Implementing a Screen-Clean-Hydrate bundle of care for improving swallow screening, oral health and hydration in acute stroke: Protocol for a Type 2 hybrid-effectiveness pre-post study

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Study protocol

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Abstract

Background

Stroke clinical guidelines recommend care processes that optimise patient outcomes and minimise hospital-acquired complications. However, compliance audits and surveys illustrate that recommended care is not always consistently or thoroughly implemented. This paper outlines the methods for a study implementing and evaluating a new bundle of care, named Screen-Clean-Hydrate, aiming to improve compliance with stroke guidelines in the areas of swallow screening, oral healthcare and hydration.

Methods

The study is a pre-post Type 2 Hybrid Effectiveness/Implementation design with an embedded process evaluation. The integrated-Promoting Action on Research Implementation in Health Services (iPARIHS) framework will be used to guide the study design, conduct and evaluation. The study will be conducted in two acute stroke units in a capital city of Australia. Screen-Clean-Hydrate bundles together recommendations from the Australian Clinical Guidelines for Stroke Management and supplements these with evidence-informed best practice from the literature for: swallow screening within four hours of presentation to hospital (Screen); oral health assessment and delivery of routine oral care (Clean); and hydration assessment and management (Hydrate). Clinical effectiveness will be measured by rates of ICD-10AM coded hospital-acquired complications and proxy measures of cost (length of stay, procedure costs) for 60 patient participants pre- and post-implementation. Implementation outcomes will focus on acceptability, feasibility, uptake and fidelity, and identification of barriers and enablers to implementation through staff interviews, medical record audits and researcher field notes.

Discussion

Bundles of health care processes to target hospital-acquired complications have successfully been implemented in other areas of healthcare. Screen-Clean-Hydrate bundles together and makes explicit the recommendations from the Australian clinical stroke guidelines for swallow screening, oral health and hydration and their importance for functional recovery and avoidance of hospital-acquired complications. Due to its design as a hybrid effectiveness/implementation study, once completed, the study will provide information on both intervention and implementation effectiveness, including details of successful and unsuccessful multidisciplinary implementation strategies. This will inform a larger multi-site effectiveness/implementation trial and promote upscale across other settings for improved compliance with stroke guidelines and therefore stroke outcomes.

Background
Eating and drinking are basic human functions that sustain life but can be impacted by stroke due to swallowing impairment, dependence on others for activities of daily living, cognitive, perceptual or communication impairment (1), or an unclean, dry or painful mouth (2). Poor nutrition and hydration can, in turn, lead to other adverse complications, such as infections, falls and slow functional recovery (3). Strategies to avoid or manage stroke complications are essential, as stroke impacts over 12.2 million people annually and is the second leading cause of death worldwide (4). Post-stroke infections occur in approximately 30% of patients, with pneumonia and urinary tract infections (UTIs) diagnosed in 10% of patients, respectively (5). Hospital acquired complications, such as aspiration pneumonia, dehydration or urinary tract infection, are associated with increased mortality risk (6) prolonged hospitalization and immunological effects (7), leading to poorer long-term outcomes (8) along with additional burden to the patient, family and healthcare system (9). Evidence-informed clinical practice guidelines for stroke care, therefore, highlight the need for fundamental stroke care to mitigate these complications (10–13), including early swallow screening, routine oral healthcare and hydration monitoring and management.

Early swallow screening is critical in identifying dysphagia, an impairment of swallowing, and minimising the risk of aspiration pneumonia and other complications (14). Hence, swallow screening within four hours of admission is anchored in many stroke guidelines internationally (10, 13). Similarly, oral healthcare is prioritised in stroke guidelines as poor oral health is a known sequela (15), and potential cause of, stroke (16). Specifically, colonisation of pathogenic bacteria in the mouth increases the risk of aspiration pneumonia if saliva, food or fluids are aspirated (17). Dehydration is also a common consequence of stroke related to poor fluid intake (18, 19) and a potential contributing factor to ischaemic stroke (20). Dehydration is associated with higher healthcare costs, poorer functioning and increased mortality, and predisposes patients to constipation, UTIs and falls, which further impact on outcomes (21, 22). Concerningly, dehydration has also been shown to exacerbate neurological deterioration by decreasing blood pressure, increasing blood viscosity and reducing perfusion (23). Dehydration is prevalent in patients both with and without dysphagia (24) but the risk increases more than two-fold for patients with dysphagia (25, 26).

Despite the known complications, the recommended care that is incorporated into evidence-informed stroke guidelines is not consistently and/or thoroughly implemented. In Australia, an audit of acute stroke care revealed that only 27% of patients who arrived at hospital with a stroke underwent swallowing screening within 4 hours (27). This delays critical specialist assessment and early management of dysphagia, or unnecessarily restricts a patient without dysphagia from eating, drinking and taking important medication (28). With respect to oral care, a recent survey of oral care practices in stroke units in Australia and Scotland revealed large variability, with only 5.8% and 17% of hospitals reporting use of a stroke-specific oral care protocol, respectively (29). Over half of the respondents in this survey reported that oral care was a neglected area of practice and a call was made for increased training for staff along with standardised oral health assessments and care protocols (29). Hydration practices are currently not formally audited, hence compliance is unclear. Substantial research exists about the association between stroke, stroke outcomes and dehydration but there is a dearth of evidence about how to quantify hydration status for the purposes of commencing what should be low-cost and broadly available
treatment. The high prevalence of dehydration in stroke patients (18) suggests that hydration may not be routinely monitored or managed.

It could be hypothesised that the lack of specificity about recommended care processes in stroke clinical guidelines may contribute to sub-optimal implementation in practice. Clinical guidelines are designed to be overarching principles and recommendations that guide or direct action intended to optimize patient care (30). As such, valid clinical guidelines have the potential to influence care outcomes but compliance depends on effective dissemination and implementation strategies to directly inform care processes (31). Care processes are more likely to be implemented if translated into more directive protocols about how to proceed in certain situations, and address barriers relevant to context (30, 32, 33).

To address the shortfalls in optimal care in the context of post-stroke swallow screening, oral care and hydration managed summarised above, we designed a bundle of care approach that intentionally places a focus on operationalising these aspects of fundamental stroke care. The resulting Screen-Clean-Hydrate bundle brings together three components of care into one systematised protocol with the intention of improving the implementation of the current stroke guidelines for swallow screening, oral health assessment and care provision, and hydration management and monitoring. It builds on the successful Australian led Quality in Acute Stroke Care study, which bundled protocols for management of fever, hyperglycaemia, and swallowing dysfunction, resulting in significantly reduced mortality and morbidity for patients in acute stroke units (34). The primary aim of the Screen-Clean-Hydrate bundle of care is to improve adherence to the stroke guideline recommendations for swallow screening within 4 hours of presentation to hospital, oral hygiene and hydration. This promises to reduce the rates of hospital acquired complications for patients following acute stroke, in turn, leading to improved patient-reported quality of life and lower health care utilisation.

This paper presents a planned study to implement and evaluate the Screen-Clean Hydrate bundle of care as the first step in the process of developing and evaluating a complex intervention (35). The project is theoretically informed by the integrated-Promoting Action on Research Implementation in Health Services (i-PARIHS) framework (36) to guide co-design of implementation strategies and evaluate the effectiveness, feasibility, acceptability and fidelity of the implementation process.

**Methods/Design**

**Setting**

The study will be conducted in two acute stroke units in a capital city of Australia, with a 16 and 25 bed-capacity, respectively. Each hospital has approximately 500 stroke admissions annually.

**Study design**

The study is a before- and after- effectiveness/implementation study with an embedded process evaluation. Phase 1 (before) will involve collection of data about patient outcomes with respect to rates
of patient hospital-acquired complications and existing care processes related to swallow screening, oral care and hydration. The Mobilising Implementation of iPARIHS (Mi-PARIHS) Facilitation Planning Tool (37) will provide baseline mapping of implementation factors for the constructs of innovation, recipients and context. Phase 2 will a) co-design multidisciplinary implementation strategies and b) implement the Screen-Clean-Hydrate bundle of care according to agreed strategies. Phase 3 (after) will document patient outcomes and care processes following implementation of the Screen-Clean-Hydrate bundle of care. An embedded process evaluation using Mi-PARIHS will be conducted to monitor implementation processes and outcomes. Refer to Fig. 1.

Theoretical framework

The widely used i-PARIHS implementation framework describes implementation as a dynamic, integrated and multi-faceted process (38). It proposes that successful implementation results from intentional facilitation of an innovation, with the intended recipients of the innovation in their specific context.

Innovation

The innovation in this study refers to the Screen-Clean-Hydrate bundle of care (Fig. 2). It brings together recommendations from the Australian Clinical Guidelines for Stroke Management (10) and supplements these with evidence-informed best practice from the literature for swallow screening within four hours of presentation to hospital, oral health assessment and delivery of routine oral care (39), and hydration assessment and management (40).

Recipients

The recipients of the innovation are the staff of both acute stroke units, including doctors, nurses, speech pathologists, occupational therapists, physiotherapists, and dietitians as they will be the individuals and teams implementing the bundle of care.

Context

Context exists at multiple levels, both inner and outer to the setting in which implementation occurs and may present important barriers or enablers of implementation. The local context in this study refers to the two stroke units at the ward level and encompasses factors such as the workplace culture, management and leadership support, workload, and resources. The wider context includes characteristics of the governing local health network and the health system in which this is embedded.

Mi-PARIHS (35) will be used to assess each construct (innovation, recipients and context) at baseline and post-implementation. This tool facilitates an evaluation of how the local, organisational and external context might shape the experience of recipients and the uptake of the innovation. Specifically, the tool will assist in identification of any significant barriers and enablers within each domain, which the project team will purposely target using the implementation strategies.

Facilitation
Facilitation is positioned as the active ingredient of implementation in i-PARIHS and can occur at multiple levels. In this study, local facilitation will be led by one novice facilitator (SGu) and one experienced facilitator (JM), with mentorship and guidance from two expert implementation facilitators (SGe and GH) from the research team. Local facilitators will help navigate the individuals and teams through the complex change processes involved and the contextual challenges encountered. The facilitators will co-opt senior staff of each stroke unit to identify areas and goals for improvements and strategies to be prioritised. This group will support the development and implementation of strategies, tailored to the recipients and local context, to promote a sustainable multidisciplinary approach to implementing the Screen-Clean-Hydrate bundle of care.

Reference group

A reference group will be established at each site to provide expert input at the organisational level and assist with system-level recommendations, such as changes to the electronic medical records and purchases of materials and equipment. The reference group will comprise of the leadership team from the stroke unit and divisional level of medicine, nursing and allied health, a representative of the quality improvement unit, along with a patient and family consumer representative.

Outcomes of interest

The Type 2 hybrid design (41) will enable simultaneous evaluation of clinical effectiveness with respect to patient outcomes and the care processes comprising the Screen-Clean-Hydrate bundle of care (Table 1), as well as an evaluation of the implementation process.
Table 1
Clinical and implementation outcomes of Screen-Clean-Hydrate

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Data sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical effectiveness of Screen-Clean-Hydrate</td>
<td></td>
</tr>
<tr>
<td>Rates of hospital-acquired complications</td>
<td>• Medical records; ICD-10AM diagnoses</td>
</tr>
<tr>
<td>Health care costs</td>
<td>• Medical records: length of stay and assessment/treatment procedures</td>
</tr>
<tr>
<td>Implementation of Screen-Clean-Hydrate</td>
<td></td>
</tr>
<tr>
<td>Acceptability</td>
<td>• Interviews with stroke unit staff</td>
</tr>
<tr>
<td></td>
<td>• Context assessment</td>
</tr>
<tr>
<td></td>
<td>• Facilitator field notes</td>
</tr>
<tr>
<td>Feasibility – for recipients and organisation</td>
<td>• Interviews with stroke unit staff</td>
</tr>
<tr>
<td></td>
<td>• Context assessment</td>
</tr>
<tr>
<td></td>
<td>• Facilitator field notes</td>
</tr>
<tr>
<td>Uptake and Adoption</td>
<td>• Fidelity/compliance with care processes from purpose-built audit of medical records</td>
</tr>
<tr>
<td>Contextual barriers and enablers of implementation</td>
<td>• Interviews with stroke unit staff</td>
</tr>
<tr>
<td></td>
<td>• Context assessment</td>
</tr>
<tr>
<td></td>
<td>• Facilitator field notes</td>
</tr>
</tbody>
</table>

Ethical, governance and clinical approval

This research received ethical approval from the Southern Adelaide Clinical Human Research Ethics Committee (2022/HRE00025) and governance approval from the Southern Adelaide Local Health Networks Office for Research (2022/SSA00198) and Northern Adelaide Local Health Network Office for Research (2022/SSA00197). The research will be conducted in accordance with National Statement on Ethical Conduct in Human Research (42) and all participants will provide informed written consent themselves or by their legal guardian.

Process

Phase 1: Pre-implementation of the Screen-Clean-Hydrate bundle of care
Phase 1 is intended to identify current clinical practice by gathering data about implementation of care processes and clinical effectiveness for patient outcomes using a purpose-built audit tool.

**Patient participants**

The aim is to recruit 30 patient participants who present at each hospital with an acute stroke diagnosis. Inclusion criteria are: 18 years and over with a confirmed stroke as reported by the medical team and able to provide supported or third-party consent. Patients who are unable to provide supported consent, deemed to require end-of-life care, or who underwent swallow screening at another hospital prior to transfer to the participating site will be excluded. Potential patient participants admitted to each stroke unit will be identified by the nurse team leader. The research team will approach and provide information to the patient and/or third-party consenter using ‘communication accessible’ verbal and written/pictorial information. Written consent to access their medical records will be obtained.

**Audits**

Audits of medical records will be completed following each participant’s discharge to collect:

1. Demographic and clinical presentation data including age, gender, ethnicity, type and location of stroke, and stroke severity according to the National Institute of Health Stroke Scale, presence of dysphagia according to the core data recommendations from the stroke recovery and rehabilitation roundtable (43).

2. Patient adverse outcomes as represented by ICD-10AM coded (44) adverse events during their episode of care on the stroke unit.

3. Length of stay and tests and procedures related to complications to determine the approximate cost of care.

4. Care processes data - Care processes will be audited using a purpose-built audit tool to understand the practices of the stroke units in relation to their completion of swallow screening and assessment and management of oral healthcare and hydration, as seen in Table 2.
Table 2
Summary of care processes data

<table>
<thead>
<tr>
<th>Swallow Screening</th>
<th>Oral Healthcare</th>
<th>Hydration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Date/time of admission</td>
<td>• Date/time of oral healthcare assessment</td>
<td>• Date/time of hydration admission (Y/N)</td>
</tr>
<tr>
<td>• Date/time of swallow screening</td>
<td>• Documentation of oral care plan e.g., method, products, assistance required, frequency (Y/N)</td>
<td>• Assessment of hydration indicators e.g., bloods Electrolytes Urea Creatinine (EUC), urine analysis (Y/N)</td>
</tr>
<tr>
<td>• Nil by mouth for food, fluid and medication prior to swallow screening (Y/N)</td>
<td>• Documentation of oral care completion (Y/N)</td>
<td>• Frequency of hydration indicators e.g., bloods EUC, urine analysis (Not completed/ completed once/ completed intermittently, completed daily)</td>
</tr>
<tr>
<td>• Outcome of swallowing screening (Pass/Fail)</td>
<td>• Referral to dental team (if required) (Y/N)</td>
<td>• Documentation of hydration plan (Y/N)</td>
</tr>
<tr>
<td>• Referral to speech pathology if failed (Y/N)</td>
<td></td>
<td>• Referral to dietitian (Y/N)</td>
</tr>
<tr>
<td>• Date/time of swallowing assessment by speech pathology team</td>
<td></td>
<td>• Date/time oral fluid commenced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Type of oral fluids recommended (level of fluid thickness)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Date/time of non-oral fluids commenced e.g., IVT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amount of fluids consumed per type, per day</td>
</tr>
</tbody>
</table>

Phase 2: Implementation of the Screen-Clean-Hydrate bundle of care

Phase 2 will a) co-design tailored implementation strategies for the Screen-Clean-Hydrate bundle of care with the clinical staff of each stroke unit and b) implement it over a period of 3 months.

Participants

The research team will invite stroke staff representing the disciplines of medicine, nursing, speech pathology, physiotherapy, occupational therapy, and dietetics to participate in individual or group interviews. Written consent will be obtained from each staff participant following provision of written and verbal information.

Tailoring of implementation strategies for Screen-Clean-Hydrate

Interviews held between the facilitators (JM and SGu) and stroke unit staff will identify the local practices, barriers and enablers to implementing the relevant components of the Screen-Clean-Hydrate bundle. Local implementation strategies will then be co-designed with the staff to address barriers and
support the implementation in their unit. Information gathered during interviews will be collated and discussed with the wider stroke team to identify and prioritise goals and strategies to be implemented. These cycles of co-design and implementation trials will be iterative to find the most feasible and acceptable care processes for each stroke unit.

**Implementation strategies**

Strategies to support implementation will be drawn from evidence-informed literature (45, 46) and be chosen to address the specific barriers identified by the stroke teams. These may include the following: educational meetings with local staff, leadership, organizational stakeholders and patient/consumer representatives to educate them about the innovation and its significance; development of a formal implementation blueprint that includes all goals and integrates strategies from multiple levels within the system; educational sessions with content experts about aspects of the innovation, for example, practical skills workshop on managing oral healthcare with care resistant patients or those with severe dysphagia; development of education materials and toolkits for ongoing staff training which could be offered as in-person training or online learning modules; awareness raising through media channels; use of visual reminders and prompts about the innovation such as posters on the ward and in patient bays; audit and feedback cycles about specific care processes; sharing of implementation ideas and resources across the two stroke unit sites; identifying and supporting individuals who will champion clinical innovation and spread the word of the significance of it; empowering patients and families to ask for care by raising awareness of the innovation and its significance; regular engagement between the clinical team and the facilitators to recognise, problem solve and support any adherence issues with staff and patients; modification to medical record systems to allow for better assessment of implementation or clinical outcomes; and revision of roles among the professionals who provide care with potential delegation of new responsibilities.

**Phase 3: Post-implementation of the Screen-Clean-Hydrate bundle of care**

Phase 3 aims to evaluate the implementation of care processes and their effectiveness for patient outcomes following implementation of the Screen-Clean-Hydrate bundle of care and how well the implementation strategies worked. Patient participant recruitment and data collection methods will replicate Phase 1, ensuring a valid pre-post-implementation evaluation.

**Process evaluation**

The implementation process will be evaluated to build a comprehensive understanding of implementation processes and outcomes at each site. Throughout phase 2, stroke unit staff will be invited to provide feedback about the implementation process during individual or group interviews. Additionally, at the end of phase 3, staff will be asked for their perspectives of what worked, what did not work, and what could inform future projects. These interview notes and transcripts will be compiled along with the facilitators field records and analysed using templates and approaches based on the i-PARIHS constructs, to inform and assess feasibility, acceptability and effectiveness of implementation strategies.
Data management

All research data will be stored on a password protected computer for five years and deleted thereafter as per guidelines for the responsible conduct of research (47). Digital data will only be accessible to the research team using a password protected file storage server.

Sample size calculation

The project aims to measure the effectiveness of the Screen-Clean-Hydrate bundle of care in reducing hospital-acquired complications. However, to power an effectiveness study based on improvements in rates of aspiration pneumonia from 6.5–5.5% for example, would require a sample size that is not feasible in the timeframe and budget of the project. Instead, the sample size of 30 patient participants at each site at each timepoint (pre-and post-implementation), approximating a quarter of patients admitted in the three-month period, was calculated to be representative of the stroke admissions for a year and feasible within the data collection timeframe of three months. A sample of this size will allow the research team to identify the care processes that are most modifiable and the complication(s) that this bundle of care impacts most significantly. Results from this study will be used to calculate a sample size for a larger multi-site hybrid effectiveness-implementation study.

Data analysis

Quantitative analysis will be used to summarise patient demographics and clinical presentation, complication rates and care process data from Phases 1 and 3. Demographic and clinical stroke data will be compared for equivalency of the pre- and post-implementation samples using Chi-Square tests of difference for categorical variables and Independent Measures t-test for continuous variables (if data is normally distributed) or Independent-Samples Median Test. The rates of complications, care process data and costs will be compared between Phases 1 and 3 using Chi-Square tests of difference for categorical variables and tests of difference (Independent Measures t-test) or Independent-Samples Median Test for continuous variables. Results will be presented as means or proportions with 95% confidence intervals.

For the process evaluation, interviews with staff will be transcribed and analysed qualitatively using content analysis. Summaries will be written and provided to the clinicians for checking to ensure their thoughts are accurately reflected. Interview notes and transcripts, context assessment results, combined with facilitator field records, will be analysed initially by the research team applying i-PARIHS as an analytic framework.

Dissemination

Study findings will be disseminated through journal publications and conference presentations but will also include deliberate interaction with local and interstate health networks and national stroke groups to maximise scale-up of the Screen-Clean-Hydrate bundle of care and successful implementation strategies.

Discussion
This hybrid effectiveness-implementation study will be the first to trial the Screen-Clean-Hydrate bundle of care in two acute stroke units in Australia. This paper outlines the methodology, methods and evaluation processes for the study. Screen-Clean-Hydrate bundles together and makes more explicit the recommendations from the Australian clinical stroke guidelines (10) for swallow screening, oral health and hydration and their importance for functional recovery and avoidance of hospital-acquired complications. To date, these care processes have been inconsistently and inadequately implemented, possibly because explicit protocols and implementation strategies, which translate the guidelines into practice, do not exist in local stroke units. Clinical guidelines infrequently include recommendations for implementation/translation to practice (32).

Bundles of health care processes to target hospital-acquired complications have successfully been implemented in other areas of healthcare such as the Eat Walk Engage program to reduce delirium (48) and the Fever Sugar Swallow Screening protocol to improve acute stroke mortality and morbidity (34). The Screen-Clean-Hydrate bundle of care builds on the Fever Sugar Swallow Screening bundle by targeting swallow screening within the recommended 4 hours and adding oral healthcare and hydration assessment and management. We hypothesise that by bundling these inter-related healthcare processes, optimal patient outcomes will be achieved with increased efficiency and reduced cognitive load and resources for clinical staff (49).

A limitation of this study is that only two stroke units are involved at this early stage, and it is not statistically powered to demonstrate effectiveness with respect to adverse patient outcomes. However, the strength of the study design is that it will evaluate the preliminary clinical effectiveness of the Screen-Clean-Hydrate bundle of care and the implementation processes (41) using a theory informed implementation framework (38). Results will therefore be able to inform future large effectiveness clinical trials and identify successful or unsuccessful implementation strategies. This will promote faster uptake of Screen-Clean-Hydrate (if deemed effective) and improved outcomes for stroke survivors than the typical extended timeframe for translation of research evidence into practice (50).

Conclusion

In summary, this pragmatic implementation study, the first step in the process of developing and evaluating a complex intervention (35), will provide preliminary evidence for the Screen-Clean-Hydrate bundle of care as a novel way to improve patient outcomes in the acute stroke setting. It will provide detailed implementation data identifying successful and unsuccessful multidisciplinary implementation strategies, which will inform a larger powered multi-centre hybrid effectiveness/implementation trial. In time, findings have the potential to support other acute stroke units to implement the Screen-Clean-Hydrate bundle of care, thus facilitating greater compliance with stroke guidelines and improving stroke outcomes internationally.

Abbreviations
Declarations

Ethics approval and consent to participate: This research received ethical approval from the Southern Adelaide Clinical Human Research Ethics Committee (2022/HRE00025) and governance approval from the Southern Adelaide Local Health Networks Office for Research (2022/SSA00198) and Northern Adelaide Local Health Network Office for Research (2022/SSA00197). The research will be conducted in accordance with National Statement on Ethical Conduct in Human Research (41) and all participants will provide informed written consent themselves or by their legal guardian.

Consent for publication: Not applicable

Availability of data and materials: As this is a study protocol paper there is no associated dataset. Once the study is completed, the generated and/or analysed dataset will be made available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

Funding: This research is supported by funding from The Hospital Research Foundation (C-PJ-006PD&S-2021). With this funding, the first author JM employed SGu as a research assistant to facilitate implementation and evaluation of the research outlined in this protocol.

Authors' contributions: JM and SD conceived of the study. JM led the protocol design, with SGe and GH developing the process evaluation plan. SGu contributed to the ethical and governance aspects of the protocol. JM and SGu drafted the manuscript. All authors critically revised the manuscript and approved the final version to be published.

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Authors’ information (optional):

References


Figures

Figure 1
Summary of the three-phase Screen-Clean-Hydrate project

SCREEN - CLEAN - HYDRATE PROTOCOL

SCREEN

- Swallow screening by a trained health professional within 4 hours of presentation at hospital.
- Swallow screening conducted prior to being given any oral food, fluid or medication. The patient should remain nil by mouth.
- If swallow screen is passed, commence oral intake.
- If swallow screen is failed, refer to speech pathology.
- Swallowing assessment conducted by a speech pathologist within 24 hours of hospital admission.

CLEAN

- Oral health assessment within 24 hours of admission.
- Individualized oral healthcare plan documented within 24 hours of admission including products, level of assistance, frequency of intervention and referrals required.
- Oral hygiene performed and documented at least 2x per day throughout admission.
- Referrals to appropriate health professionals completed within 48 hours.
- Oral healthcare plan documented in discharge plan.

HYDRATE

- Assessment of hydration status within 24 hours of admission.
- If results are indicative of dehydration, prepare and document hydration plan.
- Referrals to appropriate health professionals e.g., dietitian/speech pathologist completed within 48 hours.
- Establish appropriate hydration route (subcutaneous, intravenous, enteral, oral) and fluid calculation.
- For patients with dysphagia on modified thickened fluids, consider free water protocol.
- Monitor fluid intake and reassess hydration status via blood sample at 48-hour intervals.

Figure 2

Screen-Clean-Hydrate bundle of care