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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 sequalae) 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 difficulty[1]. Poor descriptions of stroke rehabilitation interventions pose a significant barrier to their replication in clinical practice and analysis of dosage parameters which directly influence outcomes[1].
Aim: To develop the TIDieR-Rehab checklist – an extension of the original TIDieR[2] – 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.