher negative predictive value (100% [95%CI: 88-100]) vs (90% [95%CI: 74-98]) for PFO-detection in ESUS. Three cases were TTE negative/TCD positive. All were subsequently confirmed with gold-standard TOE.

Conclusion: Despite relatively small numbers, TCD appears more accurate than bubble-enhanced TTE in ESUS under 65 for detection of PFO at our tertiary stroke centre. As a result, we have revised our ESUS diagnostic algorithm; TCD is used as first line for shunt detection, and TTE without bubble used to investigate structural cardioembolic causes.

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Achieving Covariate- and Group Size Balance for Hyperacute Stroke Trials with Adaptive Randomization

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Background: When using adaptive randomisation for randomised controlled trials (RCTs) of hyperacute stroke interventions, it is important to achieve balance in size of treatment groups to maximise statistical power, and in prognostic baseline covariates such as age and NIHSS score to avoid potential confounding. It is also important to achieve these balances while preserving as much randomness as possible in treatment allocation. Currently, common-scale minimal sufficient balance (CS-MSB) adaptive randomisation effectively controls for covariate imbalance between treatment groups while preserving allocation randomness but does not balance group sizes.

Aims: To extend the existing CS-MSB adaptive randomisation method to achieve both group size and covariate balance in hyperacute stroke trials.

Methods: Data from four hyperacute stroke trials were used to investigate the performance of the proposed adaptive CSSize-MSB algorithm under various conditions. A full factorial in silico simulation study evaluated the performance of CSSize-MSB in achieving group size balance, covariate balance and allocation randomness compared to the original CS-MSB method. A discrete-event simulation (DES) model created with AnyLogic was used to dynamically visualise the decision logic CSSize-MSB randomisation process.

Results: The proposed CSSize-MSB algorithm uniformly outperformed the CS-MSB algorithm in controlling for group size imbalance whilst maintaining comparable levels of covariate balance and allocation randomness in hyperacute stroke trials. This improvement was consistent across a distribution of simulated trials with varying levels of imbalance but was increasingly more pronounced for trials with extreme cases of imbalance. These results were consistent across different trial datasets that include a range of covariates and covariate types.

Conclusion: The proposed adaptive CSSize-MSB algorithm successfully controls for group size imbalance in hyperacute stroke trials under various settings and its complex logic can be readily explained to stroke clinicians using dynamic visualisation.

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Cost effectiveness of Constraint-induced and Multimodality Aphasia Therapy compared to standard chronic post-stroke aphasia care

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Background: The COMPARE randomised controlled trial (RCT), found that Constraint-induced Aphasia Therapy Plus (CIAT-Plus) and Multimodality Aphasia Therapy (M-MAT) improved word retrieval, functional communication, and quality of life when compared to Usual Care in people with aphasia in the chronic phase after stroke.

Aims: To estimate the cost per quality adjusted life year (QALY) gained from CIAT-Plus and M-MAT compared to usual care.

Methods: Data collected over 26 weeks from the COMPARE RCT were used. Participants were administered standardised questionnaires to ascertain health service utilisation, employment changes, and informal caregiver burden. Unit prices from Australian sources were used to estimate costs in 2020 Australian dollars. QALYs were estimated using responses to the Euroqol-5D-3L questionnaire converted to a utility score using an Australian algorithm. Multiple imputation with chained equations and nearest neighbour matching was used for missing values. To test uncertainty around the differences in costs and outcomes between groups, bootstrapping was used for 1000 random resampling iterations.

Results: There were 201 randomised participants included in the analysis (mean age was 63 years, 29% moderate or severe aphasia). Mean total costs were \$13,047 for Usual Care, \$16,591 for CIAT Plus, and \$10,420 for M-MAT. There were no differences in healthcare costs, costs including employment changes and informal care, utilities and QALYs between groups with or without multiple imputation. In bootstrapped analysis of CIAT-Plus, 44.3% of iterations were likely to result in better outcomes and be cost saving (dominant) compared to Usual Care. M-MAT was more favourable when compared to Usual Care than CIAT-Plus, with 79.3% of iterations dominant.

Conclusion: The aphasia treatments resulted in better outcomes at an acceptable additional cost, or potentially with cost savings. These data will be important for advocating implementation of these treatments for people with chronic aphasia after stroke.

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Does a 'Strong recommendation' within a clinical practice guideline change clinician behaviour? National uptake of Fever, hyperglycaemia (Sugar) and Swallowing (FeSS) management following stroke

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Background: The Quality in Acute Stroke Care (QASC) Trial demonstrated that protocols to manage Fever, hyperglycaemia (Sugar) and Swallowing (FeSS) post-stroke reduce death and disability. Subsequently, in 2017, a 'Strong Recommendation' to support their use was included in the Australian Clinical Guidelines for Stroke Management.

Aims: To compare FeSS Protocol adherence in Australian hospitals before and after recommendations included in the Australian stroke

guidelines; and to assess adherence in hospitals previously participating in FeSS Intervention studies (QASC Research Program).

Methods: Cross-sectional study using Stroke Foundation Acute Service Audit data. Adherence was compared for 2015 and 2017 (pre-guideline) against 2019 and 2021 (post-guideline); and for hospitals who participated in any of the FeSS Intervention studies. Primary outcome: a composite measure for adherence to all FeSS process variables (n=6, i.e., treatment and management for fever, hyperglycaemia, swallowing). Mixed-effects logistic regression, with a random intercept for hospital, adjusted for stroke type, age, sex, and interaction between guideline inclusion and previous participation in a FeSS intervention study.

Results: In total, 112 hospitals contributed data to at least one audit cycle for both periods (pre=7011, post=7195). An improvement in overall FeSS Protocol adherence was evident post-guideline inclusion (Pre: 35% vs Post 40%, OR: 1.17, 95%CI: 1.06, 1.30). Previous participation in a FeSS intervention study was associated with higher FeSS Protocol adherence (OR: 1.57, 95%CI: 1.22, 2.02). Patients with haemorrhagic stroke were less likely to receive care according to all FeSS Protocols compared with patients with ischaemic stroke (OR: 0.69, 95%CI: 0.61, 0.78).

Conclusion: Overall, there is evidence there has been an improvement in FeSS Protocol adherence following a strong recommendation for their use in the Australian stroke guidelines. Improved adherence for hospitals who previously participated in a FeSS Intervention study suggests active efforts provide greater implementation outcomes. Further nationwide implementation of FeSS Protocols in Australian hospitals is warranted.

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Why does Code Stroke Simulation Training improve Team Performance?

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Background: Simulation training for emergency response teams is frequently used in critical care disciplines but less commonly included in neurological education. Increasing evidence indicates that Code Stroke simulation training is associated with improved door-to-needle times and patient outcomes. However, why simulation is effective in this setting is unknown. Understanding how learning occurs may provide information to optimise Code Stroke simulation programs.

Aim: To explore how and why Code Stroke simulation supports effective learning

Methods: Debriefs of six simulation sessions from St Vincent's Hospital, Melbourne were recorded and transcribed. Participants included stroke, radiology and Education and Learning Faculty teams. A simulated participant played the stroke patient. Data were analysed using reflexive thematic analysis. Topic summaries and themes were developed and then evaluated using a Situated Learning Theory Lens

Results: Six topics were identified: Communication, Knowledge and Education, Processes Efficiency and Logistics, Team Factors, Feedback, Self-Reflection. Several sub-topics could be mapped to the elements of Crisis Resource Management, but this did not explain all content. A central theme, "Development of identity as a stroke team member," was constructed with three sub-themes: "Development of individual identity", "Communication with senior clinicians", and "Behaviour as a Team Member". A key finding was participant use of reflective practice not only to acquire new knowledge or skills but also to develop clinician identity which was both influenced and supported by belonging to the stroke team. Considering the stroke team as a Community of Practice provides

insight for debriefing multi-level learner simulations as each participant will be at a different peripherality within their team.

Conclusion: This is the first study investigating learning in Code Stroke simulation. These results provide insight, particularly for neurologists facilitating stroke simulation, for optimising scenarios and debriefing and ultimately translation to clinical outcomes. Further research is required to determine the most effective educational design.

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Deep Learning-based prediction of final infarct core from CT perfusion data: A comparison to clinical standard

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Background: CTP imaging may be used in cases of acute ischemic stroke (AIS) to predict response to treatment. Single-value thresholds are often applied to CTP-derived maps (e.g., Cerebral Blood Flow/CBF and Delay Time/DT) to estimate tissue fate from ischemic core and penumbra. However, limitations of using single-value thresholds for this purpose have been widely noted. Deep Learning (DL) methods have been proposed to better capture the complex pathophysiology of AIS. Here we use DL to predict tissue fate in AIS patients after successful intra-arterial thrombectomy, from CTP maps.

Methods: Patients with complete large vessel occlusions who recanalized following thrombectomy were selected from the International Stroke Perfusion Registry; acute CTP imaging and follow-up MR-DWI imaging were acquired. CTP maps were derived through MISTar (Apollo Imaging, Melbourne, Australia) and DWI final infarcts were segmented before registration to CTP. Patients were randomly split into training, validation and testing cohorts. An Attention U-Net DL network was trained to predict the follow-up infarct from DT, CBV and pre-contrast CT. Performance was evaluated over the testing set using ROC-AUC and Dice scores and compared to single-value threshold-based predictions.

Results: Altogether, 144 patients were included in the study (training/validation/testing 87/29/28). Patients underwent thrombectomy following thrombolysis (68) or thrombectomy alone (76), with Thrombolysis in Cerebral Infarction scores of 2C (62) or 3 (82). The median lesion size was 23.2 mL (min, max = [0.1, 217.3], IQR = [8.2-55.3]). Measured against DWI final infarct, the DL algorithm showed mean AUC and Dice scores of 0.69 (SD 0.12) and 0.34 (SD 0.23). MISTar ischemic core returned mean AUC and Dice scores of 0.61 (SD 0.09) and 0.24 (SD 0.15).

Discussion: The DL algorithm surpassed the ischemic core measurement in predicting tissue fate following successful thrombectomy, demonstrating the potential of DL to improve on current standards. Further developments include predicting tissue fate from raw CTP time series data.

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Significant Improvement of Outcomes with Pre-hospital Thrombolysis in the first Golden Hour

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Background: Pre-hospital thrombolysis on Mobile Stroke Units (MSUs) have allowed dramatic rises in treatment within the ultra-early time windows, specifically the first hour after symptom onset (named the "Golden Hour"). Literature on the effect of this early treatment is still limited by the previous scarcity of cases.

Aims: We aimed to analyse the impact of time from onset to treatment on 90-day functional outcomes from pre-hospital thrombolysis cases aboard the Melbourne Mobile Stroke Unit with a focus on treatment in the first Golden Hour.

Methods: We included all patients receiving pre-hospital thrombolysis on the Melbourne MSU from 2017-2022 with completed 90-day follow-up. Distribution of modified Rankin score (mRS) grades were both analysed for trends across 30-min time epochs from onset and dichotomised for ≤ 60 and >60 -min windows. Trends were analysed using a generalized pairwise comparisons model with adjustment for confounders.

Results: A total of 200 patients with completed 90-day follow-up were included, of which 37 (18.5%) received thrombolysis ≤ 60 min. Baseline age, severity and need for thrombectomy were similar across time epochs. Treatment in the Golden Hour was associated with a substantial increase in good outcomes: mRS 0/1/baseline (aOR 2.74 [95%CI 1.29-6.13], $p=0.01$), mRS 0/2/baseline (aOR 3.10 [95%CI 1.36-7.84], $p=0.01$) and a trend towards mRS improvement by ordinal analysis (aOR 1.75 [95%CI 0.80-3.86], $p=0.16$), compared to all other time epochs. Every 30min delay of treatment was associated with progressive deterioration of 90-day outcomes: ordinal analysis (aOR 0.76 [95%CI .49-1.17], $p=0.21$) and mRS 0/1/baseline (aOR 0.84 [95%CI 0.71-0.98], $p=0.029$).

Conclusion: Pre-hospital thrombolysis in the Golden Hour is associated with dramatic improvements in 90-day functional outcomes compared to later timepoints. The ability of MSUs to substantially increase treatment in the ultra-early time window is likely one of the key drivers for published benefit.

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Early Reperfusion after Pre-hospital Thrombolysis

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Introduction: Post-thrombolysis, there is no routine intermediate imaging performed that allows assessment of when reperfusion occurs. Many patients receiving pre-hospital thrombolysis on the Melbourne Mobile Stroke Unit (MSU) undergo an in-hospital admission CT-perfusion (CTP) which presents a unique opportunity to understand the impact of early post-thrombolysis reperfusion.

Aims: We aimed to determine the proportion of patients receiving pre-hospital thrombolysis who present with early reperfusion changes on hospital admission CTP. Additionally, we assessed the association of early reperfusion to 90-day outcomes.

Methods: We included patients receiving pre-hospital thrombolysis (without concurrent thrombectomy) on the Melbourne MSU with hospital admission CTP from three comprehensive centres. Early reperfusion was defined as a visually determined area of milder hypoperfusion (below TMax >6sec) consistent with presenting symptoms. These were subsequently grouped as full (mild hypoperfusion of entire CTP lesion) or partial (mild hypoperfusion of at least part of the CTP lesion). We then correlated these to follow-up imaging (≥ 24 h) to determine if the final infarct was smaller than that predicted by admission CTP and 90-day modified Rankin Scale (mRS) outcomes.

Results: We included a total of 51 patients with median NIHSS of 7 (IQR 5-10.3) and onset-to-CT of 59.5min (IQR 46.3-100.5). Of these, 8 (15.7%) showed full and 16 (31.3%) showed partial early reperfusion, whilst 27 (52.9%) showed no significant early reperfusion. Time metrics, baseline severity and tenecteplase use did not significantly differ between these groups. Any early reperfusion was associated with a higher proportion of reduced final infarct in comparison to patients that did not achieve early reperfusion (71.9% vs 52.6%), and improved 90-day outcomes (mRS 0/1/ baseline 59.4% vs 42.1%) were statistically non-significant ($p > 0.05$).

Conclusion: Almost 50% of patients showed evidence of early reperfusion following fast pre-hospital thrombolysis on the MSU and these were associated with trends towards smaller final infarct size and better 90-day outcomes. We require confirmation of these results with a larger study.

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StrokeLink Program: A Success in Championing Stroke Care in Queensland

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Background: Established in 2008, StrokeLink is a collaboration including the Stroke Foundation and Queensland Stroke Clinical Network. StrokeLink involves workshops with hospital staff to review their clinical data and develop action plans to support the delivery of quality stroke care. The aim was to assess adherence to processes of care (PoC) for patients with stroke or transient ischaemic attack during the 3-year StrokeLink program, by receipt of a StrokeLink Workshop.

Methods: Time series analysis in Queensland hospitals across three time-points: T0 (July 2019 to June 2020); T1 (July 2020 to June 2021); T2 (July 2021 to June 2022). Outcomes included changes in individual PoC collected in the Australian Stroke Clinical Registry. Multivariable regression models, with adjustment for patient clustering, were used to compare adherence over time-points.

Results: Overall, 8/21 hospitals received a StrokeLink Workshop in T1/ T2. Among patients treated in each time-point ($n=6677$ [T0]; $n=7002$ [T1]; $n=6422$ [T2]), characteristics were similar (43-45% female, median age 74 years). There was a 14% improvement in the odds of patients receiving stroke unit care in 2021-2022 vs 2019-2020. This improvement was greater among hospitals that received a StrokeLink Workshop (OR: 1.21; 95% CI: 1.06-1.39). There was an 8% improvement in the odds of patients receiving swallowing screens or assessments before oral intake in 2021-2022 vs 2019-2020. This improvement was greater among hospitals that received a StrokeLink Workshop (OR: 1.30; 95% CI: 1.16-1.46).

There was a 27% improvement in the odds of patients being discharged from hospital with lipid-lowering medications in 2021-2022 vs 2019-2020. This improvement was greater among hospitals that received a StrokeLink Workshop (OR: 1.38; 95% CI: 1.16-1.64).

Conclusions: The StrokeLink Program, that uses externally facilitated workshops and registry data, continues to achieve clinical practice improvements in Queensland hospitals. Further investment and upscale of similar interventions in other Australian states is warranted.

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A Community Stroke Recovery Boot Camp

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Background: Recovery is typically slower in chronic stroke. Data suggests recovery remains possible, but requires extensive training. To our knowledge, there are few community services available that provide an appropriate amount of training to accelerate recovery in people with chronic stroke.

Aims: We aimed to establish a community chronic stroke rehabilitation boot camp for upper limb recovery. Our objectives were to evaluate clinical efficacy and patient experiences in participating in the boot camp.

Methods: People with chronic stroke and upper limb impairment were invited to participate in a 5 week program. The boot camp delivered 90h of training (18h per week) by a physiotherapist, with additional support from physiotherapy students. Therapy was tailored to the individual's impairments and goals. The primary outcome measure for upper limb impairment was the Fugl-Meyer. Higher scores indicate lower impairment (max 66), with the tool having a minimal clinically important difference of 5.25 points. At the completion of the boot camp, an interview was conducted by a stroke survivor to understand patient experiences.

Results: At present, 20 participants have completed the program (13 male). Baseline motor impairment (Fugl-Meyer) was 30.7 ± 16.7 . On average, patients achieved an improvement of 11 points on the Fugl-Meyer ($t_{(19)} = 9.5$, $p < 0.001$), more than double the minimal clinically important difference. During the interview, patients reported positive outcomes regarding mental health and increased motivation. There was a common theme of enjoying the peer support and social engagement during the program.

Conclusion: The upper limb boot camp appears to promote significant arm recovery in people with chronic stroke. Benefits of the program extend beyond behavioural improvements.

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Discovery Lipidomics to Differentiate between Transient Ischaemic Attacks (TIAs), TIA Mimics, and Minor Stroke: A Clinical Study at the Royal Adelaide Hospital

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Background: Transient Ischaemic Attacks (TIAs) are a key predictor for ischaemic stroke (1) but diagnosing TIAs is complicated due to overlapping symptomatology with minor strokes and other mimic conditions such as migraines, and seizures (2). Investigation into lipidomic pathways to

differentiate between TIAs, minor strokes, and TIA mimics could provide insight into potential diagnostic targets for TIAs and reduce the risk of subsequent ischaemic stroke.

Aims: To identify lipidomic pathways differentially involved in TIAs, TIA mimics, and minor strokes.

Methods: Patients presenting with TIA-like symptoms were recruited at the Royal Adelaide Hospital (n=50). Plasma samples (9mL) were collected within 48 hours of symptom onset and stored in line with HUPO guidelines (3). Discovery lipidomic investigation was conducted using LC-MS, with preliminary data processing undertaken on Skyline and MetaboAnalyst 5.0. A volcano plot was used to identify individual lipids of interest for further exploration using MS/MS. All patients were clinically classified independently as TIAs/TIA mimics/minor strokes by two vascular neurologists, with any disagreement resolved by a third, senior vascular neurologist.

Results: We enrolled 50 patients (29 Females, 21 Males) with ages ranging from 39–94 years (Median: 72y) at time of enrolment. All patients were classified based on clinical data with 56% diagnosed as a TIA mimic. A total of 467 lipids were detected in the cohort, and 15 glycerophospholipids were selected from both negative and positive ion datasets based on significance ($p < 0.05$) and magnitude of fold change for further investigation using MS/MS.

Conclusion: The preliminary findings from this study have identified an initial set of 15 glycerophospholipids of interest that are currently being targeted for further investigation using MS/MS to differentiate between TIAs, TIA mimics, and minor strokes. The outcomes will be expanded to a larger sample set (n=100) with additional assessment using machine learning.

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Poster Abstracts

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First- and Third-Person Motor Imagery Programs for People with Stroke living in the Community – Program development and pilot-testing

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Background: Evidence suggests that motor imagery can improve hand function in people post-stroke. There are two imagery perspectives, first-person and third-person. However, the effect of these two types of imagery on promoting motor function in people with stroke is unclear.

Aims: This study aimed to develop and pilot-test a first- and a third-person motor imagery programs for people with stroke living in the community to help relearn daily hand tasks.

Methods: The first- and third-person motor imagery programs were developed based on existing literature. An expert panel of four occupational therapists were invited to comment on the programs to establish the programs' content validity. A pilot test involving six participants with stroke (receiving the programs) and one occupational therapist (delivering the programs) was completed to assess the program feasibility including participant and therapist adherence to programs. Participants with stroke were assessed before and after the program on upper extremity and hand function, daily function and quality of life.

Results: Content validity was established through the expert panel review. The pilot test showed that the participants completed the programs and engaged in the first- and third-person imagery as planned. The treating therapist delivered the programs within the specified time frame. In both programs, participants showed better performance in upper extremity and hand function and daily function.

Conclusion: Both the first- and third-person imagery programs demonstrated to be feasible for people with stroke living in the community. This study provides information on updating participant recruitment, therapist training and choice of outcome measures for a future larger trial investigating the effectiveness of the two imagery programs for people with stroke.

Note. The full paper has been accepted for publication at the BMC Pilot and Feasibility Studies.

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“We got there in the end. . . . somehow, we got there”: A Qualitative Study of Healthcare Professionals providing care in the Community to People with Chronic Aphasia, and how Technology could assist

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Abstract: Background: Little is known about the experience of health care professionals (HCPs) in the community providing ongoing healthcare to people with aphasia.

Aims: The aim of this study was to explore the experiences of HCPs in healthcare conversations with people with aphasia in the community, and whether a high-tech, purpose-built aphasia app could assist.

Methods: A qualitative phenomenological study was conducted. HCPs from seven different clinical backgrounds were interviewed and data were thematically analysed.

Results: HCPs from seven different professions participated in interviews. Six major themes were identified: (1) Healthcare communication topics; (2) HCP knowledge; (3) What communication happens in the interaction; (4) Communication impacts on care; (5) Interactions and relationships grew easier over time; and (6) How technology could help the interaction.

Conclusions: HCPs with more knowledge about aphasia reported having more positive experiences. Unsuccessful interactions were believed to lead to negative emotional responses in people with aphasia and HCPs, and that miscommunications could lead to compromised care. HCPs reported that interactions and relationships with people with aphasia grew easier over time. HCPs need system level support to acquire the knowledge and skills needed to engage people with aphasia in effective healthcare conversations. Technology has the potential to improve interactions.

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What can we learn from websites for people with chronic illness to help survivors of stroke manage their cardiovascular risk factors? A Systematic Review and Meta-Analysis

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Background: Survivors of stroke need accessible resources to manage their cardiovascular risk factors. Self-directed websites may help manage the ongoing cardiovascular risk after stroke but there are no stroke specific websites to support survivors in self-management.

Aims: Evaluate whether using self-directed websites can improve physical activity and/or diet quality in people living with chronic illness to see what might be applicable for survivors of stroke.

Methods: A search was conducted in MEDLINE, EMBASE, CINAHL and PEDro from earliest available time to 3rd of February 2023 to identify randomized controlled trials evaluating the effectiveness of self-directed websites on physical activity levels and/or diet quality in adults living with chronic illness. Quality of life and/or self-efficacy data was extracted where reported. Two independent reviewers completed data extraction. Risk of bias was assessed using the Physiotherapy Evidence Database Scale, and overall quality of evidence was assessed using the Grades of Research, Assessment, Development, and Evaluation approach.

Results: Thirty studies were included with data from 6106 participants pooled for meta-analysis. We found moderate level evidence that self-directed websites significantly improve physical activity levels (MD 41.45 minutes per week, 95% CI [22 to 61]; N=16 trials, n=3012), quality of life (SMD 0.36, 95% CI [0.12 to 0.59]) and self-efficacy (SMD 0.26, 95% CI [0.05 to 0.48]) when compared to usual care. There was high level evidence for reduction in processed meat consumption (MD 1.14 portions per week, 95% CI [0.70 to 1.58]; N=2 trials, n=109). No significant differences were detected for other outcomes when compared to usual care, or when comparing self-directed websites to websites with additional supports.

Conclusion: Engaging with self-directed websites can improve physical activity levels, quality of life, self-efficacy and diet quality in people living with chronic illness. Our findings support the development and implementation of targeted websites for risk factor management in stroke.

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The Role of Technology in Improving Quality of life and Participation of Young Stroke Survivors in Australia: a qualitative study

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Background: The incidence of stroke among younger populations is increasing globally. Many younger post-stroke needs are not being met, as current resources are tailored to older stroke survivors. Technology-based applications are being used more frequently in stroke rehabilitation and young stroke survivors use technology ubiquitously in their lives. Research on how technology can specifically reach and support the unique needs of young stroke survivors (18-30 years) is needed.

Aims: The aim of this study was to explore how technology may be leveraged to improve the quality of life and participation of young stroke survivors in Australia.

Method: This study used a qualitative phenomenological design. Semi-structured interviews were conducted with young stroke survivors, caregivers and healthcare professionals via telephone or Zoom, focussing on unmet needs for young people living in the community after stroke and the role of technology. Interviews were transcribed and analysed using inductive thematic analysis.

Results: Sixteen in-depth interviews were conducted with 10 young stroke survivors (6 males, mean age: 24 ± 2.3 years old, 3.7 ± 4.13 years since stroke), three caregivers and three healthcare professionals. Young stroke survivors rely on technology for daily activities such as social contact, reminders, and access to information. Participants indicated that very few resources targeted at young stroke survivors exist. Five main themes emerged on ways technology can improve young stroke survivors' quality life and participation: Availability of specific resources, Support for recovery, Care continuity, Adjustment, and Knowledge.

Conclusion: Technology-based resources should be designed to meet the specific needs of young stroke survivors. Developing technological solutions in collaboration with young people after stroke can maximise their relevance and effectiveness in improving quality of life and participation in this unique cohort.

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i-Rebound after stroke: A pilot feasibility study of a co-designed website with resources to reduce secondary stroke risk

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Background: Physical inactivity and poor diet quality are amongst the highest modifiable risk factors for recurrent stroke. Despite this, very few targeted resources are freely available to help survivors of stroke manage this ongoing risk.

Aims: To test feasibility and usability of a co-designed website that supports survivors of stroke to improve their diet quality and physical activity levels.

Methods: A pre-post, mixed methods, pilot study was conducted with survivors of stroke in August 2022. Demographic data, fruit and vegetable consumption, activity behaviour and self-efficacy ratings for physical activity and diet quality were collected at baseline. Trial participants had unrestricted access for self-directed use of the i-REBOUND website for 4-weeks. Physical activity and diet quality was assessed using the Health Specific Self-Efficacy Scale at baseline and follow up. The Bowens Feasibility framework was used to evaluate feasibility with domains of interest being 'Acceptability', 'Demand', and 'Limited Efficacy'. The System Usability Scale (SUS) was used to evaluate usability.

Results: Recruited survivors of stroke ($n=42$) were mostly females (52%) aged 30 to 80 years. Majority did not meet physical activity (84%) and vegetable consumption (88%) recommendations. Over half of enrolled participants (53%) used the website at least once a week throughout the trial and almost all (90%) found weekly reminders helpful. Improvements in self-efficacy were reported in 1 domain relating to diet quality and in 4 domains relating to physical activity. Participants reported positive changes in eating habits (48%) and activity levels (57%) after using the i-REBOUND website and rated usability as 'above average' with a SUS score of 73. Participants found content on the website motivating and felt the i-REBOUND website was easy to navigate.

Conclusions: Our results indicated that websites specifically designed for secondary prevention are accessible to survivors of stroke and have the potential to facilitate positive behaviour change.

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Socio-economic Status is Associated with First-ever Stroke Incidence: an Australian State-wide Record Linkage Study

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Abstract Background: Limited research has been conducted on socio-economic status (SES) and first-ever stroke incidence. We examined the association between SES and first-ever stroke incidence.

Methods: This retrospective cohort study included linked Tasmanian administrative data from the Admitted Patient Care Episodes (APC) and the Death Registry of Tasmania. Fatal and non-fatal stroke cases between 2007 to 2020 were defined from the primary diagnosis field in the APC dataset and underlying cause of death in the Death Registry, using ICD-10 codes. We used an 8-year lookback period to identify first-ever stroke cases. The Index of Relative Socio-economic Advantage and Disadvantage from the Socio-Economic Indexes for Areas 2016 was used to determine an individual's SES level by quintile, and the Accessibility and Remoteness Index of Australia for remoteness, with associated population denominators. Poisson regression models were used to estimate multivariable-adjusted incidence rate ratios (IRR).

Results: Overall, 4,158 first-ever strokes were identified (81% ischaemic stroke, mean [SD] age 73.3 [14.2], 46.4 % women). Compared to those in the high SES group, the first-ever stroke IRR was 1.27 (95% CI, 1.14 - 1.41) for low medium SES group, and IRR 1.46 (95% CI, 1.33 - 1.61) for low SES group, after adjusting for age, sex, year and remoteness. No interaction was observed between SES and year, sex or remoteness.

Conclusions: People living in lower SES areas had 30-40% greater incidence of first-ever stroke than those living in more advantaged areas. Stroke prevention strategies targeting low medium SES populations may reduce stroke incidence.

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Determining the acceptability and concurrent validity of administering the Nine Hole Peg Test via Telehealth

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Background: The COVID-19 pandemic rapidly increased the need to minimise in-person health care services, and consequently the use of telehealth has expanded. Despite implementation of many new services being delivered via telehealth, there has been limited research on the feasibility and acceptability of completing standardised stroke upper limb assessments remotely.

Aims: To establish the feasibility, acceptability and reliability of administering the Nine Hole Peg Test (NHPT) remotely to stroke survivors.

Methods: A randomised, prospective pilot feasibility study was undertaken. Stroke survivor participants were recruited from metropolitan hospital and community settings. Participants completed the NHPT in-person and remotely, randomised to either remote administration first or second. Feasibility of remote administration was rated using the System Usability Scale (SUS). Acceptability was measured through a satisfaction survey in which participants rated their comfort, ease of clinician interaction and clarity of instructions. Intra-rater and inter-rater reliability were evaluated by researchers scoring assessment video recordings blinded to initial scores. Descriptive and inferential statistics and inductive content analysis were used.

Results: Ten stroke survivors (mean age 54.8 years [SD $\pm$ 16.2]) completed both in-person and remote test administrations. Participants reported good usability with remote administration (mean SUS=77.25/100). There were no significant differences between in-person and remote administration for ease of clinician interaction (median difference=0, $z=-1.41$, $p=0.32$, $r=0.22$), clarity of instructions (median difference=0, $z=-1.34$, $p=0.18$, $r=0.30$) and participant comfort (median difference=0, $z=-1.34$, $p=0.18$, $r=0.30$). Some participants reported challenges with remote set-up, and barriers to completing the assessment remotely when alone. There was no difference in time taken to complete the NHPT between administration methods. Test-retest reliability was substantial (ICC=0.95). Intra-rater and inter-rater reliability were excellent (ICC=0.99; ICC=0.99 respectively).

Conclusion: The NHPT is feasible and acceptable to administer remotely. Findings could increase NHPT use with stroke survivors in geographically isolated locations and reduce in-person consultations.

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Use the phone to get home: Development of an informal functional mobile phone assessment tool for people with Aphasia

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Background: Aphasia is a communication disability impacting auditory comprehension, verbal expression, reading and writing. A potential functional consequence of aphasia is difficulty using mobile phones, resulting in barriers to communicating in an emergency and socially connecting with family and friends^{2,3}. Existing assessment of mobile phone use for people with Aphasia (PWA) at Balmain Hospital was ad hoc. A localised assessment template would improve efficiency, consistency, and patient outcomes¹.

Aims: To develop, pilot, adapt and tailor a mobile phone assessment tool to support Speech Pathologists' decision-making and therapy planning regarding PWA's readiness for discharge to independent living.

Methods: An informal tool was developed by student Speech Pathologists, based on a published checklist of barriers and facilitators to mobile phone use for PWA². The tool was piloted by two Speech Pathologists and one Occupational Therapist with two PWA and survey responses obtained. Clinician and consumer feedback guided adaptations to condense and tailor the tool to the population and setting. Supplemental aphasia-friendly resources were created.

Results: Clinician's barriers to use were: assessment length and duration; content duplication and privacy issues around accessing PWA's mobile phones. Consumer feedback was: difficulty understanding written scenarios and assessment fatigue. Post pilot adaptations resulted in:

reduction in tool length; decrease in assessment duration, and increased consistency of mobile phone assessment processes. Supplemental aphasia-friendly resources improved PWA's comprehension and enhanced real-life application of the assessment for PWA in an inpatient rehabilitation setting.

Conclusion: An informal mobile phone assessment for PWA was developed and piloted by Speech Pathologists and Occupational Therapists in an inpatient rehabilitation setting. Clinician and consumer feedback supported adaptation, shortening, and tailoring of the assessment to PWA, including development of supplemental, aphasia-friendly scenario resources. This tool supports Speech Pathologist's decision-making around readiness for discharge to independent living.

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Is group-based upper limb therapy for stroke patients feasible in an acute setting? A mixed methods study

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Background: Best practice supports early, high intensity upper limb (UL) therapy for patients following a stroke or neurological event. To date, the use and effectiveness of these groups has not been explored in acute settings. The acute stroke and neurology ward at The Royal Melbourne Hospital (RMH) has a dedicated allied health therapy area. Group UL therapy has been implemented into usual practice, however success of implementation and the clinical outcomes had not been evaluated.

Aims: This study aims to evaluate the feasibility of implementing a group-based UL intervention group in an acute model of care.

Methods: A mixed methods implementation research design was used to evaluate a once weekly group-based UL therapy led by occupational therapy on a stroke/neurology ward at a major hospital. During a seven-month intervention period, patient and staff feedback was gathered via paper and electronic surveys and thematically analysed. Purposively sampling occurred and data saturation reached. A retrospective audit was completed of electronic medical records to collect clinical and service data and quantitatively analysed.

Results: Patients who participated in the UL group (n=26), allied health (n=10) and nursing (n=14) staff on the ward were recruited to the study. On average, 79% of patients referred attended the group. Patients received an additional 89 minutes UL therapy time with average group attendance over an inpatient stay of 1.48 times. Survey data revealed that both staff and patient viewed the upper limb group as satisfactory and suitable within an acute model of care.

Conclusion: Group upper limb therapy is feasible within an acute setting, allowing for greater therapy provision and efficient use of resources. Further evaluation is needed of impact on patients UL outcomes to determine the optimal intervention dosage.

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Stroke prognosis prediction by Machine Learning of Japan Stroke Data Bank

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Background: Recently, it has been reported that stroke registry data analyzed by machine learning (ML) can predict patients' outcomes with high accuracy. However, there have been few reports that examined large-scale acute stroke registry data using ML, and there is no system that can adapt the results to individual cases.

Aims: The purpose of this study is developing outcome prediction formulas using ML analysis of the Japan Stroke Data Bank (JSDB), which is a nationwide acute stroke registry with individual data and have accumulated approximately 260,000 cases from more than 100 facilities nationwide over the past 23 years.

Methods: The derivation cohort used data of acute stroke patients registered in JSDB from 2016 to 2019. ML algorithm was used to develop a formula for predicting stroke outcomes at discharge. The results were compared with manual-made formulas using a logistic regression (LR) model and validated using JSDB data in 2020. Favourable functional outcome was defined as mRS 0-2.

Results: ML algorithm was able to predict favourable functional outcome with an area under curve (AUC) 0.907 [95%CI 0.903-0.913], sensitivity 81.5%, specificity 84.0%, and positive predictive value (PPV) 83.9%. Each statistical value was significantly higher than that calculated using LR model (AUC 0.868 [0.862-0.875], sensitivity 78.1%, specificity 79.9%, and PPV 79.9%). In validation, each value was comparable with that of derivation. Premorbid mRS, Japan coma scale (JCS), NIHSS total score, NIHSS sub-score of lower limbs, stroke classification, and age were the top six important factors for ML algorithm.

Conclusion: ML algorithm was able to predict favourable functional outcome in acute stroke patients at discharge with higher accuracy than LR model. Premorbid mRS, stroke classification, JCS, NIHSS total score, NIHSS sub-score of lower limbs at admission, and age were important factors for ML method.

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Risk Factors and Prediction Models of Haemorrhagic Transformation in Acute Ischaemic Stroke: A Systematic Review and Meta-analysis

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Background: Haemorrhagic transformation (HT) following reperfusion therapies for acute ischaemic stroke often predicts a poor prognosis.

Aims: (1) To identify risk factors for HT, and how these vary with hyperacute treatment [intravenous thrombolysis (IVT) and endovascular thrombectomy (EVT)]; (2) Evaluate the performance of model-based methods to predict HT.

Methods: Systematic review and meta-analysis. Electronic databases PubMed and EMBASE were searched. Studies were assessed for risk of bias using the Quality In Prognosis Studies tool. Pooled odds ratio (OR) with 95% confidence interval (CI) were estimated. For model-based studies, good discrimination was defined as area under curve (AUC) ≥ 0.7 .

Results: A total of 130 studies were included. Atrial fibrillation and NIHSS score were common predictors for any intracerebral haemorrhage (ICH) after reperfusion therapies (both IVT and EVT), while a hyperdense artery sign (OR=2.605, 95% CI 1.212–5.599, $I^2=0.0\%$) and number of thrombectomy passes (OR=1.151, 95% CI 1.041–1.272, $I^2=54.3\%$) were predictors of any ICH after IVT and EVT respectively. Common predictors for symptomatic ICH (sICH) after reperfusion therapies were age and serum glucose level. Atrial fibrillation (OR=3.867, 95% CI 1.970–7.591, $I^2=29.1\%$), NIHSS score (OR=1.082, 95% CI 1.060–1.105, $I^2=54.5\%$) and onset-to-treatment time (OR=1.003, 95% CI 1.001–1.005, $I^2=0.0\%$) were predictors of sICH after IVT. Alberta Stroke Program Early CT score (ASPECTS) (OR=0.686, 95% CI 0.565–0.833, $I^2=77.6\%$) and number of thrombectomy passes (OR=1.374, 95% CI 1.012–1.866, $I^2=86.4\%$) were predictors of sICH after EVT. In addition, AUC of model-based methods ranged from 0.543 to 0.957, with 46.6% (48 out of 103) achieving good discrimination.

Conclusion: Several predictors of ICH were identified, which varied by treatment type. Studies based on larger, multi-centre data sets should be prioritised.

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Is early initiated stroke-integrated Cardiac Rehabilitation safe and feasible?

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Background: Clinical practice guidelines recommend people with stroke should undergo cardiorespiratory fitness training and lifestyle modification education to support long-term management of risk factors. Cardiac rehabilitation (CR) is a well-established model of secondary prevention available to people with stroke, but access and uptake is limited.

Aim: To investigate the safety and feasibility of CR adapted for people with stroke in the early subacute phase.

Methods: People with acute first or recurrent ischaemic stroke or transient ischaemic attack admitted to Epworth HealthCare were screened for eligibility and invited to participate. Participants were integrated into a CR program, including cardiorespiratory fitness training 3-days/week during Phase 1 (inpatient rehabilitation), and 2-days/week centre-based cardiorespiratory fitness training + education and 1-day/week home-based cardiorespiratory fitness training for 6-weeks during Phase 2 (outpatient rehabilitation) in addition to usual care neurorehabilitation. Safety was determined by the number of adverse and serious adverse events. Feasibility was determined by participant recruitment, retention, and attendance rates, adherence to exercise recommendations, and participant satisfaction.

Results: There were no study-related adverse or serious adverse events. Of 117, 62 (53%) people with stroke were recruited, with only 10 (16.1%) withdrawals. Participants attended 189/201 (94%) scheduled cardiorespiratory fitness training sessions in Phase 1 and 341/381 (89.5%) scheduled sessions in Phase 2. Only 220/381 scheduled education sessions were attended. The minimum recommended cardiorespiratory fitness training intensity (40% heart rate reserve) and duration (20 minutes) was achieved by 57% and 55% of participants respectively during Phase 1, and 60% and 92% respectively during Phase 2. All respondents either strongly agreed (69%) or agreed (31%) they would recommend the stroke-integrated CR program to other people with stroke.

Conclusion: A stroke-integrated CR program, including cardiorespiratory fitness training, was safe and had good attendance and adherence rates. Recruitment and uptake of the education component was moderate.

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Credentialing Assessors in the Fugl Meyer Assessment and Implications for Stroke Recovery Trials: Experience from the AVERT-DOSE Trial

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Background: Fugl Meyer Assessment (FMA) was a recommended core outcome by the Stroke Recovery and Rehabilitation Roundtable. A credentialing plan is part of assessment fidelity, which ensures an outcome is performed accurately and consistently. Yet, credentialing is rarely implemented in stroke recovery trials. An accessible approach to FMA credentialing would add to current acute stroke outcomes that require credentialing e.g., National Institutes of Health Stroke Scale and modified Rankin Scale.

Aim: To develop a standardised approach for FMA credentialing.

Methods: A set of training materials (manual/scoring sheets/instructional video/patient videos for scoring) were developed and implemented within AVERT-DOSE trial assessor training. Assessors scored two patient videos that were externally rated as pass (greater than or equal to 90%) or fail (less than 90%). Failure necessitated one of two pathways: a) moderate score (70–89%) warranted a consultation between the assessor and an expert FMA assessor or b) low score (less than 70%) necessitated re-rating of the videos. Assessors provided feedback on the approach and materials, which informed amendments executed.

Results: 258 assessors from seven countries completed FMA credentialing. Round-1 videos were rated by 217 assessors: 57 (26%) passed and 160 (74%) failed: 110 warranted a one-on-one consult, and 50 necessitated re-rating. Feedback during Round-1 indicated that assessors wanted additional planes of movement to be viewable. As such, Round-2 videos were created and implemented with 41 assessors: 14 (34%) passed and 27 (66%) failed: 26 warranted a one-on-one consult and 1 necessitated re-rating.

Conclusion: Implementing credentialing for FMA identified many assessors that required additional training, even with improved videos that included multiple planes of movement. As such, we recommend that all stroke recovery trials include a credentialing process to ensure assessors are competent to accurately complete assessment. Our developed approach, including training materials, are available for use by the stroke recovery research community.

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Aphasia, Depression, and Psychological Therapy (ADaPT): A Single Case Design Evaluation of a Modified Cognitive Behavioural Therapy Intervention to Treat Depressive Symptoms in Stroke Survivors with Aphasia

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Background: While cognitive behavioural therapy (CBT) has shown effectiveness in treating depression among the general population, very little research has examined the use of CBT tailored specifically to the communication needs of stroke survivors with aphasia.

Aims: To investigate the feasibility and preliminary efficacy of a modified CBT intervention to treat symptoms of depression in individuals with post-stroke aphasia.

Methods: An ABA withdrawal/reversal single case design with concurrent multiple baselines was repeated across ten participants (4 female) with post-stroke aphasia and self-reported depression. Participants were randomly assigned a baseline length (2.5, 4.5, or 6.5 weeks), then completed 10 individual intervention sessions and a 4-week follow-up. Treatment consisted of behavioural and cognitive strategies to address depression, delivered by a clinical neuropsychologist. The primary outcome was subjective ratings of depression. Secondary outcomes were observable symptoms of depression and anxiety rated by a close other. Data were analysed visually and statistically controlling for baseline trend. Feasibility was addressed by analysing recruitment and retention rates, and adaptations. An independent rater reviewed video recordings of treatment sessions and completed fidelity ratings.

Results: During the intervention phase, five participants reported a decrease in depression ratings. Most of these participants sustained their improvement throughout the withdrawal phase, and three additional participants also showed improvement during the withdrawal phase. Close others reported a reduction in depressive and anxiety symptoms for eight participants, and this improvement was sustained for most participants. Fidelity ratings ranged from acceptable to excellent.

Conclusion: Modified CBT appears feasible and potentially efficacious for reducing symptoms of depression in people with aphasia. A randomised controlled trial is necessary to confirm these findings. Additional treatment sessions may be needed to ensure all components can be thoroughly covered. We noted discrepancies between self-rating and close other ratings of mood, and both should be retained in future studies.

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Co-designing an embodied computer agent to self-manage stroke recovery: The Taking Charge Intelligent Agent (TaCIA) Project

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Background: The conversation-based Take Charge tool is an evidenced-based self-management intervention shown to significantly improve independence and quality of life after stroke. Take Charge is delivered face-to-face by a facilitator. Adaption of the tool to be delivered via an embodied computer agent may reduce barriers to access that post-stroke impairments and/or delivery preference impose.

Aims: Work with key stakeholders to co-design and test the feasibility of an embodied computer agent to support self-management after stroke.

Methods: Co-design with stakeholders (i) Take Charge researchers, (ii) previous Take Charge facilitators and (iii) stroke survivors was conducted to build and then test the feasibility and experience of an embodied computer agent. Feasibility measures collected included (i) motivation (Autonomy, Mastery, Purpose and Connectedness, 1-4), (ii) usability

(System Usability Scale, 0-100), (iii) therapeutic alliance (Session Rating Scale, 0-10) and (iv) acceptability.

Results: Two Take Charge researchers (50% female) and four Take Charge facilitators (100% female health professionals) contributed to refinement of the research team built embodied computer agent prototype which was named 'TaCIA'. Stroke survivors (n=8, 63% male, 2 years post-stroke) with median age of 53 yrs [IQR 49.3-59.5] completed (n=7) the prescribed session (mean=28min) with TaCIA. Participants scored average motivation (3.2/4 [SD 0.6], good system usability (71/100, [SD 13]) and a satisfactory therapeutic alliance (8.0/10 [SD 2.3]). Stroke survivors agreed that: TaCIA could be used by other stroke survivors, they would like to keep using TaCIA and they would recommend use of TaCIA to other stroke survivors.

Conclusion: This is the first known attempt to build an embodied computer agent for use after stroke. Results suggest that use of this medium to support self-management is acceptable to stroke survivors but future iterations tested on a larger sample of people with a broader range of time post-stroke and age should focus on improving motivation, usability and therapeutic alliance.

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What Biopsychosocial Factors are Associated with "Reduced Self-Awareness" of Functional Capacity following Stroke?

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Background and Objectives: Stroke survivors often disagree with others' assessments of their functional abilities. Historically termed 'impaired self-awareness' we label this 'appraisal discrepancy' to focus on the presence of disagreement rather than assessment accuracy. There is limited knowledge of biopsychosocial contributors and consequences of post-stroke appraisal discrepancies ('PSAD') measured across the rehabilitation journey. This multi-site cohort study explored biopsychosocial correlates of PSAD during subacute rehabilitation (inpatient) and four months post-discharge (community-dwelling).

Methods: 45 subacute stroke survivors (Age M=71.5 SD=15.6, 56% female) participated, and 38 were successfully followed-up (Age M=69.6 SD=15.9, 53% female). We compared survivors' self-assessments with those of an independent rater (occupational therapist, close other) to calculate PSAD at both time points. Survivors and raters completed additional cognitive, psychological and functional measures.

Results: Multivariate regression identified associations between larger inpatient PSAD and poorer outcomes at follow-up, including poorer functional cognition, participation restriction, caregiver burden, and close-other depression and anxiety. Cross-sectional regression analyses indicated associations between larger inpatient PSAD and younger age, male sex, poorer functional cognition, poorer rehabilitation engagement and less frequent use of non-productive coping. Larger PSAD at community follow-up was associated with poorer functional cognition and close-other anxiety.

Conclusions: Findings confirm the clinical importance of PSAD, and support biopsychosocial frameworks of appraisal discrepancy. Key risk factors for PSAD are identified which may help guide early screening. The importance of addressing PSAD to optimise outcomes post-discharge are also highlighted.

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Real World Population Eligible for Endovascular Clot Retrieval with a Large Core Infarct based on SELECT-2 Criteria

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Background: The original Endovascular Clot Retrieval (ECR) trials in HERMES mostly excluded patients with established core volume of more than 70mL based on imaging criteria. Subsequent observational data and recent randomised control trials suggest patients may benefit from ECR with large core volumes, arguing for this exclusion criterion to be revised.

Aims: To identify the number of additional patients who would be eligible for ECR at our Comprehensive Stroke Centre using the SELECT-2 criteria.

Methods: Acute ischemic stroke (AIS) patients with large vessel occlusions (LVO) presenting within 24 hours of onset were screened retrospectively between 01/01/2021 and 28/02/2023. Additionally, all AIS with NIHSS > 10, mRS < 2 and age < 85 who presented within 24 hours were screened for LVO and eligibility for ECR under SELECT-2 criteria.

Results: The total of 660 AIS patients presented to our centre over the 26-month period, with 492 (75%) presenting within 24 hours. 84 patients underwent ECR (median age of 74 years, median NIHSS 14). The median core volume based on CT Perfusion CBF < 30% was 7mL. 8 patients had a core volume greater than 70mL (median 100.5mL) with significant core/penumbra mismatch. Of the remaining 408 patients, 141 (35%) were excluded based on high mRS (> 1), 50 (12%) on age > 85 years, and another 230 (56%) on NIHSS score < 10. Amongst the remaining 31 patients, 22 did not have an LVO (ICA or M1). Of 9 patients with LVO, 2 had core volumes greater than 70mL (167mL and 188mL), one of whom would not have qualified for SELECT-2 based on a low ASPECT score (2).

Conclusion: Retrospective screening using expanded SELECT-2 criteria identified only one additional patient. Therefore, formal adoption of the SELECT-2 criteria would not be expected to significantly affect ECR case load at our centre.

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Incidence of DOAC Ingestion in Acute Ischaemic Stroke Patients Otherwise Eligible for Intravenous Thrombolysis: A Retrospective Cohort Study

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Background: International guidelines contraindicate intravenous thrombolysis (IVT) in patients with an acute ischaemic stroke (AIS) who have taken a direct oral anticoagulant (DOAC) within 48 hours of presentation. Current pooled data shows that approximately 3% of patients with an AIS are taking a DOAC, but recent observational data suggests patients taking DOACs may not be at increased risk of haemorrhagic complications following IVT.

Aims: We sought to identify the proportion of additional patients who would have been eligible for IVT at our Comprehensive Stroke Centre if they had not been excluded based on recent DOAC ingestion.

Methods: Electronic medical records (EMR) for all patients presenting to our centre with AIS within 4.5 hours of symptom onset were screened retrospectively over 24-months (1/01/2021 to 31/12/2022). The primary outcome was the proportion of patients on a DOAC with no other contraindications for IVT.

Results: There were 569 patients with AIS in the 24-month time-period. Of these, 234/569 (41%) presented within 4.5 hours of symptom onset and 75/234 (32.1%) underwent IVT (mean age 76.1 years, median NIHSS 6). 39/234 (16.7%) had concurrent DOAC ingestion within 48 hours of presentation (17 rivaroxaban, 20 apixaban and 2 dabigatran) and were deemed ineligible for IVT. Additionally, 5/234 (2.1%) were taking warfarin with therapeutic INR. After review of the EMR, 18/234 (7.7% - mean age

76.6 years, median NIHSS 6) patients on a DOAC had no other recorded contraindications to IVT.

Conclusion: At our comprehensive centre, over a 24-month period, we identified an additional 18 (7.7%) AIS patients presenting within 4.5 hours, who could have been considered eligible for IVT had recent ingestion of a DOAC not been treated as a contraindication. Further research is required to determine the safety and efficacy of IVT for AIS patients on a DOAC.

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Working Together with a Rural and Remote Stroke Survivor to Develop a Technology-facilitated Recovery Program

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Background: The lived expertise of rural and remote stroke survivors is unique and must be considered when designing services for their use. Technological tools are often recommended to improve provision of services for rural and remote stroke survivors, but their use has rarely been explored from the stroke survivors' perspective.

Aim: To describe the process of working with a rural and remote stroke survivor to develop a technology-facilitated recovery program.

Methods: A pragmatic approach including principles of co-design was used to develop the program. As two researchers, a therapist-researcher and a stroke survivor psychologist-researcher worked alongside each other in a collegial, flexible and evolving way. The therapist-researcher: investigated the perspective of stroke survivors on recovering in rural and remote locations, via interviews and a literature review; reviewed the literature on persevering with technology-facilitated practice; and created and piloted a program with five stroke survivors, supported by an expert panel. The stroke survivor-psychologist researcher: participated in interviews and member checking with the therapist-researcher; 'walked through' the program with the therapist-researcher as the first participant; and contributed as an expert panellist. Both researchers reflected on their experiences with the program, and of working together.

Results: The 'Living My Life Program' that developed focused on stroke survivors recovering their way, in their world, according to what mattered to them. By incorporating the lived expertise of the stroke survivor-psychologist researcher, the program stayed true to the rural and remote stroke survivors' perspective and retained the flexibility to adapt to what mattered to each participant without disrupting their lives. Both researchers gained professionally and personally from the experience.

Conclusion: Working together with a rural and remote stroke survivor ensured an authentically person-centred, technology-facilitated program for use by rural and remote stroke survivors to drive their recovery.

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Goal Attainment with Integrated Upper Limb Spasticity Management Including Botulinum Toxin A (BoNT-A): Sub-analysis of Australian Data From the ULIS-III Study

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Background: Primary results from the international ULIS-III study (Turner-Stokes et al, 2021) provided robust evidence for the benefit of repeated cycles of botulinum toxin-A (BoNT-A) for upper limb spasticity, with a (mean [95%CI]) cumulated GAS T-score of 49.5 [49.1, 49.9] at 2 years. Internationally, patients with active function goals tended to require more frequent injection, and we hypothesized that reimbursement restrictions in Australia (which typically limited the number of injections received) may have adversely impacted outcomes compared with the total cohort.

Aims: Report outcomes for the Australian subgroup of the ULIS-III study.

Methods: ULIS-III was a prospective, observational study (NCT02454803) following adults living with spasticity over 2 years of goal-directed upper limb spasticity management including repeated BoNT-A treatment.

Results: The Australian effectiveness subgroup included 115 patients (mean $\pm$ SD age 53.8 $\pm$ 16.9 years, 56% male, 79% stroke aetiology, median [IQR] duration of spasticity 5.3 [15.6] years), of whom 74% had previously been treated with BoNT-A. Compared with the total cohort, Australian participants (N=82 treated with same brand) had fewer injection cycles (mean 2.7 vs 4.0), with longer injection intervals (median 331 vs 213) days. Mean [95% CI] overall cumulated GAS T-scores were 47.9 [46.4, 49.4] at 2 years. Under-achievement was particularly marked for active function goals (mean cumulated GAS-T-score 43.6 vs 46.6 in total cohort), while goals for passive function and pain ranged between 48.9–50.9, indicating achievement as expected.

Conclusion: As anticipated, the Australian cohort had fewer injection cycles with longer injection intervals than the international cohort. Their overall goal attainment was lower, especially for active function goals. Amongst other possible factors, these data support the idea that restricted reimbursement may have impacted BoNT-A injection frequency, and consequently, patient outcomes.

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Phase II, double-blinded, randomised, placebo-controlled study to determine the safety, preliminary efficacy and pharmacokinetics of ARG-007 in acute ischaemic stroke patients (SEANCON)

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Background: ARG-007 is a cationic poly-arginine peptide consisting of 18 D-arginine residues developed by Argenica Therapeutics, with the goal of neuroprotection in ischaemic stroke and other neurological conditions. Pre-clinical and a phase I study have now provided support for a phase II study in subjects with large vessel ischaemic stroke receiving guideline based standard of care.

Aims: To publicise this study amongst Australian clinical stroke researchers, and to invite up to 10 leading stroke centres to participate. The safety, preliminary efficacy and pharmacokinetics will be assessed.

Methods: The protocol for a phase II, randomised, double-blinded, placebo controlled, multi-centre study will be presented. Subjects will have ischaemic stroke due to large vessel occlusion undergoing mechanical thrombectomy (with or without thrombolysis), in accordance with local institutional practices. Subjects will be randomised 1:1 (placebo: ARG-007 0.3 mg/kg), to be administered by intravenous infusion over 10 minutes, as soon as enrolment criteria are confirmed, before completion of revascularization. Up to 100 subjects will be enrolled. In a subset, blood samples will be taken for pharmacokinetics. Follow up will be on days 2, 5 (or discharge), 30 and 90 and include standard stroke scales such as NIHSS, modified Rankin, Barthel Index, EQ-5D and tele-MOCA.

Results: Primary endpoints include mortality rate, incidence of SAEs and AEs, symptomatic intra-cranial haemorrhage, worsening of stroke severity and incidence of clinically relevant changes in routine blood tests and clinical vital signs. A secondary endpoint is change in infarct volume at 48 hours. An exploratory endpoint will be pharmacokinetic analysis of subjects treated with and without thrombolysis.

Conclusion: Results of this phase II study of ARG-007 will guide further studies.

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Conversations on the move: a pilot evaluation of a communication and movement program in social settings for people after stroke

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Background: After stroke, people living in the community benefit from ongoing exercise and social communication activities to address the impacts of stroke on their health. While community exercise programs are known to provide physical and social benefit people to people post-stroke, the addition of a structured communication component provided by a SLP to an evidence based exercise program, Fitness and Mobility Exercise after stroke (FAME) is unknown. Further, it is not yet known how combining communication and movement influences perceived experiences and engagement of people post-stroke in community-based programs.

Aims: This pilot program aimed to design, implement, and evaluate a combined exercise and communication program, called Conversations on the Move.

Methods: The program was designed and implemented by physiotherapy and speech pathology staff and students at a local university. The program included an hour of exercise and half an hour of conversation over refreshments, with the program running for four weeks in total. People post-stroke were invited to participate in the program and were supported to access appropriate transport to and from the venue. Evaluation was undertaken using in-person focus groups. A total of five people participated in two focus groups. All focus groups were audio-recorded to allow for transparent and reliable analysis. Data were subject to thematic analysis.

Results: Initial analysis of the audio data reveals three main themes; 1) the value of programs for routine and purpose, 2) a community of shared experience, and 3) belonging as a motivator for participation. Further analysis will be undertaken following the completion of the remaining transcription.

Conclusion: Combined communication and movement programs present as meaningful and impactful method of community engagement for people post-stroke. Recommendations can be made for local stakeholders involved in such programs regarding the facilitation of social

communication, and potential advances in both program engagement and participant benefit.

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Time is brain so we must BEFAST

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Background: Treatment for stroke is time critical and time limited. Missed identification of stroke in patients presenting to Emergency Departments (ED) results in treatment delays, and sometimes irreversible damage.

Aims: We aimed to increase the number of stroke patients triaged as Australasian Triage Scale (ATS) Category 1 (to be seen immediately) or 2 (to be seen within 10 minutes) following implementation of the BEFAST triage stroke identification process; and to decrease door-to-CT time.

Methods: Implementation of BEFAST involved short education sessions at handover, targeted education with individual staff members across the ED nursing and medical workforce over X weeks, and posters placed around the department. Our pre-test/ post-test study used prospective patient data from BEFAST calls (n=331). Retrospective patient record audits for confirmed stroke (n=254) were undertaken. Information on triage category, ED presentation and time to CT scan, discharge destination, length of stay (LOS), and modified Rankin Score (mRS) were extracted and analysed.

Results: Following the introduction of BEFAST, patients were three times more likely to be triaged at category 1 or 2 (57.4% vs 80.2%, $p < 0.001$). Door-to-CT scan time was reduced by an average of 20.7 minutes ($p < 0.001$), with half seen in 48 minutes or less. More patients were discharged to their usual residence ($\pm$ supports), and more quickly (LOS 7.9 vs 11.1 days, $p = 0.001$). 90-day post-implementation, patients were nearly twice as likely to experience an improvement in neurological symptoms during this (mRS ≤ 1 : 52.2% vs 36.3%, $p < 0.001$).

Conclusion: Patient outcomes were improved following implementation of the BEFAST stroke triage process. More stroke patients were identified upon presentation to the ED, and in a timely fashion. For those with a stroke diagnosis, time-critical interventions can take place earlier, allowing patients to return home sooner, and with less disability.

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Are Current Self-Efficacy Measures Reliable and Valid for Stroke Survivors?

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Background: Low self-efficacy is considered physical activity recommendations. However, tools used to measure self-efficacy currently used in research and clinical practice haven't been tested for validity and reliability in the stroke population.

Aims: To evaluate the test-retest reliability and construct validity of three self-efficacy scales for use with stroke survivors.

Methods: A repeated-measures reliability and construct validity study was conducted. Fifty-one community-dwelling stroke survivors (mean age = 74 years, median steps/day = 4,664) completed three self-efficacy scales on two occasions, seven days apart (Self-Efficacy for Exercise scale (SEE), Spinal Cord Injury Exercise Self-Efficacy Scale (SCI-ESES) and

community management domain of the Participation Strategies Self-Efficacy Scale (PS-SES)). Construct validity was assessed using eight hypotheses determined a-priori, evaluating community participation, physical activity, comorbidities and physical function via t-tests and Pearson's correlation coefficients. Test-retest reliability was analysed using intraclass correlation coefficients.

Results: Test-retest reliability was established for the SEE (ICC=0.8), PS-SES (ICC=0.8) and the SCI-ESES (ICC=0.7). The SEE and SCI-ESES achieved 3/8 hypotheses for construct validity, while the PS-SES achieved 2/8. The three measures were highly correlated with each other and with self-reported levels of physical activity, but failed to achieve target levels ($r \geq 0.5$) for association with objective physical activity levels, comorbidity or function.

Conclusion: All three measures (SEE, PS-SES and SCI-ESES) showed high test-retest reliability. However, it appears that construct validity is insufficient for clinical or research settings. Measurement of a complex phenomenon such as self-efficacy poses a challenge for the stroke research and clinical communities. Development of valid and reliable tools to better understand and measure post stroke self-efficacy for physical activity appears warranted.

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Bridging the urban and regional divide in access to stroke unit care: evaluation of patient and staff experience of tele-stroke unit care

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Background: Regional Australians have reduced access to Stroke Unit Care despite being more likely to experience stroke. Echuca Regional Health and Eastern Health piloted a telestroke unit model to address this disparity.

Aims: The aim of this study was to understand patients' and regional stroke clinician experience of a tele-stroke unit model.

Methods: BUILDS (Bridging the urban and regional divide in stroke care) provided assessment of all stroke/TIA patients by a stroke physician via telehealth with support from a local stroke coordinator. Development of education modules and case review audits for quality assurance were also included.

Patient and clinician surveys were developed using a 7-point Likert scale. These surveys included identification of disadvantages and advantages of the service.

Results: 37 experience surveys (15 females, 22 males) were analysed (34 patient, 3 family). 49% (n=18) had not used telehealth prior to BUILDS. 89% (n=33) indicated that the consultation reduced worry. 92% agreed the consultation was an acceptable way to access stroke services in regional areas. Free text analysis revealed patients felt comforted through access to a stroke specialist and stroke coordinator without the need to travel.

25 staff experience surveys (15 medical, 2 nursing, 8 allied health) were completed. 80% (n=20) had experience with telehealth. 80% (n=20) agreed BUILDS provided support in stroke care. 68% (n=17) of staff with previous experience in metropolitan stroke centres agree that BUILDS was comparable to inpatient metropolitan care. Free text analysis highlighted the following advantages: face to face communication (Zoom) with the stroke physician, timely access to specialist care, stroke

education, improved care planning with diagnostic certainty and perceived improved workflow.

Conclusion: Survey results revealed the tele-stroke model was positively received by patients and the clinical team. This information supports improving access to stroke unit care in regional areas using telehealth.

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Implementing the Screen-Clean-Hydrate Bundle of Care for Improving Swallow Screening, Oral Health and Hydration in Acute Stroke

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Background: Stroke guidelines recommend care processes that optimise patient outcomes, minimising hospital-acquired complications (HACs). However, audits and surveys of practice illustrate recommended care is not consistently/thoroughly implemented.

Aims: This study implements and evaluates a new bundle of care, Screen-Clean-Hydrate (S-C-H), which aims to improve compliance with guidelines for swallow screening within 4-hours of presentation, and routine assessment and management of oral healthcare and hydration. With improved care processes, HACs such as aspiration pneumonia, dehydration, and other infections/morbidities may reduce.

Methods: This Type-2 Hybrid Effectiveness/Implementation pre-post study is being conducted in two Australian acute stroke units. The integrated-Promoting-Action-on-Research-Implementation-in-Health-Services (iPARIHS) framework is guiding study design, implementation and evaluation. Clinical effectiveness of S-C-H is measured by rates of ICD-10AM-coded HACs, length of stay and procedure costs for 60 patient participants. Implementation is measured by acceptability, feasibility, uptake and fidelity of S-C-H, with identification of barriers and enablers through staff interviews, medical record audits and researcher field notes.

Results: Pre-implementation audits from 30 patient participants at each hospital revealed compliance with 4-hour swallowing screening of 90% and 53% respectively, oral health assessment 95% and 43%, oral healthcare planning 0% and 13%, documented oral healthcare delivery 25% and 23%, documented hydration assessment 0% and 0%, and documented hydration management plan 44% and 43%. Nine patients developed HACs.

Implementation strategies have included education, web-based resources and training, maximising functionality of electronic medical record system, identifying oral health champions, redefining interprofessional roles, visual reminders and posters in bathrooms and at bedside for patients, weekly targeted audits of care processes and feedback cycles, and nursing documentation audits.

Post-implementation evaluation of 30 patient participants at each site occurs May-July 2023. Process evaluation and analysis of implementation strategies follows.

Conclusion: Preliminary findings suggest S-C-H is acceptable, feasible and improves care processes. Results will inform a future multi-site effectiveness/implementation study.

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Maintaining Language and Quality of Life Gains with Low-dose, Technology-delivered Aphasia Therapy: Preliminary Results of the CHAT-Maintain Program

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Background: Evidence suggests that while communication improves post intensive aphasia therapy¹, for many participants these gains do not persist long term². Efficacious, feasible and cost-effective methods of maintaining gains post intensive therapy are required.

Aims: This study evaluated the feasibility and preliminary efficacy of CHAT-Maintain, an individualised, low-dose, technology supported home therapy program, delivered post-intensive therapy for people with aphasia.

Methods: A prospective, non-randomised, feasibility design was employed. Eighteen adults (11M, 7F; mean age =65.4years; mean time post onset =24.7months) with post-stroke aphasia, were recruited from the Comprehensive High-dose Aphasia Therapy (CHAT) and TeleCHAT (CHAT via telerehabilitation) programs.

Participants completed an individualised, technology-delivered home program for a minimum of one hour per week for 6months. Home practice utilised evidence-based aphasia therapy software and was supplemented with support calls from a speech pathologist.

Outcome measures included the Comprehensive Aphasia Test (CAT)³, Communication Effectiveness Index (CETI)⁴, Communication Confidence Rating Scale for Aphasia (CCRSA)⁵ and the Stroke and Aphasia Quality of Life Scale-39 (SaQOL-39)⁶ and were administered post-treatment, at 3-months and 6-months follow-up. Data were analysed using paired-samples t-tests.

Results: Fourteen participants completed CHAT-Maintain. Two participants withdrew due to medical reasons and two participants were lost to follow up.

Participants completed a mean of 44hours of self-directed therapy (range: 10–115hours) and received a mean of seven support calls (range: 4–11) over 6months.

Significant treatment gains were maintained for the CAT ($p<.001$), CETI ($p=.037$) and SaQOL-39 ($p=.023$) at 3-months follow-up and for the CAT ($p<.001$) and CETI ($p=.009$) at 6-months follow-up. While significant improvements on the CCRSA were not observed post-treatment, significant gains were found at 3-months ($p=.004$) and 6-months ($p=.006$) follow-up.

Conclusion: CHAT-maintain is a feasible, low-dose, technology-supported model of care which has the potential to support the long-term maintenance of language, communication and quality of life gains post-intensive therapy. Data collection is ongoing with planned comparisons to usual care post-intensive therapy.

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Surveying Allied Health Professionals to Develop Experience-Based Evidence for Vocational Rehabilitation Interventions Provided After Stroke

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Background: Vocational rehabilitation interventions are recommended to support work and working after stroke, yet there is very little information about what interventions and components are used in practice. The importance of drawing on expert opinion and experience-based evidence to apply results of international research in the Australian clinical setting is acknowledged yet often overlooked.

Aims: To determine interventions of choice and allied health clinicians' perceived usefulness and clinical reasoning for vocational rehabilitation components when providing services to adults with stroke.

Methods: Allied health professionals who participated had all provided rehabilitation with adults with stroke with identified vocational rehabilitation goals; adults with stroke were identified from a return-to-work after stroke trial (the WORK Trial). A multiple-choice and short-answer survey was developed and piloted before electronic distribution; content thematic analysis was conducted on qualitative data while descriptive statistics were used to analyse quantitative data.

Results: Seventeen experts participated in this study. Most (88%) were experienced working with adults after stroke (i.e. >5 years) and were occupational therapists (88%), although professionals from speech pathology and physiotherapy were represented. Vocational rehabilitation was predominantly provided face-to-face, although nine (53%) of participants did use e-health initiatives (telephone and video-conferencing). No clinicians reported being confident that their programs addressed all necessary components of vocational rehabilitation within their clinical services. Clinicians identified a great need for further training in conducting cognitive functional capacity evaluations as well as vocational skills assessments, and training in developing suitable duties programs, worksite assessments and graded return to work schedules. All commented on a lack of suitable clinical-training programs within Australia.

Conclusion: Findings emphasise the challenges of providing stroke-specific vocational rehabilitation programs and the need to have dedicated

and ongoing education for clinicians irrespective of their years of practice. The lack of suitable skills-based training programs identifies a key barrier for service delivery here in Australia.

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Effectiveness of Home-Based Exercise for Improving Physical Activity, Quality of Life and Function in Older Adults After Hospitalisation: Results from a Systematic Review

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Background: Periods of hospitalisation have a detrimental effect on the physical activity levels of older adults, including after stroke. The combined effects of impairments and inactivity during hospitalisation increases the likelihood of physical and functional decline. Facilitating regular physical activity through home-based exercise may improve long-term health outcomes of older adults after hospitalisation but the efficacy of this approach is unknown.

Aims: This review sought to describe home-based exercise programs that have been utilised for older adults after hospitalisation and investigate their effectiveness for increasing physical activity and improving health outcomes when compared to no intervention, standard care or centre-based exercise.

Methods: Databases were searched from inception to March 2022. Randomised controlled trials which utilised home-based exercise for older adults recently discharged from hospital were included. Participants in those trials were admitted to hospital for various reasons including neurological conditions, such as stroke. The primary outcome was physical activity. Secondary outcomes were quality of life, performance of activities of daily living, mobility, adverse events and hospital readmissions.

Results: Ten trials were included. Three trials demonstrated that home-based exercise can improve objective and subjective measures of physical activity. Home-based exercise was more effective than no intervention at improving performance of activities of daily living (SMD 0.6, 95% CI 0.0 to 1.2); and standard care at improving quality of life (SMD 0.3, 95% CI 0.1 to 0.5) and mobility (SMD 0.2, 95% CI 0.0 to 0.5).

Conclusion: Based on individual trials, home-based exercise has the potential to improve physical activity compared to no intervention or standard care. Meta-analyses indicate that home-based exercise is more effective than no intervention and standard care at improving some health outcomes. Home-based exercise programs should be considered as a means to improve health outcomes of older adults after hospitalisation, including those after stroke.

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Physical Activity Beliefs, Barriers and Facilitators: a Survey of Community-Dwelling People After Stroke Involved in the Falls After Stroke Trial

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Background: Although physical activity provides multiple health and functional benefits to people after stroke, high levels of sedentary behaviour are observed in this population. The Falls After Stroke Trial (FAST) is comparing a tailored, home-based exercise program (LiFE), designed to support a long-term, daily increase in physical activity, with usual care (no active intervention).

Aim: To understand the perspectives of FAST participants about overall physical activity and specific exercise program participation. In particular, if exercise beliefs differ between the control and intervention groups.

Methods: Forty-nine participants were invited to participate in a survey at the 6-month assessment. It consisted of 43 items administered to all participants and an additional five items administered to only intervention group participants. The survey was either completed independently by the participant or with a researcher over the phone. Survey data were collected between July 2021 and April 2023.

Results: 38 participants (78%) completed the survey. Less than half of the participants (37%) were completing regular physical activity and 45% of participants were satisfied with their physical activity levels. There was no difference in days per week of moderate physical activity between the control and intervention groups (MD 1.3, 95% CI -0.4 to 3.1). On average, participants reported two barriers to completing regular exercise programs. The most commonly reported barriers were poor balance (45%), being too tired (37%) and poor weather (32%). Intervention group participants reported that the LiFE program increased their desire (87%) and made it easier for them (91%) to be more physically active.

Conclusion: Although most participants agreed that physical activity is beneficial for health and wellbeing, less than half were completing regular physical activity. Intervention group participants reported that a habit-forming exercise intervention made them want to be more active and made it easier for them to do so.

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Blood Pressure Changes in Nasogastric Tube Insertion in Stroke Patients

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Background: Blood pressure (BP) fluctuations during acute stroke can be harmful. Nasogastric tube (NGT) insertion is believed to cause BP fluctuations.

Aims: To determine if NGT insertion is associated with significant BP fluctuation and define the characteristics of patients with BP variations.

Methods: We performed a single centre, prospective review of 54 patients with stroke requiring NGT insertion. Data was collected regarding demographics, BP, anti-hypertensive management, stroke severity, stroke type (haemorrhagic, ischaemic) interventionist experience, and time since stroke. An average of 3 BP readings, taken 5 minutes apart, was used as the baseline. Subsequent measurements were taken during NGT insertion, and at six 5-minute intervals after the procedure.

Results: The mean age was 72.9 years (SD = 13.9), 49% were male. NGT insertion was associated with an increase in both systolic (SBP) and diastolic blood pressure (DBP) during insertion and at 5 minutes post. During NGT insertion, BP (SBP/DBP) increased by 16.7/10.1mmHg (95% CI 12.5-20.8/6.9-13.2) from 151.2/77.8mmHg (146.4-156.1/74.2-81.3) to 167.9/87.8mmHg (163.1-172.8/84.3-91.3); and at 5 minutes post insertion it was 8.5/4.5mmHg (4.35-12.65/1.4-7.6) higher than baseline at 159.8/82.2mmHg (154.9-164.7/78.7-85.8). There was no association between other measured variables and BP fluctuation. BP readings taken from 10 to 30 minutes post NGT insertion did not show any difference from baseline.

Conclusion: Our study found that NGT insertion in stroke patients is associated with a significant increase in BP at the time of insertion and at 5 minutes post. This has implications for patient selection and timing of NGT insertion, particularly in haemorrhagic stroke, where BP variations are believed to be particularly harmful.

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INTensive ambulance-delivered blood pressure Reduction in hyper-Acute stroke Trial (INTERACT4): Progress Update and Experiences During COVID

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Background: Uncertainty exists regarding the effects of pre-hospital (ambulance) initiated blood pressure (BP) lowering.

Aims: We initiated the INTensive ambulance-delivered blood pressure Reduction in hyper-Acute stroke Trial (INTERACT4) to determine the effectiveness and safety of intensive BP lowering in patients with suspected acute stroke.

Methods: An ongoing multi-centre, ambulance-delivered, prospective, randomised, open-label, blinded endpoint trial of pre-hospital-initiated BP lowering in hypertensive patients with suspected acute stroke in regions of China. Patients are randomised through a mobile phone digital system to intensive (target systolic BP [SBP] <140mmHg within 30 min) or guideline-recommended BP management according to local protocols. Primary outcome is level of disability at 90 days, assessed by an ordinal analysis of the modified Rankin scale. The sample size was reduced from 3116 to 2320 in 2022 as the stroke mimic rate is lower than expected (6% vs. 30%).

Results: Between March 2020 and April 2023, 2053 patients were recruited: 45.0% intracerebral haemorrhage and 5.1% stroke mimic. Recruitment slowed during the COVID outbreak in 2022, and nearly stopped in Shanghai during the lockdown period, but has subsequently picked up such that we expect to reach the recruitment target in late 2023. The operation team faced travel restrictions due to COVID, resulting in entry delays and missing data, requiring a shift towards remote monitoring and online training. Good BP differences have been achieved between randomized groups, being greater in those with intracerebral haemorrhage without any safety concerns being noted.

Conclusions: As the largest ambulance trial in stroke, INTERACT4 will provide reliable evidence on the effectiveness and safety of very early intensive BP lowering in patients with suspected acute stroke.

Trial registration: ClinicalTrials.gov NCT03790800. Registered on 2 January 2019; Chinese Trial Registry ChiCTR1900020534. Registered on 7 January 2019.

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Evaluation of the Acceptability and Feasibility of Implementing a Minimum Dataset to Monitor Stroke Care for People with Aphasia

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Background: Aphasia is a language impairment resulting in communication disability and reduced quality of life. One in three stroke survivors experience aphasia. Treatment for aphasia is effective particularly when it is frequent, intensive, and tailored (Brady et al., 2016). However, clinicians do not routinely collect the data needed to tailor the right treatment, to the right person, at the right time (Wallace et al., 2022). To monitor and evaluate aphasia care, a minimum dataset has been developed by an international team of researchers, clinicians, and stroke survivors with aphasia and their families.

Aims: To pilot the implementation of a minimum dataset for stroke survivors with aphasia receiving routine clinical aphasia care.

Methods: This multi-centre implementation study will be conducted in acute and subacute stroke services within five health services across metropolitan Queensland, Victoria, and Western Australia. The minimum dataset includes sociodemographic characteristics, quality indicators, treatment descriptors, and a core outcome set. To establish benchmarks of clinically meaningful change on the core outcome set, a consensus study will be undertaken to determine thresholds of important change, from the perspective of people with aphasia and speech pathologists. An embedded process evaluation, including patient questionnaires and semi-structured interviews with speech pathologists, will examine acceptability and feasibility of implementing the minimum dataset.

Results: The minimum dataset will provide standardised, routinely collected data across the aphasia care pathway to better understand post-stroke aphasia services, benchmarks of clinically meaningful change, and treatment outcomes. Barriers and facilitators to widespread implementation of the minimum dataset will be identified.

Conclusion: This study will be the first to implement a minimum dataset for people with post-stroke aphasia and will be a driving force in aligning best practice aphasia care with improved outcomes for people recovering from aphasia.

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Recovery of Walking after Severe Stroke: A Longitudinal Cohort Study following Rehabilitation

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Background: Impaired walking contributes to functional disability post-stroke. Poor walking recovery has been associated with greater stroke severity, and it is assumed that there is little functional recovery after 6-months post-stroke.

Aims: To describe walking function and recovery in a cohort of moderate/severely affected stroke survivors who received inpatient rehabilitation, and explore the association between cognition, mood, and walking recovery.

Methods: In this study, we used an existing data set drawn from a cohort of consecutive inpatients receiving rehabilitation at a specialised acquired brain injury ward (2015-17). We only included data from patients with ischaemic/hemorrhagic and excluded traumatic brain injury. All participants were assessed at admission to and discharge from inpatient rehabilitation and again at 12, 24, and 36 months post-stroke. Walking recovery was clinically evaluated on the Functional Independence Measure (FIM™).

Results: 44 moderate/severe stroke survivors were included (hemorrhage n=30, ischaemic n=14), median age 51y (17-78), 25 males (57%) median 49 days post-stroke (range 9-333). Number of participants varied over time (at 12 months, n=34; 24 months, n=29; 36 months, n=20). Based on the FIM walking score 72% had complete walking dependence, 16% had modified dependence, and 12% were able to independently walk at admission. At discharge, 62% improved on walking dependence, from discharge-12 months 21% improved, 14% between 12-24, and 18% between 24-36 months. Further analyses include exploring associations between mood, cognition, and walking recovery and will be included in the presentation if successful.

Conclusion: Walking ability did improve in this cohort of patients with moderate/severe stroke receiving rehabilitation. People who were lost to follow-up might have had more severe strokes and therefore the proportion of recovery might be smaller. Detailed knowledge of mobility recovery and the time course of recovery is limited in the severe stroke population, yet may prove invaluable for planning future rehabilitation.

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Fracture Risk Assessment in Adults with Ischaemic Stroke

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Background: Stroke is an important risk factor for minimal trauma fracture (MTF) due to immobilisation, gait disturbance, vitamin D deficiency and increased falls risk.

Aims: To study the prevalence of osteoporosis, falls and fractures in adults with ischaemic stroke.

Methods: Adults aged ≥ 50 years admitted with ischaemic stroke at Monash Health over a 12-month period, were invited to participate in a telephone interview one year post-stroke to ascertain falls and fracture. A Fracture Risk After Ischaemic Stroke¹(FRAC-stroke) score was calculated.

Results: Of 301 adults with ischaemic stroke, 131 consented to a telephone interview. Mean age was 72.4 ± 10.7 years and 36.6% were female. The modified Rankin Scale (mRS) on discharge was between 0-1 in 45.0%, 2-3 in 47.4% and 4-5 in 7.6%.

33 patients (25.2%) had a FRAC-stroke score of ≥ 15 , equating to $\geq 5\%$ risk of fracture in the year following stroke. Fourteen (10.7%) had a MTF prior to the stroke (12 female) and 17 (13.0%) had a history of osteoporosis.

There was a significant difference in patients experiencing falls pre- and post-stroke (19.8 vs 31.3%, $p=0.041$). 62.5% of patients who had a fall pre-stroke experienced a fall post-stroke. Eleven (8.4%) patients had a MTF in the 12 months post-stroke; six fractures occurred in the upper limb and five in the lower limb/pelvis. 21.2% of patients with a FRAC-stroke of ≥ 15 experienced a MTF in the 12 months following stroke. Receiver operating characteristic (ROC) analysis found an area under the curve (AUC) of 0.815 for FRAC-stroke score in predicting fracture with a sensitivity of 66.7% and specificity of 78.2%.

Conclusion: Osteoporosis in patients presenting with an ischaemic stroke is not uncommon. The FRAC-stroke score is a simple clinical tool that can be used to identify patients at high risk of fracture post-stroke who would most benefit from osteoporosis therapy.

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What is “challenge”? An interdisciplinary concept analysis of task difficulty in stroke rehabilitation

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Background: The growing burden of stroke disability has prompted researchers to rethink our understanding of rehabilitation concepts¹. Researchers are now considering how the concept of “challenge” influences outcomes and experiences of stroke rehabilitation. However, challenge is poorly understood and holds various meanings in the literature, including overlapping descriptions of task difficulty, physiological intensity, cognitive load and perceived effort². This conceptual confusion risks sub-optimal implementation of challenge in practice³.

Aim: To explore how challenge is conceptualised in stroke rehabilitation literature from the perspectives of people with stroke, physiotherapy, occupational therapy and speech-language therapy.

Methods: Penrod and Hupcey's³ principle-based concept analysis method was used to explore challenge within the stroke rehabilitation literature. Following a systematic search of electronic databases, papers were screened using the Breadth and Depth method to select literature with high informational value⁴. All papers were analysed; codes were synthesised to elicit understandings of the range of purposes, meanings and uses of challenge, within and across perspectives.

Results: A total of 3031 papers were retrieved, with 42 included following screening. Challenge appeared to be a multidimensional, progressive and fluid concept which was understood through three components:

nominal, functional and perceived challenge. Nominal challenge was understood as the task difficulty based solely on characteristics of the task itself. Functional challenge was defined as an interaction between the nominal challenge and the person's ability. A third emerging component was identified, perceived challenge. Perceived challenge was considered as the person's experience of challenge. Functional and perceived challenge were predominantly used to create *optimal* challenge. Optimal challenge was central to enhancing (re)learning, both in the experience of rehabilitation and everyday life for people with stroke.

Conclusion: Challenge is an important concept, that when carefully optimised to the person's ability and perception of challenge, may positively influence engagement with and outcomes from stroke rehabilitation.

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Application of Real-world Clinical Data to Understand the Profile of Arm Weakness, Pre-stroke Outcomes and Other Impairments Early Post-stroke

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Background: The profile of upper limb weakness and other impairments early post-stroke may be changing. Examining the assessment completed within 24-48 hours post-stroke, recommended by the Australian Stroke Guidelines, may build an understanding of the current profile. Such an assessment can provide real-world data benefits for clinical (e.g., profile of impairments, service delivery changes) and research (e.g., recovery phenotypes) practice.

Aims: Primary aim was to determine the upper limb motor weakness profile, with a secondary aim to contextualise this profile by examining pre-stroke outcomes, other post-stroke impairments, and discharge destination.

Methods: Cross-sectional observational study. Data were extracted from the electronic medical record of a consecutive sample admitted to an acute stroke unit over 15 months. The Shoulder Abduction and Finger Extension (SAFE) score was the primary measure of upper limb

weakness. Demographics (e.g., age), clinical characteristics (e.g., National Institutes of Health Stroke Scale NIHSS), pre-stroke outcomes (e.g., Clinical Frailty Scale), other post-stroke impairments (e.g., command following), and discharge destination were also extracted.

Results: 463 patients had a confirmed stroke and SAFE score (median: 74-years; NIHSS 5. 90% ischaemic). One-third of patients received ≥ 1 acute intervention(s). Nearly one-quarter of patients were classified as frail pre-stroke. Upper limb weakness (SAFE ≤ 8) was present in 35% at a median of 1 day post-stroke, with most categorised with mild-moderate weakness (SAFE5-8). The most common other impairments were upper limb coordination (46%), delayed recall (41%), and upper limb sensation (26%). After a median 3-day acute admission, 52% of patients were discharged home.

Conclusion: The impairment profile was heterogeneous early post-stroke. While fewer patients are presenting with upper limb motor weakness than in well-cited studies from 20 years ago, many are presenting with premorbid clinical frailty. Further research is required to tease out the impact of pre- and post-stroke impairments to identify meaningful recovery phenotypes.

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Applying the Multidimensional Dose Articulation Framework to a Multidisciplinary Stroke Recovery Trial to Collect Dose Data Electronically in Real-time

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Background: Dose is multidimensional. Anecdotally, trialists perceive recording and monitoring all dimensions in a clinical trial as unfeasible. Electronic platforms may provide an innovative and realistic solution to this problem.

Aims: To test the feasibility of real-time electronic data collection through the Multidimensional Dose Articulation Framework within a multidisciplinary stroke recovery trial (UPLIFT).

Methods: A customised electronic REDCap data form was created to record Framework dose dimensions: duration (weeks), days/week, sessions/day, session density (time on task:off task), and episodes (length, difficulty, intensity). The data form was implemented prospectively to collect data electronically real-time, which was validated within 48 hours of entry per the trial fidelity protocol. Queries identified were promptly cross-checked with the relevant therapist to ensure accuracy. Benefits of real-time monitoring were documented.

Results: The Framework was successfully translated into an electronic interface, which was pilot-tested with 6 trialists/clinicians. Subsequently, 19 therapists (7 physiotherapists/2 occupational therapists/10 speech pathologists) were trained to collect data electronically. To date, 640 hours of training (948 therapy sessions) have been entered electronically and 25 queries (2.6% of sessions) were cross-checked for accuracy. Four benefits of real-time, electronic data entry were noted: 1) removal of at least 10 hours data entry/participant required to translate paper recordings into electronic records; 2) mitigation of ~230 printing pages/participant (~\$16/participant), which may have additional environmental benefits; 3) establishment of monitoring feedback loops to promptly rectify data queries, which enhanced trial rigour and reduced the need for burdensome monitoring methods e.g., video recording; and 4) enriched understanding of 'how much' training occurred according to the multiple dose dimensions.

Conclusion: Recording and monitoring the multiple dose dimensions in real-time electronically created data collection and fidelity efficiencies, which have cost-benefits for trial conduct (e.g., staffing, consumables). This REDCap data dictionary will be made accessible to enable broader implementation in stroke recovery trials.

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Evaluating the co-designed Kalmer relaxation intervention for people with aphasia after stroke: A feasibility case series

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Background: People with aphasia after stroke are more vulnerable to developing mental health conditions such as anxiety and depression, when compared to stroke survivors without aphasia. Presently, there is a dearth of quality research to support psychological treatments for this population. Current talk-based therapies may not be appropriate for people with moderate to severe aphasia after stroke.

Aims: This study aimed to evaluate the feasibility of the co-designed "Kalmer" relaxation intervention as an inclusive treatment option for people with aphasia. Further, this study aimed to determine whether the intervention shows potential to reduce anxiety and depressive symptoms immediately after the intervention and at 3 and 6 month follow up.

Methods: 10 participants with aphasia after stroke completed relaxation training for five weeks via the video sharing platform, Vimeo. Carer rated measures of anxiety and depression were used to assess outcome, specifically the Behavioural Outcomes of Anxiety (BOA) and the Stroke Aphasic Depression Questionnaire (10 items) (SADQ-10). Baseline assessments were conducted once a week for four weeks prior to the intervention. The BOA and SADQ-10 were also administered directly after the intervention and at 3 and 6 months post. Video analytics were collected. The reliable change index was used to determine intervention impact.

Results: Preliminary findings with respect to the efficacy of the intervention i.e., changes in symptoms of anxiety and depression will be reported.

Conclusion: It is hoped this technology-based intervention demonstrates potential to reduce anxiety and depressive symptoms and can be used as an accessible, and suitable treatment option for people with aphasia.

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FRONTIER-AP: a randomized controlled trial of thrombectomy versus standard thrombolytic therapy for stroke with medium sized vessel occlusion

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Background: Medium vessel occlusions (MeVO) of intracranial arteries constitute 25% of all acute ischemic strokes. More than 50% of MeVO stroke patients with untreated arterial occlusion develop significant functional impairment. However, there is a significant paucity in high quality endovascular thrombectomy data for MeVO involving segments of the middle cerebral artery such as M2 or M3. On this basis, there is equipoise in treatment choices for MeVO and this is reflected in unclear recommendations in international treatment guidelines.

Aims: To determine if the clinical outcomes of ischaemic stroke patients with MeVO treated within 9-hour by endovascular thrombectomy will be superior to standard therapy (thrombolytics by intravenous alteplase or tenecteplase within the clinically indicated timeframes).

Methods: FRONTIER-AP is an Australian-led international clinical trial (Australia, New Zealand, China and Vietnam) with prospective, randomized, open blinded end-point design. We include acute ischemic stroke patients within 9 hours of symptom onset and with MeVO (middle cerebral artery M2, M3, or anterior cerebral artery A1 or A2 segments) identified by vascular imaging. We randomize patients (1:1) to either endovascular thrombectomy or standard medical therapy. The primary outcome is Modified Rankin Score at 3 months at follow up.

Conclusion: FRONTIER-AP will: i) finally address a longstanding evidence gap impacting patient outcomes ii) support much-needed change in practice and policy to improve patient access to early thrombectomy for MeVO stroke, both here and internationally iii) reduce the risk of lifetime disability and functional deficits for this overlooked patient cohort.

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Improving Rehabilitation Services for Aboriginal Patients with Acquired Brain Injury: Process Evaluation of the Healing Right Way Trial in Western Australia

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Aims: To determine whether the research processes and interventions were implemented as planned and investigate how complex contextual factors influenced trial outcomes.

Methods: This prospective mixed-methods process evaluation used the Consolidated Framework for Implementation Research to guide data collection and inform analysis. We gathered qualitative and quantitative site-specific data throughout HRV, including staff interviews, project logs, meeting minutes, participant surveys. These data related to (1) implementation of trial processes (research design, recruitment/sample, follow-up, data collection); (2) CST; and (3) ABIC role, with fidelity and intervention integrity also examined.

Results: Both interventions were implemented broadly as planned, with diversity of culture, geography and administrative systems navigated throughout. The ABIC role refined over the study, with additional training/support introduced to the ABIC team as needed. Despite logistical challenges, mainly related to site/system-specific barriers, CST reached the target attendance numbers, with positive feedback and face-to-face sessions preferred. Sub-optimal identification of eligible hospital patients, COVID-19 and next-of-kin consent legislation were major reasons for under-recruitment (and impacted statistical power). The ~80% follow-up post-discharge was exemplary, given most participants returned to rural areas post-discharge, however, the volume/complexity of assessments made their completion challenging. HRV was under-resourced given the complex responses required to address system and contextual challenges.

Conclusion: In the context of COVID-19 and despite inconclusive results, HRV successfully implemented interventions, with completion and intervention fidelity achieved. The process evaluation documents significant lessons and makes recommendations for future research and rehabilitation services for Aboriginal people.

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Recovery Experiences of Adults with Mild Stroke: A Qualitative Analysis using a Self Determination Theory Approach

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Background: After a mild stroke, people are often discharged directly home, however, may continue to experience varying physical and psychological impacts from their stroke. These recovery experiences have seldom been captured.

Aims: To understand the factors that influence intrinsic motivation to recover from a mild stroke using self-determination theory (SDT).

Methods: Participants were from the Recovery-focused Community support to Avoid readmissions and improve Participation after Stroke (ReCAPs) trial. 24 semi-structured interviews were conducted with stroke survivors who were between 3- and 12-months post-discharge from acute hospital following a mild stroke. All interviews were conducted one-on-one via telephone or video-conferencing. Thematic analysis was undertaken informed by SDT. Data were deductively coded to the three basic psychological needs (competence, autonomy, and relatedness) that underlie intrinsic motivation and wellbeing.

Results: Diverse factors impact motivation towards recovery in early stages after stroke, and participants rarely reported feeling fulfilled across all areas of psychological need. Some reported goal setting after stroke helped them feel in control of their recovery, however, others described feeling unable to identify something to work towards or feeling helpless about their situation, which diminished feelings of autonomy. Feeling competent at completing tasks that were able to be done pre-stroke was a source of motivation, but fatigue disheartened participants about their progress. Needs pertaining to relatedness supported motivations when family or friends helped them to achieve their goals, such as going for a daily walk. Participants were demotivated when family or friends challenged their goal progress, such as they were not willing to change their behaviour to support a goal the participant set.

Conclusion: Results suggest most people did not perceive their needs were fulfilled across all three aspects of self-determination (competence, autonomy, and relatedness). Findings highlight opportunities to develop targeted interventions that could optimise an individual's intrinsic motivation after stroke.

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Exploring Stroke Survivors' Perspectives and Acceptance of Rehabilitation Amount Provided in an Early Supported Discharge (ESD) Model of Care

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Background: Globally, programs that support earlier discharge from hospital are growing in popularity. Whilst research has explored stroke survivors' experiences of an early supported discharge model of care, very few have explored their perceptions of the amount and the intensity of therapy provided, and compared this to the actual amount and rehabilitation provided.

Aims: To explore stroke survivors' perspectives and acceptance of rehabilitation amount received within an ESD model of care.

Method: A cross-sectional survey and retrospective medical file audit was conducted with stroke survivors recently discharged from ESD rehabilitation service. Participants completed a telephone-based survey regarding allied health input, therapy frequency and duration, and perceptions on therapy intensity. Occasions of service and clinical outcomes were extracted from medical records to describe the cohort and compare to self-reported data. This included: goals and goal attainment (Canadian Occupational Performance Measure), health-related quality-of-life (EQ5D5L), frequency and duration of allied health input.

Results: Data collection is underway with full results available for the conference. Preliminary data (n=15) suggests that a mean of 4.8 sessions

per week was provided, with responders (67%) identifying this as the "just right amount". 80% reported one allied health session per day as the ideal amount of sessions. Each session length was most frequently reported to be 30-45min, which most (80%) felt was 'just right'. All therapist set and check homework, and responders reported to complete between 30-60mins per day (on average) of independent practice. Most (73%) said they didn't receive information about therapy amount or intensity prior to service commencement.

Conclusion: Preliminary results indicate that stroke survivors report to complete between 90-120mins of therapy daily within an ESD service. Whilst most are satisfied with this, it remains below the recommended amount by clinical practice guidelines. This information will guide service modifications (e.g. expectation setting) to increase patient engagement.

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Expert rehabilitation and allied health services for young adults with stroke are lacking: A mapping study of Victorian and South Australian Services

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Background: While 43% of people who have a stroke in Australia are working age adults, most young adults with stroke find services to be disjointed or inappropriate for their needs. Many clinicians have also reported that they cannot adequately meet the needs of young adults with stroke; however, comprehensive service maps are lacking.

Aims: To identify and characterise services in the community for young adults post-stroke as part of a 5-year project developing a new Young Stroke Service.

Methods: Victorian, South Australian or national rehabilitation and allied health services were identified through a systematic search of previous publications, the National Health Service Directory, professional association provider listings, and the Stroke Foundation. Information on service design and delivery characteristics were collected through desktop audit and key informant interviews.

Results: 466 services from 239 organisations were included, 278 (60%) of which were in Victoria. Services were predominantly multidisciplinary (60%), physiotherapy (25%) or psychology services (10%). Less than half of services (44%) had neurological rehabilitation programs or staff with specialist training. While 43% of the 323 key informants that reported staff were very confident working with young adults post-stroke, only 33% reported that most or all clinical staff had communication accessibility training. All but four of the 323 key informants indicated that their clinicians would want further training on young adult stroke rehabilitation. Most preferred training through online webinars (61%), followed by in person training (33%), mentorship or a community of practice (30%), and written materials (28%).

Conclusion: Expert services for young adults post-stroke are lacking. To better meet young adults' needs post-stroke the new Young Stroke Service will help to provide timely support and referrals to the expert services in the community identified in this study.

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Acute Ischemic Stroke with Tandem Lesion in the anterior circulation

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Background and aims: Endovascular management of acute stroke caused by a tandem lesion (TL) in the anterior circulation is currently a discussed area. Acute insertion of a carotid stent in the absence of antiaggregation premedication often leads to acute stent occlusion with clinical impact. Conversely, early anticoagulation or anticoagulant therapy after intravenous thrombolysis can lead to hemorrhagic complications. The goal of our work is the analysis of different approaches to the problem in our file.

Methods: Patients who underwent mechanical thrombectomy (MT) between 2008 and 2022 were included in a retrospective monocenter study. Neurological deficit was assessed with National Institutes of Health Stroke Scale (NIHSS), clinical outcome with modified Rankin scale (mRS) and achieved recanalization using the TICI scale.

Results: We compared only patients who underwent successful MT (TICI 2b-3). 81 patients had a stent inserted during MT (58% males, mean age 67.4 ± 8.8 years). A good clinical result (mRS 0-2) was achieved by 61.7% of patients. Mortality was 17.3%. In 101 patients (48.5% males, mean age 71.6 ± 12 years) the stent was not inserted and an alternative solution was chosen (retention of residual stenosis - mainly patients in severe clinical condition, elective stent insertion days after effective antiaggregation therapy or carotid endarterectomy-CEA). A good clinical result was achieved by 57.4% of patients. Mortality was 24.8%.

Conclusions: There was no significant difference in achieving a good clinical outcome between the groups with acute stenting or with the alternative procedure. Study was supported by grant IGA-KZ-2021-I-15

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Clinical outcome of Mechanical Thrombectomy for Stroke before, during and after the Covid 19 pandemic

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Background and Aims: The COVID-19 pandemic has had a significant impact on all areas of health and social care, and it was no different for patients with ischemic stroke (IS). The aim of this analysis was to determine the impact of the pandemic on the clinical outcomes of mechanical thrombectomy (MT) in patients with IS for large artery occlusion.

Methods: The study included patients who underwent MT between 2008 and 2022. Neurologic deficit was assessed using the National Institutes of Health Stroke Scale (NIHSS) and clinical outcome using the modified Rankin Scale (mRS). The presence of symptomatic intracerebral hemorrhage (SICH) was assessed according to the SITS-MOST criteria. The achieved recanalization was evaluated using the Thrombolysis in Cerebral Infarction scale (TICI). For the purposes of this study, the period before the Covid 19 pandemic was defined in terms of time (MT carried out until 31.3.2020) and the period after the pandemic from 1.4.2022. The data were evaluated for all patients and also individually for individual age groups.

Results: The data of 1350 patients who underwent MT for occlusion of a great artery were retrospectively evaluated. Before the start of the pandemic (893 patients, age 71.7 ± 12.8 , recanalization TICI $\geq 2b$ 80.3%), good clinical success (mRS ≤ 2) was present in 48% and 30-day mortality was 31%. During the pandemic (327 patients, age 74.3 ± 11.5 , recanalization TICI $\geq 2b$ 80.7%), clinical success decreased to 39.8% and mortality increased to 40.1%. After the pandemic (130 patients, age 75.1 ± 12.6 , recanalization TICI $\geq 2b$ 80.8%), mortality dropped to 29.2%, but a good clinical result was still only achieved in 40%. We find a lower clinical success rate in all analyzed age categories.

Conclusion: The Covid 19 pandemic was reflected in clinical outcome in mechanical embolectomy patients of all age groups. According to our data, mortality has already returned to the pre-epidemic level, but the lower rate of clinical success of the procedure still persists.

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A Feasibility Study of Remote Delivery of Return to Work Support after Stroke

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Background: Return to work (RTW) after stroke is an important rehabilitation outcome, however in rural areas specialised RTW support might not be available.

Aims: The aim of this pilot study was to evaluate the feasibility of a RTW support service, delivered by a single 'RTW clinician', via telecommunication to increase access to people who have had a stroke. The overall aims of the study were to evaluate satisfaction with the intervention and to test acceptability of procedures.

Methods: We recruited people aged 18-74, who experienced a stroke up to 2.5 months previously, at four Victorian sites (Barwon Health, Western District Health, Albury Wodonga Health and South West Health Care). Participants were assessed at baseline, 3- and 6-months post-stroke. Satisfaction with the intervention and procedures was evaluated through qualitative interviews at each timepoint and the Client Satisfaction Questionnaire-8 (CSQ-8; score range 8-32). Data pertaining to rates of RTW and other employment variables, as well as measures of mood, anxiety, fatigue and cognition, were collected. All procedures were completed via telephone, online survey and/or videoconference.

Results: Twenty-one participants were recruited. Telehealth delivery was feasible and associated with high satisfaction (CSQ-8 median score = 32). Twenty participants had the intervention until 6 months post-stroke. Eighteen of 21 (86%) participants returned to work within 6 months, with 16 of 20 (80%) participants employed and working at 6-months post-stroke. For those working at 6-months post-stroke, no change in hours of work was seen from pre-stroke ($m=30.5$, $SD = 24.1$ hours/week) to 6-months post-stroke ($m=29.6$, $SD=11.9$ hours/week, $t=.12$, $p=.91$). Measures of depression, anxiety, fatigue and cognition improved from baseline to 6-months post-stroke (Cohen's $d = .30$ to $.50$).

Conclusion: Remote delivery of a RTW support service was feasible and acceptable to people who had recently experienced a stroke. High RTW rates were reported however a randomised controlled trial is required to confirm intervention effectiveness.

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Anticoagulation associated intracerebral hemorrhage treatment and outcomes analysed by the potential availability of specific vs non-specific reversal agents: a retrospective cohort study

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Background: Direct oral anticoagulant (DOAC) and warfarin treatment are associated with increased risk of intracerebral hemorrhage (ICH). Specific reversal agents only currently exist in Australia for warfarin and dabigatran; 'reversal' of apixaban and rivaroxaban using 3-factor Prothrombin

Complex Concentrate (PCC) is included in many protocols, however data on the speed and effectiveness of these treatments is lacking.

Aims: Our retrospective cohort study aimed to compare rates of non-dabigatran DOAC-related reversal with dabigatran/warfarin-related reversal following ICH. We also assessed the timeliness of administration of reversal agents and intravenous (IV) anti-hypertensives and their impact on mortality and functional outcomes.

Methods: We analyzed data from electronic medical records from inception until December 2022 in South Australian Tertiary Hospitals. Patients with non-traumatic ICH and a last known well time of <24 hours were included, while those with isolated intraventricular hemorrhage or secondary causes of ICH were excluded. Outcomes analyzed included 30-day mortality and discharge modified Rankin Scale (mRS). Secondary outcomes included time to administration of reversal agent, intravenous anti-hypertensives, and time to systolic blood pressure (BP) lowering below 140 mmHg.

Results: We included 102 patients (mean age 82 (SD 9)) of whom 74 (73%) were in the non-dabigatran DOAC group and 28 (27%) in the warfarin/dabigatran group. Reversal agent rates did not differ (46% dabigatran/warfarin vs non-dabigatran-DOAC 39% (OR, 1.4; 95% CI, 0.93-2.08). Time to reversal also did not differ (91.7 minutes (SD 137) dabigatran/warfarin vs non-dabigatran-DOAC 141 (SD 229); $p=0.3$). Time to first dose of IV anti-hypertensives also did not differ, nor average time from arrival to achieved BP <140. There was no difference in 30-day mortality between the two groups.

Conclusion: In anticoagulated ICH patients, time to anticoagulation reversal and initiation of first IV anti-hypertensive was greater than 120 minutes irrespective of the pre-ICH anticoagulant. Greater effort should be made to improve time-to-treatment in both groups.

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The Needs and Perspectives of People with Stroke and Communication Disabilities in Early Vocational Rehabilitation and Return to Work: A Mixed Methods Prospective Study

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Background: People with communication disability after stroke experience lower rates of return to vocational roles when compared to the broader stroke population. Despite this, factors influencing return-to-work for this stroke sub-group are not well understood, with limited research investigating the needs and perspectives of people with communication disability who seek to resume vocational activity.

Aims: This study aimed to: 1) investigate the vocational rehabilitation experiences of people with communication disability after stroke; 2) identify their return-to-work needs; and 3) provide preliminary recommendations for inclusive vocational rehabilitation service delivery.

Methods: Seven participants with communication disabilities after stroke were recruited from a larger clinical trial of early vocational rehabilitation (20% of total sample ($n=34$)). A mixed-methods design was

employed, with integrated use of quantitative (demographic and intervention audit data) and qualitative (semi-structured, in-depth interview) data. Quantitative data were analysed using descriptive statistics. Qualitative data were analysed using thematic analysis.

Results: Participants were five men and two women aged 24–69. Participant communication profile included cognitive-communication disabilities (e.g., impaired attention, retaining verbal and written information), difficulties with verbal and written expression and social communication (e.g., understanding conversation partner cues and context, generating topics and ideas). Participants perceived vocational rehabilitation as beneficial but identified gaps including, limited psychological and peer-based support, lack of targeted rehabilitation specific to participants' vocational roles, poor communication disability awareness within the workplace, multi-layered barriers to accessing to vocational rehabilitation once vocational activity resumes.

Conclusion: Greater emphasis on evaluating the workplace communication environment and better targeted communication training and preparation for workplace stakeholders is likely to reduce barriers faced by those with communication disability after stroke. Improved multidisciplinary practice during rehabilitation, inclusive of psychological care, may result in participants being more psychologically prepared to acknowledge changes in communication function and result in improved engagement in the rehabilitation process.

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Maximal Effect Size in Large Core Thrombectomy

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Background and Aims: Mechanical thrombectomy has become standard of care for management of large vessel occlusions with small ischaemic core. Recent randomised controlled trials have attempted to broaden the application of thrombectomy to large core ischaemic strokes (LCIS). However, it is unclear if there is a difference in the magnitude of effect towards functional independence between these two groups. This has implications for informed consent as the probability of favourable outcomes may differ.

We aim to determine the relative difference in obtaining functional independence defined as a modified Rankin Scale (mRS) of 0–2 in LCIS thrombectomy compared to traditional thrombectomy.

Methods: We conducted a meta-analysis by searching PubMed and EMBASE databases to identify all randomised controlled trials published up to March 2023 for large core thrombectomy, as defined by an Alberta Stroke Programme Early CT Score (ASPECTS) of ≤ 5 . Functional independence was defined as a mRS of ≤ 2 . Random effects meta-analytic models were utilised to summarise the effect of intervention compared to control. The number needed to treat and absolute risk difference was calculated.

Results: Four studies met the eligibility criteria. In a random effects model, statistical significance was demonstrated in LCIS thrombectomy towards regaining functional independence (OR 3.07, 95% CI 2.13–4.42). The number needed to treat (NNT) was 7, absolute risk reduction (ARR) was 13.9%, and mRS ≤ 2 was achieved in 24.2% of patients with LCIS thrombectomy.

However, this is lower when compared to the conventional thrombectomy, with a recent meta-analysis demonstrating a NNT of 5, an ARR of 26.6%, and a mRS ≤ 2 achieved in 45.9% of patients.

Conclusion: LCIS thrombectomy increases the rate of functional independence but not to the same extent as conventional thrombectomy. This should be clearly stated to patients and families during the informed consent process when considering intervention in large core ischaemic strokes.

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Serious Falls Over One-Year After Stroke: Insights from a Large International Rehabilitation Trial

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Background: Falls following stroke are prevalent and debilitating. Around half of individuals will fall within the first year post-stroke and these falls are more likely to cause serious injury compared to people without stroke

Aims: Using data from A Very Early Rehabilitation Trial (AVERT) [1], this study aimed to investigate the frequency, context and consequences of serious falls (i.e., those classified as serious adverse events) over 12 months post-stroke. Additionally, we explored potential risk factors associated with these falls.

Methods: Serious falls were those resulting in death, life threatening conditions, hospitalisation or prolonged hospital stay. Demographic details, pre-existing function, stroke severity, hemi-neglect, functional independence and mobility were collected within 24hrs post-stroke. The associations between serious falls and these baseline variables were assessed using Fisher's tests or Firth's logistic regressions, with adjustments for age, stroke severity (NIHSS) and AVERT intervention.

Results: Among the 2104 participants (mean age 70.6 ± 12.8 , 61% male), 85 individuals (4%) experienced at least one serious fall (mean age 78.1 ± 9.7 , 53% male). There were 91 individual serious falls incidents. While precise context was not consistently recorded, falls most often occurred while walking, at home and during the day. Fifty-five (60%) serious falls resulted in fracture. Our analysis showed that advanced age (OR 1.06, 95%CI 1.04–1.09), lower Mobility Scale for Acute Stroke scores (OR 1.06, 95%CI 1.03–1.11 per one-unit decrease), and inability to walk independently for 10m within 24hrs of stroke (OR 6.25, 95%CI 1.59–50) were associated with a greater risk of serious falls.

Conclusion: This large study found that 4% of individuals experienced at least one serious fall in the first year after stroke and 60% of these involved a fracture. Our findings highlight the importance of considering factors such as age and early post-stroke mobility to identify at-risk individuals and facilitate targeted falls and injury prevention strategies.

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The development and implementation of the Focal Neurological Observation Tool (F-NOT) using an interdisciplinary approach in a quaternary hospital in Queensland

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Background: The Glasgow Coma Scale (GCS) is insensitive for identifying focal neurological deterioration in neurological and stroke syndromes.

Aims: To develop and implement a practical and sensitive neurological observation tool to improve the early detection of focal neurological deterioration in an inpatient population.

Methods: The Focal Neurological Observation Tool (F-NOT) was developed to identify early neurological deterioration in neurology and stroke patients prior to them triggering a Medical Emergency Response Team (MERT) response through GCS-based escalation criteria. Changes in addition to the GCS included the addition of focal neurological assessments, escalation requirements, and a track-and-trend addition to limb power assessment. Success was therefore defined as a reduction in MERT activations for neurological deterioration.

We used rapid cycles of change in consultation with subject-matter experts to create the tool. F-NOT was trialled in several clinical areas in metropolitan, regional and rural facilities across Queensland. Users received pre-trial Just-In-Time training and viewed instructional media. A 4-month consultation period, 17 early iterations, and 4 further revisions were based on trial feedback including qualitative surveys assessing usability and efficacy.

Results: Using F-NOT, per month median MERTs for neurological deterioration decreased by 33.3% from pre-implementation (58.5/month) to post (39/month), indicating improved early identification of neurological deterioration.

A survey of 31 nurses found the tool easy-to-use (72%), accurate at identifying deteriorating patients (76%), and recognized that it assisted in obtaining an urgent medical review (68%). 100% compliance was demonstrated with GCS and limb power assessment.

Conclusions: F-NOT is a novel user-endorsed neurological assessment tool that demonstrated improvement in early detection of neurological deterioration resulting in fewer MERTs, prompt medical review, and improved patient safety. The tool is currently being implemented statewide with plans for further study amongst experienced and novice nurses and medical staff.

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Increasing Adherence to the Acute Stroke Guidelines: A Quality Improvement Initiative for Occupational Therapists based on the Knowledge-To-Action Framework

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Background: Despite research evidence supporting best practices in acute stroke care, gaps in translating this research into everyday occupational therapy practice exist. At Alfred Health, a working group was formed to support the translation of the Australian and New Zealand Clinical Guidelines for Stroke Management on an acute stroke unit.

Aims: To develop and pilot a tailored multifaceted implementation program to improve adherence to acute clinical practice guidelines by occupational therapists.

Methods: The working group applied the Knowledge-To-Action Framework (KTAF) to first review the guidelines and select those applicable to occupational therapists. Actions were prioritised based on past acute audit results (2021) before reviewing existing research literature. A multifaceted quality improvement intervention was developed including a clinical pathway, evidence-based work instructions, and routine data

collection for performance monitoring and team feedback. A sample of routine data collection was audited prior to (n=20) and at the end of the intervention (n=20).

Results: Six clinicians participated in this quality improvement project. Preliminary audit data suggest percentage change improvements in (1) completed Occupational Therapy home environment screening (+7%), (2) completed cognitive screening (+20%) and (3) provision of education aligned to return to work (+100%). Additionally, completion of functional assessment increased by 29% (selfcare) and 38% (hot drink preparation). This project is still underway; full results (n=470) will be analysed for presentation following completion of the implementation period (30/04/2023).

Conclusion: A multifaceted quality improvement intervention developed based on the KTAF was feasible to implement and led to improvements in occupational therapists' adherence to the stroke guidelines in a busy acute-care unit.

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Mood Screening for People Discharged from an Acute Hospital After Stroke: Initial Experience

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Background: Altered mood affects approximately half of all stroke survivors and can develop any time post-stroke. We are piloting a mood screening process for people discharged home after stroke.

Aims: A) To describe the proportion of stroke patients with symptoms of anxiety or depression after discharge and B) to describe the referral process to a clinic newly established by the Psychiatry Service for symptomatic stroke patients.

Methods: Consecutive patients discharged from the John Hunter Hospital (JHH) Neurology Department with a primary or secondary diagnosis of acute stroke (ICD-10: I61, I63, I64) or transient ischemic attack (G45) were included. Screening tools for the patient [Hospital Anxiety and Depression Scale (HADS)] and carer [Behavioural Outcomes of Anxiety (BOA) and Stroke Aphasic Depression Questionnaire-Community Version (SADQ-10)] were administered by mail out approximately four months post-discharge. A list of local mental health services was also provided. Patients above the cut-off for potential mood disorders on any tool (HADS-A $\geq$ 8; HADS-D $\geq$ 11, BOA $\geq$ 14, SADQ-10 $\geq$ 14) were referred to the rapid-referral psychiatry clinic established for this project.

Results: From 15 June (project commencement) to 30 November 2022, 48% (352/741) of discharged neurology patients were eligible. As of April 2023, 32% (112/352) of eligible patients had returned the HADS or BOA/SADQ-10 forms. Forty-one patients (12% of all eligible, 37% of returned forms) were flagged with the Psychiatry Service: 44% (18/41) for anxiety, 54% (22/41) for anxiety and depression and one patient with anger management issues that the patient and carer had both documented on their forms. Letters outlining the scores were sent to the GP of the other 63% of patients with returned forms.

Conclusion: The piloted process has identified a high proportion of patients with altered mood; however, the response rate was 32%. We plan to trial contacting patients electronically to hopefully improve response rates.

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High Intensity Interval Training P_{ost}-Stroke (HIIT-POST): Preliminary results

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Background: High Intensity Interval Training (HIIT), encompassing alternating bouts of higher and lower intensity efforts of cardiorespiratory fitness training, increases circulating biomarkers associated with enhanced neuroplasticity post-stroke. HIIT also increases cardiorespiratory fitness and cardiovascular health. But HIIT is not routinely recommended or prescribed following stroke.

Aims: This study aims to explore the barriers and facilitators to participation and prescription of HIIT by stroke survivors and clinicians, respectively.

Methods: A mixed methods study design is being used, consisting of a questionnaire and semi-structured interview. Stroke survivors and health professionals are being recruited via social media and study flyers distributed in Australian Catholic University Health Clinics and Exercise Lifestyle Clinics (i.e., Queensland, Victoria, and New South Wales). Barriers and facilitators to HIIT were conceptualised from existing post-stroke exercise and physical activity literature, with amendments to focus on HIIT specifically. The questionnaire was co-designed by stroke survivors with the research team and pilot tested by consumers (i.e., stroke survivors and health professionals). The semi-structured interview questions were developed by the research team in consultation with a sport psychologist. Questionnaire data will be presented as frequencies (counts and percentages) of responses per statement. Interview data will be presented as identified themes using the Framework Analysis approach.

Results: While data collection is ongoing, 10 stroke survivors and 14 health professionals (i.e., exercise physiologists, physiotherapists) have completed the questionnaire, and three stroke survivors have been interviewed via Zoom. Preliminary results indicate that stroke survivors are interested in completing HIIT, and health professionals commonly recommend HIIT to stroke survivors, though their confidence to prescribe HIIT is limited.

Conclusion: The findings of this study may assist in the development of strategies to increase HIIT uptake and implementation in clinical practice.

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Love Your Brain: Protocol for a novel stroke prevention digital platform

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Background: Stroke is highly preventable through effective management of risk factors. Most Australians have at least one risk factor for stroke but there are insufficient population-based strategies for preventing stroke. The growing demand for Stroke Foundation's StrokeSafe (stroke

education) presentations suggests that Australians are eager to learn about stroke prevention. To deliver the StrokeSafe presentations at scale, more accessible, effective, and cost-effective digital education programs are needed.

Aims: To co-design (with people with lived experience of stroke), implement and evaluate a novel multi-component digital health platform (Love Your Brain) for stroke prevention.

Methods: The Love Your Brain digital platform will comprise an online, structured stroke education program (Massive Online Open Course), and reinforcement messages via SMS/email. The digital platform is currently being co-designed with two advisory panels (community members and stroke knowledge experts; Stage 1). The platform will then be tested in a pragmatic feasibility pilot study (Stage 2) and evaluated in a three-arm randomised clinical trial (Stage 3). The primary outcome will be self-reported general practitioner visits for assessment of risk factors for stroke (e.g. blood pressure, lipids) within 12 weeks post-randomisation (verified using Medicare data). Secondary outcomes include improved knowledge of signs and risk factors of stroke, uptake of healthy behaviours, and medication adherence.

Results: Co-design of the digital platform is currently underway through a series of focus groups (to be completed October 2023) with significant interest from community members and stroke knowledge experts. Stage 2 testing of pragmatic feasibility will be initiated in early 2024. Stage 3 evaluation of the randomised control trial will be undertaken 2024/2025.

Conclusion: The Love Your Brain digital platform is generating substantial interest from stakeholders in Australia, who are actively involved in the co-design process. If effective, this platform will improve public awareness of stroke and management of risk factors.

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Four Year Data of a Newly Established Stroke Unit: A Physiotherapy Perspective

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Four Year Data of a Newly Established Stroke Unit: A Physiotherapy Perspective

Background: The Joondalup Health Campus (JHC) is a secondary hospital in Perth, WA. In February 2019, the JHC Stroke Unit was established to enhance stroke survivor care in the northern suburbs. It provides comprehensive stroke inpatient (12 beds) and outpatient services to ensure a complete continuum of care for stroke patients. It is staffed by four Stroke Physicians, Clinical Nurse Specialists, Physiotherapists, Occupational Therapists, Speech Therapists, Dietician and Social Worker. It was set up utilising the recommendations of the National Stroke Foundation Guidelines for Stroke Rehabilitation and Recovery.

Aims: The primary objective is to analyse referral patterns, length of stay, discharge destination, and physical outcome measures of patients admitted to the JHC stroke unit as an ongoing Quality Improvement Project.

Methods: A database has been maintained by the Senior Physiotherapist since the stroke unit's inception. The current analysis includes all patients admitted to the JHC Stroke Unit from February 2019 – December 2022. Data collection includes but is not limited to type, side and location of stroke, 4 Point Pusher Scale, Berg Balance Score, ambulation status, 10 metre Walk Test (10mWTT), discharge destination and follow up services initiated.

Results: The data shows that 73.1% of stroke survivors are admitted via the Emergency Department and 64.7% are over the age of 65. 83.2% of patents are discharged home with 3.1% transferring to another rehabilitation unit and 5.8% moving into Residential Aged Care. Of the patients discharged home, 96% are discharged within 30 days and 78.3% are ambulant in the community.

Conclusion: The JHC Stroke Unit is achieving excellent patient outcomes as demonstrated by this analysis of the Physiotherapy Database

and is at par with the standards of the Australian Stroke Clinical Registry. The database will be analysed annually to assist in continuing to review our processes and practices.

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Implementation of a Leisure Reintegration Program for Stroke Survivors: A Feasibility Study

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Background: Participation in meaningful leisure activities is significantly impacted following stroke, which can lead to decreased quality of life and psychological wellbeing. Despite this being a common community rehabilitation goal following stroke, re-engagement with leisure activities is poorly addressed within Australian rehabilitation services.

Aims: This study aimed to assess the feasibility and effect of a leisure reintegration group program for people with stroke and stroke-like conditions within a community rehabilitation service.

Methods: A single-site, pre- and post-test feasibility study was conducted at a community rehabilitation service in Queensland, Australia. Adapted from the Leisure Content Education Model, three cohorts participated in a semi-structured program, each completing eight sessions over four weeks. Clinical and feasibility outcomes were collected. Clinical effect was measured on the Nottingham Leisure Questionnaire (NLQ) and Leisure Satisfaction Measure (LSM); feasibility was assessed by collecting data on recruitment and intervention adherence, determining staffing requirements, and monitoring acceptability and safety during the program.

Results: Of the n=14 consenting participants to complete the program, nine completed all outcome measures. Mean change scores for the LSM was 4.25 (95% CI -8.53 to 17.02, p=0.46) and the NLQ -3.63 (95% CI -8.27 to 1.02, p=0.11). The program was well attended (70%), deemed acceptable by participants, and safe and feasible to deliver within the publicly-funded service.

Conclusion: Providing a leisure reintegration group program met an identified need, developed client and carer capacity, and was feasible to deliver within a community rehabilitation service for clients with stroke and stroke-like conditions. A sufficiently powered trial is warranted to examine the effectiveness and cost-effectiveness of this intervention.

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Developing a Goal Setting Process that is Culturally Safe and Meaningful for Maori in an Integrated Stroke Unit

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Background: Goal setting is an integral part of person-centred rehabilitation. It can promote engagement and align the expectations of the patient, whanau (extended family), and rehabilitation team.

For Maori the goal setting process needs to be guided by Tikanga (process), particularly Whakawhanaungatanga (building connections and trust), and needs to be a collaborative, collective experience. The patient is rarely considered in isolation, they are part of a whanau unit. We set out to design a process that meets these needs.

Aims: To create a goal setting process that is meaningful, collaborative and culturally safe for Maori and their whanau, on a comprehensive stroke unit.

Methods: A working group, including Maori clinicians, reviewed the current goal setting process, relevant literature and current best practice guidelines. In consultation with Maori health leads we developed new documentation, incorporating familiar cultural terms and used PDSA (Plan, Do, Study, Act) cycles to test this and new processes with both Maori and non-Maori.

Results: Our review revealed a very euro centric process, with no Tikanga to make this meaningful for Maori. Patient and whanau had limited involvement.

Goals were often set by clinicians with the patient, with minimal discussion between the rest of the team. Staff needed training to implement a new goal setting process, especially introducing the foundation of the process, a Maori health model - Te Whare Tapa Wha (Durie, 1982).

A new process encouraging whakawhanaungatanga with patient/whanau and then IDT meetings, lead to a collaborative, culturally safe experience for patients and whanau. New paperwork, informed by the Te Whare Tapa Wha model was used during these discussions.

Staff needed training to use the Te Whare Tapa Wha model, as conversations regarding spiritual health and mental well-being was new for them.

Conclusion: The new process is integrated and continues to be refined and feedback continues to be collected.

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Blood Pressure Changes During General Anaesthesia for Stroke Endovascular Thrombectomy

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Background: General anaesthesia (GA) during endovascular thrombectomy (EVT) appears to improve procedural success¹. However, an important concern is that fluctuations in blood pressure (BP) during GA may negatively affect stroke outcomes², particularly when stroke cohorts are predominantly hypertensive (HT). Understanding hemodynamic fluctuations under anaesthesia is critical in improving outcome after EVT.

Aims: We aimed to explore hemodynamic fluctuations during EVT in patients under GA, and any association with functional recovery. Our objective was to determine whether different subsets of population, based on history of HT and baseline BP, exhibited different BP trends under GA.

Methods: Data was collected retrospectively from the stroke registry at Auckland City Hospital. 1078 patients undergoing EVT since 2012, within 6 hours of symptoms or within 24 hours if wake-up stroke, were screened. Exclusion criteria were pre-hospital intubation, incomplete electronic anaesthesia data, or TICI score less than 2a. Exposure variables were baseline, mean procedural (MnBP), nadir BP, change in MnBP from baseline (Δ BP). Primary outcome measure was 90-day modified Rankin Score (mRS).

Results: 427 patients were included for analysis (mean age 67.1 ± 15.6 years, 51.8% males). 53% of normotensives (NT) and 69% of HT had high baseline BP (>150 mmHg). Δ BP was greater in HT vs NT patients (-8 ± 22.5 vs -12.8 ± 24.7 mmHg; p=0.024). Interestingly, regardless of history of HT, the fall in blood pressure was significantly more in patients with high baseline BP (-22.0 ± 20.2 vs 7.1 ± 17.8 mmHg, p<0.001). mRS scores in either groups did not show a significant difference.

Conclusion: Procedural BP falls during EVT procedures are more common in HT subsets. However, baseline BP may be a better indication for larger relative falls in BP than HT history alone. A uniform approach to hemodynamic management may be disadvantageous for these patients. Further research focused on guidelines for BP management in at-risk patients is warranted.

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Impact Of Changing Telestroke Notification To Post CT In The Central Region Of Aotearoa New Zealand

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Background: A telestroke service has been established in the Central Region of Aotearoa since 2016, whereby Wellington-based neurologists perform hyper-acute stroke assessments via video conferencing for patients presenting to eight regional hospitals. On the 1st of July 2022, telestroke pathways were changed, so that the neurologist was notified after neuroimaging, rather than before.

Aims: The study's aim was to assess the impact of the change in the telestroke notification on reperfusion treatment metrics.

Methods: A retrospective audit of prospectively collected data as part of the REDCap telestroke database was conducted comparing the six months prior to and following the change. The primary outcome measures were reperfusion rates and door-to needle times. Secondary outcomes included door-in-door-out time and percentage of calls which resulted in reperfusion therapy. Wilcoxon rank sum test was used.

Results: The reperfusion numbers were similar in the pre-imaging notification (86) and post-imaging (91) study periods. Time metrics were similar: door-to-needle (median 65 (IQR 52-87) vs 63.5 (59-92); $p=0.88$); door-to-CT (median 29 (18-37) vs 26 (20-41); $p=0.51$), and CT-to-needle (34 (29-53) vs 33 (30-56); $p=0.51$). Thrombolysis rates by telestroke alerts were similar pre-imaging 105/351 (29.9%) and post-imaging 109/390 (27.9%). For clot retrieval patients, the door-in-door-out and number of telestroke alert median was unchanged (160mins (IQR 110-173) vs 164mins (109-180); 360-358 minutes respectively; $p=0.56$). This data does not account for temporal trends, a potential confounder.

Conclusion: These finding suggest that the change in notification did not negatively affect reperfusion treatment metrics, and post-imaging notification appears to represent a safe alternative to early notification in the Central Region of Aotearoa.

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Use of SMS in Obtaining Patient-Reported Outcomes in the Australian Stroke Clinical Registry

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Background: Patient-reported outcomes are integral to understanding the burden of stroke. The Australian Stroke Clinical Registry (AuSCR) collects patient outcomes 90-180 days after stroke/TIA, however current data collection methods via mail and telephone are resource intensive.

Aims: To determine whether the added procedure of an SMS sent 4-weeks after the first mailout with a link to complete the survey electronically is feasible and efficient for collecting health outcome data.

Methods: Eligible patients from 27 hospitals registered in the AuSCR were randomised 1:1 to the standard follow-up process (two paper-based surveys by mail 6 weeks apart then contact by phone if no response) or to the new SMS protocol. Descriptive statistics were used to compare within and between group differences (chi-squared or Wilcoxon rank-sum tests).

Results: Overall 1,008 registrants were randomised and had similar profiles (58% male, median age 72 years). Eight were excluded post-randomisation and removed at the hospitals' request because the final diagnosis was not stroke/TIA. In the SMS group, 18% completed the survey via the SMS link. Overall follow-up completion was 11% greater in the SMS group compared to the standard group. Those who responded in the SMS group had a median response time that was 14 days shorter than the control group ($p<0.05$). The median age of SMS group participants that completed the survey via the SMS link was younger than those who completed by other methods (69 vs 74 years, $p=0.03$). Missing data were similar between groups.

Conclusion: Collecting patient-reported outcomes via an electronic survey sent by SMS was feasible; benefits included increased response rates and shorter time to completion. The younger median age of responders via electronic methods may indicate a preference over current methods. The use of SMS has now been adopted by the AuSCR as part of the follow-up protocol.

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An update on the progress of the PERSONALISED Knowledge to reduce the risk of Stroke (PERKS-International) randomised controlled trial

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Background: The Stroke Riskometer mobile phone app (the App) uses individual demographic, health, and lifestyle data to provide personalised information to modify stroke risk factors. The PERKS-International RCT is testing the App, compared to usual care group not informed about the App, to explore its effectiveness in reducing a stroke risk factor score at 6 months after randomisation.

Aim: To report on progress of recruitment, characteristics of participants and follow-up in this ongoing RCT.

Methods: This Phase III single-blinded endpoint 2 arm RCT is recruiting 790 participants across Australia and New Zealand (5 sites). Inclusion criteria: >35 and ≤ 75 years, 2+ modifiable risk factors, no history of stroke/CVD/dementia and owns a smartphone. Participants are recruited

via social media (Australia + NZ) and primary care (NZ) with self-screening online for eligibility with minimal contact with study staff. Assessments are conducted face-to-face at baseline and 6 months. The primary outcome is a combined behaviour and biomedical stroke risk score (range 0 [no healthy risk factors] to 7 [all healthy risk factors]) at 6 months. We examined (n, %) the completeness of screening, eligibility, randomisation and primary outcome assessment to date.

Results: Recruitment began in Australia in August 2021 and in New Zealand in March 2022. The COVID-19 pandemic has impacted recruitment several times. The screening website has been visited by 2,564 people, with 80% completing screening and 48% eligible to participate. Of those eligible, 504 (41%) people have been randomised with mean (SD) age 58.4 (10.8), 62% women, 65% tertiary educated, and 75% white/European ethnicity. The 6-month primary outcome assessment has been completed by 97% of participants.

Conclusion: Online self-screening requires minimal staff input but only 40% of eligible participants have continued to randomisation. Recruitment will conclude in September 2023 with primary outcome data available in May 2024.

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Comparisons between group- and individual-based programs to support recovery from stroke and ischaemic heart disease in the community: a scoping review

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Background: Community-based programs to support recovery after stroke or ischaemic heart disease (IHD) are offered in groups or individually. However, the evidence on the effectiveness of group versus individual formats is unclear.

Aims: To map and summarise the available literature on the type of program, effectiveness (health outcomes), retention, adherence, costs, or other benefits of group-based programs compared with similar individual-based programs provided for adults living with stroke or IHD in the community.

Methods: A scoping review was conducted based on Johanna Briggs Institute methods. Articles were retrieved from the following databases: Medline, PsychInfo, Embase, Scopus, and CINAHL from 2002 to 2022. Extracted outcomes from the included articles covered health outcomes for comparative effectiveness (such as impairments, activity limitations and participation restrictions), retention and adherence, social connection, and the costs associated with group- and individual-based programs.

Results: 1954 articles were retrieved. After screening, five studies were included. Three types of programs were assessed: exercise (3), communication (1), and occupational (1). Superiority of group- or individual-based programs for health outcomes was unable to be determined. The included studies were small (N=14-36 participants). Only one study reported adherence, in which the authors found that adherence was greater among

those participating in the group-based program. Authors of only one article discussed the role of social connection, in which they found that connection with peers were welcomed by participants in the group-based program. Costs associated with program delivery were not reported in the included studies.

Conclusion: There is limited evidence comparing community-based group and individual programs for adults living with stroke or IHD. Future adequately powered studies are needed to determine if group or individual-based program is more effective. Furthermore, additional studies that investigate patient and clinician experiences could provide insight into the value of delivering programs in these different formats.

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Setting community mobility goals after stroke: Falls after stroke trial (FAST)

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Background: After rehabilitation many people after stroke feel they have not been given 'permission' and therefore avoid community participation. The FAST trial aims to reduce falls after stroke by an intervention that combines exercise and home safety. An additional component aims to enhance confidence and skills in mobilising in the community through a specific goal-directed plan.

Aims: To evaluate the content of community mobility goals set by FAST participants and describe goal achievement at 6 and 12 months.

Methods: The therapist (occupational therapist or physiotherapist) supports participants to write a goal to maximise community participation, written in Goal Attainment Scale (GAS) format. The goal is established by week 5 of the intervention program and community mobility practice is included throughout the intervention. To date, 85 participants have nominated their goal and then reviewed goal achievement at 6 months and 46 participants additionally at 12 months. A content analysis of the goals explores their range and relevance, and analysis of GAS scores illustrate outcomes.

Results: Goals were personalised and varied. An example of a goal for a more disabled participant was to "walk confidently and independently to mailbox with walking stick to collect mail and return". In comparison, a less disabled participant nominated a goal to "walk independently in community at busier time of day in familiar area". By 6 months 31% (n = 26) had met their goal with 40% (n=34) surpassing their goal. Early results demonstrate goal maintenance at 12 months.

Conclusion: Setting community goals appears to be an important adjunct to an exercise program in the longer term after stroke. While balance and lower-limb strength is recognised as essential for people at risk of falling, gains made need to translate into participation in the community.

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The Acute Screening of Swallow in Stroke/TIA (ASSIST) Tool in Comparison to a Speech Pathology Assessment in a Comprehensive Stroke Centre

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Background: The Australian Stroke Foundation clinical guidelines strongly recommend all stroke and TIA patients have their swallow screened within four hours of admission prior to any oral medications, diet or fluids. The Acute Screening of Swallow in Stroke and Transient Ischaemic Attack (ASSIST) is a commonly used bedside nursing screening

tool to determine the risk of dysphagia and resultant aspiration after stroke. It comprises of four stages of assessment; if all stages are passed, the patient can recommence their premorbid diet and oral medications. Failure at any stage deems the patient nil by mouth until a formal speech pathology assessment is completed.

Aims: To assess the positive predictive value of the ASSIST tool against gold-standard, bedside speech pathology assessment.

Methods: We retrospectively reviewed demographics, ASSIST and speech pathology assessments for all patients with a diagnosis of acute stroke admitted to The Alfred Hospital, Melbourne, Australia between April 2021 and March 2022.

Results: Of the 390 patients who had an ASSIST completed, 249/390 (64%) passed the ASSIST and recommenced their premorbid diet. 141/390 (36%) failed the ASSIST.

Of the 141 who failed the ASSIST, only 75/141 (53%) were diagnosed with dysphagia by the speech pathologist assessment. 66/141 (47%) did not have dysphagia. The positive predictive value is 53%.

Conclusion: The ASSIST may result in a prolonged period of inadvertent fasting for patients who could safely commence oral medications, a diet and fluids.

Further investigation is warranted to understand the clinical utility of the ASSIST, including nurse training and inter-rater reliability.

A prospective study of sensitivity and specificity using a modified ASSIST pilot tool would be the next step to improve dysphagia screening tools in acute stroke.

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The long and the short of it: A retrospective audit of factors contributing to extended length of stay in stroke/TIA patients in a regional hospital

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Background: We conducted an audit of based on an observed increase in the length of stay (LOS) of admitted Stroke/TIA patients to our service.

Aims: This descriptive quantitative study of hospitalised stroke patients admitted to Grampians Health-Ballarat Base Hospital is aimed at understanding possible causes of prolonged LOS based on demographic and socio-economic data of patients. Our focus is on non-clinical factors that may influence LOS in the specific cohort of patients

We aim to use the identified factors to effect change within our service that other healthcare professionals, policy makers and others involved in the design and development of stroke services may use as a template and reference.

Methods: We conducted a retrospective audit of adult patients (aged ≥ 18 years). We collated existing non-identifiable, quantitative data in the medical records consisting demographic features and brief clinical data. The majority of data collection was based on socio-economic factors including home address, marital status, pre-existing care package etc. The statistical analysis is aimed at identifying trends, patterns, and relationships of non-clinical factors that influence LOS.

Results: We identified a number of socio-economic and demographic factors that contributed to prolonged LOS. This was especially true in older and disadvantaged patients with poor existing social support networks.

Discussion: Prolonged LOS in stroke patients is generally attributed to clinical factors. Our findings suggest that non-clinical factors are contributing factor. These issues need to be addressed differently and underline the importance of non-clinical members of the multidisciplinary team such as the social worker. (Words: 248)

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Open Access Automated Segmentation of Cerebral Blood Vessels from MRA using Hysteresis

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Background: MRI is a valuable tool for the intervention and treatment of cerebrovascular diseases. However, quantitative segmentation of blood vessels from raw MRI data, to study the disease and perform clinical measurements, is difficult and time-consuming. Automated methods provide a solution to this; however, such tools are scarce.

Aims: Due to the absence of open-access tools, we aim to develop an open-access segmentation method that generates cerebral vessel segmentations from Magnetic Resonance Angiography (MRA).

Methods: The novel method combines vessel size-specific Hessian filters and hysteresis thresholding for segmentation and connected component correction (CCC) for noise removal. The optimal choice of processing steps was evaluated with a blinded scoring by a clinician using 24 image samples from the IXI Dataset. The code is available at <https://github.com/georgiakenyon/Segmentation-method-for-cerebral-blood-vessels-from-MRA-using-hysteresis>.

Results: The ablation study confirmed that all steps of the method, in the specific sequence established, were required to optimize the segmentation output and produce the highest quality score (14.2/15). Omitting the CCC caused the largest quality loss (11.0/15), as CCC removed clusters of noise without affecting the structural integrity of the vessels, unlike existing morphological operations (e.g. erosion). Hysteresis thresholding reduced the loss of vessel edges during segmentation. Optimisation of Hessian filters for vessels of different radii improved segmentation, with complete loss of small vessel detail shown when a low Hessian parameter filter was omitted (12.8/15), and under-prediction of larger vessels when a high value Hessian filter was removed (12.4/15).

Conclusion: We provide and validate a method to efficiently segment vessels from brain MRA images for quantitative studies, improved diagnostics and intervention planning. The method, which is available on GitHub, can further be used to produce training data for solving the vessel segmentation problem from non-MRA modalities (e.g. T2-weighted images) using deep learning.

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Arms Matter. Is it feasible to implement an upper limb group on an acute neurosciences ward?

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Background: In a large metropolitan acute hospital, occupational therapists (OT) and physiotherapists (PT) reported stroke patients were not receiving the recommended amount of upper limb (UL) therapy due to competing clinical demands. Evidence endorses group therapy should be used to increase therapy time and improve opportunities for socialisation to increase engagement in rehabilitation.

Aims: To determine the feasibility of running an UL group in an acute neurosciences ward. Secondary aims were to increase 1) amount of UL therapy; 2) use of standardised UL outcome measures; 3) opportunities for patient socialisation; and 4) clinician confidence in UL goal setting and management.

Methods: Information from a literature review and benchmarking of major Victorian public hospitals was used to design and implement an UL group on an acute neurosciences ward. Feasibility was evaluated during the three-month period of the group's implementation. Patients meeting inclusion criteria, minutes of UL therapy per week, and outcome measures completed were collected. Clinicians were surveyed to understand their perceived confidence in UL management, (using Likert scales, with 10/10 indicating maximal confidence), and perceived barriers and enablers to conducting the group. Consumer feedback was collected.

Results: Following group implementation, average minutes of active UL therapy per person per week increased from 22 to 57 minutes. Patients who had completed an UL outcome measure increased from 11% to 45%. The clinicians involved reported increased confidence assessing the UL (6.7/10–8.3/10) and writing measurable goals (5.9 – 8.1/10). Patients reported an average enjoyment rating of 9/10 with key reasons including: "focusing on my arm", "being out of my room" and "seeing others like me". No adverse events occurred.

Conclusion: Overall, the group was feasible to implement. Despite challenges identified in the acute setting, there was positive feedback from both clinicians and consumers. The group has continued, because 'arms matter'.

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Can we be more inclusive? Recruitment Barriers to Exercise Trials for Stroke Survivors

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Background: Stroke rehabilitation trials involve heterogeneous samples with varying interventions, rendering the results difficult to generalise to the stroke population. Patients with communication and cognitive barriers are often excluded due to perceived participation difficulties in exercise therapies. The challenge of maintaining a balance between equitable representation and targeted research is an ongoing conundrum in trial designs. Strict eligibility criteria can limit generalisability, delay recruitment, and increase health inequities.

Aim: To review the literature and identify key eligibility criteria used in stroke exercise trials that limit recruitment.

Methods: A systematic review of stroke rehabilitation RCTs published 2017–2022 were included from an electronic database search (PUBMED). The inclusion criteria were: 1) randomised controlled trials, 2) ischaemic or haemorrhagic stroke patients, 3) exercise intervention, 4) cognitive outcomes (either primary or secondary) and 5) publication within the last 5 years (to capture pre- and peri-pandemic studies). Included and excluded studies were reported as per PRISMA guidelines.

Results: Eighty studies were identified with 19 (n=1908) included in the final review. A significant number of trials excluded aphasia (37%), had cognitive restrictions (68%) or mobility limits (58%). The presence of comorbid conditions such as neurological or psychiatric conditions were also common exclusion criterion (63%). The recruitment rate varied from 2% to 100%, with a mean of 48%. The most common exclusion reason was "does not meet eligibility criteria" (n=4604, 62%) followed by "declined to participate" (n=2242, 30%). Interestingly, 476 (6%) patients were excluded due to convenience reasons (e.g., lived too far away).

Conclusion: Despite being frequent post-stroke deficits, aphasia and cognitive impairment were common exclusions in stroke recovery exercise trials, limiting the applicability of such therapies in stroke survivors and

significantly reducing accessible cohorts. Researchers must expand the inclusivity of their trials to ensure all stroke patients who are presumed to benefit from an intervention are represented.

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A feasibility study of a multicomponent digital Care Assistant and support Program for people after Stroke or transient ischaemic attack (CAPS)

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Background: Our novel, multicomponent care assistant and support program (CAPS) for stroke or TIA was co-designed with consumers, clinicians, and scientists to improve secondary stroke prevention. The CAPS program is delivered entirely virtually over 12 weeks. It comprises of clinician-facilitated goal setting, health behaviours/risk factor monitoring through a mobile application (app) and a wearable device, and SMS messages to support the achievement of goals.

Aim: To determine the reach, adoption, and usability of CAPS as a secondary prevention program for people with stroke or TIA.

Methods: An open-label, non-randomised feasibility study which applied a single group, pretest-posttest mixed methods design. We sought to recruit ~40 participants via the Australian Stroke Clinical Registry from Victoria, Queensland, South Australia, and Tasmania. Eligibility: stroke or TIA 6 months to 3 years ago, ≥18 years, access to a mobile phone with internet, and living in a private residence. At baseline, participants set 1–2 secondary prevention goals, provided a wearable device to monitor risk factors, and trained to use the app. Feasibility outcomes included study recruitment, retention, and technology usage.

Results: Following mailed invitations, 58/600 (10%) agreed to participate, 22 were ineligible. Of the 36 eligible participants, 2 withdrew following baseline assessment. Subsequently, 34/36 (94%) participants commenced the program (median age 70 years, 27% female, 64% stroke). As of May 5th, 32 had completed the study, 1 withdrew. Preferred secondary prevention goals included increasing exercise (40%) and losing weight (23%). Wearable devices were provided to 26 participants (20 Fitbit, 6 Apple Watch); 11 requested to keep these. In the app, participants entered 4,775 health measurements (average of 132 per participant), recorded 874 text notes, and set 72 medication reminders.

Conclusions: The CAPS digital secondary prevention program was feasible, demonstrating good retention and engagement from participants. Findings will inform the design of an effectiveness trial.

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Evaluating the Safety and Efficacy of Telemedicine Neurology Assessments on a Mobile Stroke Unit: Protocol for a Randomised Trial

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Background: Stroke is the third most common cause of death in Australia. Early treatment leads to improved stroke outcomes. Mobile Stroke Units (MSUs) have been shown to deliver faster patient care, resulting in improved clinical outcomes and reduced disability. However, costs associated with staffing currently limit their use to densely populated cities.

Aims: Using the Melbourne MSU, we aim to validate a MSU telemedicine model as safe, timely, and resource-effective compared to a traditional onboard neurologist model. We hypothesise that the telemedicine model of care will provide superior resource efficiency without compromising patient care.

Methods: This study is a prospective randomized single-centre trial of a MSU telemedicine (using Zeus) versus an onboard neurologist staffing model using prospective designation of randomly permuted days onboard or a telemedicine neurologist. We will enrol all patients assessed on the MSU aged ≥ 18 years with stroke symptom onset < 24 h. The primary outcome will be the probability that a randomly selected participant in the telemedicine arm will have a better outcome than a randomly selected participant in the onboard arm. This will be measured using a desirability of outcome ranking design, a novel trial design involving, in order of importance: (1) safety; (2) scene-to-decision time metrics; (3) resource utilisation. All participants within each arm will be compared to those in the other, resulting in a "win, loss, or draw" for telemedicine, compared with the onboard arm.

Results: We hypothesise the telemedicine intervention will result in a "win/draw/loss" distribution of 0.5/0.2/0.3 corresponding to Win Odds = 1.5. A sample size of 270 patients, recruited over 6-9 months, and accounting for 10% non-evaluable data, will yield a power of 0.8.

Conclusion: Demonstrating superior resource efficiency of a telemedicine neurologist without compromising patient care will enable the broader utilisation of MSUs across Australia, improving equity in access to time-critical, lifesaving stroke care.

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Making Home First a Priority: Increasing Discharges to Early Home-Based Rehabilitation From a Tertiary Acute Stroke and Neurology Unit Using Low-Cost Interventions Identified Using the Capacity Opportunity Motivation Model of Behaviour Change – A Pre-Post Study

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Background: With a hospital-wide strategic priority of "home first" and stroke related hospitalisations increasing nationwide, our hospital saw the need to increase utilisation of our early supported discharge service (ESD) by our acute stroke and neurology cohort.

Aims: Our aim was to increase this cohort's referrals and discharges to ESD, through low-cost interventions identified using the COM-B (Capacity, Opportunity, Motivation) Model of Behaviour Change.

Methods: Pre-post study in acute stroke and neurology. The primary outcome of interest was discharges to ESD. Small scale interventions were identified based on staff survey using the COM-B. Public consumers reviewed the interventions and gave feedback prior to implementation. Interventions delivered over an 8 month period included: sharing ESD patient stories, referral checklist, and refinement of referral communication channels.

Results: Data were analysed on 1181 patients in the pre-phase (median age 65 [50-77] years, females 47%) and 631 patients in the post phase (median age 66 [52-76] years, females 47%). Pre and post patient groups were similar with respect to admission speciality (stroke or neurology) and admission continence. Discharges with ESD statistically increased from 4% (n=51) in the pre-phase to 7% (n=44) in the post-phase (p=0.02). Nineteen staff were surveyed in the pre-phase, and 29 in the post. Post-survey staff reported increased levels of ESD knowledge (pre-survey 42%, post-survey 79%, p=0.008) and increased confidence in referring (pre-survey 37%, post-survey 69%, p=0.028).

Conclusion: The COM-B model in conjunction with consumer consultation can be used to tailor low-cost interventions for behaviour change and increase service utilisation of ESD.

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Championing Better Care for Young People with Stroke: Australia's New Young Stroke Service

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Background: Too many young people with stroke report unmet needs related to their age and life stage, and health services for young people are very limited. To improve access to appropriate services for young people with stroke, we are building a dedicated, co-designed, digitally enabled health service. Two test sites are in Victoria and South Australia, with the ultimate goal of expanding nationally.

Aims: Key aims are to establish a digital platform to engage with young adults with stroke, establish a suite of screening and assessment tools, validate new clinical pathways, and establish a curated patient dataset to inform future clinical research. We outline 18-month achievements and planned evaluations of our 5-year project.

Methods: Existing services have been mapped, and evaluations of communication accessibility, health economics, service provision, digital platform, and user acceptability of our new service have commenced.

Results: The project group comprises over 70 investigators, staff and consultant groups of people with lived experience of stroke, and General Practitioners. Ethical and clinical approvals have been received, including for the collation of core measures and clinical processes of all users for evaluation purposes. Our first patient was enrolled in March 2023, and the digital platform and service officially launched in May.

Conclusion: This new service will fill critical gaps in diagnosis, treatment and ongoing support for young adults with stroke. Ongoing evaluations will inform clinical policies and practice, and critical considerations for sustainability of the service beyond the life of our project.

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Unspoken, unseen, and at times, silenced: The emotions and emotional work of people in stroke services in Aotearoa

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Background: Well-being is critical to living well and flourishing after stroke. While physical aspects of recovery are commonly well-addressed within services, broader aspects of well-being can remain unrecognised and unsupported in care.

Aims: To identify how people's experiences in stroke services impact on well-being.

Methods: Our research uses Interpretive Description methodology. Using He Awa Whiria as a framework for upholding Māori and non-Māori knowledges, we conducted 37 semi-structured interviews with 24 people with stroke and 13 family or whānau members. Data were analysed using reflexive thematic analysis.

Results: People impacted by stroke report many unspoken, unseen and seemingly invisible experiences during care which impact on their well-being. In this presentation, we report on one theme identified: "the hidden emotional work". People undertook significant emotional work in response to the social, emotional, and relational impacts of stroke. The depth of this work was reportedly unseen by others, sometimes hidden from staff, and at times, made visible but then actively or passively silenced through clinicians' care practices. Examples include giving primacy to people's physical needs, excluding family and whānau, and diminishing the person's worldview and cultural identity. This could compound the emotional burden carried by people with stroke and whānau, and overall, contributed to many people reporting a dominant sense of feeling alone and unheard. Care processes did not appear to prompt or support staff to attend to people's emotions; instead, this was reliant on individual staff recognising and providing support.

Conclusion: The emotional impacts of stroke are significant, yet not consistently recognised. It appears vital that clinicians and services create space to attend to and support people's emotions and broader well-being. This work should prompt reconsideration of what is valued and given primacy in stroke care, if we are to provide high-quality, person-centred care that supports people to live well after stroke.

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Supporting Well-being After Stroke: The Problem of the Pace of Stroke Care in New Zealand

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Background: Psychosocial well-being is important for living well after stroke, however, people with stroke and clinicians agree that it is not adequately addressed in services. It remains an unmet need after stroke, contributing to the burden of stroke. Clinicians have previously suggested their ability to address well-being is limited by their work environment.

Aims:

- (1) To explore how clinicians support well-being, and
- (2) To understand how practice is influenced by the context in which clinicians work.

Methods: Informed by an Institutional Ethnography methodology, we interviewed 35 healthcare professionals working across the continuum of care throughout New Zealand. Data were analysed using an applied tensions analysis framework.

Findings: In-patient stroke services are focussed on delivering best physical and impairment-based outcomes for people with stroke during the early phase post-stroke. When combined with time-limited services and significant caseload and discharge pressures, it meant other areas of care were pushed out. While clinicians described providing conditional psychosocial support in-the-moment, holistic well-being was generally viewed as an aspect of care and recovery that could be deferred and addressed later by other services. Instead, providing the 'best chance' of physical improvement and working at 'top of scope' were prioritised. Many clinicians felt they had limited agency to resist the dominant pace of care despite knowing this had consequences for people with stroke. Clinicians expressed frustration at the pace of care, although often inadvertently reproduced this pace.

Discussion: The pace of services shapes the goals of the service and the types of care and aspects of stroke that are prioritised. This influences what people consider is a good outcome, and what it means to recover and live well after stroke. Given the high rates of psychosocial distress post-stroke, it is imperative that we critically consider the unintended consequences of dominant approaches to care.

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Low Sensitivity of 000 Dispatch for Recognition of Thrombectomy Patients

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Background: Dispatch algorithms used by emergency 000 call-takers to recognise stroke have limited diagnostic accuracy, but it is currently unknown whether recognition may be better in patients requiring thrombectomy due to more severe deficits.

Aims: We aimed to evaluate the accuracy of 000 call-taker dispatch codes for recognising thrombectomy patients as having a stroke.

Methods: We linked 000 call-taker dispatch codes to metropolitan and rural patients receiving thrombectomy (direct presenting and secondary transfer) at The Royal Melbourne Hospital from 2007-2021. The primary outcome was the proportion of cases dispatched as stroke versus non-stroke, with secondary analyses of differences in time to thrombectomy and recognition accuracy according to baseline clinical severity. Chi-square and Mann-Whitney tests were used where appropriate.

Results: A total of 618 patients were successfully linked, of whom 382 (61.8%) were recognised by the 000 call-taker as having a stroke. This rose to 552 (89.3%) post paramedic arrival and assessment. Of the non-stroke dispatches, the most common were "Unconsciousness/Fainting" (117; 49.6%) and "Falls" (40; 16.9%). Patients with higher baseline severity (NIHSS ≥ 10) were less likely to receive stroke dispatch than those with a lower severity (59% vs 76%, $p < 0.001$). No statistically significant time differences were found between stroke and non-stroke dispatches for time from dispatch to thrombectomy (median 208 vs. 216 minutes, $p = 0.593$) or time from hospital arrival to thrombectomy (median 42 vs. 42 minutes $p = 0.851$).

Conclusion: Nearly 40% of thrombectomy patients were not recognised as having a stroke by the 000 call-taker, with 10% still unrecognised after paramedic assessment. Patients with higher baseline severity were less likely to receive a stroke dispatch despite theoretically having more obvious symptoms. Time to thrombectomy; however, was not significantly longer for non-stroke dispatches.

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Incidence of Spontaneous Intracerebral Haemorrhage in Patients Prescribed Oral Anticoagulants: A Five-Year, Single-Centre Retrospective Study

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Background: Oral anticoagulants (OACs) are used commonly in patients with prosthetic heart valves, treatment of venous thromboembolism and systemic embolism prevention in atrial fibrillation. Intracranial haemorrhage is a feared and potentially fatal complication of OAC therapy. National stroke guidelines recommend reversal of OAC in selected patients with spontaneous intracerebral haemorrhage (sICH).

Aims: To investigate the incidence and type of OAC-associated sICH at a major tertiary neuroscience referral centre over a five-year period.

Methods: International Classification of Diseases (ICD-10) I60.x and I61.x discharge coding data were used to identify total events of intracranial haemorrhage (ICH), presenting from 1 January 2018 to 20 September 2022. Patients were included if they were on an OAC pre-admission and had sICH confirmed on imaging. Patients were excluded if the bleed was trauma-related, neoplastic, an incidental finding or a haemorrhagic transformation of a cerebral infarct. Primary outcome was the incidence of each OAC in OAC-associated sICH. Secondary outcomes were types of bleeds.

Results: There were 1781 ICH admission events screened, of which 72 (4%) patients met the criteria for inclusion (mean 15.2 per year). Among these, 39/72 (54%) were primary emergency department presentations and 33/72 (46%) interhospital transfers. Patients were most frequently taking apixaban 30/72 (41%), followed by warfarin 23/72 (32%), rivaroxaban 17/72 (24%) and dabigatran 2/72 (3%). There were intracerebral 64/72 (89%) and subarachnoid 8/72 (11%) haemorrhages. The bleed locations were cortical 37/72 (51%), subcortical 21/72 (29%), cerebellar 9/72 (13%) and intraventricular 5/72 (7%). Intraventricular extension was seen in 30/72 (42%).

Conclusion: OAC-associated sICH is uncommon in our comprehensive stroke service, accounting for 4% of all ICH admissions. About two-thirds were related to factor Xa inhibitors. Effective reversal of factor Xa inhibition is a potential therapeutic target in selected OAC-associated sICH.

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Characteristics of Patients Presenting with Oral Anticoagulant-Associated Spontaneous Intracerebral Haemorrhage: A Five-Year, Single-Centre Retrospective Study

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Background: Oral anticoagulants (OACs) are routinely prescribed for conditions such as atrial fibrillation (AF), prosthetic heart valve replacements (VR) and venous thromboembolism (VTE). Bleeding remains an inherent risk, with spontaneous intracerebral haemorrhage (sICH) a potentially fatal consequence.

Aims: To characterise patients presenting with OAC-associated sICH over a five-year period at a tertiary neuroscience referral centre.

Methods: Through International Classification of Diseases (ICD-10) I60.x and I61.x discharge coding data, patient events of intracranial haemorrhage (ICH) were acquired from a major hospital centre from 1 January 2018 to 20 September 2022. Inclusion criteria was confirmed OAC-use pre-admission and sICH confirmed on imaging. Exclusion criteria were bleeds related to trauma, neoplasia, incidental findings, or haemorrhagic transformations of cerebral infarcts. Baseline demographics, medical comorbidities, pre-morbid modified Rankin scale (mRS), time of hospital arrival, first brain imaging, haematoma volume and expansion, and discharge outcomes were obtained.

Results: Of 1781 ICH presentations, 72 were included (median age 79; female 36/72, 50%). OAC indications were primarily AF 52/72 (72%) and VR 12/72 (17%). Interhospital transfers (IHT) accounted for 33/72 (46%). Majority were known hypertensives 55/72 (76%). Median mRS was 1. Median ictus-to-arrival hours for primary emergency department presentations (PEDP) was 4.1, and 11.3 for IHT. Median door-to-imaging time for PEDP was 27.5 minutes. 20/72 (28%) died in hospital with a median length of stay (days) of 1.1 compared to 9.2 for survivors. Among available initial scans 33/72 (46%), fatal sICHs had a median initial sICH volume of 27 cm³ versus 7 cm³ for survivors. Majority of survivors 42/52 (81%) were discharged to a rehabilitation facility.

Conclusion: OAC-associated sICH occurred in hypertensive, elderly, fit individuals that had a high early fatality (28% in 24 hours). Timely diagnosis and effective reversal remain an important therapeutic target.

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A Nudge in the Right Direction? Haptic Nudging using Wearable Devices for Upper Limb Stroke Rehabilitation

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Background: Wearable devices that deliver haptic nudges have shown potential for increasing physical activity in stroke rehabilitation. Haptic nudges provide vibratory stimuli via a wearable device. These devices have the potential to improve outcomes from rehabilitation for people with stroke by promoting upper limb activity.

Aims: The aim of this study was to determine the optimal method for delivering haptic nudges to promote upper limb activity in stroke rehabilitation by investigating diurnal variation in the effect of haptic nudges, the

duration of the effect, and the impact of repeated nudges on upper limb activity.

Methods: The study analysed data from a multiple-period randomized crossover study involving 20 participants with stroke undergoing inpatient rehabilitation. The participants received haptic nudges via the BuzzNudge wrist worn wearable device over a single 12-hour day. Observations were conducted in 72 one-minute periods, during which participants received either a 'nudge' or 'no nudge' at the start of each period, based on a randomization schedule. The upper limb movement of each participant was observed and classified, and statistically analysed using longitudinal mixed models.

Results: The findings showed that the odds of affected upper limb activity immediately following nudging varied significantly across the day. Increasing repetitions of nudges did not have a cumulative effect. However, longer breaks without haptic nudging resulted in a diminished effect. The effect of the haptic nudge was no longer statistically significant at 50-60 secs post-nudge.

Conclusion: The research has implications for the development of wearable devices that deliver haptic nudges in stroke rehabilitation and provides valuable insights into how these devices can be used most effectively. The findings suggest that the scheduling of nudging across the rehabilitation day should be carefully planned, and long periods without nudging avoided. Further research is needed to determine the effects of different haptic nudge schedules over longer periods of time.

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CT Perfusion-guided Patient Selection and Perioperative Care in Superficial Temporal Artery-Middle Cerebral Artery Bypass Surgery: a Pilot Series

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Background: STA-MCA bypass surgery (SBMS) may be considered as a rescue treatment for patients with progressive stroke in the setting of intracranial steno-occlusive cerebrovascular disease despite optimal medical management.

Aims: The aim of this study was to describe the utility of CT perfusion (CTP) imaging in guiding perioperative haemodynamic care for patients receiving SBMS.

Methods: Three patients with persistent neurologic deficits pre-SBMS (n=2) and post-SBMS (n=1) underwent CT perfusion on and off pressor support to assess the impact of pressor support on lesion volumes.

Results: In all three patients (aged 41, 43 and 44) CTP imaging demonstrated large Tmax>6s lesions volumes (35, 224 and 380mL respectively). CTP lesion volumes were markedly reduced with pre-operative blood pressure augmentation (13, 125 and 289mL respectively). However, radiological improvement was not associated with immediate improvement in clinical outcomes.

Conclusion: CTP imaging may guide perioperative pressor support care in SBMS. Future studies should determine whether routine use may improve post-operative patient outcomes.

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Post-stroke resuscitation orders demonstrate differences by gender, stroke type and intervention

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Background: Resuscitation orders describe individual preferences guiding the provision of potentially life-saving interventions in the event of critical deterioration, such as cardiopulmonary resuscitation (CPR). Stroke-related and social factors may influence resuscitation order completion and content.

Aims: The purpose of this study was to examine factors associated with differing stroke inpatient resuscitation order completion rates and content.

Methods: This retrospective cohort study examined resuscitation orders in consecutive individuals admitted to a tertiary stroke centre with ischaemic stroke or intracerebral haemorrhage (ICH) over a 21-month period (March 2020 to January 2022). Multivariable logistic regression was used to identify factors associated with resuscitation order completion and content.

Results: 1924 individuals were included in the study. The proportion of individuals who had resuscitation orders completed was 37.4%. Increased odds of increased resuscitation order completion were seen in patients receiving endovascular thrombectomy (Odds Ratio (OR) 1.40 [95% confidence interval (CI) 1.07-1.82]; p=0.013) and presenting with ICH (OR: 1.57 (95% CI 1.19-2.07; p=0.001). Females were more likely to have a not for CPR resuscitation order (OR: 1.66 [95%CI 1.08-2.54]; p=0.021). Patients with intracerebral haemorrhage were also more likely have a not for CPR order (OR: 1.87 [95%CI 1.04-3.35]; p=0.037)

Conclusion: Disparities exist in resuscitation order completion and content based on demographic and stroke characteristics. Further research is required to identify the reasons for these differences, determine their appropriateness and to optimise resuscitation order completion.

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Delays in the diagnosis of ischaemic stroke presenting with persistent reduced level of consciousness: A systematic review

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Background: Missed or delayed diagnosis of acute ischaemic stroke may prevent individuals from accessing hyperacute stroke interventions. Stroke presenting with a reduced level of consciousness (RLOC) may result in delayed or missed diagnosis.

Aims: This systematic review aims to determine the frequency, reasons for, and consequences of missed stroke diagnoses due to RLOC.

Methods: A systematic review was conducted of the databases PubMed, EMBASE, and Cochrane library in accordance with the PRISMA guidelines. The systematic review was registered prospectively on PROSPERO.

Results: Initial searches returned 1162 results, of which 6 fulfilled inclusion criteria. Most identified studies demonstrated that patients with ischaemic stroke with RLOC were at an increased risk of missed or delayed diagnosis. There may have been delays to certain stroke investigations and interventions. The delays included the lack of urgent magnetic resonance imaging (MRI) and lack of firm diagnosis for patients with RLOC. There was limited evidence regarding the outcomes of patients with stroke and RLOC who have delayed diagnoses. The available evidence suggested that outcomes of these patients may be poor. Patients with thalamic strokes may experience minimally conscious states and thalamic dementia. The included studies have not evaluated but have suggested urgent MRI access, educational interventions, and protocolisation of the evaluation of RLOC.

Conclusion: Patients with ischaemic stroke with RLOC are at risk of having their diagnosis missed or delayed, which may be associated with poor outcomes. Additional research is required regarding the reasons for and strategies to prevent these missed diagnoses.

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Conceptualising Centres of Clinical Excellence in Stroke Recovery and Rehabilitation: A Scoping Review

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Background: The International Stroke Recovery and Rehabilitation Alliance (ISRRRA) highlighted a key theme for future research; the 'development of a network of Clinical Centres of Excellence in Stroke Recovery'. Criteria to define and evaluate Centres of Clinical Excellence (CoCE) are necessary to create this network.

Aims: To map the available evidence about CoCEs, clarify the key definitions and identify currently existing CoCEs in Stroke Care.

Methods: A refined scoping review methodology was used. Databases were searched to identify relevant published studies since 2010. Additionally, grey literature was searched using Google and Google Scholar. Literature with information about the definition of CoCEs; processes used to nominate, monitor or evaluate CoCEs; or frameworks used to establish CoCEs were included. A bespoke data charting form was developed to collate data on the features of each CoCE.

Results: In total, 5322 records were screened, and 47 records were included for analysis. No report described a CoCE in the field of stroke. Most literature about CoCEs was produced in the USA (n=26, 60%), based on one clinical condition or population. Definitions used to describe CoCEs were inconsistent, but common features included treating large numbers of patients, having highly skilled multi-disciplinary teams, and delivering high-quality care leading to the best patient outcomes. Processes used to select centres as CoCEs varied ranging from self-identification as a CoCE with no explicit criteria or external assessment, to application and assessment by an approval panel. Less than half the studies (n=25) reported on monitoring of care after facilities are identified as CoCE.

Conclusion: CoCEs are frequently defined by multi-disciplinary input, the concentration of expertise, quality of care and best patient outcomes. There are inconsistencies reported on how healthcare facilities are selected as CoCEs, and limited information on how CoCEs are monitored and evaluated. There was no literature reporting on CoCE in the field of stroke.

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Assessing the diagnostic accuracy of CT perfusion parameters and thresholds

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Background: Computed tomography perfusion (CTP) has successfully extended the time window for reperfusion therapies in ischemic stroke. However, the published perfusion parameters and thresholds vary between studies.

Aims: We conducted a systematic review to investigate the accuracy of parameters and thresholds for identifying core and penumbra in adult stroke patients.

Methods: We searched Medline, Embase, the Cochrane Library and reference lists of manuscripts up to April 2022 using terms such as

"computed tomography perfusion", "stroke", "infarct" and "penumbra." Studies were included if they reported perfusion thresholds and undertook co-registration of CTP to reference standard. Quality of studies was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool and STARD guidelines.

Results: 24 studies were included. A meta-analysis could not be performed due to insufficient data and significant heterogeneity in study design. When reported, mean age was 70.2 years (SD +/−3.69) and median NIHSS on admission was 15 (IQR 13-17). Perfusion parameter identified for core was relative cerebral blood flow (rCBF), with a median threshold of <30% (IQR 30%, 40%). However, later studies reported lower thresholds in the early time window with rapid reperfusion (median 25%, IQR 20%, 30%). 15 studies defined a single threshold for all brain regions irrespective of collaterals and grey and white matter.

Conclusion: A single threshold and parameter may not always accurately differentiate penumbra from core and oligemia. Further refinement of parameters is needed in the current era of reperfusion therapy.

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A Student Led Ward – Two Birds with One Stone?

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Background: Stroke guidelines recommend 2-3 hours of active practice daily. From other studies, we know that stroke patients spend most of their day inactive and alone in hospital. Therapists are stretched across many clinical and non-clinical responsibilities, including increasing demand for student placements.

Aims: To establish whether doubling students on neurological placements to four at a time, with an additional supervisor increases the amount of therapy stroke patients receive in inpatient rehabilitation, compared to usual practice.

Methods: The study design was a non-randomised study of intervention with outcomes from one block of clinical placements compared with the next block of placements when the intervention was introduced. Students within the experimental group had more structured opportunity to demonstrate caseload management and inter-professional communication skills, while stroke patients were offered additional therapy sessions.

Results: Patients allocated to the experimental group received an average of 10 (95%CI 1 to 18) additional physiotherapy sessions and received an increase of approximately 33% in therapy time. There were no significant changes in functional independence, length of stay or discharge destination. In fact, patients in the experimental group had a significantly less change in FIM efficiency. 43% of respondents in the control care group reported that they felt they received "not quite enough" or "far too little" physiotherapy. However, 100% of respondents in the experimental group reported "just the right amount" of physiotherapy. Student outcomes were not statistically significant between groups.

Conclusion: Providing a student-led ward model with additional undergraduate students and an additional supervisor was safe and feasible, and resulted in a statistically significant increase in physiotherapy sessions without adversely affecting student outcomes. There was a statistically significant difference in FIM efficiency favouring the control group, which suggests that additional therapy is not the only factor impacting functional change, and that the skill level of the person providing therapy is also likely to impact.

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Impact of covariates on temporal aspects of Post-stroke Pneumonia

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Background: The timing of the onset of pneumonia and the impact of covariates on its temporal profile is not well described. This knowledge can help in formulation on approaches to prevent post-stroke pneumonia, a condition associated with higher mortality from stroke.

Aims: The aim is to determine the impact of covariates on the temporal profile of pneumonia.

Methods: Retrospective study of admissions to the stroke unit at Monash Medical Center between 15/12/2014-29/6/2016. Survival curve analysis and time-dependent explanations of variable importance were performed.

Results: There 1256 admissions and 866 patients with ischemic and 146 patients with hemorrhagic stroke (age 72.7 ± 14.5 , male = 54.0%, National Institute of Health Stroke Scale/NIHSS 7.8 ± 8.0). The frequency of pneumonia for NIHSS[0] was 0 (0/86), for NIHSS[1-5] was 2.35% (10/425), NIHSS[6-10] was 7.83% (17/211), NIHSS[11-15] was 15.18% (12/79), NIHSS[16-20] was 20.48% (17/83), NIHSS[>20] was 24.79% (30/121). The frequency of pneumonia among stroke patients was 86 (9.28%). Risk of pneumonia was 1.5% on day 1, 3.2% on day 2, 4.9% on day 3, 5.5% on day 4, 6.1% on day 5, 6.5% on day 6, 6.9% on day 7. Cox regression show that NIHSS (HR 1.09, 95% CI 1.06-1.13, $p<0.001$), nasogastric tube/NGT (HR 3.23, 95% CI 1.79-5.82, $p<0.001$), Charlson comorbidity index (HR 1.13, 95% CI 1.01-1.26, $p=0.03$), were significantly associated with pneumonia. There was a trend to significance for failed dysphagia screen and NIHSS > 4 ($p=0.0538$), male ($p=0.10$), diabetes ($p=0.09$) but not thrombolysis or ischemic heart disease. The pseudoR² was 0.585. Collinearity for the covariates was low (maximal variance inflation factor was 1.97). Permutation of covariates show that the largest impact on Brier score (model calibration) occurred with NIHSS, follow by NGT and failed dysphagia screen with NIHSS >4 .

Conclusion: After stroke onset, pneumonia occurs early in the first week. Stroke severity, NGT insertion, and higher comorbidity were associated with pneumonia.

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Cost-effectiveness of Tenecteplase versus Alteplase for Pre-hospital Thrombolysis on the Melbourne Mobile Stroke Unit

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Background: Tenecteplase is non-inferior to alteplase for thrombolysis of patients with acute ischemic stroke. The recent TASTE-A trial demonstrated that for patients treated on the Melbourne Mobile Stroke Unit (MSU), tenecteplase reduced perfusion lesion volumes (compared to alteplase) post-administration on imaging on admission to hospital, but the long-term cost-effectiveness of this approach needs further investigation.

Aims: We seek to assess the cost-effectiveness of Tenecteplase compared to Alteplase in the MSU setting.

Methods: A within-trial (TASTE-A) economic analysis and a model-based long-term cost-effectiveness analysis were performed. This post-hoc within-trial economic analysis utilised the patient-level data (intention to treat, ITT) prospectively collected over the trial to calculate the difference in both healthcare costs and quality-adjusted life years (QALYs, estimated from 90-day modified Rankin scale score). A Markov

microsimulation model was developed to simulate the long-term costs and benefits.

Results: In total, there were 104 patients with ischemic stroke randomised to tenecteplase ($n=55$) or alteplase ($n=49$) treatment groups. The ITT-based analysis showed that treatment with tenecteplase was associated with non-significantly lower costs [A\$28,903 vs A\$40,150 ($p=0.056$)] and greater benefits [0.171 vs 0.158 QALY ($p=0.457$)] than that for the alteplase group over the first 90 days post the index stroke. The long-term model showed that tenecteplase led to greater savings in costs (-A\$18,610) and more health benefits (0.47 QALY or 0.31 LY gains). Tenecteplase-treated patients had reduced costs for rehospitalisation (-A\$1,464), nursing home care (-A\$16,767), and nonmedical care (-A\$620) per patient.

Conclusion: Use of Tenecteplase in preference to Alteplase for pre-hospital thrombolysis in a MSU setting was cost-effective and improved long-term QALYs. The reduced total cost from Tenecteplase was driven by savings from acute hospitalisation and reduced need for nursing home care.

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Stroke Coding Accuracy – a retrospective Pre- and Post-Electronic Medical Record Implementation Study

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Background: Clinical coding is routinely used both for clinical and epidemiological research, health services planning and validation of data provided to the stroke registry. The Australian Stroke Clinical Registry (AuSCR) uses two methods to perform this surveillance: a primary ICD-10 code, and previously an any-of-first three code method. With wider electronic medical records (EMR) use, these methods, derived pre-EMR, require validation. Since 2017, the Royal Adelaide Hospital (RAH) has maintained a complete neurologist-validated 'dual-ascertainment' (prospective and retrospective coding-based) stroke database. Roll-out of RAH EMR (27/11/2019) allowed a coding accuracy comparison pre- and post-implementation.

Aims: To quantify the accuracy of different AuSCR case ascertainment methods pre- and post-EMR implementation.

Methods: Hospital ICD-10 coding data was extracted from pre-EMR (1/1/2017 to 26/11/2019) and post-EMR (27/11/2019 to 31/12/2022) dates. Patients positive for ICD-10 stroke codes in the primary diagnostic and first 3 codes were identified. Using the RAHs neurologist-validated stroke database as the gold standard, we calculated the sensitivity and positive predictive value (PPV) of a positive stroke code, pre- and post EMR initiation.

Results: Sensitivity of the first three diagnostic code position method improved following EMR implementation from 0.940 (95% CI 0.931 – 0.947) to 0.971 (95% CI 0.965 – 0.976), however the PPV declined (from 0.806 (95% CI 0.793 – 0.788) to 0.776 (95% CI 0.763 – 0.788)). Sensitivity of the primary code-only method also increased (from 0.897 (95% CI 0.886 – 0.907) to 0.935 (95% CI 0.926 – 0.943)) without significant change in the PPV (0.830 (95% CI 0.818 – 0.842) pre-EMR versus 0.816 (95% CI 0.803 – 0.828) post-EMR).

Conclusion: EMR implementation improved diagnostic stroke coding sensitivity for both methods, however the PPV of the first three diagnostic code method declined. The utility of these two methods may vary depending on a hospital's EMR status and the purpose (i.e.,

maximising sensitivity vs evaluation of AuSCR case ascertainment comprehensiveness).

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EMVision Gen I Brain Scanner Study Stage I Insights

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Background: Access to imaging devices that can assist in the diagnosis of stroke in the prehospital environment are desperately needed. The Australian Stroke Alliance, in partnership with EMVision are aiming to reduce stroke inequity and bring the hospital to the patient with a lightweight, affordable imaging device. EMVision have developed an imaging device that uses an electromagnetic imaging system operating in the microwave band of the spectrum.

Aims: To acquire EMVision Gen I brain scans + 'ground truth' CT/MRI scans of participants with healthy brains, acute stroke and stroke mimics to advance the AI algorithms of the EMVision Gen I Brain Scanner.

Methods: In stage 1, the device will image 30 healthy participants for baseline healthy brain assessment for hardware qualification and as an input for the AI algorithms. Stage 2 will be participants suspected of stroke and include a minimum 15 haemorrhagic, 15 ischaemic, 10 migraine, 10 seizure and other stroke mimics. All baseline characteristics and endpoints for each study stage will be summarized descriptively.

Results: Stage 1 enrolment is complete and Stage 2 is in progress. Stage 1 included 30 healthy participants (17 male and 13 female) with a mean age of 63.8 ± 9.29 . The hardware had a 100% scan success rate in terms of signal processability. The mean time to complete an EMVision Gen I workflow and brain scan was 9.2 ± 2.13 minutes. No adverse events occurred.

Stage 1 participant data has been incorporated into the EMVision AI algorithm training database. AI algorithm development continues as Stage 2 recruitment progresses.

Conclusion: The EMVision Gen I brain scanner has verified hardware and further advanced its AI algorithm in the assessment of healthy participants. Patients with acute stroke and stroke mimics are now being enrolled into the study.

Correction September 2023: The authorship and content of this abstract has been updated since it's original publication.

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Repetition counters Enhancing ACute Hemiparesis Independent Therapy (REACH-IT): Co-designing an Interactive Upper Limb Therapy System for Acute Stroke

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Background: Early engagement in upper limb rehabilitation following stroke may contribute to improved long term motor recovery. Many factors influence acute stroke clients' ability to achieve an adequate dose of movement both within and outside of designated therapy sessions. Previous work demonstrates that interactive technology can increase engagement with rehabilitation – but how can this be implemented in an acute stroke unit when your client doesn't have much movement to start with?

Aims: To design and develop a simple rehabilitation system that enables, motivates and engages clients in an acute stroke ward to perform in-bed

semi-supervised and supervised upper limb rehabilitation movements. The device must direct and record movements, be flexible to meet client needs and pre-functional abilities, be useable in the acute stroke ward and increase engagement with rehabilitation movements.

Methods: An iterative co-design process was used at the Launceston General Hospital Stroke Unit. Each new design iteration was guided by client and therapist feedback. Field notebooks recorded client and clinician feedback. Actigraph accelerometers were used to measure arm movements.

Results: Key design characteristics identified through the co-design process were: app setup efficiency (pre-established movement patterns with ease of customisation), flexible app screen layout (matching physical layout of sensors, customisable information presentation), customisable feedback options, movement sensor requirements (adaptable, sensitive), and creating an in-bed therapy surface (stable, removeable, supports system, enables client movement). High repetition counts were observed in clients during system testing.

Conclusion: Progressive design improvements through co-design allowed many environmental and client barriers to be overcome. Simplicity combined with flexibility were key contributors to use. This work provides the knowledge required for further development of systems to increase the dose of early upper limb rehabilitation.

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Is a Stroke-Specific In-Reach Rehabilitation Model of Care Effective and Efficient?

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Background: The Stroke-Specific In-Reach Rehabilitation (SSIR) Model of Care is designed to provide a multidisciplinary rehabilitation service to patients admitted with a stroke to an acute hospital. The Functional Independence Measure (FIM) is a uniform system of measurement used in all Australian and New Zealand Rehabilitation Centres that measures level of disability. Admission and discharge FIM data are collected for all SSIR patients admitted at Royal North Shore Hospital (RNSH). The SSIR has two streams; Full (patients for discharge home) and Supplementary (patients for transfer to an inpatient rehabilitation facility).

Aims: To determine the effectiveness and efficiency of a SSIR Model of Care in a Tertiary Metropolitan Hospital.

Method: The AN-SNAP calculator developed by the Australasian Rehabilitation Outcome Centre was utilised to benchmark the SSIR against national averages of rehabilitation admissions. Time from hospital admission to program commencement, length of stay, discharge destination and location, and FIM efficiency was calculated for each stream. Data was collected for all SSIR patients over a 6 month period.

Results: On average patients commenced the SSIR 8.9 days into their hospital admission, and were on the program for an average of 7.8 days. Specifically, length of stay was 7.2 days for 'Full' patients and 10.1 days for 'Supplementary' patients. The Program discharged 39%(28) of patients home, 49%(35) of patients to an inpatient rehabilitation facility and 12%(9) of patients were discharged back to the acute ward. 86%(62) of patients on the program lived in the Local Health District. The SSIR has a mean FIM efficiency of 1.6. Specifically, for 'Full' patients the FIM efficiency was 2.2, and for 'Supplementary' patients the FIM efficiency was 1.1. A FIM efficiency of $>0.66/\text{day}$ is clinically significant. This demonstrates clinically significant changes across all streams.

Conclusion: The SSIR Model of Care at RNSH provides an effective, efficient rehabilitation service that improves patient outcomes and flow.

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Promises and pitfalls of telehealth cardiovascular lifestyle education to stroke patients using Pexip Infinity Connect app

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Background: During the COVID-19 pandemic, the use of telehealth has been shown to be the best way of delivering health education to prevent transmission of the virus. Telehealth has been used to manage stroke at all stages of the recovery. In 2021, we collaborated with the cardiac rehabilitation team in providing telehealth cardiovascular lifestyle education to our stroke patients. This was a weekly 1-hour class for 5 weeks on lifestyle modification using the Pexip Infinity Connect application. The topics included: *Understanding Stroke; Physical Activity & Exercise; Thinking & Perception and Stroke; Nutrition Workshop; and Understanding Your Medication*. Selection of patients was based on a) cognition or presence of a family member who can assist the patient; b) English speaking; c) patients discharged home.

Aim: This study aims to assess the feasibility of telehealth in providing cardiovascular lifestyle education to stroke patients using Pexip Infinity Connection application, in collaboration with the cardiac rehabilitation team.

Methods: Audits & interviews of patients were conducted. Outcome measures were full attendance to the 5 sessions and recurrent stroke 3 months from discharge.

Results: Of the 69 patients who were recruited, only 36% (n=25) attended at least one session and 56% (n=14) completed the 5 sessions. Only 1 patient represented to hospital due to a recurrent stroke. The patients interviewed found the sessions useful and were satisfied with the information included. Moreover, patients claimed an increase in their knowledge about stroke, the importance of their medications and lifestyle modification. The reasons for non-attendance include a) difficulties operating the computer/Pexip Infinity Connect app; poor internet connection; c) conflicting health-related appointments/outpatient rehabilitation.

Conclusion: Despite the pitfalls in the use of the Pexip Infinity Connect app, the participants found the collaboration telehealth cardiovascular lifestyle education useful and improved their awareness of lifestyle modification. This supports the feasibility of future research on virtual post-stroke education with IT assistance.

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What baseline and intervention characteristics predict walking speed six months after stroke?

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Background: High-intensity treadmill training and self-management strategies positively effect walking outcomes after stroke. However, it is unclear how these strategies can be matched to individuals after stroke.

Aims: This study aimed to evaluate novel clusters of stroke survivors based on baseline and intervention characteristics, predicting improvement in walking speed six months after an intervention post-stroke.

Methods: This study is a secondary analysis of data from a randomized controlled trial of adults within two months of stroke. Fifty-six participants received a self-management program embedded in high-intensity treadmill gait training (3 x 30-minute sessions per week, 8 weeks). Baseline characteristics included demographic details, daily step count, walking and exercise self-efficacy. Intervention characteristics included treadmill performance (speed, distance, and rate of perceived exertion) and self-management strategies used. Primary outcomes consisted of comfortable and fast walking speed, measured at baseline and six months after intervention. A machine learning-based unsupervised clustering approach was used to identify clusters. Multiple regression models were used to identify predictors.

Results: Three distinct clusters were identified: Cluster 1 [n=20, mean age = 58 (11)], Cluster 2 [n=15, mean age = 70(9)] and Cluster 3 [(n=21, mean age = 61(11)]. Clusters had baseline mean comfortable walking speed of 1.2 (0.07) m/s, 0.9 (0.11) m/s and 0.64 (0.14) m/s respectively. Walking related self-efficacy and treadmill training speed predicted comfortable walking speed (adjusted $r^2 = 0.67$, $p < 0.001$). Self-management strategies and treadmill training distance predicted fast walking speed (adjusted $r^2 = 0.82$, $p < 0.001$).

Conclusion: This study highlights that adults with stroke may need different strategies to improve walking speed. Baseline characteristics such as walking speed, walking self-efficacy, fatigue and stroke severity, as well as intervention strategies including treadmill training speed, intensity and self-management could be used to target long-term walking speed changes in people with stroke.

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Thrombectomy Time Savings from Melbourne Mobile Stroke Unit Operation During COVID-19 Pandemic

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Background: Mobile Stroke Unit (MSU) operation globally has dramatically improved time to thrombolysis but uncertain impact on endovascular thrombectomy (EVT) times, especially with major workflow changes during the COVID-19 pandemic.

Aims: We examined the effect of the Melbourne MSU on time to thrombectomy pre- and post-pandemic onset in regard to patients within the catchment of a EVT-centre (who would normally present directly to the centre) and those outside (who require bypass to the EVT-centre).

Methods: Patients receiving EVT facilitated by the Melbourne MSU from 2017-2022 were compared to non-MSU patients (metropolitan direct and secondary transfer for EVT) admitted to The Royal Melbourne Hospital. Quantile regression analysis was used to calculate median time differences (50th quantile).

Results: A total of 468 patients were included, with 134 MSU-facilitated patients. Pre-pandemic, no reduction in ambulance dispatch to arterial access time was seen for MSU patients within an EVT centre catchment (median 9 min slower; $p=0.55$). However, post-pandemic onset a significant time saving was observed (median 22 min faster; $p=0.05$, p -interaction= 0.0462). MSU facilitation reduced hospital arrival to arterial access time by median 29 min pre-pandemic vs 56 min post-pandemic onset, p -interaction= 0.058). The pandemic did not significantly alter MSU-related time savings for patients located outside of an EVT centre catchment (p -interaction >0.05).

Conclusion: Melbourne MSU operation during the COVID-19 pandemic significantly improved time to thrombectomy regardless of location within or outside an EVT-centre catchment. Slower in-hospital EVT workflows post-pandemic onset were likely mitigated by early identification on the MSU and pre-notification of the hospital EVT team.

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Stroke survivor experiences of completing a constraint induced movement therapy program via telehealth: The ReCITE study

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Background: Constraint-induced movement therapy (CIMT) is recommended in the Australian and New Zealand Clinical Guidelines for Stroke Management, however only 11% of eligible stroke survivors receive CIMT. Difficulties attending a program is one of the identified barriers to access for stroke survivors. The remote constraint induced therapy of the upper extremity (ReCITE) study explored the feasibility and acceptability of delivering CIMT via telehealth (TeleCIMT).

Aim: To explore the experiences of stroke survivors who have completed a three-week TeleCIMT program.

Methods: Qualitative design using semi-structured interviews. Stroke survivors who had completed a three-week TeleCIMT program as part of usual rehabilitation were interviewed individually one month post program completion. Interviews were conducted by a researcher not involved in their care. Interviews were audio-recorded, transcribed and imported into Nvivo for thematic analysis using inductive coding.

Results: Eight participant interviews have been completed to date. Preliminary analysis indicates that whilst participants found programs beneficial and reported seeing improvements in their arm function both during and after a program, there were several challenges to program adherence. Challenges to the program included the level of direct input of a therapist during the program and the high cognitive demands of technology use to complete sessions online with a therapist. Participants also reported a high time burden for program preparation and recording of practice when completing CIMT remotely. Tolerating six hours of mitt wear per day within the home was also reported to be challenging,

especially during the first week of the program and when trying to also maintain employment. Most participants completed their programs on their own however reported having a support person would have been beneficial to support program adherence, assist with paperwork and to provide encouragement.

Conclusion: Stroke survivors describe TeleCIMT as an acceptable intervention. Additional support is required for technology use and recording practice.

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Inpatient Endovascular Thrombectomy: A Single Comprehensive Stroke Centre Retrospective Cohort Study

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Background: Endovascular thrombectomy (EVT) is standard of care for patients with large vessel occlusion (LVO) acute ischaemic stroke (AIS). The stroke metrics, stroke detection, stroke mechanisms and outcomes of inpatients with LVO undergoing EVT at our institution are unknown.

Aims: To investigate the cohort of inpatients who received EVT and delineate time to stroke detection, general stroke metrics, stroke severity, mechanisms and functional outcomes.

Methods: Inpatients who had EVT from 2018 to 2022 were selected from our stroke registry. Data was extracted from the registry and electronic medical records. Stroke detection was defined as time between stroke onset and code stroke activation. SPSS(R) was used for data analysis.

Results: A total of 24 patients were included. Nine female (37%) with a mean age of 66 years. The mean Charleston Comorbidity Index was 4. Median stroke detection time was 25 minutes IQR (8.5 - 47.3) with only 1 case last known well the previous night. Median NIHSS was 19 IQR (14- 24). Two patients were intubated. Stroke codes were called for 14 patients (60%) in the after-hours space. CT perfusion core mean volume was 46 ± 40 ml and the mean penumbral volume was 95 ± 58 ml. Only 2 patients received thrombolysis. The median time from code stroke activation to reperfusion was 149 mins IQR (112-203). Most inpatient strokes were secondary to cardiac embolism (38%). The median pre-stroke modified Rankin score (mRS) was 0. Nine patients (38%) had a mRS 0-2 at 3 months. The 3-month post discharge mRS median was 3 and 3-month mortality was 21%.

Conclusion: Stroke detection at our institution was highly varied as was the time to reperfusion. These findings are suggestive of medically multimorbid and acutely unstable cohort leading to severe strokes and poorer functional outcomes. Further study in this cohort is required to improve stroke metrics and outcomes.

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Music Listening and Aphasia Recovery: Examining the Usability and Acceptance of a Purpose-Built Mobile Music Listening Application

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Background: Music listening positively impacts the cognition and mood of individuals following stroke. Research indicates potential language recovery benefits of music listening specifically for people with post-stroke aphasia. Aphasia is a complex language and communication disorder that effects up to one third of people following stroke. Care for this population within multi-disciplinary teams is limited by available clinical resources that promote language recovery. Music listening and specialised music listening technology provide an opportunity to care for people with post-stroke aphasia and promote language recovery.

Aims: We examined the effect of design and implementation of a mobile music listening application with individuals with post-stroke aphasia.

Methods: Participants with chronic post-stroke aphasia used a purpose-built mobile music listening application for two weeks. Prior to use, technology confidence and use, aphasia severity, self-efficacy and music engagement rating scales and questionnaires were completed. Following use, the system usability scale as well as semi-structured interviews were completed. Semi-structured interviews were based on the Technology Acceptance Model with all interviews transcribed and analysed using content analysis.

Results: The usability and acceptance of the specialised mobile music listening application was measured across 19 participants with chronic aphasia. Confidence in the technology was a key emotional and psychological determinant of outcomes in using the application.

Conclusion: The acceptance of engaging in music listening post-stroke facilitated language recovery by a purpose-built mobile music listening application. Such technology provides a critical clinically relevant approach to aphasia recovery post-stroke.

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Amyloid- β Related Angiitis presenting with recurrent Generalised Tonic Clonic Seizures

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Background: Amyloid β Related Angiitis (ABRA) is a rare inflammatory central nervous system (CNS) vasculitis.

Aims: To describe the clinical, radiological and pathological findings of ABRA.

Methods: A single case report at our institution.

Results: A 61 year old male presented with a witnessed Generalised Tonic Clonic Seizure (GTCS) on the background of a GTCS a week prior to presentation and a past medical history of hypertension, hypertrophic cardiomyopathy, hypercholesterolaemia, gout and a radical prostatectomy for prostate cancer.

On examination, there was no neurological deficits. MRI Brain showed multiple abnormal tortuous vessels within the left frontal region, with associated extensive hemosiderin staining suggestive of prior subarachnoid haemorrhage. A formal angiogram revealed a cluster of abnormal vessels in the left frontal lobe. Neurosurgical biopsy macroscopically revealed numerous superficial serpiginous arterioles. Histopathology showed features of CNS vasculitis evident by lymphohistiocytic inflammation and fibrinoid necrosis of small and medium vessels along with amyloid deposits confirmed by Congo Red stain in keeping with ABRA. The patient was started on oral corticosteroid immunosuppressive therapy with clinical response to seizure frequency.

Conclusion: ABRA requires early multi disciplinary input and brain biopsy to confirm diagnosis.

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F.A.S.T. Signs of Stroke Community Education Program: Improving Community Awareness to Support the NSW Telestroke Service Rollout

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Background: Stroke is a time-critical medical emergency. The first step in ensuring better outcomes is getting to hospital quickly, which means recognising the signs and calling triple zero. To support the rollout of the NSW Telestroke Service, Stroke Foundation ran a three-year F.A.S.T. (Face. Arms. Speech. Time) Community Education Program in regional NSW (2020-2022), funded by NSW Health.

Aims: To increase unprompted awareness of the signs of stroke in regional NSW communities, and ensure more people know to dial triple zero as their first action.

Methods: The program was rolled out in a phased approach in line with the NSW Telestroke Service implementation strategy. An integrated multi-channel advertising campaign (commercial television, radio, YouTube, social media, bus-back advertising, and hospital patient Wi-Fi displays) was used. Media activity focused around each Telestroke site launch and Government communication. Community education StrokeSafe presentations were used along with local community partnerships to deliver grass-roots community messaging and engagement which helped spread awareness through trusted local voices.

Results: There was a total of 408 media mentions, 182,199 30-second YouTube ad impressions (49.6% viewed full video) and 148,313 social media impressions. Thirty-three StrokeSafe presentations were delivered reaching approximately 1,000 residents, and 1,500 local community partners were engaged. The multi-level targeted approach was pivotal to the success of this program, resulting in a 23% uplift in unprompted awareness of two or more F.A.S.T. signs of stroke from 22% in 2020 to 45% in 2022, as measured through Stroke Foundation's annual surveys.

Conclusion: This increased F.A.S.T. awareness, means more residents of regional NSW recognise the common signs of stroke and the importance of seeking emergency treatment to improve outcomes. Quick access to life-saving diagnosis and treatment means less death and disability caused by stroke. These factors reduce the impact stroke has on the community, and the burden on the health economy.

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Improving Earlier Access to Hyper-Acute Intracerebral Treatments As Supported By a Valid Collaborative Clinical Guideline

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Background: Intensive blood pressure (BP) lowering and anticoagulation reversal improve intracerebral haemorrhage (ICH) patient outcomes and implementing guidelines in conjunction with clinician engagement may improve compliance.

Aims: To audit Wellington Regional Hospital (WRH) ICH time metrics, patient outcomes and, to ascertain barriers/facilitators to implementing evidence-based ICH treatments.

Methods: This mixed method study includes a retrospective audit conducted for all WRH ICH patients between 1st January and 31st December 2021. The audit considered BP treatment and targets, anticoagulation

reversal and patient outcomes. A literature review and collaborative multi-disciplinary approach informed a guideline update and implementation. Clinicians were surveyed pre-and-post implementation which supplemented the guideline update.

Results: Forty-three patients were included in the audit. Anticoagulation reversal occurred in 4/10 (40%) patients in 129 minutes (IQR 77-215) from arrival. Forty-one patients were hypertensive on arrival of whom 16/41 (39%) received antihypertensive medication within 60 minutes and a further 13/41 (32%) within 24 hours (median 52 minutes; IQR 36-109). Early deterioration rates, defined as GCS drop of 2 or NIHSS rise of 4) were 13/41 (32%), with 11/41 (25%) three-month mortality.

The survey found that guideline confidence improved post revision (3.6/5 vs 3.8/5) and user-friendliness (3.8/5 vs 4.1/5). Specific ICH treatment knowledge improved post-revision including, correctly naming BP parameters 39/59 (66%) to 29/37 (78%), time to target BP (60 minutes) (44/63 (70%) to 35/37 (95%)) and, more respondents reversing anticoagulation (54/66 (82%) vs 36/37 (97%)).

A multidisciplinary stakeholder engagement approach to guideline revision resulted in a collectively endorsed protocol.

Conclusion: The WRH ICH guidance time metrics were not met, adherence was inconsistent, and advice did not fully align with international literature. Clinician engagement and guideline revision increased ICH treatment knowledge, resulting in increased confidence and user-friendliness. Further research is needed to assess impact of the new guideline on adherence and patient outcomes.

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Does an in-reach Neurological Physiotherapy Service improve therapy intensity for patients waiting inpatient rehabilitation?

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Background: The National Acute Stroke Service Framework provides evidenced based recommendations for service delivery of acute stroke patients to ensure equitable access to best practice stroke care across Australia. Primary Stroke centres, such as Bendigo Health, should provide an acute stroke unit with a dedicated stroke team who complete standardised assessment to determine individual rehabilitation needs and goals. Delivering optimal stroke services in regional Victoria remains a challenge and these criteria are yet to be met. Alternative solutions to such shortcomings with the aim of improving patient outcomes should be explored.

Aims: We aim to increase the intensity of physiotherapy input for patient's waiting inpatient rehabilitation.

Methods:

- Collect pre and post data on the physiotherapy intensity provided to patients on acute wards waiting for inpatient neurological rehabilitation.
- An in-reach physiotherapy service; consisting of three inpatient neurological rehabilitation physiotherapists taking over the physiotherapy care for patients on the acute wards once they have been identified as requiring inpatient rehabilitation.

Results:

- Baseline data was collected (n = 26) which demonstrated patients referred to in-patient rehabilitation received on average 3.4 sessions of physiotherapy for an average of 9.1 acute days waiting for a rehabilitation bed.
- An interventional study was conducted from March – May 2023. Based on current data (as of end of April 2023) we had 28 patients waiting an average of 10 days for an inpatient rehabilitation bed and receiving 6 physio sessions. 4 patients have been able to discharge from acute wards.

Conclusion:

- Little has been published regarding nuanced ways of improving patient outcomes in regional and rural health services.

- There was an increase in intensity provided to patients waiting for inpatient rehabilitation.
- Based on average length of stay this has saved 160 bed days.

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Perspectives of Stroke Survivors and Carers Completing a Late-Stage Swallowing Rehabilitation Program for Severe Chronic Dysphagia: Implications for Clinical Practice and Service Development

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Background: Research reporting on dysphagia outcomes rarely provides in-depth analysis of perspectives and experiences of individuals following stroke. Qualitative research allows for the analysis of systematically collected data reporting on the lived experience of clients and their carers following stroke. These methods create an opportunity to complement functional outcome measures with client and carer perspectives to capture a more holistic perspective of life after stroke.

Aims: This study aimed to evaluate client and carer perspectives of the lived experience of managing severe and chronic dysphagia following stroke. It further explored the experiences of completing a late stage swallowing rehabilitation program. It aimed to provide insight into care received, future planning of service delivery and under-recognised burden of managing chronic post stroke dysphagia.

Methods: A qualitative, constructivist grounded theory approach (Charmaz 2014) was utilised to investigate long-term dysphagia experiences for stroke survivors and their families. Stroke survivors and their family members (n=8) participated in semi-structured interviews about their experience living with dysphagia and with the rehabilitation that they had received since their stroke. Stroke survivors had sustained strokes 17-47 months earlier and were dependent on enteral tube feeding.

Results: Interview transcripts were coded and analysed for themes and sub-themes. Major themes included: the experience of stroke and its aftermath; living with dysphagia and its implications; perspectives of the therapeutic experience post-stroke, both in the hospital system and as members of a community based rehabilitation program. Subthemes around the type of intervention, the clients themselves and the therapeutic approach are elucidated.

Conclusion: Client and carer perspectives can provide insight to under-researched and under-reported aspects of the care continuum for people living with chronic post stroke dysphagia. Considerations for service planning and intervention delivery are identified.

Reference

1. Charmaz, K. (2014). Constructing grounded theory. London. Sage.

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Mapping the patient pathway across regional comprehensive stroke service in NZ

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Back ground: In 2017 we started off with hyper acute stroke pathway and accepted regional hospital patient for Psi and thrombolysis. Due to increase in demand and limited bed space, hence unable to transfer patient to rehab ward in timely manner.

Method: Due to challenges and catering for regional service decision was made to start integrated unit acute rehab stroke unit. The design of

the unit was clinically led with input from patients and whānau, and draws on international best practice.

Results: The name Taiao Ora has been gifted to our ward by our Chief Advisor Tikanga, Dame Rangimārie Naida Glavish. In 2020 unit was officially opened with 41 beds, there has been a radical change in the model of care for patients suffering strokes, the key points being:

- **Treatment**– The treatment of patients with the use of neuro-interventional radiology procedures to dissolve the stroke causing blood clot (thrombolysis) and/or remove the blood clot (thrombectomy) has resulted in one person being able to go home and live independently for every five treated.
- **Early Rehabilitation**– In parallel, a more intense approach to therapy is also promoted with the focus on early rehabilitation, combining time-limited targeted therapy with the incorporation of rehabilitation activities into all aspects of patients' care.

Conclusion

- Welcoming and comforting setting to help put patients at ease when they are feeling most vulnerable
- Stimulation and entertainment – ability to choose access to a total rehabilitation environment
- Recovery and adaptation emphasis, to support patient's rehabilitation
- Connection with people, world, whanau
- Accessibility and autonomy – giving patients a sense of control back

Reference

1. Auckland DHB opens New Zealand's first integrated stroke and rehabilitation unit | Te Whatu Ora. (2020, November 15). <https://www.adhb.health.nz/about-us/latest-stories/integrated-stroke-and-rehabilitation-unit/>

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Incorporating Experts with Lived Experience into Occupational Therapy University Teaching provides richness and invaluable learning potential

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Background: Research indicates the input of experts with lived experience is invaluable in establishing fundamental and meaningful knowledge regarding the impact of clinical conditions. Furthermore, their involvement enhances understanding of provision of quality care through development of knowledge, skills, and attitudes. This knowledge is especially important in educational settings, where experts with lived experience can improve the learning objectives of university students studying health science degrees. While co-design in professional education is emerging as an essential component of quality health care, training requires ongoing advocacy from educators to sustain the institutional investment of time and resources required to do it well.

Aims: We sought to examine third year occupational therapy (OT) students' perceived value of a neurological rehabilitation module co-designed and co-delivered with experts with lived experience as part of the undergraduate occupational therapy program at the University of South Australia.

Methods: An expert with lived experience of stroke (≥ 5 years experience) co-produced and co-delivered the lecture and workshop material. 68 OT students provided feedback via survey (Likert scale, short answers) about their learning experience. Descriptive statistics and thematic analysis were used to analyse data.

Results: Students reported high satisfaction levels across questions (Mean=95.25%). Following participation, key themes from qualitative feedback demonstrated that students perceived value in; developing their ability to critically think, enhancing understanding of the impact of neurological conditions, development of empathy in their training as a clinician, and enhanced problem solving with their client's needs in mind.

Conclusion: The involvement of experts with lived experience of stroke into the OT program in co-design and co-delivery of a module has positive learning outcomes for students. Further research is required to support people on their journey from person with lived experience to expert and understanding the achievement of this.

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Prevalence of Urinary Incontinence, Indwelling Catheter Usage, and Faecal Incontinence Among Adults Presenting to Hospital After Acute Stroke

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Background: Incontinence and indwelling catheter (IDC) usage are common after acute stroke. Understanding the prevalence of these are essential in planning services. Previous prevalence estimates range from 44-47% for urinary incontinence (UI), 26-31% for IDC usage, and 30-40% for faecal incontinence (FI). Results of a recent New Zealand study suggest the prevalence of UI and FI among adults presenting to hospital post-stroke may be lower in the current Australasian population.

Aims: The purpose of this study was to provide updated prevalence estimates of UI, IDC usage, and FI among adults admitted to acute care after stroke.

Methods: We analysed the screening data of a prospective study (Post-stroke Incontinence Rehabilitation with Adjunct Transcutaneous Electric Stimulation; PIRATES). Included were 652 inpatients admitted consecutively during a 15-month period beginning 1 May 2021 to a single, stroke service in Melbourne, Australia. Stroke was diagnosed by a neurologist according to the ICD-11 criteria. Incontinence was evaluated by a continence nurse following the International Continence Society (ICS) definitions.

Results: Acute stroke was confirmed in 440 inpatients. The median age of stroke survivors was 76 years (IQR 66-84), 58% were male, and 76% had ischaemic stroke. The median National Institutes of Health Stroke Scale (NIHSS) score was 4 (IQR 2-12). Within the first 7 days after stroke, proportions of patients with UI, IDC, and FI were 29.1%, 6.6%, and 26.1% respectively. Among those with UI and FI, the majority (84% and 90% respectively) were continent prior to stroke.

Conclusion: Current prevalence of UI and FI among adults who received specialist stroke inpatient care may be up to 35% lower than previous estimates. IDC usage is significantly lower than previously observed. Rehabilitation for continence issues post-stroke continues to be essential.

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Using accelerometers and behaviour change to target physical activity, risk of recurrent stroke and fatigue in subacute stroke: a pilot study

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Background: Beneficial physical activity behaviours can improve risk of recurrent stroke and fatigue after stroke.

Aims: To determine the feasibility of a 6-week device-based behaviour change intervention to increase physical activity and reduce systolic pressure and fatigue severity after subacute stroke.

Methods: Sixteen people (age: 59.9 SD 20 years, 50% male) were recruited within 1-month of stroke and randomised to an intervention (n=8) or control group (n=8). The intervention group received a six-week behaviour change intervention with real-time feedback and behaviour change

strategies targeting beneficial physical activity behaviours. The control group received a dose-matched intervention. Feasibility of the study was determined by measures of recruitment, assessment and intervention (e.g. enrolment, measurement duration, adherence, adverse events and satisfaction). Potential effect of the intervention was determined by changes in beneficial physical activity (steps/day and time in moderate-to-vigorous activity (MVPA), measured via the ActivPALTM), systolic blood pressure and fatigue at baseline, post-intervention and 1-month follow-up. Descriptive statistics determined feasibility, and repeated measures ANOVA explored potential efficacy (ACTRN12617000746336). **Results:** The intervention was feasible, with 92% of sessions delivered, and sessions taking one hour. All participants perceived the intervention to be useful. The intervention group showed a trend for increasing daily steps by 1639 (95%CI -6862 to 3584) and 2106 (95%CI -1406 to 5618) steps and time in MVPA by 18 (95%CI -16 to 51) and 16 (95%CI -11 to 43) minutes at post-intervention and follow-up respectively when compared to the control group. There intervention group showed a trend for decreasing systolic blood pressure by 13 (95%CI -6 to 31) and 4 (95%CI -11 to 19) mmHG and fatigue severity by 3 (95%CI 1 to 4) and 3 (95%CI 2 to 5) at post-intervention and follow-up respectively when compared to the control group.

Conclusion: A six-week device-based behaviour change intervention is feasible, and potentially effective in increasing beneficial physical activity and reducing systolic blood pressure and fatigue poststroke.

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Risk Factors Associated with New-Onset Urinary and Faecal Incontinence After Acute Stroke in Adults

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Background: Understanding the factors associated with stroke complications, such as incontinence, provides insights into targeted assessments and therapies for at-risk groups. Screening for continence issues is essential among those with significant risk factors for incontinence, however there is little information available on the impact of these risk factors within an Australian acute hospital setting.

Aims: To examine the association of previously published risk factors for new-onset urinary incontinence (UI) and faecal incontinence (FI) after acute stroke.

Methods: A prospective intervention study on incontinence after stroke (Post-stroke Incontinence Rehabilitation with Adjunct Transcutaneous Electric Stimulation; PIRATES) was conducted. Included were 652 inpatients admitted consecutively to the acute stroke unit of a Comprehensive Stroke Centre (CSC) in Melbourne during a 15-month period beginning 1 May 2021. Univariate analyses on age, sex, stroke severity, premorbid disability, type of stroke, and anatomical location of stroke were conducted to explore unadjusted associations with UI and FI. Logistic and stepwise regression were used to perform multivariate analysis and build iterative models.

Results: Four hundred eighteen inpatients had acute stroke with no premorbid incontinence. Within the first 7 days after acute stroke, 107 had UI and 103 had FI. Significant factors associated with increased risk of new-onset UI and FI were age, stroke severity, premorbid disability, and having intraventricular haemorrhage. Females were more likely to have new-onset UI after acute stroke than males. Lobar haemorrhagic strokes were associated with higher risk of new-onset FI after acute stroke.

Conclusion: Continence assessment and care after acute stroke are more likely to be needed by those who had a severe stroke, intraventricular haemorrhage, greater premorbid disability, and are of advanced

age. Findings suggest that inpatients with these risk factors may warrant specialist nursing care for continence issues.

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An Evaluation of the Rural Stroke Mentorship Program

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Background: The introduction of Telestroke across NSW has seen a rise in regional patients receiving reperfusion therapies for stroke. Consultation with the Rural Stroke Network showed a need for peer mentorship and knowledge exchange, to support stroke care coordinators and stroke champions in rural NSW. The Agency for Clinical Innovation (ACI) facilitated a mentorship program for clinicians working with stroke patients in rural settings.

Aims: To improve stroke services and equity of care for people in rural NSW by providing structured peer support and exposure to comprehensive stroke program activities for rural based stroke clinicians.

Methods: Each month 3 rural stroke clinicians participated in a 3 day program in metropolitan Sydney. Participants rotated through 4 hospitals and observed the activities of high volume stroke centres including stroke codes, thrombolysis treatment, clot retrieval procedures and multidisciplinary team meetings. Pre and post evaluations were conducted.

Results: 14 clinicians attended the program over 8 rounds in 2022/2023. Qualitative evaluation reflected the positive experience of participants and mentors: "The experience has helped me identify the areas that need more urgent attention and how to prioritise demands within the role." "I have developed increased knowledge of role of stroke care coordinator / CNC for managing stroke calls / code stroke "This reminded me that I am part of a network that exists not only at my site or LHD but across the state. I now consider my Team as all of NSW stroke clinicians."

Limitations: Quantitative evaluation data was collected however due to the low denominator its value was limited.

Conclusion: Based on the positive experience of both program participants and metropolitan site mentors it is recommended that the Rural Stroke Mentorship Program continues. It is also recommended that expansion of the program to include other specialities such as Cardiology and Intensive Care nursing is considered.

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Childhood Stroke Project: Delivering new resources to support survivors and their families

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Background: Contrary to expectations, children do not experience better stroke recovery than adults. The lifetime impact on children and their families is likely to be greater than in adults, because children surviving stroke face many more years living with disability. Research shows reduced levels of well-being for survivors of childhood stroke across a variety of domains. Families tell us of the dearth of help and support available, and that they feel alone and often helpless.

Aims: This project aims to address key barriers to recovery by developing new information products (guides, checklists, planning tools, podcasts, videos, blogs and learning modules), formalising partnerships and increasing awareness.

Methods: Following a codesign framework, the Stroke Foundation Childhood Stroke team are working alongside a Lived Experience Advisory Group, made up of survivors of childhood stroke and parents.

Results: This presentation will explore the value of lived experience and the codesign process. It will also provide an overview of the project plan, the resources that have been developed and what is planned for delivery throughout the 3-year project.

Conclusion: The Stroke Foundation Childhood Stroke Project will deliver much needed resources to survivors of childhood stroke and their families. The project will also raise awareness of childhood stroke and promote inclusion.

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Psychosocial Toolkit developed for New Zealand Stroke Services

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Background: Effective identification, assessment and support for psychosocial issues can have many positive outcomes for stroke survivors and their family, influencing quality of life, functional outcomes, health

utilisation, and even mortality. The NZ National Stroke Network Psychosocial Working Group was established to support greater effectiveness and consistency of psychosocial care pathways in NZ stroke services.

Aims: Develop a national psychosocial 'toolkit' to support stroke services develop their psychosocial care pathways and provide educational resources to stroke clinicians.

Methods: An online psychosocial toolkit was developed following the working group completing a national survey with 28 services (health boards, NGOs and primary care), semi-structured interviews with service leaders and subject matter experts, and a review of international guidelines.

Results: The survey and interview results indicated significant variability in psychosocial screening and intervention across services, limited resources and training for staff relating to identifying, triaging and supporting psychosocial wellbeing, and most services did not have documented pathways for psychosocial care. The online psychosocial toolkit includes guidance on developing psychosocial pathways, education on informal and formal screening, simple action plans for communication and immediate support for clients and family/carers, and considerations for enhancing cultural responsiveness and wellbeing environments.

Conclusion: This project is consistent with an international drive to improve psychosocial care practices and processes for people post-stroke and to provide more culturally appropriate screening and treatment. Based on these findings, an online resource was developed to provide guidance for psychosocial care post-stroke and to share examples and resources to provide a more effective, consistent and equitable approach to psychosocial care across NZ.