

SOUTH AFRICAN- CONTEXTUALISED STROKE REHABILITATION GUIDELINE (SA-CSRG)

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FOREWORD

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LIST OF ABBREVIATIONS

ACA	Adoption or Contextualisation or Adaptation
CPGs	Clinical practice guidelines
HICs	High-income countries
HMICs	Higher- to middle-income countries
HQ	High quality
I	Insufficient evidence
Int S	Interim support
LMICs	Lower-to-middle-income countries
MQ	Moderate quality
NCJ	No clear judgement
NDoH	National Department of Health
NHMRC	National Health and Medical Research Council
NICE	National Institute of Health and Care Excellence
NZGG	New Zealand Guidelines Group
OSoBE	Overall SoBE
PQ	Poor quality
SA	South African
SA-cSRG	South African Contextualised Stroke Rehabilitation Guidelines
SAGE	South African Guidelines Excellence Project
SoBE	Strength of the Body of Evidence
SIGN	Scottish Intercollegiate Guidelines Network
WHO	World Health Organisation

LIST OF DEFINITIONS

Adapt - to change the wording of a recommendation in an existing clinical practice guideline (CPG), by including information from local evidence (research evidence or local consensus opinion), in order to address local contexts. Without adapting the recommendation, it would have little relevance in the local setting.

Adopt - to implement one or more recommendations from a CPG that has been produced in one health care system, directly into another similar healthcare system, with no change to the recommendation. Adoption assumes that the recommendation will be implementable, and just as effective, in the adopting healthcare setting, as it was in the parent setting.

Assessment - a detailed process which aims to define the nature and impact of an impairment and devise a treatment plan.

Clinical Practice Guideline (CPG) - A collection of recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.

Contextualise -taking a CPG recommendation from an existing CPG with no change to the evidence base, but considering local context conditions to implement the recommendation.

de novo CPG development- developing a new CPG from ‘scratch’. Good *de novo* development should address the conventional guideline development steps.

Discharge planning - the continuity of healthcare delivered between the health care setting and the community, focused on the needs of the individual patient.

Patient pathway - the route that a patient takes from the first contact with a health professional, through to the completion of treatment. It can also cover the period from entry into a hospital or a treatment centre, until the patient is discharged.

Rehabilitation - a set of measures that assist individuals, who experience or are likely to experience, disability, to achieve and maintain optimum functioning in relation to their environments.

Screening - a population-based process to identify people with particular impairments. People can then be offered information, further assessment and appropriate treatment if necessary. Screening may be a precursor to a more detailed assessment.

Strength of the body of evidence - a mechanism of indicating the type and quality of the evidence (its believability) that underpins a clinical practice guideline recommendation. A recommendation underpinned by strong evidence is far more believable than a recommendation underpinned by weak evidence. End-users of clinical practice guidelines (clinicians, policy-makers, managers, patients, funders etc.) can have confidence that if they implement a recommendation underpinned by a strong body of evidence, it has the potential to make a difference.

Stroke unit - A healthcare environment in which multidisciplinary stroke teams deliver stroke care in a dedicated ward

BACKGROUND

The South African (SA) burden of disease has changed significantly over the last ten years. There is an increasing focus on the need for rehabilitation for chronic conditions and disability, as more lives are saved from communicable diseases [1, 2, 3]. The shift in SA from communicable disease mortality to communicable and non-communicable disease morbidity, has put the spotlight firmly on the need for evidence-informed rehabilitation, to ensure that resources are wisely allocated to achieve best health and cost outcomes for people living with chronic disability and health problems.

Effectively implementing evidence-based practice, particularly using clinical practice guidelines (CPGs), has been the subject of considerable research in high-and middle-higher income countries (HMICs) over the past two decades [4]. Much of this research has focused on why so much difficulty is experienced by policy-makers, managers and clinicians in implementing evidence-based practice recommendations [5]. Across health disciplines, there are generally positive attitudes to using evidence in practice, and despite discipline differences in competencies and areas of practice, similar reasons have emerged for not actually doing so [6],[7]. Commonly reported barriers are lack of time, lack of ready access to CPGs, lack of understanding about CPGs and how to evaluate their quality, disagreement with CPG recommendations, unwillingness to change practices, peer pressure, lack of managerial and organisational support, and differences between research recommendations and clinical realities [6], [7], [8].

Research into evidence implementation and uptake in low- and lower-middle-income countries (LMICs) has been mainly in knowledge translation into policy, which has concurrently identified gaps between research and end-user/stakeholder needs for guidance [9]. It also appears that the challenges of evidence-implementation into clinical practice in LMICs are yet to be fully identified and addressed [10]. A study into the key barriers to implementing evidence-based rehabilitation in SA, such as lack of training, support, resources and recognition of effort found similar barriers to those reported in HMICs [11]. However, the SA study also found a number of country-specific facilitators which mediate some barriers, including the innovative use of resources, and informal rehabilitation networks, to improve functioning and quality of life.

The World Health Organisation (WHO) has noted that rehabilitation services are often not accessible or optimal in many LMICs [3]. The World Health Assembly resolution on disability, including prevention, management and rehabilitation, also considered that rehabilitation could contribute to reducing poverty through improving functioning, activity levels and participation. Inefficient rehabilitation can cause health deterioration, which is associated with an increased rate of complications and healthcare utilisation [3].

Stroke is a leading cause of disability worldwide. Over the past 40 years, the rate of stroke in places such as Southern India and rural SA has approximately doubled, whereas rates in more economically-developed nations have decreased. The most striking problem is that disability and mortality rates arising from stroke are at least tenfold greater in medically-underserved regions versus high-income countries (HICs) [12]. The causes of these disparities are explained by lack of access to early stroke screening, basic medical management, post-stroke rehabilitation, and secondary stroke prevention. The WHO initiated public health programmes to address stroke management in underserved regions. The success of these global initiatives depends on the support

and expansion of these efforts by local governments to prevent post-stroke disabilities in economically-constrained nations.

In SA, it is estimated that 240 people suffer a stroke each day, which translates into ten strokes each hour [13]. Stroke now affects many young South Africans in their twenties and thirties, due to comorbidities such as HIV/AIDS. In SA, stroke is a leading cause of disability among adults of all ages [13], contributing significantly to healthcare costs with long-term implications, particularly if rehabilitation is sub-optimal.

Rehabilitation is currently not included in any national SA CPG [14]. This lack of local guidance perhaps underpins evidence that stroke care varies across the country, and that many stroke sufferers do not have access to rehabilitation [2]. These shortcomings are in accordance with the WHO report, which estimated that in LMICs, only 26% to 55 % of people receive the rehabilitation they need. This World Health Survey revealed that people with disabilities were more than twice as likely to find healthcare provider skills or equipment inadequate, and nearly thrice more likely to be denied care [3]. The deficiencies in rehabilitation policy and guidelines should be redressed to improve the SA healthcare system for the growing number of people in need of post-stroke rehabilitation.

This report outlines the innovative methods and focus taken to produce the SA-contextualised CPG for stroke rehabilitation 2017-2018 (SA-c CSRG).

PROJECT DETAILS

PROJECT NAME

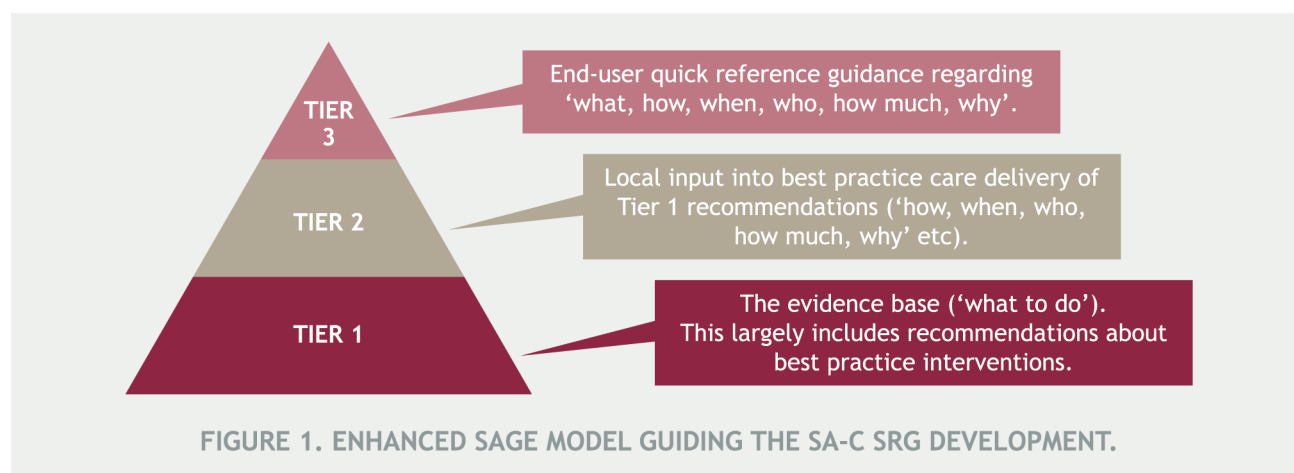
South African-contextualised Stroke Rehabilitation Guideline (SA-cSRG).

PROJECT FRAMEWORK

The project framework was focused on CPG implementation rather than CPG development. This approach follows the implementation framework developed during the South African Guidelines Excellence Project (Project SAGE 2013-2017) [14]. Project SAGE described CPGs as having three tiers: Tier 1 reports the current best available evidence from existing secondary evidence sources; Tier 2 engages local stakeholders regarding implementation of Tier 1 evidence into local contexts; and Tier 3 consists of documentation collated from existing resources, or developed specifically for local contexts, to assist end-users to implement locally-relevant recommendations efficiently, into their local practice [15] (See Appendix 1).

The Project SAGE tiers were underpinned by two approaches (See Figure 1):

1. The five-level Australian National Health and Medical Research Council (NHMRC) Strength of Recommendations Evidence Matrix [16] (Appendix 2). The NHMRC matrix is a method for determining the strength of the body of evidence for CPG recommendations, with the first three levels (evidence base, consistency of findings, impact) relating to Tier 1 of the SAGE model. The fourth and fifth NHMRC levels (local relevance, applicability) underpin the SAGE adoption, contextualisation or adaptation (ACA) approach which addresses issues of local implementation (SAGE model Tiers 2 and 3).
2. The World Health Organisation (WHO) characteristics for good quality service delivery [17]. This work separates best practice interventions (derived from experimental studies) from operationalisation of services, or how to effectively put interventions into practice. These characteristics relate to inputs (such as workforce; service comprehensiveness; resources; continuity; coordination; accountability) and outputs of quality care processes, and quality health outcomes). Outputs can be measured using different constructs including person-centredness; efficiency; equality (individual rights to care); equity (coverage); access; timeliness; and effectiveness.



METHODOLOGY

This project consisted of set-up activities, and five project phases. The first three phases outline the steps taken to:

- produce the recommendations and strength of the underpinning body of evidence that form Tier 1 of the SA-cSRG; and
- contextualise and, if necessary, adapt the recommendations for SA applications (Tier 2 and Tier 3 activities).

Phases 4 and 5 outline the processes by which feedback will be sought on the SA-cSRG, through a national survey, and broad public consultation.

SET-UP ACTIVITIES *(Funding, Organisation, Division of Labour)*

Funding

Successful grant funding was received in February 2017 from Stellenbosch University with support from the WHO Alliance for Health Policy and Systems Research, to write contextualised clinical practice guidelines (CPGs) for stroke rehabilitation in SA (Principal Investigator Mr Maluta Tshivhase (National Dept of Health (NDoH)), in conjunction with Prof Quinette Louw, Stellenbosch University).

Project team

A **SA Stakeholder Reference Group** was established of expert clinicians, academics, representatives of the Provincial DoH (Gauteng), and consumer representatives (Elma Burger; Tina Pinto, Sameera Haffeejee, Juliana Freeme, George Scola, Bhavika Chhania, Bianca Knoetze Dietition, Witness Mudzi, Veronica Ntsiea, Pauline Ramushu, Frida Kotsokoane, Kganetso Sekome, Caitlin von Berg, Marlie Enright, Caroline De Wet, Jamie de Grass-Clementser, Anthea Rhoda, Daleen Campher, Metilda Lewis, Jinnae Kleinsmit, Loreta Krige, Carolyn Davids, Maatje Kloppers, Rochelle Felix, Ivy Kekana and Maryke Bezuidenhout. **An independent methodology team** was based at Stellenbosch University, under the leadership of Prof Quinette Louw (team members Dr Sjan-Mari Brown, Dr Dawn Ernszten, Mrs Gakeemah Inglis-Jassiem, Dr Dominique Leibbrandt, Dr Linzette Morris, Prof Karen Grimmer, Dr Janine Dizon). The Stakeholder Reference Group and the methodology team worked collaboratively and divided project tasks in the manner defined by the implementation framework underpinning the SA-cSRG. The tasks, and division of labour in the SA-cSRG are outlined in Table 1.

Premises and processes underpinning the project

It was essential that this project made best use of available financial resources, and ensured efficiency in human capacity. Thus, the Stakeholder Reference Group and the methodology team agreed on the ways in which the SA-cSRG work would be undertaken to ensure that all project purposes were met within financial, time and resource constraints. Agreement was established on premises and processes before project commencement. These premises and processes related particularly to the secondary purpose of the project, to produce transparent methods that could be applied to write CPGs for other conditions in the future. These premises and processes are outlined in Table 1.

TABLE 1. PROJECT PREMISES AND PROCESSES

Novel outputs which contribute to the secondary aim of this project are highlighted in **RED**

1. There was no need to write <i>de novo</i> CPGs for stroke rehabilitation for SA, as many CPGs were already available around the world which could efficiently provide a summary of the current evidence base. This articulated with SAGE project CPG tiers framework.
2. It was essential that the SA-cSRG group's efforts focused on dissemination and implementation of best available evidence to rehabilitation providers dealing with South Africans suffering stroke.
3. The SA-cSRG project would address local care decisions, specific to an agreed 'average' patient pathway related to stroke rehabilitation in SA healthcare settings.
4. The evidence for Tier 1 (the research evidence) would come from: • recommendations extracted from freely- and publically-available CPGs published in the last seven years, for stroke rehabilitation, that addressed the SA-cSRG questions, and • the component CPG strength of the body of evidence (SoBE) grading underpinning each extracted recommendation.¹
5. No attempt would be made to interrogate the studies underpinning the included CPG recommendations, or to search for new primary or secondary literature where evidence gaps were identified (i.e. where no current CPG was identified to address a SA-cSRG question).
6. The component CPG SoBE grading for each extracted recommendation would be reported initially in the manner presented in the included CPG. It was anticipated that the component CPG SoBE gradings would differ depending on CPG construction methods. It was also recognised, however, that the different methods of SoBE grading would need to be standardised, as this element was essential for determining the overall strength of the body of evidence for composite recommendations (see points 8 and 9).
7. To provide a standard way of interpreting component CPG SoBE gradings, a 'faces' model was developed. This approach also assisted in determining consistency of findings (if all 'faces' were positive, for instance, it would indicate that despite different ways of reporting SoBE gradings, the evidence all pointed in the one direction).
8. Once data extraction was completed, composite recommendations (summary answers) for each SA-cSRG question would be constructed, using the intent and best choice of words from the component CPG recommendations relevant to each SA-cSRG question.
9. The overall SoBE grading underpinning each composite recommendation (overall answer) for each Sa-c SRG question will be established using metrics of: the standardised 'faces' system (Step 7); the consistency of direction of the 'faces'; the number of component CPGs; their quality; and (where indicated), their currency.

¹ SoBE is defined in different ways in the literature, but deals mainly with the confidence that end-users place in the quality with which the research was conducted, to provide a believable answer. Higgin et al. [18] note that '*The notion of study "quality" is not well defined but relates to the extent to which its design, conduct, analysis, and presentation were appropriate to answer its research question*'.

Arguments underpinning the use of existing stroke CPGs. The successful SA-cSRG grant application argued that the focus of the SA-cSRG should be on implementation, and not on *de novo* CPG development. The limited resources available for this project, and the enormous and urgent need for effective, efficient, equitable and safe rehabilitation for patients with acute and chronic stroke in all SA healthcare settings, meant that there was neither time, nor need, to ‘reinvent the wheel’ by developing yet another *de novo* CPG for stroke rehabilitation about ‘what’ to do. The focus needed to be on getting evidence into practice by considering the ‘who’, ‘how’, ‘when’, ‘where’, ‘why’ and ‘how much’ aspects of care [17].

Is stroke different in SA from stroke occurring in other countries? This is the key question underpinning the decision to produce a *de novo* CPG, or to use CPGs already produced by others. The SA-cSRG Stakeholder Reference Group debated this question, particularly as there are indications that some strokes in SA may have different aetiologies than strokes suffered by people in other countries, because of changes in body systems resulting from comorbidities specific to SA (such as living with chronic HIV/AIDS, or tuberculosis (TB)) [19]. The Stakeholder Reference Group decided however, that whatever the etiology, systems mechanisms and pathology of stroke, rehabilitation needs post-stroke would be similar across countries.

To this end, the methodology team undertook a preliminary international search for CPGs dealing with stroke rehabilitation. This identified a number of freely-available international CPGs for stroke rehabilitation published in the last seven years. A scan of the scope and purpose, and table of contents of each CPG found that none directly addressed all the SA-cSRG questions. The funders, and the project team, agreed that synthesis of recommendations from as many currently-available CPGs as were relevant to this project, would efficiently provide the most robust body of evidence (Tier 1), upon which the SA-cSRG could be built (Tiers 2 and 3) [14], [15].

CPG quality reflects robust development methods. The SA-cSRG project team considered that AGREE II quality scores, in particular the domains of Scope and Purpose, and Rigour of Development, would provide defensible indications of the relevance of the included CPGs, and quality of the methods by which the recommendations had been derived. The McMaster checklist [20] sets current internationally agreed standards for CPG development processes, and elements of this checklist align with the AGREE II items [21, 22]. The methodology team assumptions regarding the defensibility of the use of relevant recommendations (secondary evidence) extracted from included component CPGs, were that:

1. there was a clearly defined process outlined in each included component CPG, by which the CPG questions had been established (re scope and purpose);
2. the scope and purpose of the component CPGs, and the information they provided, mapped in part to the scope and purpose of the SA-cSRG;
3. each question in the component CPGs had been appropriately framed to find the best available evidence through literature searches (PICO, PICOS, PECOT etc.);
4. the search strategies in the component CPGs had been accurately mapped to the CPG questions (i.e. intervention questions were answered by intervention or prospective cohort studies; diagnostic questions were addressed by diagnostic studies etc.);
5. the included literature in each component CPG was current, and was comprehensively and systematically identified by defensible search terms and search strategies;

6. the methodological quality of the included literature in each component CPG had been appropriately interrogated for risk of bias;
7. the ways in which data had been extracted and synthesised from the included literature, for each question addressed in each component CPG, were defensible, transparent and available for scrutiny; and
8. the ways in which the underpinning evidence in each component CPG had been synthesised and interpreted as recommendations, were comprehensively described and defensible.

The SA-cSRG team assumed that the AGREE II domain scores would provide evidence by which these eight assumptions could be validated [21]. Thus, there was no efficiency in interrogating each component CPG for search strategies, literature inclusion, evidence synthesis methods, evidence tables or included studies. If a CPG did not provide an answer to a SA-cSRG question, then it was assumed that this CPG did not consider this question in its own evidence search.

Overview of the SA-cSRG processes. A conceptual model of the approach that was taken by the SA-cSRG project team to move individual CPG recommendations and their SoBE gradings, to composite recommendations and overall SoBE statements, is provided in Appendix 3.

Meetings

A project team teleconference was held in April 2017 to identify the SA-cSRG questions, draft the patient pathway, and ratify the premises and processes underpinning SA-cSRG construction. A face-to-face project team meeting was held in July 2017 in Johannesburg, to refine the SA-cSRG questions and the patient journey, confirm the SA-cSRG scope and purpose and the steps and division of labour for producing the SA-cSRG. A writing meeting was held in early November 2017 to discuss and ratify the draft SA-cSRG recommendations, and to commence ACA discussions for implementation. The SA-cSRG tasks and Project SAGE tiers are outlined in Table 2.

TABLE 2. TASKS, TIERS, DIVISION OF LABOUR, TIMELINES

Tasks	Tier	Timeline	SA Stakeholder Reference Group	SA Methodology Team
Phase 1				
1. Establish the scope and purpose of the SA-cSRG	1	April 17	✓	✓
2. Establish the ‘average’ pathway for a South African stroke patient	1	April 17	✓	✓
3. Establish the SA-cSRG questions	1	April 17	✓	✓
4. Map SA-cSRG questions to the pathway	1, 2	April-June 17	✓	✓
5. Categorise the SA-cSRG questions relevant to the patient pathway	1, 2	May 17	✓	✓
Phase 2				
6. Establish a search strategy	1	May 17	✓	✓
7. Conduct the evidence search	1	May-June 17		✓
8. Map potentially relevant CPGs to the SA-cSRG patient pathway and questions		June 17		✓
9. Critically appraise component CPGs	1	July 17		✓

10. Extract recommendations and underpinning SoBE gradings from component CPGs, relevant to each SA-cSRG question		June-Aug 17		
11. Extract potentially relevant ‘how to do it’ documents for each question	3	June-Aug 17		✓
12. Identify gaps in available evidence for CPG questions	1, 2	June-Aug 17		✓
13. Collate extracted recommendations into composite recommendations for each SA-cSRG question	1	Aug-Sept 17		✓
Phase 3				
14. Standardise the SoBE grading for component CPG recommendation using the ‘faces’ scale	1	Aug-Sept 17		✓
15. Debate the elements underpinning the overall SoBE grading for each composite recommendation	1	Aug-Sept 17		✓
16. Present overall SoBE grading in a standard manner for each composite recommendation		Aug-Sept 17		✓
17. Develop and trial an adoption/ contextualisation / adaptation (ACA) process for each composite recommendation [23]	2	Sept 17		✓
18. Present and discuss the composite recommendations	2	Oct 17	✓	✓
19. Debate and endorse draft composite determinations of ACA decisions for each composite recommendation	2	Oct 17	✓	✓
20. Develop ACA implementation plans for each composite recommendation	2	Oct 17	✓	✓
21. Consider the Tier 3 documents from composite CPGs for local relevance	2, 3	Oct 17	✓	✓
22. Apply the ACA framework to the available Tier 3 documents	2, 3	Oct 17	✓	✓
23. Produce draft SA-cSRG		Nov 17	✓	✓
Phase 4				
24. Test the SA-cSRG in a national survey	2, 3	Feb 18	✓	✓
25. Modify wording and presentation of the SA-cSRG according to national survey responses	2, 3	March 18	✓	✓
Phase 5				
26. Conduct public consultation	2, 3	March-April 17	✓	✓
27. Modify wording and presentation of the SA-cSRG according to public consultation feedback	2, 3	May 18	✓	✓
28. Produce ratified SA-cSRG		June 18	✓	✓

PHASE 1

ESTABLISHING PROJECT PARAMETERS

Task 1. Determine scope and purpose

Scope: The scope of the SA-cSRG project was rehabilitation for acute and chronic stroke in any SA healthcare setting. Not in scope was specific pre-hospital emergency care, specific hospital-based medical care to manage and stabilise acute stroke, or pharmaceutical management (except where it was relevant to rehabilitation).

Primary Purpose: Thee primary purposes were to:

- Provide the first ever comprehensive evidence-based guidance contextualised to South Africa, for rehabilitation of patients suffering acute and chronic stroke;
- Write this guidance in a way that would improve and minimise variability in rehabilitation practices for acute and chronic stroke around SA; and
- Provide current evidence-based recommendations upon which national and provincial government funding decisions, directives and policies could be based.

Secondary purpose: To design and test overarching novel methods by which locally contextualised CPGs could be produced efficiently and transparently over the next five years, to guide best practice rehabilitation of other important healthcare conditions in SA.

Task 2. Develop the ‘average’ patient pathway

The notion of the patient pathway approach was pioneered in the Philippines by Gonzalez-Suarez et al. [24] To draft an ‘average’ patient pathway for SA rehabilitation settings for adults suffering acute and chronic stroke, we first conducted a rapid review of contextual factors that may influence the rehabilitation journey (from onset of stroke to community integration) of stroke survivors in SA. The search was conducted in Google Scholar, Scopus and PubMed and using broad search terms, it yielded 36 relevant articles. Contextual information was also obtained via telephonic and email interviews from key rehabilitation clinicians (20 invitations were sent out to therapists from four different provinces (Western Cape; Gauteng; Mpumalanga and KwaZulu Natal). They worked in rural, semi-urban and urban geographical regions and represented all levels of care, except quaternary care.

The draft pathway provides a tangible framework for discussion of when, and where, rehabilitation guidance was required. The key to Appendix 5 is 1= primary healthcare clinics / community centres; 2 = district hospitals; 3 = tertiary hospitals; and 4 = specialist rehabilitation centres; h = home and s = society (See Appendix 5).

Task 3. Identify project questions

A set of 38 questions regarding best practice stroke rehabilitation in SA was drafted by the project team, based on information obtained from the participating therapists in Task 2. The question set is reported in Appendix 4. This question set was linked to the four levels of available care in SA in the ‘usual’ patient pathway (See Appendix 5).

Task 4. Map questions and pathway

Throughout the project, the project team modified and clarified the question set, and how questions mapped to the patient pathway. This ensured that the final answers were provided in

such a way as to appropriately inform practice throughout the patient journey, irrespective of the stage in which rehabilitation care was provided.

Task 5. Organise the questions

The 38 questions were organised into clusters, to better reflect the question intent, and to map the points at which the questions were relevant to the patient pathway (See Appendix 5).

PHASE 2

ESTABLISHING THE SA-cSRG DATASET

Task 6. Establish the search strategy

The search strategy was broad. It aimed to identify any relevant CPG published from 2010 onwards, by any organisation, in any country. The key words were ‘stroke’ (or ‘cerebral vascular accident’ or ‘ischaemic stroke’) and ‘clinical practice guidelines’ (or ‘guidance’ or ‘clinical guidelines’ or ‘management protocol’). The search dates for inclusion of CPGs were from January 2010 to April 2017. A broad seven-year window was opened to ensure that no potentially-relevant recent CPG would be missed. The seven-year window was established because CPG are often updated every five years, and this would allow for leeway in producing the CPG [20].

Inclusion criteria. Any clinical guidance document which provided freely and publicly available guidelines / standards / protocols to inform best practice rehabilitation for any adult stroke sufferer was potentially relevant. The document did not need to be called a CPG to be included in the dataset.

Task 7. Conduct the CPG search

Systematic searches were conducted through www.google.com to identify potential CPGs. Specific searches were also conducted through international CPG clearing houses and CPG developers’ websites, including, but not limited to, National Guidelines Clearing House (<https://www.guideline.gov/>); Scottish Intercollegiate Guidelines Network (SIGN) (UK) www.sign.ac.uk/; National Institute of Health and Care Excellence (NICE) (UK) <https://www.nice.org.uk/>; National Health and Medical Research Council (NHMRC) (Australia) www.NHMRC.gov.au/; and New Zealand Guidelines Group (NZGG) (www.nzgg.org.nz/).

Task 8. Map potentially relevant CPGs to the patient pathway

An initial scan was undertaken of the purpose and scope of each potentially relevant guidance document identified in the search (Task 6), to ensure that it addressed at least one SA-cSRG question (Appendix 4) within the draft patient pathway (Appendix 5). If the CPG contained a recommendation relevant to any question, it was retained in the project dataset. The retained CPGs were called ‘included component CPGs’ for the questions to which they were relevant. The revised SA-cSRG questions were categorised by their intent (clinical, communication, service delivery, organisation, training required) to provide an efficient, workable framework for data extraction and analysis (Tier 1), and to assist in later Tier 2 tasks [23] (See Appendix 6). The SA-cSRG question clusters were then given draft ‘action statement’ headings (‘Do’ statements) which were distilled from chapter headings in the included component CPGs. This reflected the general intent of the question clusters (See Appendix 7).

Task 9. Score CPG quality

The quality of the included component CPGs was scored using the AGREE II instrument (<http://www.agreetrust.org/>) [22], [22]. Scoring was undertaken by independent scorer pairs who were assigned two to three AGREE II domains to score for all included component CPGs. The AGREE II domains of CPG quality are *Scope and Purpose*; *Stakeholder Involvement*; *Rigour of Development*; *Clarity of Presentation*; *Applicability*; *Editorial Independence*. All independent scorers were familiar with using the AGREE II instrument. The independent reviewers' scores were combined using the AGREE II scoring rubric for each domain which reports scores as a percentage of the possible domain total score. While the AGREE II instrument metrics are not usually reported as a total AGREE II score, a total score was calculated in this project to provide a quick reference to the overall quality of the included component CPGs. Total AGREE II scores were calculated by summing the scores from the 23 questions and transforming them by applying the scoring rubric for two independent scorers, with a minimum total possible score ($1 \times 23 = 23$) and a maximum total possible score ($7 \times 23 = 161$).

Potentially relevant component CPGs were not excluded for poor quality, on the basis that all included CPGs provided answers to at least one SA-cSRG question. However, the quality of component CPGs was taken into consideration when determining the overall SoBE for each composite recommendation (Item 9 in the premises and processes underpinning the project, and Task 15 in Table 2). To classify CPG quality for the purpose of determining the overall SoBE for each composite recommendation, arbitrary total overall CPG quality score classifications were established by the methodology team as:

1. 80%+ of the total possible AGREE II score denoted high-quality CPGs (HQ);
2. 60-79% of the total possible AGREE II score denoted moderate quality CPGs (MQ); and
3. <60% of the total AGREE II score denoted poor quality CPGs (PQ)).

Task 10. Extract recommendations

Inclusion criteria for 'recommendations'. What constituted a 'recommendation' for data extraction purposes was initially determined by the methodology team, and subsequently confirmed with Brian Alper and his colleagues (who are working in the same area [25, 26]) at the Global Evidence Summit (Cape Town September, 2017). The importance of determining what constituted a 'recommendation' was to reduce variability and improve efficiency in data extraction.

The inclusion criteria were:

- wording that was clearly labelled as a 'recommendation' in an included component CPG (appearing in designated recommendation boxes, specific fonts or tables) and accompanied by a SoBE grading; or
- wording that appeared in the CPG text, that was not necessarily labelled 'recommendation' but which had the intent of a recommendation in terms of its wording (particularly the use of intention words such as 'should', 'could', 'might consider'). It would also have an associated SoBE grading.

Exclusions. Not considered to be recommendations was wording which appeared in the body of the CPG text, but which was not labelled as a recommendation, nor had the intent of a recommendation (regarding wording), nor had a SoBE grading assigned to it. This information was often presented as descriptive text.

Extracting data: Purpose-built data extraction sheets for each SA-cSRG question were developed. These sheets recorded component CPG details, extracted recommendations and associated SoBE gradings from each relevant CPG. These were CPGs that provided an answer (in part, or total) to each SA-cSRG question. Recommendations which met the inclusion criteria were extracted verbatim from the relevant included component CPGs, along with the associated SoBE grade (in whichever way it was reported). This formed Tier 1 evidence.

Task 11: Identify Tier 3 documents

Any document in any component CPG which provided ‘how to do it’ information was identified during data collection to assist in implementing SA-cSRG recommendations. This was potential Tier 3 material for the SA-c SRG. These ‘how-to-do-it’ documents would assist in Phase 4 implementation discussions, on the understanding that there was efficiency in using Tier 3 documents already prepared by other CPG groups. These documents could include, but were not limited to, protocols, patient management or service decision-making tools, organisational flowcharts, stroke team construction, workforce issues, assessment criteria, specific assessment tools, outcome measures, minimal clinically significant changes from interventions, discharge planning checklists, and patient information material.

Task 12: Identify evidence gaps

The project team identified SA-cSRG questions which could not be answered at all by the included component CPGs. These were questions where further research was required. This task was also revisited after the overall SoBE was determined for each composite recommendation. The questions for which there was no clear judgement, insufficient evidence or could be presented only as interim suggestions were identified as areas for further research.

Task 13. Provide composite answers

Recommendations were extracted ‘verbatim’ from the included component CPGs for each SA-cSRG question, and recorded in individual data extraction files. These provided the foundation datasets for the SA-cSRG. Also included in these data extraction files were the associated SoBE gradings for each extracted recommendation, recorded in the manner in which it was reported in the component CPG. The data extraction files are provided as supplementary files.

Revisiting question cluster classifications and the draft patient pathway. After completing data extraction and developing the composite recommendations (answers) for each SA-cSRG question, the methodology team met to reconsider the clusters of patient pathway-related questions (See Appendix 5). The team also revisited, modified and finalised the initial patient pathway (Appendix 4) in light of the composite draft recommendations for each SA-cSRG question. The revised patient pathway was realigned to the draft overarching ‘Do’ headings for each question cluster (see Appendix 8). Modifications to the pathway were mostly made to streamline responses to questions which had been asked multiple times in the initial question set, but which were actually relevant across the patient journey. An example of this is the number of questions relating to discharge planning. Only one set of questions was actually required, as the same information on discharge planning needed to be reported multiple times. This was because the evidence was the same, irrespective of stage in the pathway at which the question was asked.

PHASE 3

ANSWERING THE SA-CSRSG QUESTIONS, & DETERMINING THE COMPONENT SoBE UNDERPINNING THE ANSWERS

Task 14. Standardise reporting of SoBE gradings

The ways in which each included CPG reported gradings for its recommendations, were collated. As has been reported by others when synthesising multiple CPG recommendations [24-26], CPGs often report SoBE gradings in different ways. There is no one agreed approach to standardise SoBE grading descriptions. Thus, because multiple CPGs on stroke rehabilitation were included in the SA-cSRG, the methodology team developed an approach to standardise the component CPG SoBE gradings to assist in determining the overall SoBE discussions for composite recommendations. Thus, the different ways in which SoBE gradings were reported in the component CPGs were extracted and aligned, and a standard set of ‘faces’ (positive, equivocal, negative) was proposed.

Task 15. Determine the elements required to determine the overall SoBE for each composite recommendation

There is currently little methodological guidance about how to develop overall SoBE statements for composite answers derived from multiple component CPG recommendations. Berkman et al. [27] define the SoBE as a method *‘to help clinicians, policymakers, and patients make well-considered decisions about health care. The goal of strength of evidence assessments is to provide clearly explained, well-reasoned judgments about reviewers’ confidence in their systematic review conclusions so that decision-makers can use them effectively’*. To develop a defensible approach to determining overall SoBE statements, the methodology team combined the determination methods published by Gonzalez and colleagues, and Alper and colleagues [24-26].

The methodology team initially considered that it would determine the underpinning strength of the body of evidence for each composite recommendation using the decision-making algorithm provided by the Healthcare Guidance for Patients Society [25, 26] (Appendix 9). This is a flowchart of decision-making relevant to reconciling recommendations from a small number of CPGs which address the same question, based on the consistency of findings, and reported SoBE gradings underpinning each extracted recommendation. The Alper et al. [25, 26] work takes a similar approach to that of Gonzalez-Suarez et al. [24], which used ‘consistency of thought’ and ‘strength of evidence’.

However, the methodology team found that it required more information on which to understand the overall SoBE for each composite recommendation. This finding was in line with the NHMRC Strength of the Body of Evidence matrix [16] (Appendix 2) and the additional elements reported by Gonzalez-Suarez et al. [24] for its contextualised stroke rehabilitation CPG in the Philippines. Moreover, this approach was required to ensure that the broad body of knowledge for stroke rehabilitation was best represented.

Thus, an additional layer of information was added to the Alper et al. algorithm [25, 26], consisting of the number of CPGs which provided recommendations for each SA-cSRG question, their methodological quality (high, moderate or poor as determined from the overall AGREE II score [21, 22]), and where required, their currency. This additional layer of decision-making is shown in summary form, as the superimposed (yellow) box on the Alper et al. decision-making flowchart [25, 26] (Appendix 9).

Assembling the elements required to determine the strength of the body of evidence underpinning answers to SA-cSRG questions. A summary table was developed from the information recorded in the individual data extraction files. This table identified which CPGs had provided answers to which SA-cSRG questions, the year of CPG production, and CPG methodological quality (high, moderate or poor as determined from the overall AGREE II score). The SoBE grading for recommendations extracted from relevant component CPGs to answer each SA-cSRG question is also reported in this table, using the standardised purpose-built ‘faces’ system. This summary table allowed efficient identification of how many CPGs had provided answers to each SA-cSRG question (volume), their currency, their quality, their consistency (‘do all recommendations point in the same direction?’) determined as the type of ‘face’ assigned to each extracted recommendation, and the SoBE grading for each SA-cSRG question (determined by the number and type of ‘faces’ for each extracted recommendation for each question).

Task 16. Determine the overall SoBE for each composite recommendation

A new system was devised to describe the overall SoBE for each component recommendation. This is summarised in Table 4 and the decision-making framework is reported in detail in Table 5. The SoBE components was considered for each composite recommendation for each SA-cSRG question, and a determination was made ‘on balance’ of the component SoBE gradings for each composite recommendation, and the number, consistency, quality and currency of the CPGs providing answers to each question (see Appendix 10).

TABLE 4. SUMMARY OF THE STRENGTH OF THE BODY OF EVIDENCE CLASSIFICATIONS DEVELOPED FOR THE SA-CSR

One, two or three ‘Ticks’ ✓ were assigned to demonstrate the overall SoBE for composite recommendations which were underpinned by consistently positive SoBE gradings from three or more CPGs. The number of CPGs which provided component recommendations and CPG quality classifications for each included CPG was reported. Where there were concerns with the currency of included CPGs, this was noted.
✓✓✓ were assigned when the SoBE was high [☺☺☺], ✓✓ were assigned when the SoBE was moderate [☺☺], and ✓ was assigned when the SoBE was low [☺].
A system of ‘Crosses’ ✗ was assigned to demonstrate the overall SoBE for composite recommendations which were underpinned by consistently negative SoBE gradings from three or more CPGs. The number of CPGs which provided component recommendations, and CPG quality classifications for each included CPG was reported. Where there were concerns with the currency of included CPGs, this was noted.
✗✗✗ were assigned when the SoBE was high [☹☹☹], ✗✗ were assigned when the SoBE was moderate [☹☹], and ✗ was assigned when SoBE was low [☹].
Determinations regarding No Clear Judgement (NCJ) were made when the recommendations extracted from any number of relevant CPGs were: • inconsistent (different SoBE gradings and/or consistency); or • equivocal (no significant findings). No composite recommendation was thus made.
Determinations regarding Insufficient evidence (I) were made when: • there was only one component CPG which provided a recommendation; or • there were two component CPGs with inconsistent findings and different SoBE gradings underpinning component recommendations. No consideration of CPG quality or currency occurred in this instance, and no composite recommendation was made.
Determinations regarding Interim Support (Int S) were made when there were two moderate or good quality CPGs which provided consistent evidence for the component extracted recommendation, and where at least one of these recommendations had a strong SoBE grading. A composite recommendation was made in this instance, however its uncertainty was identified by the Interim Support grading for overall SoBE.

TABLE 5. THE DETAILED DECISION-MAKING FRAMEWORK DEVELOPED TO DETERMINE THE STRENGTH OF THE BODY OF EVIDENCE FOR EACH COMPOSITE RECOMMENDATION

Considering Positive Evidence (For)
1. Strong Consistent Evidence For (a care action) When the composite recommendation is underpinned by three or more component CPG recommendations that have high SoBE grading, and provide positive consistent recommendations for (a care action) [😊😊😊], the composite recommendation wording states: <i>‘There are Consistent and Strong Recommendations from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) For (a particular care action)’</i>. This composite recommendation strength of the body of evidence has three ‘ticks’ ✓✓✓. The evidence body strength could still be called ‘strong’ if it included • <10% individual moderate [😊😊] SoBE gradings for (a care action) considering all included CPGs; or • moderate [😊😊] SoBE gradings underpinning recommendations for (a care action) from component CPGs older than five years, which may not have had the benefit of including new more definitive literature. The percentage of older CPGs in the evidence dataset which met this rule was limited to 50% or less. If the percentage of older CPGs with moderate [😊😊] SoBE gradings were higher than 50%, the composite strength of the body of evidence was downgraded to ✓✓. However, if the moderate evidence [😊😊] SoBE gradings were reported for recommendations extracted from one or more recent, high quality component CPGs, the Alper et al. (2017) decision-making algorithm would be invoked, and the composite strength of the body of evidence would be downgraded to ✓✓. The reasons for downgrading the composite strength of the body of evidence would be explained.
2. Moderate Consistent Evidence For (a care action) When the composite recommendation is underpinned by three or more component CPG recommendations that are supported by moderate SoBE gradings, and provide positive consistent recommendations for (a care action) [😊😊], the composite strength of the body of evidence wording states: <i>‘There are Consistent Suggestions from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) For (a particular care action)’</i> The composite recommendation strength of the body of evidence has two ‘ticks’ ✓✓. The evidence body strength could still be called ‘moderate’ if it included • <10% low SoBE gradings [😊] overall from the included CPGs; or • Low SoBE gradings [😊] for recommendations from included component CPGs older than five years, which may not have had the advantage of including new, more definitive literature.

The percentage of older CPGs in the evidence dataset which met this rule was limited to 50% or less. If the percentage of older CPGs with low ☹ SoBE gradings was higher than 50%, the composite strength of the body of evidence would be downgraded to ✓

However, if the low SoBE grading ☹ came from one or more recent, high quality component CPGs (published within the last five years), the Alper et al. (2017) decision-making algorithm would be invoked and the composite strength of the body of evidence would be downgraded to weak ✓. The reasons for downgrading the composite strength of the body of evidence would be explained.

3. Weak Consistent Evidence For (a care action)

When the composite recommendation is underpinned by component CPG recommendations that are generally underpinned by **low SoBE gradings**, but provide **positive consistent recommendations** for (a care action) ☺, the composite strength of the body of evidence wording states: *‘There is Weak Support from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) For (a particular care action)’*. The composite recommendation has one ‘tick’ ✓

The evidence body strength could still be called ‘weak’ if it included

- <10% equivocal/ insufficient/ inconsistent ☹ SoBE graded recommendations over all included CPGs; or
- Equivocal/ insufficient/ inconsistent ☹ SoBE graded recommendations from included component CPGs older than five years, which may not have had the advantage of including new, more definitive literature.

The percentage of older CPGs in the evidence dataset which met this rule was limited to 50% or less. If the percentage of older CPGs with low SoBE graded recommendations was higher than 50%, then the composite strength of the body of evidence was downgraded to No Clear Judgement (NCJ).

However, if the equivocal/ inconsistent/ insufficient evidence came from one or more recent, high-quality CPGs (published within the last five years), the Alper et al. (2017) decision-making algorithm would be invoked and the composite recommendation strength of the composite body of evidence would be downgraded to No Clear Judgement (NCJ). The reasons for downgrading the composite strength of the body of evidence would be explained in the text.

Inconsistent, Equivocal or Insufficient (limited) Evidence

4. Inconsistent evidence strength and/or direction

When there are recommendations from three or more component CPGs with **inconsistent SoBE gradings** [☺☺☺, ☺☺, ☺, ☹, ☹, ☹☹, ☹☹☹] and / or **inconsistent evidence directions** (the evidence points in different ways), the wording states: *‘There are component recommendations from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) that provide inconsistent evidence for this question. No clear*

judgement can be made for or against (a care action)'. The question cannot be answered because No Clear Judgement (NCJ) is possible.

N.B. One approach to clarify the evidence in this scenario could be to reconsider a subset of the current evidence base if there are sufficient recent, high quality component CPGs available to do so. CPGs published in the last five years that contribute component recommendations for this SA-cSRG question could be re-assessed as a subset for SoBE and consistency.

- If there are three or more recent, high quality CPGs that report more consistent and/or higher SoBE gradings, an interim composite recommendation could be proposed, and the underpinning composite SoBE determination could be referred through the relevant stronger evidence pathways (positive or negative). Caveats and limitations on the believability of the recommendation would be explained in the text.
- If there are two consistent CPGs where at least one provides a recommendation which has a higher SoBE grading, an interim composite recommendation could be proposed, and the underpinning composite SoBE determination could be graded as Interim Suggestion (Int S). Caveats and limitations on the believability of the recommendation would be explained in the text.

5. Equivocal / uncertain evidence

When there are component recommendations from three or more CPGs with consistently **equivocal/ uncertain SoBE gradings** [☹] (reflecting non-significant findings from the underpinning research), the composite SoBE wording states: *'There are component recommendations from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) that provide an equivocal evidence base for this question. No clear judgement can be made for or against (a care action)',* and thus the question cannot be answered. Strength of the body of evidence is **NCJ** (No Clear Judgement).

6. Limited evidence from one or two component CPGs

- When the SA-cSRG question is answered by only one component CPG recommendation, irrespective of its SoBE grading (☺☺☺, ☺☺, ☺, ☹, ☹, ☹☹, ☹☹☹), the composite SoBE wording is *'There is insufficient evidence from one CPG (aa high quality (HQ) OR bb moderate quality (MQ) OR cc (Poor Quality (PQ))'* and thus the question cannot be answered because of Insufficient evidence (**I**)

When the question is answered by two-component CPGs

- Where the two-component recommendations have inconsistent findings and different SoBE grading in their underpinning evidence base (☺☺☺, ☺☺, ☺, ☹, ☹, ☹☹, ☹☹☹), the composite SoBE strength of the body of evidence wording is *'There is insufficient/ inconsistent evidence from two inconsistent, different strength evidence base CPGs (aa high quality (HQ), bb moderate quality (MQ) OR cc (Poor Quality (PQ))'*, thus the question cannot be answered because **NCJ** (No Clear Judgement) is possible.

If one of these CPGs is current and high quality, this component recommendation could be referred through the pathway for one CPG, and an Insufficient evidence statement (**I**) could be made with an appropriate justification.

- Where both component CPGs are current, have consistent direction component recommendations, and at least one component recommendation has a high SoBE, the strength of the body of evidence wording is *‘Interim support is provided on the basis of two current, consistent CPGs (aa HQ, bb MQ)’* (graded Int **S** (Interim Support)).

For all examples of Inconsistent, Equivocal or Insufficient (limited) Evidence, the composite SoBE determinations (No Clear Judgement, Insufficient evidence, Interim Support) could provide the impetus for research to provide a stronger evidence base for the question.

Negative evidence (Against)

7. Strong Consistent Evidence Against (a care action)

When the composite recommendation is underpinned by three or more component CPG recommendations that are generally supported by **high SoBE gradings**, which provide **negative consistent recommendations** (against a care action) [⊖⊖⊖], the composite SoBE wording states: *‘There are Consistent and Strong Recommendations from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) Against (a particular care action)’*. This composite recommendation strength of the body of evidence has three ‘crosses’ **× × ×**

The evidence base could still be called ‘strong’ if it included

- <10% individual moderate [⊖⊖] SoBE graded recommendations against (a particular care action) considering all included CPGs; or
- moderate [⊖⊖] SoBE graded recommendations against (a care action) from composite CPGs older than five years, which may not have had the benefit of including new more definitive literature.

The percentage of older CPGs in the evidence dataset which met this rule was limited to 50%. If the percentage of older CPGs with moderate [⊖⊖] composite SoBE graded recommendations was higher than 50%, the composite SoBE was downgraded to **× ×**

However, if the moderate SoBE gradings [⊖⊖] underpin recommendations extracted from one or more recent, high quality component CPGs, the Alper et al. (2017) decision-making algorithm would be invoked, and the composite recommendation SoBE would be downgraded to **× ×** The reasons for this decision would be explained in the text.

8. Moderate consistent evidence against (a care action)

When the composite recommendation is underpinned by three or more CPG recommendations with **moderate rSoBE gradings**, which provide **negative consistent**

recommendations against (a care action) (⊕⊕) the composite SoBE wording is *‘There were Consistent Suggestions from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) Against (a particular care action)’*. The composite recommendation is given two ‘crosses’ ✖ ✖

The evidence base could still be called ‘moderate’ if it included

- <10% low SoBE recommendations [⊕] against (a particular care action) over all included CPGs for that question; or
- Low SoBE recommendations [⊕] against (a care action) from CPGs older than five years, which may not have had the advantage of including new, more definitive literature

The percentage of older CPGs in the evidence dataset which met this rule was limited to 50%. If the percentage of older CPGs with low [⊕] SoBE recommendations were higher than 50%, the strength of the body of evidence was downgraded to ✖.

However, if the low SoBE grading (⊕) underpins recommendations extracted from one or more recent, high quality component CPGs, the Alper et al. (2017) decision-making algorithm would be invoked and the composite SoBE would be downgraded to ✖. The reasons underpinning this decision would be explained in the text.

9. Weak consistent evidence against (a care action)

When the composite recommendation is underpinned by three or more CPG recommendations with **low SoBE gradings** which provided **consistent negative recommendations** against (a particular care action) [⊕], the composite SoBE wording is *‘There was Weak Support from xx CPGs (aa high quality (HQ), bb moderate quality (MQ), cc (Poor Quality (PQ)) Against (the care action)’*. The composite recommendation is given one ‘cross’ ✖.

The evidence base could still be called ‘weak’ if it included:

- <10% equivocal / inconsistent / insufficient evidence recommendations [⊕] regarding a care action, over all included CPGs for that question; or
- Equivocal/ insufficient/ inconsistent (⊕) SoBE recommendations from CPGs older than five years, which may not have had the advantage of considering new more definitive literature.

The percentage of older CPGs in the evidence dataset which met this rule was limited to 50%. If the percentage of older CPGs with equivocal [⊕] SoBE graded recommendations was higher than 50%, the composite SoBE was downgraded to **NCJ**.

However, if the equivocal/ insufficient / inconsistent evidence (⊕) came from more recent, high quality CPGs (within the last five years), the Alper et al. (2017) decision-making algorithm would be invoked and the composite evidence body strength would be downgraded to No Clear Judgement (**NCJ**). The reasons for this decision would be explained in the text.

Task 17. Develop and trial ACA) processes

This task deals specifically with developing local implementation strategies for each composite recommendation (Tier 2). This addresses the relevance and applicability of recommendations to local contexts [16] (Appendix 2). Discussions were framed by the WHO quality health service delivery characteristics [17] within the ACA framework [23]. Appendices 11-13 were developed to assist these activities.

Task 18. Present composite recommendations within an ACA framework

Preliminary implementation discussions (Tier 2 activities) were conducted by the methodology team in early Sept 2017 to test the decision-making processes underpinning the ACA approach. Local context discussions can only be undertaken by people who understand local barriers.

Task 19. Debate draft determinations of ACA decisions (endorsement)

The ACA endorsement framework presents a novel approach to implementation [23]. It engages end-users in determining the barriers which might prevent immediate uptake of a recommendation into practice. This framework was a product of the SAGE project [14, 15, 23] and provides a practical, end-user-focused approach to translating evidence from the page to the bedside. The ACA discussions were applied using Appendices 12 and 13, and produced an endorsement for each recommendation. Every composite recommendation was considered as to whether it:

- could be adopted (and implemented) immediately; (**Adopt**)
- required contextualisation first before they could be implemented (**Contextualise**). These discussions were supported by a list of potential barriers to implementation in SA settings (Appendix 11). These prompts had been modified from Gonzalez-Suarez et al. [24]; and
- could not be adopted or contextualised without further local evidence (Appendix 13) (**Adapt**).

Task 20. Develop draft ACA plans

The methodology team developed draft implementation strategies for each recommendation that could be adopted or contextualised. It put to one side those recommendations which required adaptation, for later consideration. The draft implementation strategies took into account policy issues, funding, workforce and training requirement. They set one- to five-year timeframes for implementation, supported by interim steps and end goals. These determinations were ratified by the Stakeholder Reference Groups in face-to-face meetings held from October 2017 -August 2018.

Tasks 21 and 22. Consider and ratify Tier 3 documents

The Tier 3 documents (Task 11) were first presented at the project team meeting in October 2017, and again at subsequent meetings. The Tier 3 documents were linked to relevant composite recommendations, and implementation plans. They provided a starting point for the project team to consider whether these documents could be adopted, contextualised or adapted, using the same process as outlined in Appendices 13 and 14, for composite recommendations.

Task 23. Produce the draft SA-cSRG

Following the October 2017 meeting, the first draft of the SA-cSRG was produced for discussion. This included the composite recommendations which provided answers to the SA-cSRG questions, the SoBE underpinning each recommendation, the endorsements and implementation plans. The recommendations with endorsements and relevant context points, are reported below.

RECOMMENDATIONS

ORGANISE FOR BEST PRACTICE REHABILITATION

*refer to Appendix 12 for interpretation of endorsement levels; Ticks indicate the SoBE

Multidisciplinary AH stroke rehabilitation		Endorsement*
✓✓✓	1. There are consistent strong recommendations that people who suffer from stroke should be seen by a multidisciplinary team/inter-professional/ interdisciplinary stroke team for medical and rehabilitation assessment and management.	B2
✓✓	2. There are consistent suggestions that all members of the multidisciplinary team should have specialised training in stroke care and recovery.	A2
✓✓✓	3. There are consistent strong recommendations that all patients who suffer from stroke should have access to specialist stroke service units with multidisciplinary team (where available) as early as the hyper-acute to acute stages of stroke and up to discharge.	B2
✓✓✓	4. There are consistent strong recommendations that the rehabilitation processes should commence in the acute setting as soon as the person with stroke is medically safe and/or able to participate. Tier 3 document available: Tier 3 Document 1 (page 107).	A1
✓✓	5. There are consistent suggestions that a standard set of outcome measures should be used to assess rehabilitation needs throughout the patient journey.	C2

OPERATIONALISE STRATEGIES FOR BEST PRACTICE COMMUNICATION, RISK MINIMISATION AND PLANNING THROUGHOUT THE PATIENT JOURNEY

Minimise risks of adverse events and complications after stroke		
✓✓✓	6. There are consistent strong recommendations that stroke survivors should be screened as early as possible for risks of adverse events.	B1
✓✓	7. There are consistent suggestions that patients with a stroke need to have their swallowing capacity screened (e.g. a simple water swallow test) by a trained health professional before taking any food, drink and oral medication. Tier 3 document available: Tier 3 Document 2 and 3 (page 111 and 112).	B2
✓✓	8. There are consistent suggestions that a standardised clinical assessment should be applied by a professional skilled in the management of dysphagia (currently speech and language therapists).	A1
✓✓✓	9. There are consistent strong recommendations that videofluoroscopic swallow studies (VSS, VFSS,) or fiberoptic endoscopic examination of swallowing (FEES) should be performed on all patients considered at risk for pharyngeal dysphagia or poor airway protection, based on results from the bedside swallowing assessment.	B2

✓✓	10. There are consistent suggestions that education should be made available to all healthcare providers about adverse events following stroke. There is no evidence about the best way that this information should be provided to all healthcare providers.	A1
✓✓	11. There are consistent suggestions that all patients with a stroke should be mobilised as early as possible, to lessen likelihood of complications such as pneumonia, DVT, PE, and pressure sores.	A1
✓✓	12. There are consistent suggestions that patients with mild and moderate stroke should be provided with frequent, short activity sessions.	A1
✗✗✗	13. There are consistent strong recommendations against the <u>routine</u> use of splints or prolonged positioning of upper or lower limb muscles in a lengthened position (stretch) for stroke survivors who are at risk of developing contracture.	A1
✓✓✓	14. There are consistent strong recommendations that all stroke survivors should undergo pressure care risk assessment (monitor skin breakdown) and regular evaluation, completed by trained personnel.	B2
✓✓✓	15. All stroke survivors should undergo fall risk assessment using a validated tool. An interdisciplinary management plan should be initiated for all those identified as at risk of falls. Tier 3 document available: Tier 3 Document 1 (page 107).	C2
✓✓✓	16. There are consistent strong recommendations that subluxation of hemiplegic shoulder should be prevented, and if it occurs, minimise pain and dysfunction.	A2
✓✓✓	17. There are consistent strong recommendations that falls should be prevented by improving balance.	A2
INT S	18. There is interim support for a recommendation that the use of psychological principles from motivational interviewing and problem solving should be incorporated into education programmes for people who have suffered a stroke.	
I	19. There is insufficient evidence to suggest that offering routine psychological therapies in one-to-one format following a stroke will prevent post-stroke depression.	
I	20. There is insufficient evidence that each multidisciplinary team should have access to a clinical psychologist (SIGN 2010).	

	Patient and family engagement and communication	
✓✓	21. There are consistent suggestions that patients, family and carers should be involved in planning rehabilitation goals and management, problem-solving and decision-making, and be given formal and informal education on stroke rehabilitation.	B2
✓✓	22. There are consistent suggestions that patient and family education, and family support, should commence once the patient presents to a healthcare professional and should continue throughout the rehabilitation process.	B2, C2
No evidence	23. There is no evidence that provides guidance regarding the appropriate timing of communication and meetings between the patients, family members and health professionals	
INT S	24. There is interim support for the recommendation that communication should ideally be commenced and led by one nominated key worker identified by the multidisciplinary team.	C
✓✓	25. There are consistent suggestions that communication should include: - written information about stroke, the rehabilitation process, referrals, appointments, GP discharge summary individualised for the needs of the patients and carers; - a mixture of education and counselling techniques; and - behaviour change for long-term prevention. - There is no evidence regarding the most optimal communication platform for the rehabilitation team. - Consider face-to-face or telephone communication/ tele-medicine	B2
INT S	26. There is interim support for the recommendation that communication between the health professionals (medical and rehabilitation therapists) could occur via multidisciplinary meetings and case conferences, as well as in liaison with other health professionals through networks.	B2
I	27. There is insufficient evidence regarding alternative methods of communication and support (e.g. telephone visits, telehealth, or web-based support), particularly for patients in rural settings.	C2

	Reintegration of stroke survivors into their community	
✓✓✓	28. There are consistent strong recommendations that patients should be given support to re-integrate in the community and encourage social participation	C2
I	29. There is insufficient evidence that patients with a stroke whose social behaviour is causing distress to themselves or others should be assessed by an appropriately trained healthcare professional to determine the underlying cause, and advise on management.	
I	29. There is insufficient evidence to ensure long-term maintenance of health benefits, a planned transition could be implemented from structured aerobic exercise to more self-directed physical activity at home or in the community.	

Support self-efficacy principles and training for patients and family		
INT S	31. There is expert consensus that capacity for self-management could be assessed early in the hospital admission.	
INT S	32. There is expert consensus that patients could be trained for self-management to do compensatory techniques, to be able to overcome barriers to engagement in active activities and to engage in social and leisure activities.	C2

ADMIT TO ACUTE HOSPITAL

Admission to a medical facility for patients with a stroke		
✓✓	33. There are consistent suggestions that it is important that the public and health professionals are educated in the use of the F.A.S.T. assessment instrument to recognise stroke symptoms, and to minimise delays for patients in reaching medical care quickly, and in recognising subsequent strokes in stroke survivors. Tier 3 document available: Tier 3 Document 4 (page 116).	A2
✓✓	34. There are consistent suggestions that delays should be reduced so that people suspected of suffering a stroke receive the medical treatment they require in the shortest time possible. Tier 3 document available: Tier 3 Document 1 (page 107).	A2

REFER TO INPATIENT REHABILITATION

Referral to multidisciplinary rehabilitation		
✓✓✓	35. There are consistent strong recommendations that patients with a stroke should be referred to a multidisciplinary stroke unit as soon as he/she is deemed to be medically stable and able to participate safely in rehabilitation. Tier 3 document available: Tier 3 Document 5 (page 117).	B2
I	36. There is insufficient evidence that the criteria for admission to any rehabilitation setting should be standardised and communicated to all referring centres and services.	A1
✓✓✓	37. There are consistent suggestions that a multidisciplinary acute stroke unit should include physiotherapy, occupational therapy, speech-language pathology, dietetics, clinical psychology and social work (for stroke survivors as well as their families). Tier 3 document available: Tier 3 Document 6 (page 118).	A2
✓✓	38. There are consistent suggestions that patients' rehabilitation progress should be documented centrally and be accessible to all multidisciplinary team members (documentation must be based on regular assessment and decisions which are matched to patient and family goals).	A2
✓✓	39. There are consistent suggestions that formal and informal multidisciplinary team meetings should occur regularly.	A2

ACTION INPATIENT REHABILITATION

	Comprehensive Assessment	
✓✓	40. There are consistent suggestions that stroke survivors should be screened as early as possible for rehabilitation potential.	B1
✓✓	41. There are consistent suggestions that a standard assessment process should follow within 24 to 48 hours of admission to hospital, once the patient can tolerate it.	B2
✓✓	42. There are consistent suggestions that comprehensive assessment of rehabilitation needs should include: • Previous functional abilities; • Impairment of psychological functioning (cognitive, emotional) and communication; • Impairment of body functions, including pain/orientation; • Activity limitations and participation restrictions e.g. positioning, moving, transfer and handling; • Swallowing (see section 2); • Pressure area risk (see section 2); • Continence; • Nutritional status and hydration; • Environmental factors (social, physical, and cultural). Tier 3 document available: Tier 3 Document 7 (page 119).	A1
✓✓	43. There are consistent suggestions that the ART assessment instrument is a comprehensive international tool which enables comparisons among sites. Tier 3 document available: Tier 3 Document 7 (page 119).	
✓✓✓	44. There are consistent strong recommendations that rehabilitation plans and management strategies should be designed to meet person-centred goals and needs for recovery, within their level of tolerance/ability.	A2
✓✓	45. There are consistent suggestions that there should be routine use of standard outcome measures to detect changes over time and to underpin decisions regarding ongoing rehabilitation. Tier 3 document available: Tier 3 Document 1 (page 107).	A2
✓✓	46. There are consistent suggestions that the more therapy is provided, the better the outcome.	B2
✓✓✓	47. There are consistent strong recommendations that rehabilitation should commence as early as possible after the onset of the stroke, or when the person is medically stable, whichever comes first.	A2

	Multidisciplinary rehabilitation	
✓✓✓	48. There are consistent strong recommendations that physiotherapists, occupational therapists, speech and language therapists and dieticians bring specific competencies and skills to patient assessment and rehabilitation planning. They operate most effectively when sharing the assessment and rehabilitation tasks, and communicating findings verbally and in written form in patient notes, as members of the multidisciplinary team.	A1
NCJ	49. There is a range of treatment approaches to manage the manifestations of stroke, with different approaches recommended for different stages of stroke rehabilitation and recovery. The treatment approaches are underpinned by variable evidence.	

Best practice methods for recording assessment, treatment and goal setting		
✓✓	50. There are consistent suggestions that treatment decisions should be clearly documented.	A1
✓✓	51. There are consistent suggestions that progression of rehabilitation programmes should be documented, including reason for progression, and patient responses.	A1
✓✓✓	52. There is consistent strong recommendations that all documentation should be recorded in legible format in a central place accessible to the multidisciplinary team.	B2
✓✓	53. There are consistent suggestions that progress reports on interventions and outcomes should be communicated regularly within the team, and to the patient and family.	A1

Assistive technology		
✓✓	54. There are consistent suggestions that walking aids should be considered only after a full assessment of the potential benefits and harms of the walking aid in relation to the individual patient's stage recovery and presentation. Tier 3 document available: Tier 3 Document 1 (page 107).	A2
✓✓	55. There are consistent suggestions that ambulatory assistive devices (including AFOs) should be used where appropriate, to optimise gait and balance impairments, and improve mobility efficiency and safety.	A2
NCJ	56. There is no clear judgement regarding whether AFOs should be used for ankle instability or dorsiflexor weakness.	C1
NCJ	57. There is no clear judgement on whether wheelchairs should be used for non-ambulatory individuals or those with limited walking ability.	C1
✓✓	58. There are consistent suggestions that adaptive and assistive devices should be used for safety and function, if other methods of performing the task/activity are not available or cannot be learned or if the patient's safety is a concern.	A1

DISCHARGE FROM PATIENT REHABILITATION

	Discharge planning	
✓✓✓	59. There are consistent strong recommendations that discharge planning (DCP) for stroke survivors should commence from day 1 of admission to the acute hospital to community rehabilitation as an integral part of the patient journey. Tier 3 document available: Tier 3 Document 8 (page 120).	A2
✓✓	60. There are consistent strong recommendations that DCP should include all members of the multidisciplinary team, and the patient and family. Tier 3 document available: Tier 3 Document 8 (page 120).	A1/2
✓✓✓	61. There are consistent strong recommendations that DCP should articulate patient and family circumstances.	A1/2
✓✓✓	62. There are consistent strong recommendations that DCP should include patients' capacity to be rehabilitated.	A2
✓✓	63. There are consistent suggestion that DCPs should be revised regularly throughout the patient journey (inpatient and after discharge to community care).	A2
✓✓	64. There are consistent suggestions that revision of DCPs should align with re-assessments of patient progress and goals.	A2
✓✓	65. There are consistent suggestions that every member of the multidisciplinary team should take responsibility for planning and monitoring the continuation of care.	A1
✓✓✓	66. There are consistent strong recommendations that OT home visits should be conducted prior to the patient returning home.	B2
✓✓✓	67. There are consistent strong recommendations that information about patient progress should be recorded formally in patient notes and shared at discharge planning meetings.	A1
✓✓	68. There are consistent suggestions that one member of the multidisciplinary team should take overall responsibility of DCP to ensure continuity.	A1
NCJ	69. There is no clear judgement on who is best placed to take overall carriage of DCP.	

	Community care	
✓✓	70. There are consistent suggestions that DCP should be communicated early with community care providers, to ensure that appropriate care and supports are available for patients as soon as they are discharged from hospital and to facilitate transition.	B2

LONGER TERM COMMUNITY-BASED REHABILITATION

	Long-term rehabilitation progress	
✓✓	71. There are consistent suggestions that achievable and agreed rehabilitation goals should be set and recorded formally in-patient notes.	B1
✓✓✓	72. There are consistent strong recommendations that rehabilitation progress should be regularly evaluated and recorded in a standardised manner.	A1
✓✓	73. There are consistent suggestions that the next best level of care should be considered after discharge from hospital.	B2
✓✓	74. There are consistent suggestions that longer-term care for stroke survivors should reflect their goals and circumstances.	A1
✓✓	75. There are consistent suggestions that long-term rehabilitation should be patient and family and/or carer-centred. There is no evidence regarding what interventions should be provided in different settings (rehabilitation facility; Community Health Center (CHC); long-term home care; home or community).	B2

Role of traditional healers (and other alternative medical practitioners) in local contexts

I	76. There is insufficient evidence to answer this question.	
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Monitoring discharge from rehabilitation

NCJ	77. There is no clear judgement on whether patients should be discharged from outpatient care when no more improvement is being reported, and/or when patients are managing well in the community.	C2
NCJ	78. There is inconsistent evidence regarding ongoing monitoring of stroke patients after discharge from rehabilitation.	C2

CONTEXTUAL CONSIDERATIONS

Organisation / service delivery (Barriers)

Contextual organisational and service delivery barriers to the implementation of the SA-contextualised Stroke Rehabilitation Guideline (SA-cSRG) are proposed below.

BARRIERS TO MULTIDISCIPLINARY AH STROKE REHABILITATION

Barrier: Not all levels of care have access to a multidisciplinary team consisting of doctors, nurses, physiotherapists, occupational therapists, speech and language therapists, social workers, dietitians, clinical neuropsychologists/clinical psychologists (Recommendation 1).

Suggestions to overcome barrier(s):

The available member of the multidisciplinary team should assess a stroke patient to determine whether there is a need to be seen by a dietitian, clinical neuropsychologist and/or clinical psychologist. If there is a need, a referral pathway should be in place to allow all stroke patients to have access to the specific member of the Multidisciplinary team, at a facility where such a service is available.

Barrier: Not all stroke patients will have access to a specialist multidisciplinary stroke unit (Recommendation 3).

Suggestions to address barrier:

Where a stroke unit is available, a patient should be assessed and admitted to the stroke unit by means of a clear and standard set of criteria. If a stroke unit is not available or the patient does not fit the admission criteria then the patient should have access to a multidisciplinary team for care.

MINIMISE RISKS OF ADVERSE EVENTS AFTER STROKE

Barrier: Not all patients considered at risk for pharyngeal dysphagia or poor airway protection have access to videofluoroscopic swallow studies (VSS, VFSS,) or fiberoptic endoscopic examination of swallowing (FEES) as these tests are available only at tertiary hospitals (Recommendation 9).

Suggestions to address barrier

When a person with a stroke has been identified by one of the multiD team members, to be in need of videofluoroscopic swallow studies (VSS, VFSS,) or fiberoptic endoscopic examination, referral systems should be put in place for those patients to have access to these specialised investigations.

Barrier: A patient with a stroke has limited access to clinical psychologist as not all medical facilities have a resident or roaming psychologist (Recommendation 19).

Suggestions to address barrier

When a patient with a stroke has been identified by one of the multidisciplinary team members, to be in need of a psychologist, referral systems should be put in place for those patients to have access to a psychologist.

PATIENT AND FAMILY ENGAGEMENT AND COMMUNICATION

Barrier: There is no clear judgement on whether contact with, and education by, trained staff should be offered to all people with stroke, and family or carers after discharge (Recommendation 25).

Suggestions to address barrier

Community health workers (CHW), rehabilitation community workers (RCW) and peer support groups should be able to stay in contact with and educate patients with a stroke, and family and/or carers after discharge. Where a RCW is available, they should preferably be in charge of patient care. Referral pathways back into the healthcare system needs to be put in place.

ADMISSION TO A MEDICAL FACILITY FOR PATIENTS WITH A STROKE

Barrier: There is often a delay in presenting for medical treatment (Recommendation 34). Transport is often not available for people who have suffered a stroke, which delays admission for medical treatment within the critical 48 hour period following a stroke.

Suggestions to address barrier

Emergency services policy and procedures need to be changed to allow for patients with a stroke to be identified quickly and taken to the closest, most appropriate medical facility (preferable a medical facility with a dedicated stroke unit or ward).

High-level management awareness will be needed for such changes.

REFERRAL TO MULTIDISCIPLINARY REHABILITATION

Barrier: Not all stroke patients will have access to a specialist multidisciplinary stroke unit (Recommendations 35 to 37).

Suggestions to address barrier

Where a stroke unit is available, a patient should be assessed and admitted to the stroke unit by means of a clear set of criteria. If a stroke unit is not available or the patient does not fit the admission criteria then the patient should have access to a multidisciplinary team for rehabilitation.

COMPREHENSIVE ASSESSMENT

Barrier: It is not always possible to design rehabilitation plans and management strategies to meet person-centred goals and needs for recovery due to a lack of communication with family/caregivers, lack of support structures and no access to transport. (Recommendation 44).

Suggestions to address barrier

It is important to take the contextual factors influencing recovery into account and to adapt rehabilitation plans and management strategies accordingly. Inter-sectoral collaboration is necessary in regards to the transport barrier.

MULTIDISCIPLINARY REHABILITATION

Barrier: There are not always physiotherapists, occupational therapists, speech and language therapists or dieticians available at all levels of care, to allow for task sharing. Task sharing has also not yet been tested in the local context.

Suggestions to address barrier

A member of the multidisciplinary team should assess a stroke patient to determine whether there is a need to be seen by one of the other members of the multidisciplinary team. If there is a need, referral pathways should be in place to allow all stroke patients to have access to identified members of the multidisciplinary team at a facility where such a service is available. Feasibility of task sharing systems should be tested within the local context. Promote trans-professionalism instead of inter-professionalism.

ASSISTIVE TECHNOLOGY

Barrier: There is often a shortage of ambulatory assistive devices, especially in the rural areas (Recommendation 58).

Suggestions to overcome barrier

The national backlog must be addressed as soon as possible.

The budget for a new financial cycle must be based on need, and not on the number of devices issued, as is the current procedure. Allocation of assistive devices must also take the needs of emergency rooms into consideration.

DISCHARGE PLANNING

Barrier: The social worker is not routinely included in the team involved in DCP (Recommendation 60).

Suggestions to address barrier

Where a social worker is available, he/she should be part of DCP when needed.

Barrier: DCP does not routinely consider patient and family circumstances (Recommendation 61).

Suggestions to address barrier

DCP should also include: financial; social; housing; employment; family responsibilities, as well as patient goals; and family capacity to assist the patient in meeting these goals.

Barrier: There is not always an OT available at all levels of care, to conduct a home visit (Recommendation 66).

Suggestions to address barrier

When an OT is not available to conduct a home visit, then any other member of the multidisciplinary team should conduct the home visit, using a standardised protocol.

COMMUNITY CARE

Barrier: Not all areas have community rehabilitation services available to a person who has been discharged from medical care after a stroke (often due to staffing and financial restraints) (Recommendation 70).

Suggestions to address barrier

Community support organisations, home-based carers and primary healthcare centres should be alerted if there are any available. Community support of the carers should be placedd.

LONG TERM REHABILITATION PROGRESS

Barrier: Long-term rehabilitation is not always possible due to a lack of rehabilitation facilities as well as access to facilities (Recommendation 71).

Suggestions to address barrier

CHWs or RCWs should be able to continue the care of patients needing long-term rehabilitation.

Training

RECOMMENDATIONS FOR TRAINING

- Assistive device training, including positioning and seating (Recommendation 2).
- Communication skills (team, family and patient) (Recommendation 2).
- How to perform the swallow test as well as feeding training (Recommendations 2, 7, 10).
- Assistance with care management, self-efficacy, case management and discharge planning (Recommendation 2).
- Which outcome measures to use that are specific to stroke condition and valid for the local context training and how to access these (South African context: EQ5D; Bartel Index, FIM, COPM, MOCA, Goal Attainment Scale (GAS), OT and Speech Outcome measures needed (Recommendations 2, 4, 45).
- How to prevent shoulder problems (subluxation, pain shoulder and hand syndrome) (Recommendation 15).
- Incontinence management at undergraduate/post-graduate level (Recommendation 42).
- How to determine capacity to be rehabilitated (Recommendation 62).
- How can task sharing be implemented (Recommendation 41).

RECOMMENDATIONS FOR FAMILY AND/OR CAREGIVER/PATIENT EDUCATION/TRAINING

- The importance of family support structure (Recommendation 44).
- The importance of continued rehabilitation (Recommendation 46).
- How to recognise secondary complications and how to access care when needed.
- How to promote self-management, self-efficacy and self-empowerment.

RECOMMENDATIONS FOR TRAINING AND EDUCATION OF THE GENERAL POPULATION

The general public should have knowledge to easily identify when someone has had a stroke e.g. using BeFAST (Balance; Eyes; Face; Arms; Speech; Time) (Recommendation 33).

We also need a diagram on what the response should be once a stroke has been identified.

RECOMMENDATIONS FOR THE DELIVERY OF TRAINING

What would be the best method of delivering training (Peer education/Face-to-face/Pamphlet) (Recommendation 22).

Training should be feasible for the local context (Recommendation 10).

In-service training.

Public - use social media platforms, TV, phone (e.g. WhatsApp)

Communication: BARRIERS TO COMMUNICATION WITHIN THE MULTIDISCIPLINARY TEAM

REFERRAL TO REHABILITATION

Barrier: Regular formal and informal multidisciplinary team meetings are not always possible (Recommendation 39).

Suggestions to overcome barrier

The team at a specific setting should decide on the most appropriate communication channels and intervals for their context.

COMPREHENSIVE ASSESSMENT

Barrier: Not all stroke patients are referred for rehabilitation; often only referred at discharge (Recommendation 40).

Suggestions to address barrier

The multidisciplinary team should do daily rounds to ascertain whether ‘new’ stroke patients have been admitted and then communicate with medical personal about when and if to start rehabilitation. Communication channels must be established for a specific setting to improve referrals.

BEST PRACTICE RECORDING METHODS FOR ASSESSMENT, TREATMENT AND GOAL SETTING

Barrier: There is a lack of regular communication within the multidisciplinary team, and with the patient and family with regard to progress reports on interventions and outcomes (Recommendation 58).

Suggestions to address barrier

Regular team meetings should be put in place to address this barrier.

ASSISTIVE TECHNOLOGY

Barrier: It is not possible to do a full assessment of a patient’s potential benefits and disbenefits (with regard to assistive technologies) in relation to the patient’s stage of recovery and presentation as patients are often discharged too soon due to bed shortages and are often not mobile at discharge (Recommendations 54, 57).

Suggestions to address barrier

Potential for recovery should be assessed before the prescription of an assistive device (such as a wheelchair). Reason for the assistive device should be documented and revised at intermitted intervals, regarding the needs for the assistive device.

DISCHARGE PLANNING

Barrier: Discharge planning does not always commence on day of admission and does not always include the family or carers, due to patients often being discharged by the medical doctor without communication with the multidisciplinary team (Recommendations 59, 61, 69).

Suggestions to address barrier

Communication channels must be established for a specific setting to improve referrals. Multidisciplinary team should be involved since the admission of the patient with a stroke. Each team/setting should decide who should take overall responsibility of DCP.

BARRIERS TO COMMUNICATION BETWEEN THE MULTIDISCIPLINARY TEAM AND THE FAMILY/ CAREGIVERS/PATIENT

PATIENT AND FAMILY ENGAGEMENT AND COMMUNICATION

Barrier: Patients, family and carers are not always involved in planning rehabilitation goals and management, problem solving and decision-making, and are not given formal and informal education on stroke rehabilitation. This is often due to caregivers visiting only after hours or not at all due to lack of finance for transport; families are not always interested in being involved (levels of involvement).

Suggestions to address barrier

Determine the level of family involvement. Community rehabilitation workers might be more important here as they might have better access to family or carers and can provide education and support at community level.

REINTEGRATION OF STROKE SURVIVORS INTO THEIR COMMUNITY

Barrier: Patients with a stroke whose social behaviour is causing distress to themselves or others are not always assessed and managed appropriately (Recommendation 29).

Suggestions to address barrier

The nature of the problem and its cause should be explained to family and carers, other people in social contact and the rehabilitation team. The person should be helped to learn the best way to interact without causing distress. Those involved in social interactions should be trained in how to respond to inappropriate or distressing behaviour. Psychosocial management approaches should be considered.

Context-specific Clinical Considerations

MINIMISE RISKS OF ADVERSE EVENTS AFTER STROKE

Clinical practice point: There are consistent suggestions that a standardised clinical assessment should be applied by a professional skilled in the management of dysphagia (currently speech and language therapists) (Recommendation 8).

Suggestion for local application

Full assessment should be performed by a SLT if the water swallow screening test was positive. If no SLT at the facility, a referral pathway should be created to refer the patients to another medical facility where a SLT is available.

Clinical practice point: In-patients who are not mobile are more at risk of developing pressure sores; these patients should undergo pressure care risk assessment (Recommendation 14).

Suggestion for local application

Each setting should decide who is responsible for this type of screening.

All persons with a stroke should have a pressure care assessment and those at risk should be managed appropriately.

SUPPORT SELF-EFFICACY PRINCIPLES AND TRAINING FOR PATIENTS AND FAMILY

Clinical practice points

Assessment should include physical, social and psychological function (Recommendation 31).

Patients who have had a stroke who are cognitively able should be made aware of the availability of generic self-management programmes before discharge from hospital and should be supported to access such programmes once they have returned to the community (Recommendation 32).

Stroke-specific programmes for self-management should be provided (Recommendation 32).

COMPREHENSIVE ASSESSMENT

Clinical practice point: There are consistent suggestions that comprehensive assessment of rehabilitation needs should include:

- Previous functional abilities;
- Impairment of psychological functioning (cognitive, emotional) and communication;
- Impairment of body functions, including pain/orientation;
- Activity limitations and participation restrictions e.g. positioning, moving, transfer and handling;
- Swallowing (see section 2);
- Pressure area risk (see section 2);
- Continence;
- Nutritional status and hydration; and
- Environmental factors (social, physical, and cultural) (Recommendation 42).

Suggestion for local application:

The LTP screening tool/checklist is often used in the local context. During a clinical assessment a patient should also be screened for: shoulder subluxation; DVT; comorbidities (HIV; DM; epilepsy; TB; meningitis).

Clinical practice point: There are consistent suggestions that the more therapy is provided, the better the outcome (Recommendation 46).

Suggestion for local application:

This depends on the stage and severity of the stroke as well as presence of comorbidities comorbidities, the context and intensity and specificity of treatment should be taken into account.

BEST PRACTICE RECORDING METHODS FOR ASSESSMENT, TREATMENT AND GOAL SETTING

Clinical practice point: Recording should include intervention choice (and reason for choice), frequency of intervention and response to it (Recommendation 55).

Suggestion for local application: Documentation should also include patient consent/assent/proxy. Documentation should include reason for progression, and patient responses (Recommendation 56). Documentation should preferably be in digital format (Recommendation 57).

ASSISTIVE TECHNOLOGIES

Clinical practice points:

Potential for recovery should be assessed before the prescription of assistive devices (Recommendations 54, 57).

Patients are often discharged too soon due to bed shortages and are often not mobile at discharge, but have potential to become mobile later. Potential for recovery should be assessed before the prescription of an assistive device (such as a wheelchair).

Reason for the assistive device should be documented and revised at intermitted intervals, regarding the needs for the assistive device.

LONG -TERM REHABILITATION PROGRESS

Clinical practice points:

Rehabilitation goals should be used for re-evaluation and these goals should be regularly reassessment (Recommendation 71).

Essential items to record when assessing and treating a person with a stroke patient should include, but are not limited to:

- Diagnosis and health status
- Contextual factors
- Participation
- Activity limitations
- Impairments
- Risk factors
- SMART Goals

If the patient is discharged from an acute healthcare facility to home, ongoing rehabilitation should be available, and could be provided in home, at local community centres, outpatient clinics, or rehabilitation centres. If the patient is discharged to residential care, ongoing rehabilitation may be provided ‘in house’ or in a community centre. (Recommendation 73).

ROLE OF TRADITIONAL HEALERS (AND OTHER ALTERNATIVE MEDICAL PRACTITIONERS) IN LOCAL CONTEXTS

Clinical practice point:

Consider the role of all alternative medical practitioners. Consider the role of alternative medical practitioners in delaying seeking medical treatment, but also the role in secondary stroke due to not taking prescribed medications, but rather alternative medicine. Promote communication with traditional healers.

DISCHARGE FROM REHABILITATION

Clinical considerations

Re-assessment intervals could grow wider apart as a person reaches a functional plateau. It could be considered at least six months after discharge from hospital, but could occur up to 12 months after discharge from hospital (Recommendation 77).

PHASE 4

NATIONAL STAKEHOLDER CONSULTATION

Task 24. Canvass national feedback on wording, intent, layout etc.

National stakeholder feedback was sought on the composite recommendations, adoption, contextualisation and adaption plans, CPG layout, content and quality of reporting. The approach encompassed a presentation of the draft guideline at the 2018 National Rehabilitation Forum (August 2018- Johannesburg), which clearly outlined the type and mode of feedback that was required. This presentation included example contextualisation and adaption plans using two of two of the A- endorsed recommendations. The request for feedback was followed-up with written email instructions and a due date by which provinces should respond. All provincial rehabilitation managers were requested to respond to Prof Q Louw by the due date. In addition, similar requests and feedback was also obtained from the reference groups in the Western Cape and Gauteng. In addition, a follow-up workshop was requested by interested stakeholders from Gauteng, Mpumalanga and North-West provinces. This workshop was held at the University of the Witwatersrand in September 2018. The aim of the workshop was to provide guidance with the process of formulating contextualisation plans. The methodology group obtained *Ethics approval* from Stellenbosch University Human Research Ethics Committee for this process (ethics number 0602).

Task 25. Modify wording and presentation

The feedback and analysed by the research team and changes were made based on the feedback.

Outcome. National stakeholder agreement on the SA-cSRG 2019

Task 26. Produce and dissemination of the SA-cSRG

The resultant SA-cSRG 2019 was compiled but the following formats and supporting documents will also be considered.

The full SA-cSRG 2019 will be published electronically, including all supporting documentation (methods, results, supplementary files, recommendations and strength of the body of evidence, adoption, contextualisation and adaptation implementation activities and future plans, and accompanying Tier 3 material).

- The composite recommendations and their overall SoBE, and relevant Tier 3 documents will be provided electronically, and in printed format as easy-to-use documents in clinical settings (such as wall-charts, or laminated booklets). The printed material will be published and disseminated to public hospital and community sites by the Department of Health, on request.
- Consumer versions of the SA-cSRG will be printed as brochures in key languages. Pictorial messages will be provided where possible, to minimise the opportunity for gaps to occur between evidence intention and implementation. The consumer versions will include information for carers, to assist in implementing self-help programmes at home and in communities.
- The funder received a full report on the project.
- Peer-reviewed publications for national and international journals were written, to report on the SA-cSRG recommendations and methodology to promote the CPG writing processes.

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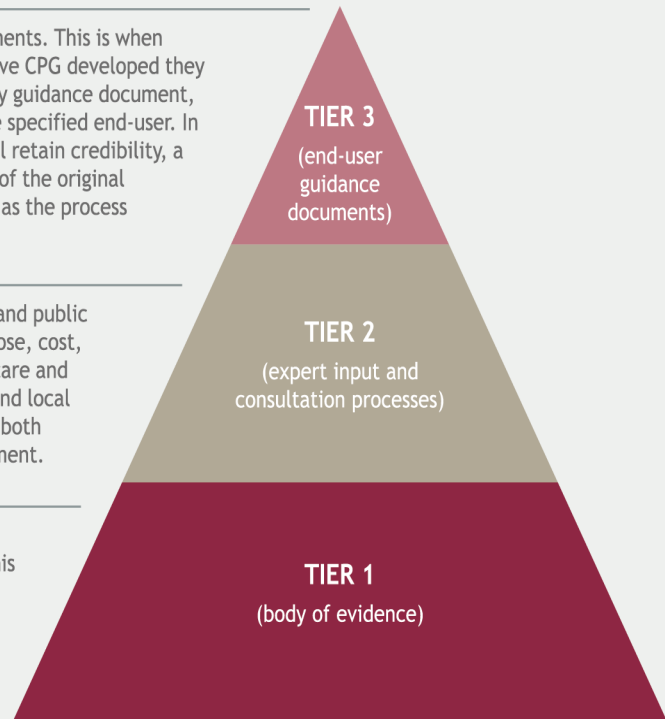
APPENDICES

APPENDIX 1. Tier model of guideline writing (Machingaidze & Grimmer et al [15])

TIER 3 (top) is the development of end-user guidance documents. This is when guideline developers may decide that from the comprehensive CPG developed they would like a shorter, simpler, more concise, and user-friendly guidance document, tailored to meet the level of understanding and needs of the specified end-user. In order to ensure that these end-user guidance documents still retain credibility, a summary of methodological information should be provided of the original source of the evidence and recommendations made, as well as the process followed in order to produce the final product.

TIER 2 (middle) is expert input (guideline panel discussions and public consultations), to assess the evidence in terms of local purpose, cost, feasibility and application, using local experts, local healthcare and health systems contexts, local health challenges (purpose) and local stakeholders (end-users). Tiers 1 and 2 produce a CPG when both these processes are fully reported in a comprehensive document.

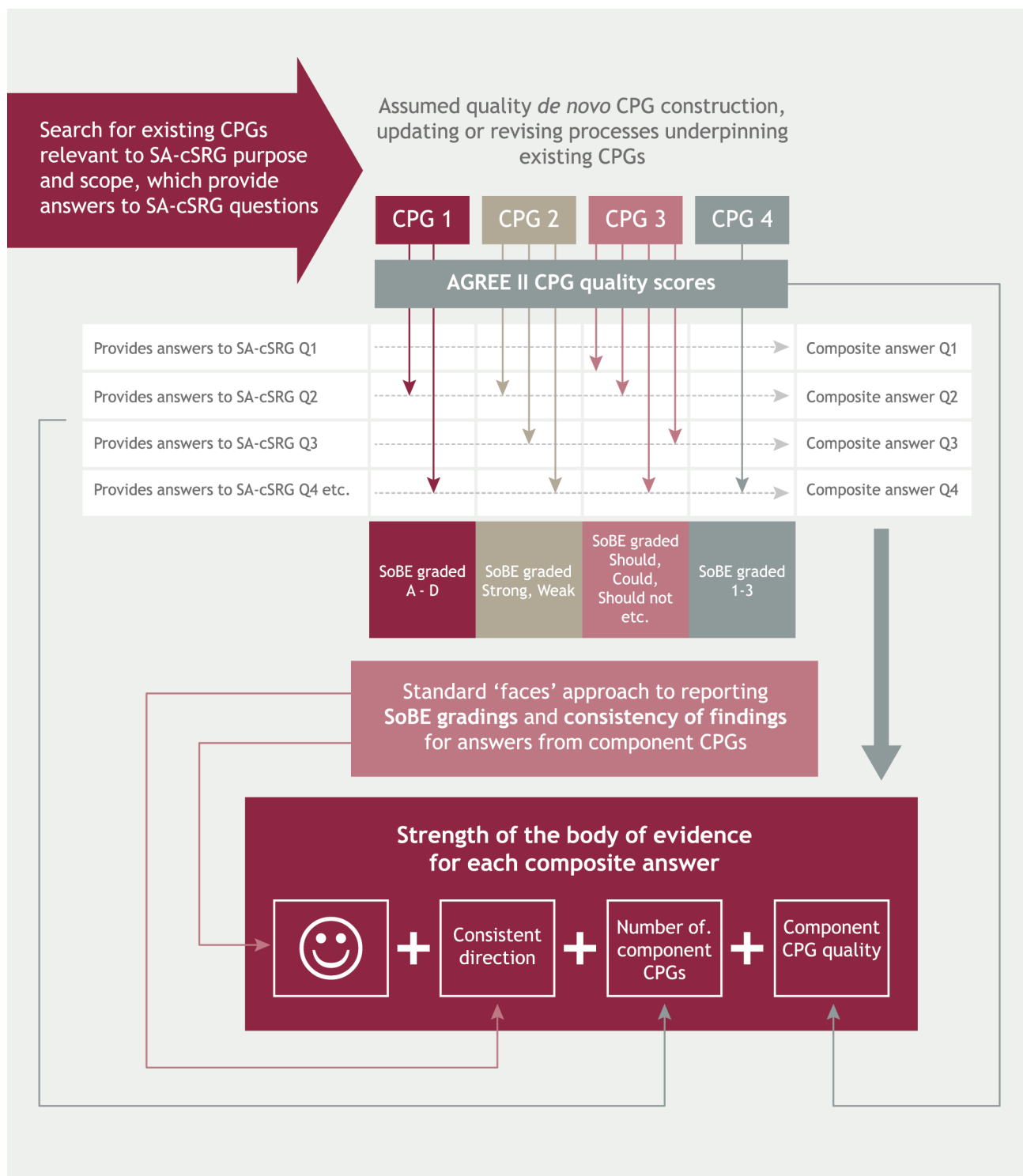
TIER 1 (bottom) is the evidence foundation, based on a systematic search of relevant research, and a synthesis of this in terms of its hierarchy, volume, quality and consistency. Without this tier, there is no support for the credibility of guidance, and it cannot be labelled as 'best practice'.



APPENDIX 2. NHMRC body of evidence matrix (Hillier et al [16])

Component	A Excellent	B Good	C Satisfactory	D Poor
Evidence base	One or more level I studies with a low risk of bias or several level II studies with a low risk of bias	One or two level II studies with a low risk of bias or a SR/several level III studies with a low risk of bias	One or two level III studies with a low risk of bias, or level I or II studies with a moderate risk of bias	Level IV studies, or level I to III studies/SRs with a high risk of bias
Consistency	All studies consistent	Most studies consistent and inconsistency may be explained	Some inconsistency reflecting genuine uncertainty around clinical question	Evidence is inconsistent
Clinical impact	Very large	Substantial	Moderate	Slight or restricted
Generalisability	Population/s studied in body of evidence are the same as the target population for the guideline	Population/s studied in the body of evidence are similar to the target population for the guideline	Population/s studied in body of evidence differ to target population for guideline but it is clinically sensible to apply this evidence to target population ³	Population/s studied in body of evidence differ to target population and hard to judge whether it is sensible to generalise to target population
Applicability	Directly applicable to Australian healthcare context	Applicable to Australian healthcare context with few caveats	Probably applicable to Australian healthcare context with some caveats	Not applicable to Australian healthcare context

APPENDIX 3. Conceptual framework for determining the strength of the body of evidence for composite recommendations in the SA-cSRG



APPENDIX 4. Clinical Questions underpinning development of the SA-cSRG

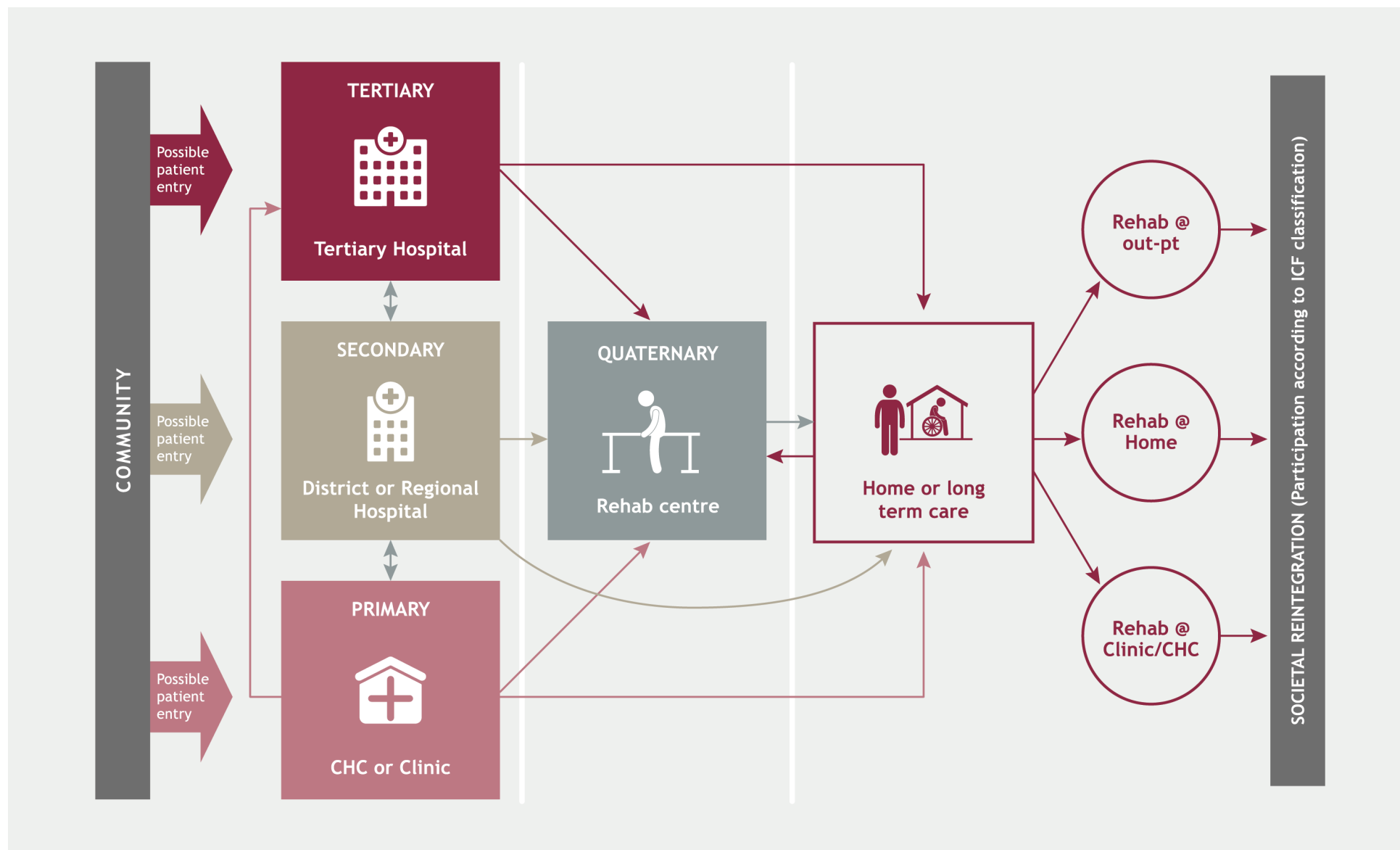
Key (relates to the pathway outlined in Appendix 2, and links to specific questions)

Community ^c; Tertiary ³ Secondary (District/Regional) ²; Primary ¹; Quaternary ⁴; Home/long-term care ^h; Society ^s

1. Which factors might delay admission to a medical facility after suffering a stroke at home? ^c
2. What is the optimal time for referral to rehabilitation since admission to hospital? ^{4,3,2,1}
3. What is the optimal time for commencement of rehabilitation since suffering a stroke? ^{4,3,2,1}
4. What are the factors indicating when it is safe for rehabilitation to commence? ^{4,3,2,1}
 - EB assessment planning ^{4,3,2,1}
 - Which factors should be assessed?
 - Which outcome tools should be used?
5. Best practice recording method for assessment, treatment and goal setting when treating a stroke patient? ^{4,3,2,1,h,p}
6. What is critical to record when assessing and treating a stroke patient? ^{4,3,2,1, h, s}
7. What is the best, locally relevant communication platform for improving communication between levels of care; medical personnel; therapists; therapist/patient; therapists/family; therapist/employer? ^{4,3,2,1, h, s}
8. What should be communicated with medical personnel, other therapists, patient and carer/family? ^{4,3,2,1,h,p}
9. What are the EB guidelines on setting rehabilitation goals and how to record these goals? ^{4,3,2,1, h, s}
10. EB discharge planning: ^{4,3,2,1, h}
 - When should it start for a stroke patient?
 - Who should be involved?
 - What should it include?
11. Which rehabilitation professional should first see the patient? ^{4,3,2,1, h}
 - What is the EB most critical first step?
 - What are the EB criteria for referral between therapists?
 - What is the best practice communication between therapists (devises, discharge planning and care continuation)?
12. According to the evidence, which therapist should communicate with the family? ^{4,3,2,1, h, s}
13. What are the EB roles of the physiotherapist, occupational therapist and speech therapist when assessing and treating a stroke patient? ^{4,3,2,1}
14. How does the model of care differ between the different points of entry (primary; secondary; tertiary; quaternary level)? ^{4,3,2,1}
15. What are the EB rehabilitation interventions at each level of care? ^{4,3,2,1, h, s}
16. What are the best outcome measures for the South African context for all levels of care as well as suburban and urban settings? ^{4,3,2,1, h, s}
17. When should family education commence? ^{4,3,2,1, h, s}
 - Which communication channel is most appropriate?
 - How is family incorporated into discharge planning?
 - Who should be communicated with?
 - What should be included in the communication and in which format?

18. What are the EB criteria for referral to other professions such as social workers/psychologists? ^{4,3,2,1, h, s}
19. Which rehabilitation professional should take responsibility for planning and monitoring continuation of care? ^{4,3,2,1, h, s}
20. What are the EB rehabilitation criteria for discharge from rehabilitation as an in-patient and out-patient? ^{4,3,2,1, h, s}
21. What is the EB information for the best next level of care? ^{4,3,2,1, h, s}
22. What are the EB interventions for longer term care ^{h, s}
 - rehabilitation facility
 - Community Health Centre (CHC)
 - long-term home care
 - home or community.
23. What are the EB ways of communicating with patient/family/other professionals? ^{4,3,2,1, h, s}
24. What are the EB rehabilitation outcome measures for longer term care? ^{h, s}
25. What is the EB education linked to complications of stroke (aspiration pneumonia/secondary strokes etc.) ^{4,3,2,1, h, s}
26. How should traditional healers be incorporated into the medical system? ^{c, h}
27. What training should traditional healers receive to appropriately refer a stroke patient?^{c,h}
28. What are EB criteria for ending rehabilitation? ^{h, s}
 - Ongoing monitoring?
29. What is the evidence for the swallow test? When should it be done and by whom? ^{4,3,2,1}
30. What are the EB criteria for assistive technology? ^{4,3,2,1, h, s}
 - Walking aids
 - Slings
 - AFOs
 - Wheelchairs
 - Splints.
31. What is the EB approach to re-integrating stroke patients into the community, society, leisure and work (participation)? ^{h, s}
32. How should rehabilitation therapists liaise with other sectors (transport/labour/social) for facilitated participation? ^{h, s}
33. How should the community and general public be educated to facilitate societal participation of a person who has suffered a stroke? ^{h, s}
34. Therapists are not trained for inter-sectorial integration when it comes to general care or the rights of a person who has suffered a stroke. What is the best practice to address this issue? ^{h, s}
35. “Work hardening”; aerobic capacity, effort and tolerance: ^{4,3,2,1, h, s}
 - When should treatment or focus on these factors start?
 - What is the evidence based strategy to address this?
36. Self-efficacy - compliance with medication and self-care: ^{4,3,2,1, h, s}
 - When should this start?
 - Which therapist should be responsible for educating the patient?
37. Best practice to work with mental health professionals and mental health issues. ^{4,3,2,1, h, s}
38. Best practice to equip/educate rehabilitation therapists to deal with bereavement and depression after stroke? ^{4,3,2,1, h,}

APPENDIX 5. Initial patient pathway



APPENDIX 6. Clusters of questions per intent for implementation purposes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
Communication		x			x	x	x	x	x	x	x						x	x		x	x	x	x				x					x	x			x				
Service Delivery			x														x	x		x	x	x									x									
Organisational										x	x	x	x					x	x	x	x	x					x	x			x	x	x				x			
Clinical				x											x	x										x			x	x	x	x					x			
Training requirements									x			x																							x			x	x	

APPENDIX 7. Clusters of SA-cSRG questions related to the patient journey

ORGANISE FOR BEST PRACTICE REHABILITATION

Recommendation. Establish best practice multidisciplinary AH stroke rehabilitation teams at all points of entry to the healthcare system

1. What education should be provided to AH providers about multidisciplinary team building?
2. What education should be provided to medical and nursing professionals about multD AH teams?

Recommendation. Establish clear models of care relevant to different points of entry to the healthcare system

3. Does the AH model of care differ between the different points of entry (primary; secondary; tertiary; quaternary level)?
4. What are the EB rehabilitation interventions at each level of care?
5. What are the best outcome measures for the South African context for all levels of care as well as urban, suburban and urban settings?

OPERATIONALISE STRATEGIES FOR BEST PRACTICE COMMUNICATION, RISK-MINIMISATION AND PLANNING THROUGHOUT THE PATIENT JOURNEY

Recommendation. Minimise risks of adverse events after stroke

6. All patients suspected of having suffered a stroke should be administered a swallow test before anything is given to them by mouth.
7. When should the swallow test be done?
8. *Who should undertake the swallow test?*
9. *What type of swallow test should be provided, and when?*
Education should be made available to all healthcare providers about adverse events following stroke.
10. *What is the EB education linked to complications of stroke?*

21. Recommendation. Ensure that patient and family are engaged in relevant discussions and decisions throughout the patient journey

22. When should family education commence?
25. Which communication channel is most appropriate?
24. Who should be the first AH person to communicate with the family?
25. What should be included in the communication and in which format?

Recommendation. Communicate effectively with others about rehabilitation plans and progress

26. What is the best platform for communication with:

medical personnel;

therapists;

therapist/patient;

therapists/family;

therapist/employer?

28-20. What is best practice to work with mental health professionals?

What is the best practice for communication between therapists (devises, discharge planning and care continuation)?

What should be communicated with medical personnel; other rehabilitation therapists, patient and carer/family?

According to the evidence, which therapist should communicate with the family?

28.Recommendation. Establish active plans early within the patient journey to reintegrate stroke patients into their community

What is the EB approach to re-integrating a stroke patient into the community, society, leisure and work (participation)?

How should rehabilitation therapists liaise with other sectors (transport, labour, social) for facilitated participation?

How should the community/general public be educated to facilitate societal participation of a patient who has suffered a stroke?

30. What is the best practice to address therapist training for inter-sectorial integration regarding general care/rights of stroke patients?

When should treatment or focus on “work hardening”; aerobic capacity, effort and tolerance start?

What is the evidence based strategy to address this?

31. Recommendation. Support self-efficacy principles and training for patients and family

31. When should self-efficacy training commence?

Which therapist should be responsible for educating the patient?

31. How is EB self-efficacy training related to compliance with medication and self-care?

ADMIT TO ACUTE HOSPITAL

34.Recommendation. Reduce delay in admission to a medical facility for patients suffering a stroke

REFER TO INPATIENT REHABILITATION

Recommendation. Refer to AH rehabilitation immediately the patient is medically stable

35. What is the best way to do this?

39. What is the best form of communication with other healthcare providers about AH rehabilitation?

ACTION INPATIENT REHABILITATION

Recommendation. Conduct comprehensive assessments within 48 hours of receiving referral to rehabilitation

40. What factors are associated with safe commencement of rehabilitation?

41. What are the elements of comprehensive rehabilitation assessment?

42/43. Which outcome tools should be used?

Recommendation. Commence multidisciplinary rehabilitation within two days of referral

48. Which rehabilitation professional should see the patient first?

49. What is the EB role of the physiotherapist, occupational therapist and speech therapist when assessing and treating a stroke patient?

What are the EB rehabilitation interventions at each level of care?

What are the critical first steps?

What are the EB criteria for referral among therapists?

Recommendation. Set achievable rehabilitation goals

What is the minimum standard for outcome measures that can demonstrate change in patient rehabilitation performance?

Recommendation. Use best practice recording methods for assessment, treatment and goal setting

45. What is critical to record when assessing and treating a stroke patient?

Recommendation. Record outcomes effectively along the patient journey

Recommendation. Provide appropriate aids and assistive technology

54/58. What are the EB criteria for indicating use of assistive technology?

Walking Aids when needed

Slings for painful shoulder

AFOs to improve gait

Wheelchairs as needed

Routine splints

Adaptive devices as needed

DISCHARGE FROM INPATIENT REHABILITATION

59. Recommendation. Establish discharge plans early in the hospital stay

When should DCP start for a stroke patient?

61/64. What should it include?

63. When should discharge plans be revised?

65/66. Which rehabilitation professional should take responsibility for planning and monitoring continuation of care?

How is family incorporated into discharge planning?

69. Who should be involved?

Recommendation. Ensure best practice, timely referral to community care, and other mainstream health professionals

LONGER TERM COMMUNITY-BASED REHABILITATION

72. Recommendation. Regularly evaluate and record rehabilitation progress

71. What are the EB guidelines on setting rehabilitation goals and how to record these goals?

73. What is critical to record when assessing and treating a stroke patient?

74. What is the EB information for the best next level of care?

75. What are the EB interventions for longer term care:

Rehabilitation facility;

Community Health Centre (CHC);

Long-term home care;

Home or community.

Recommendation. Consider the role of traditional healers in local contexts

76. How should traditional healers be incorporated into the medical system?

What training should traditional healers receive to appropriately refer a stroke patient?

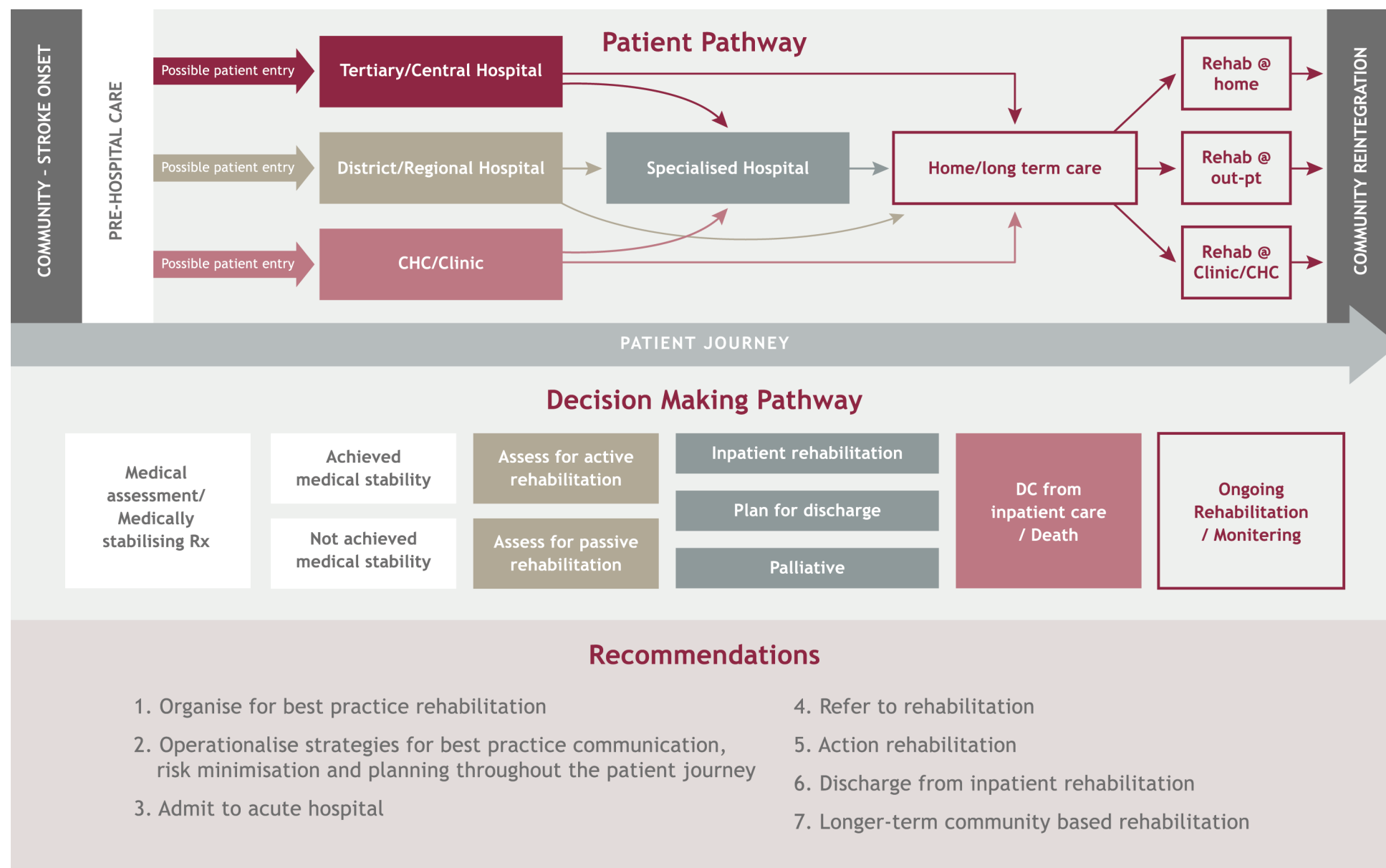
Recommendation. End active community rehabilitation when there is no further benefit, but monitor as needed

77. What are the EB rehabilitation criteria for discharge from rehabilitation as an outpatient?

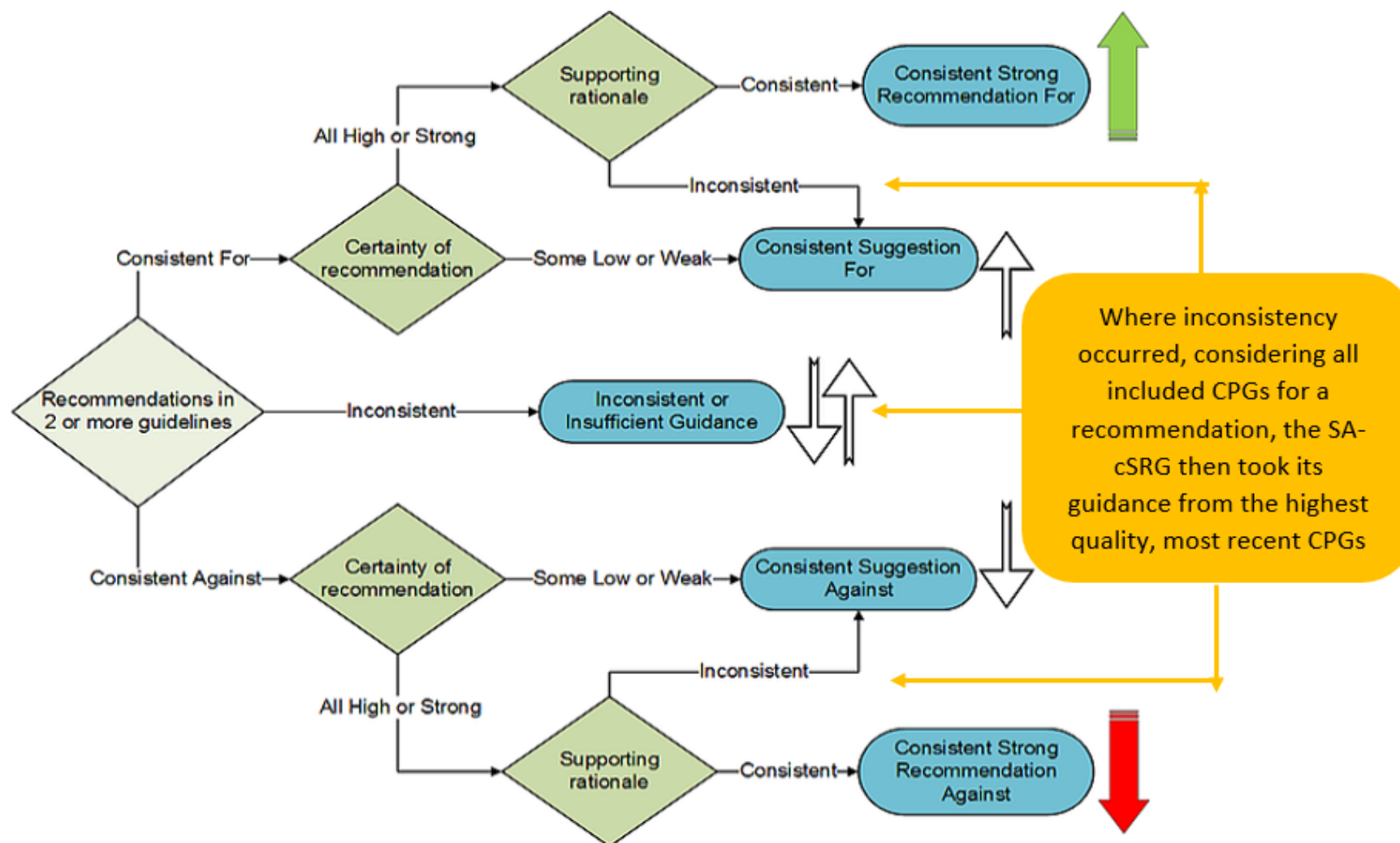
78. What are EB criteria for ending rehabilitation?

What are the EB criteria for ongoing monitoring?

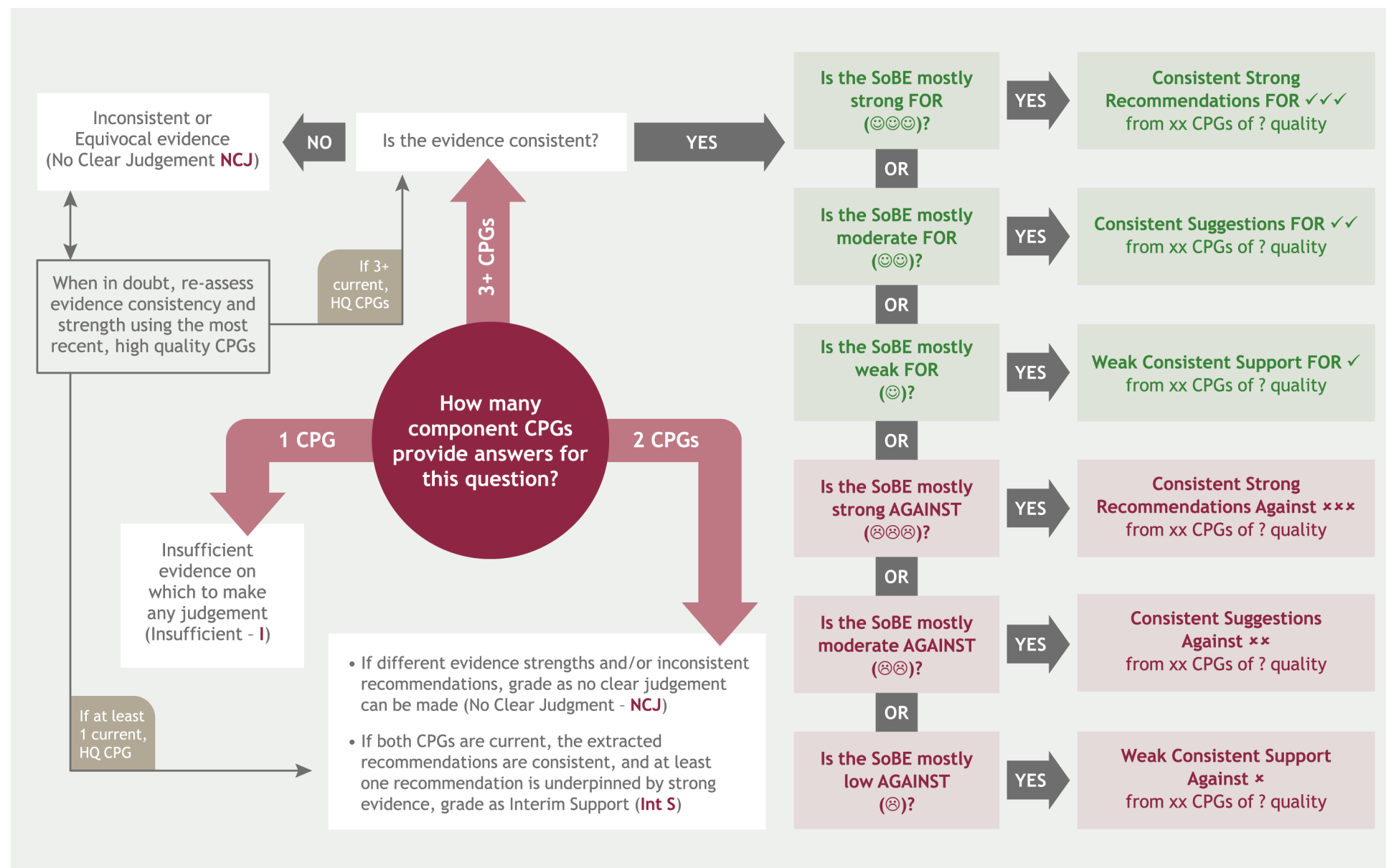
APPENDIX 8. Revised patient pathway with draft labelled question clusters



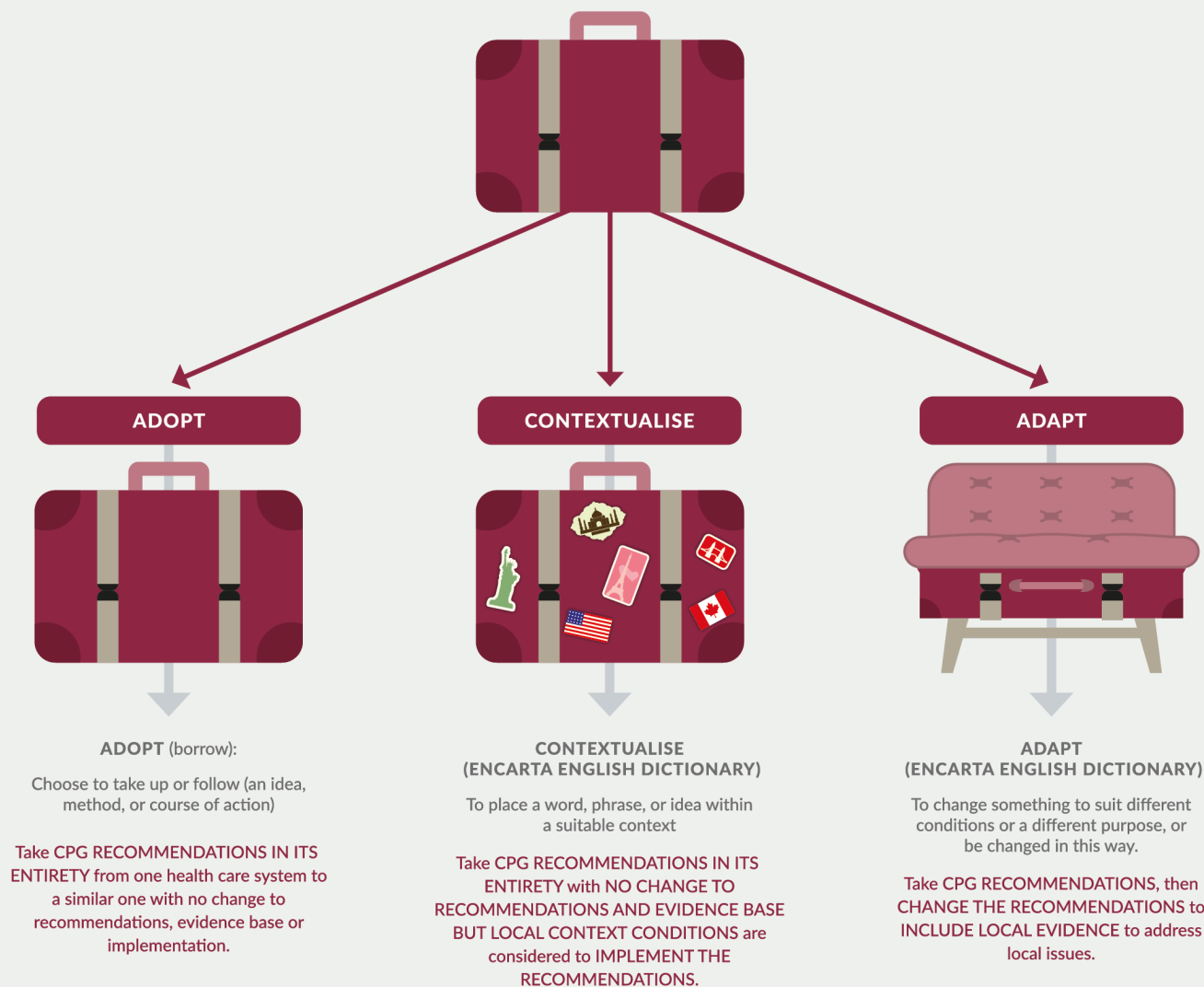
APPENDIX 9. Alper et al. [25, 26] decision-making tool with SA-cSRG additional steps in yellow



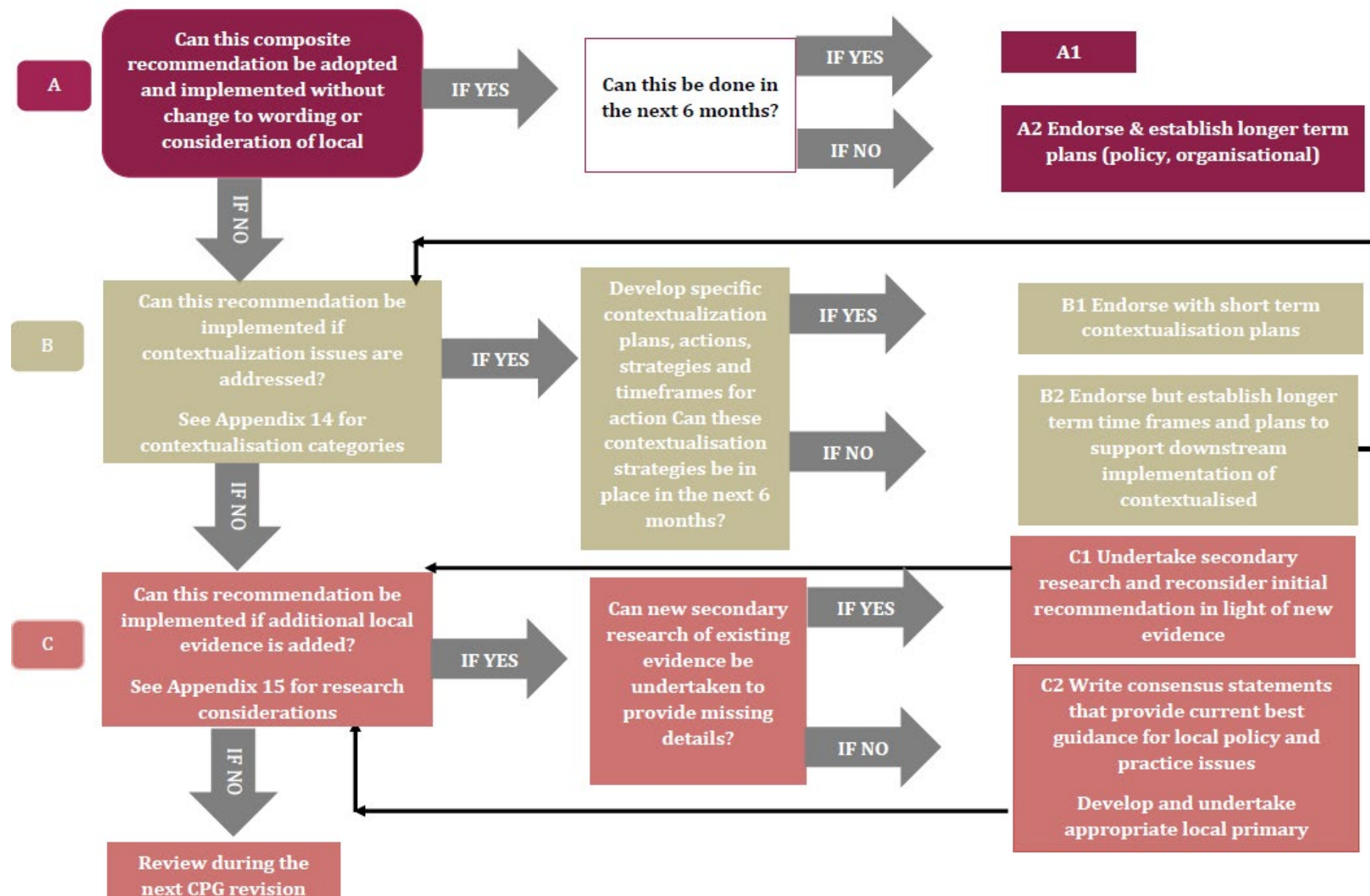
APPENDIX 10. Decision-making approach to determine the strength of the body of evidence for composite recommendations



APPENDIX 11. Adoption, Contextualisation, Adaptation model (ACA) (Dizon et al [23])



APPENDIX 12. ACA decision-making and endorsement process for each composite recommendation

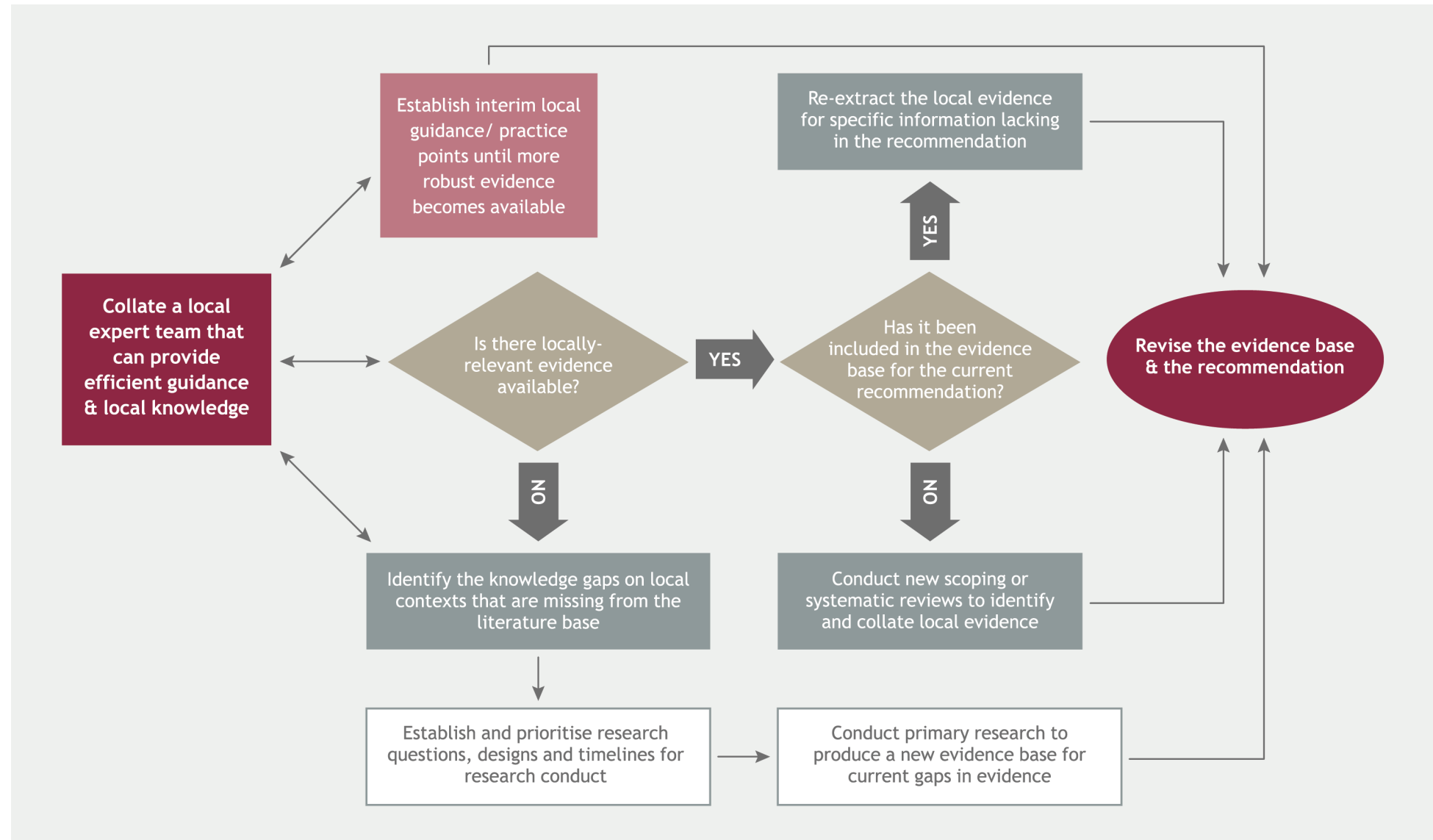


APPENDIX 13. Barrier prompts for Tier 2 and 3 Contextualisation discussions

If adoption of a composite SA-cSRG recommendation is not feasible, consider contextualising the recommendation using the following prompts. Contextualisation puts ‘what’ (Tier 1) into service delivery perspective by considering the who, how, when, where, why, how much aspects of care [17].

	Details of what is required	<i>In Minimum standard of care</i>	<i>In Higher standard of care</i>	Training required, what and for whom?
Organisation - Resources - Type of workforce				
Service delivery - Legislative responsibilities / constraints - Availability of workforce				
Communication - People - Resources (phone, internet, fax)				
Clinical care - Availability of workforce - Type of workforce - Capacity of workforce - Available equipment - Other available resources				

APPENDIX 14: Adaptation process for composite recommendations when they cannot be implemented without additional local information



APPENDIX 15: Treatment recommendations

Appendix 15 lists treatment recommendations, extracted verbatim, from four recent, good quality CPGs. These are colour-coded to assist readers:

- American Heart Association / American Stroke Association (USA) Stroke Rehabilitation Guidelines 2016 (AHA/ASA 2016) (black)
- Australian Stroke Guidelines 2017 (ASG 2017) (tan)
- Canadian Stroke Guidelines 2015 (CSG 2015) (green)
- Royal College of Physicians (UK) Stroke Guidelines 2016 (RCP 2016) (blue)

These CPGs were chosen from the CPGs included in the larger body of work, because they were published in the last three years (2015-2018) (therefore they reflect recent practice), and all have Good-Excellent AGREE II scores. This means that these CPGs were produced using defensible, transparent, internationally-agreed methods. Clinicians can thus have confidence in applying any of these recommendations, as the strength of the body of evidence underpinning them, to their treatment decisions. The strength of the body of evidence for each recommendation is reported using the standardised faces schemata developed for this work:

Strong positive evidence	😊😊😊	Moderate positive evidence	😊😊	Weak positive evidence	😊
Strong negative evidence	😞😞😞	Moderate negative evidence	😞😞	Weak negative evidence	😞
Ambivalent, conflicting, consensus or practice point evidence 😐 (evidence source is noted where available)					

To collate the list of recommendations presented in this appendix, each of the four CPGs was searched for any treatment-related recommendation, and extracted verbatim. No changes to any wording was made, and no attempt was made to amalgamate recommendations into a composite recommendation. This is to ensure that nothing was lost in interpretation. Thus, clinicians using these recommendations can clearly see which recommendations came from which CPG, using the colour coding.

Differences in recommendation wording largely reflected the different purposes behind writing the CPGs. Reflecting the differences in purpose, CPG developers asked different questions, which led to different literature being identified. This also explains why different evidence strengths were found for similarly-worded recommendations, and also why some CPGs did not address particular treatment questions at all.

Because of the different methodological approaches adopted by the different CPG writers, readers will note that there is variable use of ‘strength’ words (such as should, could, must, might etc) in recommendations. This may not reflect the underpinning strength of the body of evidence. It is thus important that readers consider the relevant ‘face’ when interpreting a recommendation, and decide whether it is relevant to, and implementable in, local practice.

Ideally, strong words (such as ‘should’ (or its opposite ‘should not’), ‘must’ (or its opposite ‘must not’)) reflect strong underpinning research evidence (☺☺☺, ☹☹☹) [30]. Recommendations in this instance are usually based on consistent findings from good quality systematic reviews of controlled trials, or multiple individual randomized or clinical controlled trials [16, 31]. Lesser strength recommendations (usually identified by the use of words ‘might consider’, ‘could consider’, ‘might recommend’, ‘is not recommended’ etc) are based on less robust evidence, generated by poor quality systematic reviews of trials, systematic reviews of epidemiological studies, or individual non-controlled trials or observational studies.

The lack of standard approach across the CPGs to wording recommendations, based on the underpinning strength of the body of evidence, was a key reason that the SA CPG Stroke Team decided against amalgamating recommendations. For instance, there are many examples in this appendix where the words ‘should’ or ‘should not’ were used in recommendations based on lower strength evidence (denoted by ☺☺, ☹☹, ☺, ☹). These words were even used in recommendations based on inconsistent or ambivalent evidence, or recommendations based on consensus opinion. This is why the SA CPG Stroke Team has provided each recommendation verbatim, along with the relevant (but standardised) strength of the body of evidence (the ‘face’), so that clinicians can make their own decisions as to the believability of the recommendation.

The only modification made by the SA CPG Stroke Team, to the wording of the recommendations in this Appendix, was where recommendations were based on consensus opinion (or reflected consensus practice points). In this instance, each recommendation was prefaced as coming from consensus opinion to differentiate them from recommendations based on ambivalent or conflicting evidence. Modification to wording was made because all of these options attracted the same ‘face’ ☹.

For ease of reading, the recommendations were organised into eight sections of clinical activity:

Section 1: Prevention and Management of Risk Factors and Consequences;

Section 2: Nutrition;

Section 3: Communication;

Section 4: Rehabilitation of Function;

Section 5: Rehabilitation Interventions;

Section 6: Mental Function;

Section 7: Sensory and Other Functional Loss; and

Section 8: Reintegration into The Community.

SECTION 1. PREVENTION AND MANAGEMENT of RISK FACTORS and CONSEQUENCES

1.1 Spasticity & Contracture

Pharmacology

AHA/ ASA 2016	Targeted injection of Botulinum Toxin A into localized upper limb muscles is recommended to reduce spasticity, to improve passive or active range of motion, and to improve dressing, hygiene, and limb positioning.	😊😊😊
ASG 2017	In patients with stroke, Botulinum Toxin A, in addition to rehabilitation therapy may be used to reduce <i>upper</i> limb spasticity. Botulinum Toxin A in addition to rehabilitation therapy is unlikely to improve activity or motor function.	😊 😊
AHA/ ASA 2016	Targeted injection of botulinum toxin into lower limb muscles is recommended to reduce spasticity that interferes with gait function.	😊😊😊
ASG 2017	For patients with stroke, Botulinum Toxin A in addition to rehabilitation therapy may be useful for improving muscle tone in patients with <i>lower</i> limb spasticity. Botulinum Toxin A in addition to rehabilitation therapy is unlikely to improve motor function or walking.	😊 😊
CSG 2015	Chemo-denervation using Botulinum Toxin A can be used to increase range of motion and decrease pain for patients with focal and/or symptomatically distressing spasticity.	😊 within 6 mths of stroke; 😊😊😊 longer term
AHA/ ASA 2016	Oral anti-spasticity agents can be useful for generalized spastic dystonia but may result in dose-limiting sedation or other side effects.	😊😊😊
AHA/ ASA 2016	Intrathecal baclofen therapy may be useful for severe spastic hypertonia that does not respond to other interventions.	😊😊😊
CSG 2015	Intrathecal Baclofen should be considered for specific cases of severe, intractable and disabling/ painful spasticity	😊😊
CSG 2015	Oral medications can be prescribed for the treatment of disabling spasticity: a. Tizanidine can be used to treat more generalized, disabling spasticity b. Baclofen can be used as a lower cost alternative but has not been studied in this population c. Benzodiazepines should be avoided due to sedating side effects, which may impair recovery	😊 early; 😊😊 longer term 😊 😊

Electrical stimulation

AHA/ ASA 2016 Physical modalities such as Neuromuscular Electrical Stimulation (NMES) or vibration applied to spastic muscles **may be reasonable** to improve spasticity temporarily as an adjunct to rehabilitation therapy. ☺☺☺

Acupuncture

ASG 2017 **There is consensus opinion** that acupuncture **should not** be used for treatment of spasticity in routine practice other than as part of a research study. ☹

Postural, positioning and motor control retraining

AHA/ ASA 2016 Postural training and task-oriented therapy **may be considered** for rehabilitation of ataxia. ☺

ASG 2017 **There is consensus opinion** that suggests that serial casting may be trialled to reduce severe, persistent contracture when conventional therapy has failed. For stroke survivors at risk of developing contracture or who have developed contracture, active motor training to elicit muscle activity may be provided. ☹

CSG 2015 Spasticity and contractures **may be prevented or treated** by anti-spastic pattern positioning, range of-motion exercises, and/or stretching ☺ for all stroke phases

CSG2015 For the lower limb, anti-spastic pattern positioning, range-of-motion exercises and/or stretching **may be considered** for prevention or treatment of spasticity and contractures (evidence is stronger for later stroke phases, than early phase) ☺ early phase; ☺☺ later stroke phases

CSG2015 The presence of spasticity **should not limit** the use of strength training in the arm., or the leg ☺

Splints

AHA/ ASA 2016 The use of splints and taping **are not recommended** for prevention of wrist and finger spasticity after stroke. ☹☹

ASG 2017 There is strong evidence that suggests that for people with stroke at risk of developing contracture, routine use of splints or prolonged positioning of upper or lower limb muscles in a lengthened position (stretch) **is not recommended**. ☹☹☹

ASG 2017 There is weak evidence that routine use of stretch to reduce spasticity **is not recommended**. ☹

CSG2015	Routine use of splints is not recommended in the literature.	☹
	Optimal protocols for utilizing splinting for improvement or preservation of tissue length and spasticity management have not yet been determined .	☹
ASG 2017	Adjunct therapies to Botulinum Toxin A, such as electrical stimulation, casting, taping and stretching may be used to reduce spasticity	☺
CSG2015	In selected patients, the use of splints may be useful , and should be considered on an individualized basis. A plan for monitoring the splint for effectiveness should be provided.	☺
CSG2015	Ankle splints used at night, and during assisted standing may be considered for prevention of ankle contracture in the hemiparetic lower extremity.	☺

1.2 Swollen extremities

ASG 2017	There is consensus opinion that for people with severe weakness who are at risk of developing swelling of the extremities, management may include: • dynamic pressure garments; • electrical stimulation; or • elevation of the limb when resting.	☺
ASG 2017	There is consensus opinion that for stroke survivors with swelling of hands or feet, management may include: • dynamic pressure garments; • electrical stimulation; • continuous passive motion with elevation; or • elevation of the limb when resting.	☺
CSG 2015	For patients with hand oedema, the following interventions may be considered: a) active, active-assisted, or passive range of motion exercises in conjunction with arm elevation; b) retrograde massage; or c) gentle grade 1-2 mobilizations for accessory movements of the hand and fingers	☺ ☺ ☺

1.3 Complex Regional Pain Syndrome (CRPS) (also known as Shoulder-Hand Syndrome or Reflex Sympathetic Dystrophy)

CSG 2015	Prevention: Active, active-assisted, or passive range of motion exercises should be used to prevent CRPS.	☺ ☺
	Diagnosis should be based on clinical findings including pain and tenderness of metacarpophalangeal and proximal interphalangeal joints, and can be associated with edema over the dorsum of the fingers, trophic skin changes, hyperaesthesia, and limited range of motion	☺
	A triple phase bone scan (which demonstrates increased periarticular uptake in distal upper extremity joints) can be used to assist in diagnosis.	☺☺
	Management: An early course of oral corticosteroids, starting at 30-50mg daily for 3-5 days, and then tapering doses over 1-2 weeks can be used to reduce swelling and pain	

1.4 Pain

AHA/ ASA 2016	The diagnosis of central post-stroke pain should be based on established diagnostic criteria after other causes of pain have been excluded.	☺
AHA/ ASA 2016	The choice of pharmacological agent for the treatment of central post-stroke pain should be individualized to the patient's needs and response to therapy and any side effects.	☺
AHA/ ASA 2016	Amitriptyline and lamotrigine are reasonable first-line pharmacological treatments.	☺☺
AHA/ ASA 2016	Interprofessional pain management is probably useful in conjunction with pharmacotherapy.	☺
AHA/ ASA 2016	Pregabalin, gabapentin, carbamazepine, or phenytoin may be considered as second-line treatments.	☺☺
AHA/ ASA 2016	TENS has not been established as an effective treatment.	☺☺
AHA/ ASA 2016	Motor cortex stimulation might be reasonable for the treatment of intractable central post-stroke pain that is not responsive to other treatments in carefully selected patients.	☺☺
AHA/ ASA 2016	Deep brain stimulation has not been established as an effective treatment.	☺☺
CSG 2015	Patients with persistent Central Post Stroke Pain (CPSP) should receive a trial of low-dose, centrally acting analgesics	☺
	a. Patients should receive an anticonvulsant (such as gabapentin or pregabalin) as a first-line treatment.	☺
	b. Patients should receive a tricyclic antidepressant (e.g., amitriptyline) or an SNRI (particularly duloxetine) as second-line treatment.	☺
		☺

	c. Treatment for patients resistant to first and second line treatment can include opioids or tramadol. Caution is advised for the use of Opioids as there is a significant risk of physical dependency.	
CSG 2015	An individualized patient-centered approach for management of central pain syndromes should be implemented by an interdisciplinary team that includes healthcare professionals with expertise in mental health and central pain management	😊

1.5 Falls Prevention and Treatment

AHA/ ASA 2016	Tai Chi training may be reasonable for fall prevention.	😊😊
ASG 2017	For stroke patients who are at risk of falling, multifactorial interventions in the community, including an individually prescribed exercise program and advice on safety, should be provided	😊
CSG 2015	Based on risk assessment findings, an individualized falls prevention plan should be implemented for each patient	😊😊 😊😊
	a. The patient, family, and caregiver should be made aware of their increased risk for falls and given a list of precautions to reduce their risk of falling	😊😊
	b. The patient, family, and caregiver should receive skills training to enable them to safely transfer and mobilize the patient.	😊 😊😊
	• This should include what to do if a fall occurs and how to get up from a fall	
	c. The patient, family, and caregiver should receive education regarding suitable gait aids, footwear, transfers, and wheelchair use, considering the healthcare and community environment.	😊😊
	d. External hip protectors should be considered in stroke patients who are identified as high risk for falls.	
CSG 2015	If a patient experiences a fall, an assessment of the circumstances surrounding the fall should be conducted to identify precipitating factors.	😊
	Pre-existing falls prevention plans should be modified to reduce the risk of further falls.	😊

1.6 Loss of sensation

ASG 2017	For stroke survivors with sensory loss of the upper limb, sensory discrimination training may be provided .	😊
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1.7 Seizures

AHA/ ASA 2016	Any patient who develops a seizure should be treated with standard management approaches, including a search for reversible causes of seizure in addition to potential use of antiepileptic drugs.	😊
AHA/ ASA 2016	Routine seizure prophylaxis for patients with ischemic or haemorrhagic stroke is not recommended .	😊

1.8 Deep Vein Thrombosis (DVT)/ Pulmonary Embolus (PE)

ASG 2017	Antithrombotic stockings are not recommended for the prevention of DVT or PE post stroke.	☹☹☹
ASG 2017	For acute ischaemic stroke patients who are immobile, low molecular weight heparin in prophylactic doses may be used in the absence of contraindications	😊
CSG 2015	For <u>acute stroke patients</u> who are immobile, the use of intermittent pneumatic compression may be used , either as an alternative to low molecular weight heparin or in those with a contraindication to pharmacological DVT prophylaxis (including patients with intracerebral hemorrhage).	😊
ASG 2017	There is consensus opinion that: - Pharmacological prophylaxis should not be used in the first 24 hours after thrombolysis until brain imaging has excluded significant hemorrhagic transformation. - For acute stroke patients, early mobilisation and adequate hydration should be encouraged to help prevent DVT & PE. - For stroke patients receiving intermittent pneumatic compression, skin integrity should be assessed daily. - For patients with intracerebral haemorrhage, pharmacological prophylaxis may be considered after 48-72 hours and once haematoma growth has stabilised, although evidence is limited.	😊

1.9 Osteoporosis

AHA/ ASA 2016	Increased levels of physical activity are probably indicated to reduce the risk and severity of post-stroke osteoporosis.	😊😊
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1.10 Deconditioning

Cardiovascular conditioning

CSG 2015	Individually tailored aerobic training involving large muscle groups should be incorporated into a comprehensive stroke rehabilitation program to: - enhance cardiovascular endurance; and - reduce risk of stroke recurrence.	😊😊😊 😊
CSG 2015	To achieve a training effect, patients should participate in aerobic exercise at least 3 times weekly for a minimum of 8 weeks, progressing as tolerated to 20 minutes or more per session, exclusive of warm-up and cool-down.	😊😊

CSG 2015	Heart rate and blood pressure should be monitored during training to ensure safety and attainment of target exercise intensity	☺☺☺
CSG 2015	To ensure long-term maintenance of health benefits, a planned transition from structured aerobic exercise to more self-directed physical activity at home or in the community should be implemented .	☺☺☺
CSG 2015	Strategies to address specific barriers to physical activity related to patients, health care providers, family, and/or the environment should be employed .	☺☺☺

Muscle strengthening

AHA/ ASA 2016	Strengthening exercises are reasonable to consider as an adjunct to functional task practice	☺☺
ASG 2017	Stroke survivors with reduced strength in their arms or legs should be offered progressive resistance training.	☺☺☺
RCP 2016	People with stroke should accumulate at least 45 minutes of each appropriate therapy every day, at a frequency that enables them to meet their rehabilitation goals, and for as long as they are willing and capable of participating and showing measurable benefit from treatment	☺☺☺

Electrical stimulation

ASG 2017	For stroke survivors with reduced strength in their arms or legs (particularly for those with less than antigravity strength), electrical stimulation may be used .	☺
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SECTION 2. NUTRITION

2.1 Dysphagia

AHA/ ASA 2016	Enteral feedings (tube feedings) should be initiated within 7 days after stroke for patients who cannot safely swallow.	☺☺☺
AHA/ ASA 2016	Nasogastric tube feeding should be used for short term (2–3 weeks) nutritional support for patients who cannot swallow safely.	☺☺
AHA/ ASA 2016	Percutaneous gastrostomy tubes should be placed in patients with chronic inability to swallow safely.	☺☺
AHA/ ASA 2016	Nutritional supplements are reasonable to consider for patients who are malnourished or at risk of malnourishment.	☺☺
AHA/ ASA 2016	Incorporating principles of neuroplasticity into dysphagia rehabilitation strategies/interventions is reasonable .	☺
AHA/ ASA 2016	Behavioral interventions may be considered as a component of dysphagia treatment.	☺☺☺
AHA/ ASA 2016	Acupuncture may be considered as an adjunctive treatment for dysphagia.	☺☺
AHA/ ASA 2016	Drug therapy, NMES, pharyngeal electrical stimulation, physical stimulation, tDCS, and transcranial magnetic stimulation are of uncertain benefit . These treatments are not currently recommended .	☺ ☹☹☹
CSG 2015	Abnormal results from the initial or ongoing swallowing screens should prompt a referral to a speech-language pathologist, occupational therapist, dietitian or other trained dysphagia clinician for more detailed bedside swallowing assessment and management of swallowing, feeding, nutritional and hydration status. An individualized management plan should be developed to address therapy for dysphagia, dietary needs, and specialized nutrition plans.	☺ ☺
CSG 2015	Video-fluoroscopic swallow study (VSS, VFSS, MBS) or fiberoptic endoscopic examination of swallowing (FEES), should be performed on all patients considered at risk for pharyngeal dysphagia or poor airway protection, based on results from the bedside swallowing assessment.	☺☺
CSG 2015	Restorative swallowing therapy and/or compensatory techniques to optimize the efficiency and safety of the swallow, with reassessment as required, should be considered for dysphagia therapy. Restorative therapy may include lingual resistance, breath holds and effortful swallows. Compensatory techniques may address posture, sensory input with bolus, volitional control, texture modification and a rigorous program of oral hygiene.	☺ ☺☺ ☺☺

CSG 2015	Patients, families and caregivers should receive education on swallowing and feeding recommendations	😊
CSG 2015	To reduce the risk of pneumonia, patients should be permitted and encouraged to feed themselves whenever possible	😊
CSG 2015	Patients should be given meticulous mouth and dental care, and educated in the need for good oral hygiene to further reduce the risk of pneumonia	😊
2.2 Early Feeding		
ASG 2017	For stroke survivors whose nutrition status is poor or deteriorating, nutrition supplementation should be offered .	😊😊😊
ASG 2017	For stroke patients who do not recover a functional swallow, nasogastric tube feeding is the preferred method of feeding. Continuous pump feeding is preferred over intermittent feeding.	😊
ASG 2017	For stroke patients who are adequately nourished, routine oral nutrition supplements are not recommended .	😞
ASG 2017	There is consensus opinion that following an acute stroke, food intake should be monitored for all patients.	😊
ASG 2017	There is consensus opinion that stroke survivors who are deemed to be at risk of malnutrition, including those with dysphagia, should be referred to a dietitian for assessment and ongoing management.	😊
CSG 2015	Stroke patients with suspected nutritional concerns, hydration deficits, dysphagia, or other comorbidities that may affect nutrition should be referred to a dietitian for recommendations to meet nutrient and fluid needs orally while supporting alterations in food texture and fluid consistency should be recommended by a speech-language pathologist or other trained professional	😊😊
	For enteral nutrition support in patients who cannot safely swallow or meet their nutrient and fluid needs orally, the decision to proceed with tube feeding should be made as early as possible after admission, usually within the first three days of admission in collaboration with the patient, family (or substitute decision maker), and interprofessional team.	😊😊
RCP 2016	Patients with stroke who are unable to maintain adequate nutrition and fluids orally should be:	
	- referred to a dietitian for specialist nutritional assessment, advice and monitoring; - considered for nasogastric tube feeding within 24 hours of admission; - assessed for a nasal bridge if the nasogastric tube needs frequent replacement, using locally agreed protocols; - assessed for gastrostomy if they are unable to tolerate a nasogastric tube with nasal bridge.	😊😊 😊😊 😊😊 😊😊
RCT 2016	Do not routinely offer oral nutritional supplements to patients with acute stroke who are adequately nourished on admission.	😞😞
	Do assess hydration and risk of malnutrition in patients admitted to hospital with acute stroke	😊😊😊

2.3 Oral Hygiene

ASG 2017	All patients with stroke, particularly those with swallowing difficulties, should have assistance and/or education to maintain good oral and dental (including dentures) hygiene	☺☺☺
ASG 2017	Chlorhexidine in combination with oral hygiene instruction, and/or assisted brushing may be used to decrease dental plaque and gingival bleeding	☺

SECTION 3. COMMUNICATION

3.1 Cognitive communication disorders

AHA/ ASA 2016	Interventions for cognitive-communication disorders are reasonable to consider if they are individually tailored and target: • The overt communication deficit affecting prosody, comprehension, expression of discourse, and pragmatics • The cognitive deficits that accompany or underlie the communication deficit, including attention, memory, and executive functions	☺☺
AHA/ ASA 2016	Speech and language therapy is recommended for individuals with aphasia.	☺☺☺
RCP 2016	People with communication problems after stroke should be assessed by a speech and language therapist to diagnose the problem and to explain the nature and implications to the person, their family/ carers and the multidisciplinary team. Reassessment in the first four months should only be undertaken if the results will affect decision-making or are required for mental capacity assessment.	☺☺☺
AHA/ ASA 2016	Treatment for aphasia should include communication partner training.	☺☺
AHA/ ASA 2016	Intensive treatment for aphasia is probably indicated , but there is no definitive agreement on the optimum amount, timing, intensity, distribution, or duration of treatment.	☺☺☺
AHA/ ASA 2016	Computerized treatment may be considered to supplement treatment provided by a speech-language pathologist.	☺☺☺
AHA/ ASA 2016	A variety of different treatment approaches for aphasia may be useful , but their relative effectiveness is not known.	☺☺
AHA/ ASA 2016	Group treatment may be useful across the continuum of care, including the use of community-based aphasia groups.	☺☺
AHA/ ASA 2016	Pharmacotherapy for aphasia may be considered on a case-by-case basis in conjunction with speech and language therapy, but no specific regimen is recommended for routine use at this time.	☺☺

AHA/ ASA 2016	Brain stimulation techniques as adjuncts to behavioral speech and language therapy are considered experimental and therefore are not currently recommended for routine use.	☹️
ASG 2017	There is consensus opinion that management of patients with cognitive communication disorders may include: • Motoric-imitative, cognitive-linguistic treatments to improve use of emotional tone in speech production • Semantic based treatment connecting literal and metaphorical senses to improve comprehension of conversational and metaphoric concepts.	☹️
CSG 2015	All health care providers working with persons with stroke across the continuum of care should be trained about aphasia, including the recognition of the impact of aphasia and methods to support communication such as Supported Conversation for Adults with Aphasia (SCATM)	😊
CSG 2015	All health care providers working with persons with stroke across the continuum of care should be trained about other communication disorders that may result from stroke including: dysarthria, apraxia of speech and cognitive communication deficits	😊
CSG 2015	All stroke patients should be screened for communication disorders using a simple, reliable, validated tool	😊
CSG 2015	Patients with any suspected communication deficits should be referred to a Speech-Language Pathologist (SLP) for assessment in the following areas using valid and reliable methods: comprehension, speaking, reading, writing, gesturing, use of technology, pragmatics (e.g. social cues, turn-taking, body language, etc.) and conversation	😊
CSG 2015	Persons with aphasia should have early access to a combination of intensive language and communication therapy according to their needs, goals and impairment severity	😊😊
CSG 2015	Treatment to improve functional communication can include language therapy focusing on: a. production and/or comprehension of words, sentences and discourse; b. reading and writing, conversational treatment, and constraint induced language therapy; c. use of non-verbal strategies, assistive devices and technology (e.g. i-Pads, tablets, other computer-guided therapies) which may be incorporated to improve communication; and d. use of computerized language therapy to enhance benefits of other therapies.	😊 😊😊 😊 😊
CSG 2015	Treatment for aphasia should include group therapy and conversation groups. Groups can be guided by trained volunteers and caregivers overseen by an SLP to supplement the intensity of therapy during hospitalization and/or as continuing therapy following discharge	😊😊
CSG 2015	Treatment to improve functional communication should include Supported Conversation techniques for potential communication partners of the person with aphasia	😊😊😊
CSG 2015	All information intended for patient use should be available in aphasia-friendly formats (e.g., patient education material should be available in audio/ visual format). This includes materials such as educational information, information on	😊

	diagnostic imaging procedures, consent forms and information regarding participation in stroke rehabilitation research, and assessment tools.	
CSG 2015	Families of persons with aphasia should be engaged in the entire process from screening through intervention, including family support and education, and training in supported communication	😊
CSG 2015	The impact of aphasia on functional activities, participation and Quality of Life (QoL), including the impact on relationships, vocation and leisure, should be assessed, and addressed as appropriate , from early post-onset and over time for those chronically affected.	😊

3.2 Motor speech disorders

AHA/ ASA 2016	Interventions for motor speech disorders should be individually tailored and can include behavioral techniques and strategies that target: • Physiological support for speech, including respiration, phonation, articulation, and resonance • Global aspects of speech production such as loudness, rate, and prosody • Augmentative and alternative communication devices and modalities should be used to supplement speech.	😊😊
AHA/ ASA 2016	Tele-rehabilitation may be useful when face-to-face treatment is impossible or impractical.	😊
AHA/ ASA 2016	Environmental modifications, including listener education, may be considered to improve communication effectiveness.	😊
AHA/ ASA 2016	Activities to facilitate social participation and promote psychosocial well-being may be considered .	😊
ASG 2017	For stroke survivors with aphasia, speech and language therapy should be provided to improve functional communication.	😊😊😊
ASG 2017	For stroke survivors with aphasia, intensive aphasia therapy (at least 45 minutes of direct language therapy for five days a week) may be used in the first few months after stroke.	😊
ASG 2017	Brain stimulation (transcranial direct current stimulation or repetitive transcranial magnetic stimulation), with or without traditional aphasia therapy, should not be used in routine practice for improving speech and language function and only used as part of a research framework.	😞
ASG 2017	For stroke survivors with aphasia, the routine use of piracetam is not recommended .	😞
ASG 2017	For stroke survivors with dysarthria, interventions should be individually tailored and provided by a speech and language pathologist or a trained communication partner.	😊

ASG 2017	For stroke survivors with dysarthria, non-speech oromotor exercises have not been shown to add additional benefit to behavioural speech practice and are not recommended .	☹
ASG 2017	For stroke survivors with apraxia of speech, interventions may be individually tailored and incorporate articulatory-kinematic and rate/rhythm approaches. In addition, therapy may incorporate : • Use of modelling and visual cueing • Principles of motor learning to structure practice sessions • Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT) therapy • Self-administered computer programs that use multimodal sensory stimulation For functional activities, the use of augmentative and alternative communication modalities such as gesture or speech-generating devices is recommended	☺ ☺

SECTION 4. REHABILITATION OF FUNCTION

4.1 Rehabilitation approach

CSG 2015	Patients should engage in training that is meaningful, engaging, progressively adaptive, intensive, task-specific and goal-oriented in an effort to improve transfer skills and mobility.	☺☺☺
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4.2 Sitting

ASG 2017	For stroke survivors who have difficulty sitting, practising reaching beyond arm's length while sitting with supervision/assistance should be undertaken .	☺☺☺
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4.3 Standing up

ASG 2017	For stroke survivors who have difficulty standing, practice of standing balance should be provided. Strategies could include : • practising functional tasks while standing; • walking training that includes challenge to standing balance (e.g. overground walking, obstacle courses); and • providing visual or auditory feedback.	☺☺☺ ☺☺☺ ☺☺☺
ASG 2017	For stroke survivors who have difficulty with standing balance, virtual reality including treadmill training with virtual reality or use of Wii Balance Boards may be used.	☺

CSG2015	Task and goal-oriented training that is repetitive and progressively adapted should be used to improve performance of selected lower-extremity tasks such as walking distance, speed, and sit to stand.	☺☺☺ in all stroke phases
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4.4 Gait

Pharmacology

AHA/ ASA 2016	The effectiveness of fluoxetine or other SSRIs to enhance motor recovery is not well established	☺
AHA/ ASA 2016	The effectiveness of levodopa to enhance motor recovery is not well established	☺
AHA/ ASA 2016	The use of dextroamphetamine or methylphenidate to facilitate motor recovery is not recommended	☹

Task Training

AHA/ ASA 2016	Intensive, repetitive, mobility- task training is recommended for all individuals with gait limitations after stroke.	☺☺☺
AHA/ ASA 2016	Group therapy with circuit training is a reasonable approach to improve walking.	☺☺☺
AHA/ ASA 2016	Incorporating cardiovascular exercise and strengthening interventions is reasonable to consider for recovery of gait capacity and gait-related mobility tasks.	☺☺☺
AHA/ ASA 2016	Practice walking with either a treadmill (with or without body-weight support) or over-ground walking exercise training combined with conventional rehabilitation may be reasonable for recovery of walking function.	☺☺☺
AHA/ ASA 2016	The effectiveness of rhythmic auditory cueing to improve walking speed and coordination is uncertain	☺
ASG 2017	Stroke survivors with difficulty walking should be given the opportunity to undertake tailored repetitive practice of walking (or components of walking) as much as possible. The following modalities can be used to achieve this include: • Circuit class therapy (with a focus on over-ground walking practice); • Treadmill training with or without body weight support; and • Virtual reality (VR) training	☺☺☺
CSG 2015	Strength training should be considered for persons with mild to moderate lower extremity function in both subacute and chronic phases of recovery.	☺ for subacute, ☺☺ for chronic phases

	Strength training does not affect tone or pain	😊😊😊
CSG 2015	Treadmill-based gait training (with or without body weight support) can be used to enhance walking speed and distance walked, when over-ground training is not available or appropriate.	😊😊😊 in all stroke phases
CSG 2015	Rhythmic auditory stimulation (RAS) could be considered for improving gait parameters in stroke patients, including gait velocity, cadence, stride length and gait symmetry	😊😊😊
Robotics		
AHA/ ASA 2016	Robot-assisted movement training to improve motor function and mobility after stroke in combination with conventional therapy may be considered .	😊😊😊
AHA/ ASA 2016	Mechanically assisted walking (treadmill, electromechanical gait trainer, robotic device, servo-motor) with body weight support may be considered for patients who are non-ambulatory or have low ambulatory ability early after stroke.	😊😊😊
CSG 2015	Electromechanical (robotic) assisted gait training devices could be considered for patients who would not otherwise practice walking.	😊😊😊 in all stroke phases
	They should not be used in place of conventional gait therapy	😞😞😞
Acupuncture		
AHA/ ASA 2016	There is insufficient evidence to recommend acupuncture for facilitating motor recovery and walking mobility.	😊
Electrical stimulation		
AHA/ ASA 2016	The effectiveness of TENS in conjunction with everyday activities for improving mobility, lower extremity strength, and gait speed is uncertain	😊
AHA/ ASA 2016	The usefulness of electromyography biofeedback during gait training in patients after stroke is uncertain	😊
AHA/ ASA 2016	NMES is reasonable to consider as an alternative to an AFO for foot drop.	😊😊😊
ASG 2017	For stroke survivors with difficulty walking, the following interventions may be used , in addition to those listed above: • Electromechanically assisted gait training • Biofeedback • Cueing of cadence • Functional electrical stimulation	😊
CSG 2015	Biofeedback could be used as an adjunct to improve gait and balance	😊😊

Virtual Reality

- AHA/ ASA 2016 Virtual reality **may be beneficial** to improve gait 😊😊
- CSG 2015 Virtual reality training (such as non-immersive technologies) **could be considered** as an adjunct to conventional gait training 😊😊😊

Rehabilitation and exercise approaches

- AHA/ ASA 2016 The effectiveness of neurophysiological approaches (ie, neurodevelopmental therapy, proprioceptive neuromuscular facilitation) compared with other treatment approaches for motor retraining after an acute stroke **has not been established**. 😊
- AHA/ ASA 2016 The effectiveness of water-based exercise for motor recovery after an acute stroke **is unclear** 😊

Orthoses

- ASG 2017 For stroke survivors, individually fitted lower limb orthoses **may be used** to minimise limitations in walking ability. Improvement in walking will only occur while the orthosis is being worn. 😊
- AHA/ ASA 2016 Resting ankle splints used at night and during assisted standing **may be considered** for prevention of ankle contracture in the hemiplegic limb. 😊😊
- AHA/ ASA 2016 An AFO after stroke **is recommended** in individuals with remediable gait impairments (eg, foot drop) to compensate for foot drop and to improve mobility and paretic ankle and knee kinematics, kinetics, and energy cost of walking. 😊😊😊

Mental practice / imagery

- CSG 2015 Mental Practice **could be considered** as an adjunct to lower extremity motor retraining 😊😊😊

Ambulatory devices

- AHA/ ASA 2016 Ambulatory assistive devices (e.g. cane, walker) **should be used** to help with gait and balance impairments, as well as mobility efficiency and safety, when needed 😊😊
- AHA/ ASA 2016 Ankle-Foot Orthoses (AFOs) **should be used** for ankle instability or dorsiflexor weakness 😊😊
- AHA/ ASA 2016 Wheelchairs **should be used** for non-ambulatory individuals or those with limited walking ability 😊
- AHA/ ASA 2016 Adaptive and assistive devices **should be used** for safety and function if other methods of performing the task/activity are not available or cannot be learned or if the patient's safety is a concern 😊

CSG 2015	Ankle-foot orthoses should be used on selected patients with foot drop following proper assessment and with follow-up to verify its effectiveness	😊😊😊 in all stroke phases
CSG 2015	FES should be used to improve strength and function (gait) in selected patients, but the effects may not be sustained	😊😊😊
CSG 2015	The need for gait aids, wheelchairs, and other assistive devices should be evaluated on an individual basis.	😊
	Prescription and/or acquisition of an assistive device should be based on anticipation of a long-term need	😊
	Once provided, patients should be reassessed , as appropriate, to determine if changes are required or equipment can be discontinued	😊

4.5 Balance retraining

AHA/ ASA 2016	Individuals with stroke who have poor balance, low balance confidence, and fear of falls or are at risk for falls should be provided with a balance training program.	😊😊😊
AHA/ ASA 2016	Individuals with stroke should be prescribed and fitted with an assistive device or orthosis if appropriate to improve balance.	😊😊😊
AHA/ ASA 2016	Individuals with stroke should be evaluated for balance, balance confidence, and fall risk.	😊
AHA/ ASA 2016	Postural training and task-oriented therapy may be considered for rehabilitation of ataxia.	😊
CSG 2015	For patients with balance disorders post stroke, balance training should be offered	😊😊😊
CSG 2015	Therapists should consider both voluntary and reactive balance control within their assessment and treatment	😊
CSG 2015	Effective interventions for balance can include : - trunk training/ seated balance training (early and late stage stroke), task-oriented intervention with or without multisensory intervention (late stage stroke rehab), force platform biofeedback (early and late stage stroke) - Tai Chi (late stage stroke), aquatic therapy (late stage stroke), structured, progressive, physiologically based therapist-supervised home exercise program (early stage stroke), cycling training (early stage stroke), and partial body weight support treadmill training (early stage stroke)	😊😊😊 😊😊

SECTION 5. REHABILITATION INTERVENTIONS

5.1 Upper extremity

Activities of Daily Living (ADL) and motor retraining

AHA/ ASA 2016	Functional tasks should be practiced .	😊😊😊
	They should be task-specific training, in which the tasks are graded to challenge individual capabilities, practiced repeatedly, and progressed in difficulty on a frequent basis.	😊😊😊
AHA/ ASA 2016	All individuals with stroke should receive Activities of Daily Living (ADL) training tailored to individual needs and eventual discharge setting.	😊😊😊
AHA/ ASA 2016	All individuals with stroke should receive Instrumental Activities of Daily Living (IADL) training tailored to individual needs and eventual discharge setting.	😊😊
CSG 2015	Range of movement exercises (passive and active assisted) should be provided . They should include placement of the upper limb in a variety of appropriate and safe positions within the patient's visual field.	😊
AHA/ ASA 2016	Bilateral training paradigms may be useful for upper limb therapy.	😊😊😊
CSG 2015	Bilateral arm training does not appear to be superior to unilateral arm training in improving upper extremity motor function.	😐😐
ASG 2017	Bilateral arm training may be used as part of comprehensive goal directed rehabilitation. When matched for dosage, unilateral training may be more effective.	😊
RCT 2016	Do ensure careful positioning of the affected arm and that carers and family handle the arm correctly.	😊😊😊
CSG 2015	Therapists should consider supplementary training programs aimed at increasing the active movement and functional use of the affected arm between therapy sessions, e.g. Graded Repetitive Arm Supplementary Program (GRASP) suitable for use during hospitalization and at home.	😊😊 within 6 months; 😊 longer term
CSG 2015	Strength training should be considered for persons with mild to moderate upper extremity function in both subacute and chronic phases of recovery. Strength training does not aggravate tone or pain	😊😊😊

Acupuncture

AHA/ ASA 2016 Acupuncture **is not recommended** for the improvement of ADLs and upper extremity activity ☹️☹️☹️

Splints

AHA/ ASA 2016 Resting hand/wrist splints, along with regular stretching and spasticity management in patients lacking active hand movement, **may be considered**. 😊

AHA/ ASA 2016 Use of serial casting or static adjustable splints **may be considered** to reduce mild to moderate elbow and wrist contractures. 😊

ASG 2017 Hand and wrist orthoses (splints) **should not be used** as part of routine practice as they have no effect on function, pain or range of movement ☹️☹️☹️

Surgery

AHA/ ASA 2016 Surgical release of brachialis, brachioradialis, and biceps muscles **may be considered** for substantial elbow contractures and associated pain. 😊😊

Restraint therapy

AHA/ ASA 2016 CIMT or its modified version **is reasonable to consider** for eligible stroke survivors 😊😊😊

ASG 2017 For stroke survivors with some active wrist and finger extension, intensive constraint induced movement therapy (minimum 2 hours of active therapy per day for 2 weeks, plus restraint for at least 6 hours a day) **should be provided** to improve arm and hand use. 😊😊😊

Trunk restraint **may also be incorporated** into the active therapy sessions at any stage post-stroke 😊😊😊

CSG 2015 Traditional or modified constraint-induced movement therapy (CIMT) **should be considered** for a select group of patients who demonstrate at least 20 degrees of active wrist extension and 10 degrees of active finger extension, with minimal sensory or cognitive deficits 😊😊😊 in all stroke phases

Mechanically-assisted training

ASG 2017	In people with mild to severe arm weakness after stroke, mechanically assisted arm training (e.g. robotics) should be used to improve upper limb function	😊😊😊
AHA/ ASA 2016	Robotic therapy is reasonable to consider to deliver more intensive practice for individuals with moderate to severe upper limb paresis	😊😊😊
RCT 2016	Do not use overhead arm slings and pulleys in people with stroke who have functional loss in the arm.	😞😞😞

Electrical stimulation

AHA/ ASA 2016	NMES is reasonable to consider for individuals with minimal volitional movement within the first few months after stroke, or for individuals with shoulder subluxation.	😊😊😊 early phase
ASG 2017	For people with mild to severe arm or hand weakness, electrical stimulation in conjunction with motor training should be used to improve upper limb function after stroke.	😊😊😊
CSG 2015	Functional Electrical Stimulation (FES) targeted at the wrist and forearm muscles should be considered to reduce motor impairment and improve function.	😊😊😊 in all stroke phases
CSG 2015	It is uncertain whether sensory stimulation (e.g. transcutaneous electrical nerve stimulation (TENS), acupuncture, muscle stimulation, biofeedback improves upper extremity motor function	😊

Virtual reality

AHA/ ASA 2016	Virtual reality is reasonable to consider as a method for delivering upper extremity movement practice	😊😊
ASG 2017	For stroke survivors with mild to moderate arm impairment, virtual reality and interactive games should be used to improve upper limb function.	😊😊😊
	Virtual reality therapy should be provided for at least 15 hours total therapy time	😊😊😊
CSG 2015	Virtual reality, including both immersive technologies such as head mounted or robotic interfaces and non-immersive technologies such as gaming devices, can be used as adjunct tools to other rehabilitation therapies as a means to provide additional opportunities for engagement, feedback, repetition, intensity and task-oriented training	😊😊😊

Mental practice and imagery

AHA/ ASA 2016	Mental practice is reasonable to consider as an adjunct to upper extremity rehabilitation services	😊😊😊
ASG 2017	For stroke survivors with mild to moderate weakness of their arm, mental practice in conjunction with active motor training may be used to improve arm function	😊
CSG 2015	Following assessment to determine if they are suitable candidates, patients should be encouraged to engage in mental imagery to enhance upper-limb, sensorimotor recovery	😊😊😊 within 6 months; 😊😊 longer term
ASG 2017	For stroke survivors with mild to moderate weakness, complex regional pain syndrome and/or neglect, mirror therapy may be used as an adjunct to routine therapy to improve arm function after stroke	😊
CSG 2015	Mirror therapy should be considered as an adjunct to motor therapy for select patients. It may help to improve upper extremity motor function and ADLs	😊😊😊 in all stroke phases

Brain stimulation

ASG 2017	Brain stimulation (transcranial direct stimulation or repetitive transcranial magnetic stimulation) should not be used in routine practice for improving arm function, and only used as part of a research framework	😞😞
CSG 2015	Repetitive Transcranial magnetic stimulation (rTMS) may be considered , and transcranial direct current stimulation (tDCS) should be considered as an adjunct to upper extremity therapy	rTMS B 😊😊 tDCS A 😊😊😊😊

Adaptive Devices

CSG 2015	Adaptive devices designed to improve safety and function may be considered if other methods of performing specific functional tasks are not available or tasks cannot be learned	😊
CSG 2015	The need for special equipment (such as wheelchair trays) should be evaluated on an individual basis. Once provided, patients should be reassessed as appropriate to determine if changes are required or equipment can be discontinued with the aim of achieving independent function	😊
CSG 2015	Functional dynamic orthoses are an emerging therapy tool that may be offered to patients to facilitate repetitive task-specific training	😊😊

5.2 Shoulder-specific interventions

Pharmacology

AHA/ ASA 2016	Botulinum Toxin A injection can be useful to reduce severe hypertonicity in hemiplegic shoulder muscles	☺☺☺
AHA/ ASA 2016	Suprascapular nerve block may be considered as an adjunctive treatment for hemiplegic shoulder pain.	☺☺
AHA/ ASA 2016	Usefulness of subacromial or glenohumeral corticosteroid injection for patients with inflammation in these locations is not well established.	☺☺

Positioning

AHA/ ASA 2016	Positioning of hemiplegic shoulder in maximum external rotation while the patient is either sitting or in bed for 30 minutes daily is probably indicated.	☺☺
AHA/ ASA 2016	It is reasonable to consider positioning and use of supportive devices and slings for shoulder subluxation.	☺

Electrotherapy

ASG 2017	For stroke survivors, electrical stimulation may be used to prevent or reduce shoulder subluxation.	☺
AHA/ ASA 2016	Ultrasound may be considered as a diagnostic tool for shoulder soft tissue injury.	☺☺
CSG 2015	For patients with a flaccid arm (i.e., Chedoke-McMaster Stroke Assessment <3) electrical stimulation should be considered	☺☺

Surgery

AHA/ ASA 2016	Surgical tenotomy of pectoralis major, latissimus dorsi, teres major, or subscapularis may be considered for patients with severe hemiplegia and restrictions in shoulder range of motion	☺
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Pulleys

AHA/ ASA 2016	The use of overhead pulley exercises is not recommended.	☹
CSG 2015	Overhead pulleys should not be used	☹☹☹

Strapping

ASG 2017	For stroke survivors, shoulder strapping is not recommended to prevent or reduce shoulder subluxation.	☹
ASG 2017	There is consensus opinion that for stroke survivors at risk of shoulder subluxation, firm support devices (e.g. devices such as a laptray) may be used.	😊

Manual Handling

CSG 2015	The arm should not be moved beyond 90 degrees of shoulder flexion or abduction, unless the scapula is upwardly rotated and the humerus is laterally rotated	😊😊😊
CSG 2015	Healthcare staff, patients and family should be educated to correctly handle the involved arm	😊😊😊
	Careful positioning and supporting the arm should occur during assisted moves such as transfers.	😊😊😊
	Avoid pulling on the affected arm	😊
ASG 2017	There is consensus opinion that to prevent complications related to shoulder subluxation, education and training about correct manual handling and positioning should be provided to the stroke survivor, their family/carer and health professionals, particularly nursing and allied health staff.	😊

Pharmacology

AHA/ ASA 2016	A trial of neuromodulating pain medications is reasonable for patients with hemiplegic shoulder pain who have clinical signs and symptoms of neuropathic pain manifested as sensory change in the shoulder region, allodynia, or hyperpathia	😊😊😊
AHA/ ASA 2016	Suprascapular nerve block may be considered as an adjunctive treatment for hemiplegic shoulder pain.	😊😊
CSG 2015	Injections of Botulinum Toxin A into the subscapularis and pectoralis muscles could be used to treat hemiplegic shoulder pain thought to be related to spasticity	😊😊
ASG 2017	In selected stroke patients, Botulinum Toxin A may be used to reduce shoulder pain.	😊
ASG 2017	In stroke patients with shoulder pain, shoulder injections (either subacromial steroid injections for patients with rotator cuff syndrome, or methylprednisolone and bupivacaine for suprascapular nerve block) may be used to reduce shoulder pain	😊
CSG 2015	Subacromial corticosteroid injections can be used in patients when pain is thought to be related to injury or inflammation of the subacromial region (rotator cuff or bursa) in the hemiplegic shoulder	😊😊
CSG 2015	If there are no contraindications, analgesics (such as acetaminophen or ibuprofen) can be used for pain relief	😊

Acupuncture

AHA/ ASA 2016 Usefulness of acupuncture as an adjuvant treatment for hemiplegic shoulder pain is **of uncertain value**. ☹

Electrical stimulation

AHA/ ASA 2016 NMES **may be considered** (surface or intramuscular) for shoulder pain. 😊😊😊

ASG 2017 Electrical stimulation **is not recommended** to manage shoulder pain. ☹

Strapping and positioning

ASG 2017 **There is consensus opinion** that for stroke survivors who develop shoulder pain, management should be based on evidence-based interventions for acute musculoskeletal pain. ☹

ASG 2017 In stroke patients with shoulder pain, shoulder strapping **may be used** to reduce pain ☹

ASG 2017 **There is consensus opinion** that for stroke survivors with severe weakness who are at risk of developing shoulder pain, management may include:
• shoulder strapping;
• education of staff, carers and stroke survivors about preventing trauma; or
• active motor training to improve function ☹

CSG 2015 Joint protection strategies **should be used** during the early or flaccid stage of recovery to prevent or minimize shoulder pain. These specifically include:
a. Positioning and supporting the arm during rest; ☹😊
b. Protecting and supporting the arm during functional mobility; ☹
c. Protecting and supporting the arm during wheelchair use by using a hemi-tray or arm trough; and ☹
d. The use of slings remains controversial beyond the flaccid stage, as disadvantages outweigh advantages (such as encouraging flexor synergies, discourages arm use, inhibiting arm swing, contributing to contracture formation, and decreasing body image) ☹

CSG 2015 Treatment of hemiplegic shoulder pain related to limitations in range of motion **may include** gentle stretching and mobilization techniques, and typically involves increasing external rotation and abduction. ☹😊
Active range of motion **should be increased** gradually in conjunction with restoring alignment and strengthening weak muscles in the shoulder girdle ☹😊

SECTION 6. MENTAL FUNCTION

6.1 Cognition and Memory

AHA/ ASA 2016	Enriched environments to increase engagement with cognitive activities are recommended .	😊😊😊
AHA/ ASA 2016	Use of cognitive rehabilitation to improve attention, memory, visual neglect, and executive functioning is reasonable .	😊😊
AHA/ ASA 2016	Use of cognitive training strategies that consider practice, compensation, and adaptive techniques for increasing independence is reasonable	😊😊
AHA/ ASA 2016	Compensatory strategies may be considered to improve memory functions, including the use of internalized strategies (eg, visual imagery, semantic organization, spaced practice) and external memory assistive technology (eg, notebooks, paging systems, computers, other prompting devices).	😊😊😊
AHA/ ASA 2016	Some type of specific memory training is reasonable such as promoting global processing in visual-spatial memory and constructing a semantic framework for language-based memory.	😊😊
AHA/ ASA 2016	Errorless learning techniques may be effective for individuals with severe memory impairments for learning specific skills or knowledge, although there is limited transfer to novel tasks or reduction in overall functional memory problems	😊😊
AHA/ ASA 2016	Music therapy may be reasonable for improving verbal memory	😊😊
AHA/ ASA 2016	The usefulness of donepezil in the treatment of post-stroke cognitive deficits is not well established	😊
AHA/ ASA 2016	The usefulness of rivastigmine in the treatment of post-stroke cognitive deficits is not well established	😊
AHA/ ASA 2016	The usefulness of antidepressants in the treatment of post-stroke cognitive deficits is not well established .	😊
AHA/ ASA 2016	The usefulness of dextroamphetamine, methylphenidate, modafinil, and atomoxetine in the treatment of post-stroke cognitive deficits is unclear .	😊
ASG 2017	There is consensus opinion that for patients with stroke and cognitive impairment, strategy and/or cognitive training may be provided	😊
ASG 2017	For stroke survivors with attention and concentration deficits, cognitive rehabilitation may be used.	😊
ASG 2017	For stroke survivors with attention and concentration deficits, consideration may be given to prescribing exercise training and leisure activities	😊
ASG 2017	There is consensus opinion that any patient found to have memory impairment causing difficulties in rehabilitation or adaptive functioning should: • have their nursing and therapy sessions tailored to use techniques which capitalise on preserved memory abilities; • be assessed to see if compensatory techniques to reduce their disabilities, such as notebooks, diaries, audiotapes, electronic organisers and audio alarms; • have therapy delivered in an environment as similar to the stroke survivor's usual environment as possible to encourage generalization; and • be taught approaches aimed at directly improving their memory e.g. using a notebook, diary, mobile phone/audio alerts, • electronic calendars and/or reminders.	😊

ASG 2017	There is consensus opinion that stroke survivors with an identified perceptual impairment, and their carer, should receive: • verbal and written information about their impairment(s); • assessment of their environment, and advice on environmental adaptation to reduce potential risk and promote independence; • practical advice/strategies to reduce risk (eg trips falls, limb injury) and promote independence; and • perceptual interventions, ideally within the context of a clinical trial	😊
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6.2 Limb Apraxia and Neglect

AHA/ ASA 2016	Strategy training or gesture training for apraxia may be considered	😊😊
AHA/ ASA 2016	Task practice for apraxia with and without mental rehearsal may be considered .	😊
ASG 2017	Treatment for people with limb apraxia may incorporate gesture training, strategy training and/or errorless learning	😊
ASG 2017	Stroke survivors with symptoms of unilateral neglect may be provided with cognitive rehabilitation (e.g. computerised scanning training, pen and paper tasks, visual scanning training, eye patching, mental practice	😊
ASG 2017	There is consensus opinion that stroke survivors with impaired attention to one side could be: • given a clear explanation of the impairment; • should be systematically taught compensatory strategies such as visual scanning to reduce to impact of neglect on activities such as reading, eating and walking; • given cues to draw attention to the affected side during therapy and nursing procedures; and • monitored to ensure that they do not eat too little through missing food on one side of the plate.	😊
ASG 2017	Non-invasive brain stimulation should not be used in routine clinical practice to decrease unilateral neglect but may be used within a research framework.	😊
ASG 2017	In stroke survivors with neglect, mirror therapy may be used to improve arm function and ADL performance	😊
CSG2015	Patients with suspected limb apraxia should be treated using errorless learning, gesture training and graded strategy training	😊😊
CSG2015	Mirror therapy may be considered as an intervention for unilateral inattention	😊😊

6.3 Depression

Pharmacology

AHA/ ASA 2016	Combining pharmacological and nonpharmacological treatments of post-stroke depression should be considered	😊😊😊
AHA/ ASA 2016	Patients diagnosed with post-strokes depression may be treated with antidepressants in the absence of contraindications and closely monitored to verify effectiveness.	😊😊
AHA/ ASA 2016	A therapeutic trial of an SSRI or dextromethorphan/quinidine is reasonable for patients with emotional lability or pseudobulbar affect causing emotional distress.	😊😊😊
AHA/ ASA 2016	The usefulness of routine use of prophylactic antidepressant medications is unclear	😊😊😊
AHA/ ASA 2016	Selective Serotonin Reuptake Inhibitors (SSRIs) are commonly used and generally well tolerated in this patient population. No recommendation for the use of any particular class of antidepressants can be made.	😊😊😊
AHA/ ASA 2016	The efficacy of individual psychotherapy alone in the treatment of post-stroke depression is unclear .	😊
ASG 2017	For stroke survivors with emotionalism, antidepressant medication such as selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants may be useful	😊
ASG 2017	For stroke survivors, routine use of antidepressants to prevent post-stroke depression is not recommended .	😞
ASG 2017	For stroke survivors with depression or depressive symptoms, antidepressants, which include SSRIs should be considered . There is no clear evidence that any particular antidepressant produces greater effects than others, and effects will vary according to the risk profile of the individual.	😊😊😊

Psychological support

AHA/ ASA 2016	Patient education, counselling, and social support may be considered as components of treatment for post-stroke depression	😊😊
AHA/ ASA 2016	Early effective treatment of depression may have a positive effect on the rehabilitation outcome.	😊😊
ASG 2017	For stroke survivors, psychological strategies (e.g. problem solving, motivational interviewing) may be used to prevent depression.	😊

Exercise

AHA/ ASA 2016	An exercise program of at least 4 weeks duration may be considered as a complementary treatment for post-stroke depression	😊😊
ASG 2017	For stroke survivors with depression or depressive symptoms, structured exercise programs, particularly those of high intensity, may be considered	😊

Acupuncture

ASG 2017	For stroke survivors with depression or depressive symptoms, acupuncture may be considered	😊
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Brain stimulation

ASG 2017	For stroke survivors with depression, non-invasive brain stimulation procedures such as TMS have possible benefits for reducing depression, but it is unclear which specific TMS procedures are of most benefit.	😊
	It is suggested that TMS not be routinely used until more data are available	😞

SECTION 7. SENSORY AND OTHER FUNCTION LOSS

7.1 Fatigue

ASG 2017	There is consensus opinion that therapy for stroke survivors with fatigue should be organised for periods of the day when they are most alert. • Stroke survivors and their families/carers should be provided with information and education about fatigue • Potential modifying factors for fatigue should be considered including avoiding sedating drugs and alcohol, screening for sleep-related breathing disorders and depression • While there is insufficient evidence to guide practice, possible interventions could include exercise and improving sleep hygiene	😊
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7.2 Vision

AHA/ ASA 2016	It is reasonable to provide repeated top-down and bottom-up interventions such as prism adaptation, visual scanning training, optokinetic stimulation, virtual reality, limb activation, mental imagery, and neck vibration combined with prism adaptation to improve neglect symptoms.	😊😊😊
AHA/ ASA 2016	Repetitive transcranial magnetic stimulation of various forms may be considered to ameliorate neglect symptoms.	😊😊
ASG 2017	There is consensus opinion that all stroke survivors should have an: - assessment of visual acuity whilst wearing the appropriate glasses to check their ability to read newspaper text and see distant objects clearly - examination for the presence of visual field deficit (e.g. hemianopia) and eye movement disorders (e.g. strabismus and motility deficit) There is consensus opinion that treatment for central vision loss due to retinal artery occlusion should only be provided by an ophthalmologist	😊
AHA/ ASA 2016	For deficits in eye movements: - Eye exercises for treatment of convergence insufficiency are recommended. - Compensatory scanning training may be considered for improving functional ADLs. - Compensatory scanning training may be considered for improving scanning and reading outcomes	😊😊😊 😊😊 😊
AHA/ ASA 2016	For deficits in visual fields: - Yoked prisms may be useful to help patients compensate for visual field cuts - Compensatory scanning training may be considered for improving functional deficits after visual field loss. - This treatment is not effective at reducing visual field deficits. - Computerized vision restoration training may be considered to expand visual fields, but evidence of its usefulness is lacking.	😊😊 😊😊 😊 😊
AHA/ ASA 2016	For visual-spatial/perceptual deficits: - Multimodal audiovisual spatial exploration training appears to be more effective than visual spatial exploration training alone and is recommended to improve visual scanning - There is insufficient evidence to support or refute any specific intervention as effective at reducing the impact of impaired perceptual functioning. - The use of virtual reality environments to improve visual-spatial/perceptual functioning may be considered	😊😊 😊 😊😊

	The use of behavioral optometry approaches involving eye exercises and the use of lenses and colored filters to improve eye movement control, eye focusing, and eye coordination is not recommended.	☹️☹️
CSG2015	Treatment of neglect can include visual scanning techniques, phasic alerting, cueing, imagery, virtual reality, hemispheric (limb) activation and trunk rotation	😊
CSG2015	Remedial-based techniques could include :	
	prisms, eye patching;	😊
	repetitive transcranial magnetic stimulation (rTMS); or	😊😊
	neck muscle vibration.	😊
CSG2015	Mirror therapy may be considered as an intervention for unilateral inattention	😊😊

7.3 Somatosensory training

AHA/ ASA 2016	Somatosensory retraining to improve sensory discrimination may be considered for stroke survivors with somatosensory loss	😊😊
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7.4 Hearing

AHA/ ASA 2016	It is reasonable to use some form of amplification (eg, hearing aids).	😊
AHA/ ASA 2016	It is reasonable to use communication strategies such as looking at the patient when speaking.	😊
AHA/ ASA 2016	It is reasonable to minimize the level of background noise in the patient's environment.	😊

7.5 Urinary Continence

ASG 2017	All stroke survivors with suspected urinary continence difficulties should be assessed by trained personnel using a structured functional assessment.	😊
	For stroke survivors, a portable bladder ultrasound scan should be used to assist in diagnosis and management of urinary incontinence.	😊
ASG 2017	Stroke patients in hospital with confirmed continence difficulties, should have a structured continence management plan formulated, documented, implemented and monitored.	😊
	- A community continence management plan should be developed with the stroke survivor and family/carer prior to discharge. It should include information on accessing continence resources and appropriate review in the community. - If incontinence persists, the stroke survivor should be re-assessed and referred for specialist review.	😊
ASG 2017	For stroke patients with urge incontinence: - anticholinergic drugs can be tried; - a prompted or scheduled voiding regime program/ bladder retraining can be trialled; - if continence is unachievable, containment aids can assist with social continence.	😊 😊 😊
ASG 2017	There is consensus opinion that for stroke patients with urinary retention: - the routine use of indwelling catheters is not recommended. However if urinary retention is severe, intermittent catheterization should be used to assist bladder emptying during hospitalisation. If retention continues, intermittent catheterisation is preferable to indwelling catheterisation. - if using intermittent catheterisation, a closed sterile catheterisation technique should be used in hospital. - where management of chronic retention requires catheterisation, consideration should be given to the choice of appropriate route, urethral or suprapubic. - if a stroke survivor is discharged with either intermittent or indwelling catheterisation, they and their family/carer will require education about management, where to access supplies and who to contact in case of problems.	😊
ASG 2017	There is consensus opinion that the use of indwelling catheters should be avoided as an initial management strategy except in acute urinary retention.	😊
RCP 2016	Do not routinely use a urinary catheter or continence pads as first line management for people with continence problems after a stroke.	😞😞😞
	Do use behavioural interventions such as timed toileting and prompted voiding first.	😊😊

7.6 Fecal (Faecal) Continence

ASG 2017	All stroke survivors with suspected fecal continence difficulties should be assessed by trained personnel using a structured functional assessment • For stroke survivors with constipation or fecal incontinence, a full assessment (including a rectal examination) should be carried out and appropriate management of constipation, fecal overflow or bowel incontinence established and targeted education provided	😊
ASG 2017	For stroke survivors with bowel dysfunction, bowel habit retraining using type and timing of diet and exploiting the gastro-colic reflex should be used	😊
ASG 2017	There is consensus opinion that for stroke survivors with bowel dysfunction: • Education and careful discharge planning should be provided; • Use of short-term laxatives may be trialled; • Increase frequency of mobilisation (walking and out of bed activity) to reduce constipation; • Use of the bathroom rather than use of bed pans should be encouraged; and • Use of containment aids to assist with social continence where continence is unachievable	😐

SECTION 8. REINTEGRATION INTO THE COMMUNITY

8.1 Community Care

AHA/ ASA 2016	After successful screening, an individually tailored exercise program is indicated to - enhance cardiorespiratory fitness; and - reduce the risk of stroke recurrence.	😊😊😊 😊😊
AHA/ ASA 2016	After completion of formal stroke rehabilitation, participation in a program of exercise or physical activity at home or in the community is recommended	😊😊😊
AHA/ ASA 2016	It is reasonable to consider alternative methods of communication and support (eg, telephone visits, telehealth, or Web-based support), particularly for patients in rural settings.	😊😊
ASG 2017	Community-dwelling stroke survivors with confirmed difficulties in personal or extended ADL should have specific therapy from a trained clinician (e.g. task-specific practice and training in the use of appropriate aids) to address these issues	😊😊😊
RCP 2016	Do not routinely provide specialist occupational therapy for people who have reached the end of their stroke rehabilitation and are now living in a care home. Do offer assessment and activities that might improve quality of life	😞😞😞 😊😊

8.2 ADLs

Acupuncture

ASG 2017	For stroke survivors in the acute, sub-acute or chronic phase post stroke, acupuncture should not be used to improve ADL.	😞😞😞
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Pharmacology

ASG 2017	Administration of amphetamines to improve ADL is not recommended	😞😞😞
ASG 2017	For stroke survivors, selective serotonin reuptake inhibitors may be used to improve performance of ADL	😊

Brain stimulation

ASG 2017	Brain stimulation (transcranial direct stimulation or repetitive transcranial magnetic stimulation) should not be used in routine practice to improve ADL and only used as part of a research framework	😞
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Virtual Reality

ASG 2017 For stroke survivors, virtual reality technology may be used to improve ADL outcomes in addition to usual therapy 😊

Community rehabilitation

ASG 2017 People who have had a stroke and have difficulty with outdoor mobility in the community **should set** individualised goals and get assistance with adaptive equipment, information, referral on to other agencies. Walking practice may benefit some individuals and if provided, should occur in a variety of community settings and environments, and may also incorporate virtual reality training that mimics community walking 😊

ASG 2017 For people who have had a stroke, targeted occupational therapy programs including leisure therapy **may be used** to increase participation in leisure activities 😊

CSG2015 Patients **should be given** the opportunity to discuss pre-stroke leisure pursuits and be assessed for rehabilitative needs to resume these activities. Participation in leisure activities should be encouraged 😊😊

Patients **should be offered** information regarding leisure activities in the community and/or be referred to relevant agencies. Use of peer support groups should be encouraged 😊

CSG2015 Adult or child stroke survivors who experience difficulty engaging in leisure activities **should receive** targeted therapeutic interventions 😊😊😊 adult; 😊 child

Children affected by stroke **should be offered** treatment aimed at achieving play and leisure related skills that are developmentally relevant and appropriate in their home, community, and school environments 😊

ASG 2017 For older stroke survivors living in a nursing home, routine occupational therapy **is not recommended** to improve ADL function. 😊😊😊

8.3 Self-management

ASG 2017 **There is consensus opinion** that:

stroke survivors who are cognitively able, **should be made aware** of the availability of generic self-management programs before discharge from hospital and be supported to access such programs once they have returned to the community. 😊

Stroke-specific programs for self-management **should be provided** for those who require more specialised programs. 😊

A collaboratively developed self-management care plan **can be used** to harness and optimise self-management skills 😊

8.4 Return to Work

AHA/ ASA 2016	Vocationally targeted therapy or vocational rehabilitation is reasonable for individuals with stroke considering a return to work.	☺
AHA/ ASA 2016	An assessment of cognitive, perception, physical, and motor abilities may be considered for stroke survivors considering a return to work.	☺
ASG 2017	There is consensus opinion that for stroke survivors who wish to return to work, assessment to establish abilities relative to work demands, assistance to resume or take up work including worksite visits and workplace interventions, or referral to a supported employment service should be offered.	☺
CSG2015	Patients, especially those <65 years of age, should be asked about vocational interests (i.e. work, school, volunteering) and should be assessed for their potential to return to their vocations. This initial screening should take place early in the rehabilitation phase, and become included in the individualized patient goal setting and planning for rehabilitation needs.	☺
	A detailed cognitive assessment including a neuropsychological evaluation, where appropriate, is recommended to assist in vocational planning	☺
CSG2015	School age stroke survivors in the community should have ongoing assessment of educational and vocational needs throughout their development	☺
CSG2015	Resumption of vocational interests should be encouraged where possible. A gradual resumption should occur when appropriate	☺
CSG2015	Patients should receive vocational rehabilitation services, as appropriate, for advice on relevant issues such as health and disability benefits and legal rights	☺
CSG2015	Employers and education providers should be encouraged to provide work/school modifications and flexibility to allow patients to return to work/ school	☺
RCT 2016	People who wish to return to work after stroke (paid or unpaid employment) should: • have their work requirements established with their employer (provided the person with stroke agrees); • be assessed cognitively, linguistically and practically to establish their potential for return; • be advised on the most suitable time and way to return to work, if return is feasible; • be referred through the job centre to a specialist in employment for people with disability if extra support or advice is needed; and/or • be referred to a specialist vocational rehabilitation team if the job centre specialist is unable to provide the necessary rehabilitation	☺

8.5 Return to Driving

AHA/ ASA 2016	Individuals who appear to be ready to return to driving, as demonstrated by successful performance on fitness-to-drive tests, should have an on-the-road test administered by an authorized person	☺
AHA/ ASA 2016	It is reasonable that individuals be assessed for cognitive, perception, physical, and motor abilities to ascertain readiness to return to driving according to safety and local laws	☺☺
AHA/ ASA 2016	It is reasonable that individuals who do not pass an on-the-road driving test be referred to a driver rehabilitation program for training	☺☺
AHA/ ASA 2016	A driving simulation assessment may be considered for predicting fitness to drive.	☺
ASG 2017	There is consensus opinion that all stroke survivors should be asked if they wish to resume driving. - Any person wishing to drive again after a stroke or TIA should be provided with information about how stroke may affect his/her driving and the requirements and processes for returning to driving. Information should be consistent with the Austroads standards and any relevant state guidelines. - For private licenses, people who have had a stroke should be instructed not return to driving for a minimum of four weeks post stroke. People who have had a TIA should be instructed not to drive for two weeks (in accordance with the Austroads standards). - For commercial licenses, people who have had a stroke should be instructed not return to driving for a minimum of 3 months post stroke. People who have had a TIA should be instructed not to drive for four weeks (in accordance with the Austroads standards). - A follow-up assessment should be conducted by an appropriate specialist to determine medical fitness prior to return to driving (in accordance with the Austroads standards). - If a person who has had a stroke is deemed medically fit but has residual motor, sensory or cognitive changes that may influence driving, they should be referred for an occupational therapy driving assessment. This may include clinic-based assessments to determine on-road assessment requirements (for example modifications, type of vehicle, timing), on-road assessment and rehabilitation recommendations.	☺
ASG 2017	Driving simulation may be used for people who have had a stroke needing driving rehabilitation. Health professionals using driving simulation need to receive training and education to use effectively and appropriately, with knowledge to mitigate driving simulator sickness.	☺
CSG 2015	Patients should be told to stop driving for at least one month after stroke, in accordance with the Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards for Drivers	☺
CSG 2015	Patients who have experienced one or multiple transischemic attacks (TIAs) should be instructed not to resume driving until a comprehensive neurological assessment (including sensorimotor function and cognitive ability) shows no residual loss of functional ability, discloses no obvious risk of sudden re-occurrence, and any underlying cause has been addressed	☺

	with appropriate treatment, in accordance with the Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards for Drivers	
CSG 2015	After one month, patients interested in returning to driving should be screened, ideally by an occupational therapist, using valid and reliable methods for any residual sensory, motor, or cognitive deficits: a. Sensory assessment should focus on vision, visual fields, visual attention and reading comprehension; b. Motor assessment should focus on strength, coordination and reaction time; c. Cognitive assessment should focus on perception, problem solving, speed of decision making and judgment	😊😊
CSG 2015	For patients who have relevant residual neurological deficits related to driving ability, a full comprehensive driving evaluation, including a government-sanctioned on-road assessment, is recommended to determine fitness to drive	😊😊
CSG 2015	Patients can be referred to training programs, such as simulator-based training, to help prepare for a road test or the resumption of driving	😊😊
RCT 2016	Do not assess driving eligibility with cognitive tests if the person's language impairment would invalidate the results.	😞😞
	Do refer for an on-road assessment if there is uncertainty about eligibility for driving	😊

APPENDIX 16. Suggestions for future research

Contextualisation (in the methods stage) incorporated an additional step to devise specific strategies or plans to implement the recommendations if not immediately possible in the local context.

Examples of primary research that is needed before implementation of the recommendation is possible:

- Which outcome measures, relevant to stroke, are valid for our context?
- What is the best practice for patient and family education, and family support?
- What should this education consist of and what method of delivery would be feasible in the local context?
- What is the best practice for alternative methods of communication and support (e.g. telephone visits, telehealth, or web-based support) for patients with a stroke as well as their families, particularly for patients in rural settings?
- What are the components of a standard comprehensive assessment process, including assessment items, frequency of assessment and efficient documentation available to all?
- There is a need to determine whether task sharing systems are feasible within the local context.
- Which rehabilitative interventions should be provided at the different healthcare settings (rehabilitation facility; Community Health Centre (CHC); long-term home care; home or community)?
- What is the role of the traditional healer in treating a patient who has suffered a stroke?
- Should AFOs be used for ankle instability or dorsiflexor weakness in patients with a stroke? (systematic review).

APPENDIX 17. Tier 3 Documents

Tier 3 Document 1: Outcome Measures

Construct/Measure	Comments	Approximate Time to Administer, min	References for Further Information
Impairment			
Paresis/strength			
Motricity Index	Consists of strength testing via manual muscle testing at 3 key UE segments and 3 key LE segments; yields a score from 0–100 indicating strength of each limb	<5 for UEs; <5 for LEs	294–299
Muscle strength	Via manual muscle testing, graded on a 0–5 scale or handheld dynamometry	<5	
Grip, pinch dynamometry	Grip and pinch dynamometers are available in most rehabilitation clinics and hospitals; normative data are available for comparison	<5	
Tone			
Modified Ashworth scale	Quantifies spasticity on a scale measuring resistance to passive movement from 0–4, with higher numbers indicating greater severity; can assess at all joints or only a few	10	294, 298, 299

Sensorimotor impairment measures			
Fugl-Meyer	Quantifies sensorimotor impairment of the UE (0–66 points) and LE (0–34 points) on separate subscales; items are rated on ability to move out of abnormal synergies	25	298–302
Chedoke McMaster Stroke Assessment, impairment inventory	Quantifies impairments in 6 dimensions of shoulder pain, postural control, arm, hand, leg, and foot, each on a 7-point scale, with higher scores equalling less impairment	45	
Activity			
UE function			
Action Research Arm Test	Criteria based with 19 items; scores are from 0–57, with normal=57; allows observation of multiple grasps, grips, and pinches	10	294, 298–300, 302–306
Box and Block Test	Score is the number of blocks moved in 1 min; higher scores equal better performance; normative data are available for comparison	<5	
Chedoke Arm and Hand Activity Index	Criterion based with functional items requiring bilateral UE movement; available in 7-, 8-, 9-, and 13-item versions	25	
Wolf Motor Function Test	Time- and criterion-based scores on 15 items; contains some isolated joint movements and some functional tasks	15	
Balance			
Berg Balance Scale	Criterion-based assessment of static and dynamic balance; widely used in multiple settings	15	307–311
Functional Reach Test	A single-item test that measures how far one can reach in standing; normative data are available for comparison	<5	
Mobility			
Walking speed†	Brief and widely used; categories based on speed are: <0.4 m/s=household ambulation 0.4–0.8 m/s=limited community ambulation >0.8 m/s=community ambulation; normative data available for comparison	<5	307, 308, 312–314
Timed Up and Go	Quantifies more than straight walking, including sit/stand and a turn; scored by time to complete; criterion values available for comparison	<5	
6-Min walk test	Quantifies walking endurance; normative and criterion values for community ambulation distances available	<10	
Functional ambulation category	Classification made after observation or self-report of walking ability; 6-point scale with higher equals better walking ability; this tool allows assessment of walking ability in people who are not independent ambulators	<5	
Observational gait analysis	Commonly used in many clinics to plan treatment programs; several standardized formats are available; appropriate to use in conjunction with one of the above more quantifiable measures	5	
Participation			
Self-reported impairments, limitations, and restrictions			
Stroke Impact Scale: Strength, Mobility, ADL, and Hand Function subscales	These 4 subscales measure different aspects of physical performance; people rate their perceived ability to do different items; each subscale ranges from 0–100, with higher scores indicating better abilities	5 per subscale	294, 304, 307, 315
Motor Activity Log	14 or 28 questions about how the affected UE is used in daily life; scores range from 0–5, with 5 equal to similar to before the stroke	20	
Activities-specific Balance Confidence Scale	16 questions in which people with stroke rate their balance confidence during routine activities; scores range from 0–100, with higher scores indicating more confidence	20	316–319
Construct/Measure	Comments	Approximate Time to Administer, min	References for Further Information
Technology for monitoring activity and participation			
Accelerometers, step activity monitors, pedometers	Numerous commercially available options; issues to consider when purchasing: cost, expected wear and tear, accompanying software, ease of use, wearing comfort; pedometers are the most economic option but need to be checked for ability to register steps of individuals with slow walking speeds	<5 to don/doff; additional processing time	7, 294, 321–328, 350

ADL indicates activity of daily living; LE, lower extremity; and UE, upper extremity.

*Note that it is recommended that clinicians select a single measure for each construct; it is often unnecessary to use >1 measure.

†Generally tested on 5- or 10-m walkways.

(AHA/ ASA 2016, Appendix 1)

Outcomes	Agreed MID	Evidence base	Other considerations
Barthel Index	1.85 points (SE 1.45)	Hsieh, Wang, Wu, Chen, Sheu, Hsieh 2007. ¹¹⁶	• Taiwan setting (n=43) • Paper's aim to estimate MID
Action Research Arm Test (ARAT)	12 and 17 points for the affected dominant and non-dominant sides respectively	Lang, Edwards, Birkenmeier, Dromerick 2008. ¹⁴¹	• Inpatient rehabilitation hospital setting- early after stroke patients with hemiparesis (N=52) • Paper's aim to estimate MID.
Fugl-Meyer Assessment (FMA)	Difference by 10% of the total scale	Van der Lee, Beckerman, Lankhorst and Bouter 2001. ²⁶⁹	Paper assessed sensitivity of the research arm test in 22 chronic stroke patients
Wolf Motor Function Test (WMFT)	An improvement of 19 seconds on the affected dominant side (16% of the 120 second limit)	Lang, Edwards, Birkenmeier, Dromerick 2008 ¹⁴¹	• Inpatient rehabilitation hospital setting- early after stroke patients with hemiparesis (N=52) • Paper's aim to estimate MID.
Motor Activity Log (MAL)	At least 1.0 and 1.1 points (17-18% of the scale)for the affected dominant and non-	Lang, Edwards, Birkenmeier, Dromerick 2008 ¹⁴¹	• Inpatient rehabilitation hospital setting- early after stroke patients with hemiparesis (N=52)

	dominant sides respectively		Paper's aim to estimate MID.
Functional Independence Measure (FIM)	22 points for the total FIM, 17 points (on the 105 point scale- 16%) for the motor FIM and 3 points for the cognitive FIM.	Beninato, Gill-Body, Salles, Stark, Black-Schaffer, Stein. 2006. ²⁴	- Patients with stroke in long term acute hospital. (N=113) - Paper's aim to estimate MID
Walking speed (for chronic stroke patients)	20 cm/sec	Perry J, Garrett M, Gronley JK, Mulroy SJ. Classification of walking handicap in stroke population. <i>Stroke</i> 1995; 26: 982-89. ²⁰²	chronic stroke patients (over 3 months post stroke)
Walking speed (for acute stroke patients)	16 cm/sec	Tilson J K, Sullivan K, Cen S Y, Rose D.K, C H. Koradia, S P. Azen, P W. Duncan 2010. ²⁵⁸	- First time stroke patients (20-60 days post stroke) with severe gait impairments (N=283) - Paper's aim to estimate MID for gait speed
Timed Up and Go	10 sec	Perry J, Garrett M, Gronley JK, Mulroy SJ. Classification of walking handicap in stroke population. <i>Stroke</i> 1995; 26: 982-89. ²⁰²	
Stairs Test	15 sec	Podsiadlo D, Richardson S. The timed 'Up & Go': a test of basic functional mobility for frail elderly persons. <i>J Am Geriatr Soc</i> 1991; 39: 142-48. ²⁰⁷	
6 minute walk test	28 m	Dean CM, Richards C L, Malouin F 2000. ⁵⁸	
Range of movement (wrist extensibility)	5° change (SD 4.1°)	Lannin N A, Cusick A, McCluskey A, Herbert R D 2007. ¹⁴⁴	MID taken from sample size calculation (N=63)

ASSIST: Acute screening of swallow in stroke/TIA

Print name and profession:

Signature:

*Completion of this screening tool is recommended in the presence of persisting acute stroke symptoms by personnel that have successfully completed approved dysphagia screening training.**

Date: ____ / ____ / ____ Time of screen:* ____ : ____ (Please use 24-hour clock)

MRN No.

Name:

Address:

Date of birth: Sex:

Please fill in if the patient label is unavailable

1. Is the patient able to:

- Maintain alertness for at least 20 minutes? Yes ☐ No ☐
- Maintain posture/positioning in upright sitting? Yes ☐ No ☐
- Hold head erect? Yes ☐ No ☐

STOP HERE if you answered NO to ANY part of Q1. Place patient nil by mouth (NBM) and review when all of the parameters in section 1 are answered YES.* Consider alternative means for nutrition, hydration and medication in consultation with the treating medical team and dietician.

2. Does the patient have any of these?

- Suspected brainstem stroke Yes ☐ No ☐
- Pre-existing swallowing difficulty Yes ☐ No ☐
- Facial weakness/droop Yes ☐ No ☐
- Slurred/absent speech Yes ☐ No ☐
- Coughing on saliva Yes ☐ No ☐
- Drooling Yes ☐ No ☐
- Hoarse/absent voice Yes ☐ No ☐
- Weak/absent cough Yes ☐ No ☐
- Shortness of breath Yes ☐ No ☐

STOP HERE if you answered YES to ANY part of Q2. Place patient NBM and refer to speech pathology. Please refer to follow-up plan over page.*

3. Test the patient with a sip (10 mL)* of water and observe:

- Any coughing/throat clearing Yes ☐ No ☐
- Change in vocal quality Yes ☐ No ☐
- Drooling Yes ☐ No ☐
- Change in respiration/shortness of breath Yes ☐ No ☐

STOP HERE if you answered YES to ANY part of Q3. Place patient NBM and refer to speech pathology. Please refer to follow-up plan over page.*

4. Observe the patient drink a cup of water:

- Any coughing/throat clearing Yes ☐ No ☐
- Change in vocal quality Yes ☐ No ☐
- Drooling Yes ☐ No ☐
- Change in respiration/shortness of breath Yes ☐ No ☐

STOP HERE if you answered YES to ANY part of Q4. Place patient NBM and refer to speech pathology. Please refer to follow-up plan over page.*

5. Commence pre-morbid oral diet

- Nursing staff to observe patient with first meal
- Staff member reviewing first meal: Time: ____ : ____ Date: ____ / ____ / ____

A spike in temperature and/or deterioration in chest condition may indicate silent aspiration. Place patient NBM and refer to speech pathology.

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* VDSP modifications to the original ASSIST tool

Tier 3 Document 3: GUSS Swallow screen

GUSS (Gugging Swallowing Screen)¹

Patient	Date:
	Time:
	Investigator:

1. Preliminary Investigation / Indirect Swallowing Test

	YES	NO
VIGILANCE <i>(The patient must be alert for at least 15 minutes)</i>	1 ☐	0 ☐
COUGH and/or THROAT CLEARING <i>(Voluntary cough! Patient should cough or clear his or her throat twice)</i>	1 ☐	0 ☐
SALIVA SWALLOW		
• SWALLOWING SUCCESSFUL	1 ☐	0 ☐
• Drooling <i>(Herausrinnen von Speichel aus dem Mund)</i>	0 ☐	1 ☐
• VOICE CHANGE <i>(hoarse, gurgely, coated, weak, choke on own saliva)</i>	0 ☐	1 ☐
SUM:	(5)	
	1 – 4 = Investigate further ² 5 = Continue with „Direct Swallowing Test“	

¹The Gugging Swallowing Screen. *Stroke*. 2007;38:2948 Michaela Trapl, SLT, MSc; Paul Enderle, MD, MSc; Monika Nowotny, MD; Yvonne Teuschl, PhD; Karl Matz, MD; Alexandra Dachenhausen, PhD Michael Brainin, MD

GUSS

(Gugging Swallowing Screen)¹

2. Direct Swallowing Test

(Material: Aqua bi, flat teaspoon, food thickener, bread)

<i>In the following order:</i>	1 →	2 →	3 →
	SEMISOLID*	LIQUID**	SOLID ***
DEGLUTITION:			
▪ Swallowing not possible	0 ☐	0 ☐	0 ☐
▪ Swallowing delayed (> 2 sec.) (Solid textures > 10 sec.)	1 ☐	1 ☐	1 ☐
▪ Swallowing successful	2 ☐	2 ☐	2 ☐
COUGH (involuntary): (before, during or after swallowing – until 3 minutes later)			
▪ Yes	0 ☐	0 ☐	0 ☐
▪ No	1 ☐	1 ☐	1 ☐
DROOLING:			
▪ Yes	0 ☐	0 ☐	0 ☐
▪ No	1 ☐	1 ☐	1 ☐
VOICE CHANGE: (listen to the voice before and after swallowing- patient should speak „Oh“)			
▪ Yes	0 ☐	0 ☐	0 ☐
▪ No	1 ☐	1 ☐	1 ☐
SUM:	(5)	(5)	(5)
	1 – 4 = Investigate further ² 5 = Continue „LIQUID“	1 – 4 = Investigate further ² 5 = Continue „SOLID“	1 – 4 = Investigate further ² 5 = NORMAL

¹The Gugging Swallowing Screen. Stroke. 2007;38:2948 Michaela Trapl, SLT, MSc; Paul Enderle, MD, MSc; Monika Nowotny, MD; Yvonne Teuschl, PhD; Karl Matz, MD; Alexandra Dachenhausen, PhD Michael Brainin, MD

GUSS (Gugging Swallowing Screen)¹

Instruction „Direct Swallowing Test“	
*	First administer ¼ - ½ teaspoon Aqua bi with food thickener (pudding-like consistency). If there are no symptoms apply 3 to 5 teaspoons. Assess after the 5 th spoonful.
**	3, 5, 10, 20 ml Aqua bi – if there are no symptoms continue with 50 ml Aqua bi (Daniels et al. 2000; Gottlieb et al. 1996) Assess and stop the investigation when one of the criteria is observed.
***	Clinical: Dry bread ; FEES: Dry bread which is dipped in coloured liquid.
2	Use functional investigation such as Videofluoroscopic Evaluation of Swallowing (VFES) , Fiberoptic Endoscopic Evaluation of Swallowing (FEES)

SUMMARY	
Sum „Indirect Swallowing Test“:	(5)
Sum „Direct Swallowing Test“:	(1 5)
Sum TOTAL:	(2 0)

¹The Gugging Swallowing Screen. *Stroke*. 2007;38:2948 Michaela Trapl, SLT, MSc; Paul Enderle, MD, MSc; Monika Nowotny, MD; Yvonne Teuschl, PhD; Karl Matz, MD; Alexandra Dachenhausen, PhD Michael Brainin, MD

GUSS

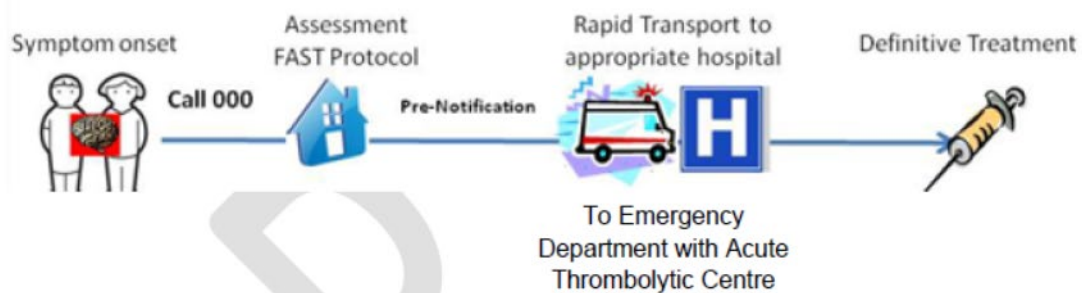
(Gugging Swallowing Screen)¹

RESULTS	SEVERITY CODE	RECOMMENDATIONS
20	Semisolid / liquid and solid textures successful	Slight / No dysphagia Minimal risk of aspiration • Normal diet • Regular liquids • First time under supervision of the SLT or a trained stroke nurse !
15-19	Semisolid and liquid texture successful and solid unsuccessful	Slight dysphagia with a low risk of aspiration • Dysphagic diet (pureed and soft food) • Liquids very slowly – one sip at a time • Functional swallowing assessments such as Fiberoptic Endoscopic Evaluation of Swallowing (FEES) or Videofluoroscopic Evaluation of Swallowing (VFES) • Refer to Speech and Language Therapist (SLT)
10-14	Semisolid swallow successful and liquids unsuccessful	Moderate dysphagia with a risk of aspiration Dysphagia diet beginning with: • Semisolid textures such as baby food and additional parenteral feeding • All liquids must be thickened! • Pills must be crushed and mixed with thick liquid • No liquid medication!! • Further functional swallowing assessments (FEES, VFES) • Refer to Speech and Language Therapist (SLT) <i>Supplementation with nasogastric tube or parenteral</i>
0-9	Preliminary investigation unsuccessful or semisolid swallow unsuccessful	Severe dysphagia with a high risk of aspiration • NPO (non per os = nothing by mouth) • Further functional swallowing assessments (FEES, VFES) • Refer to Speech and Language Therapist (SLT) <i>Supplementation with nasogastric tube or parenteral</i>

¹The Gugging Swallowing Screen. *Stroke*. 2007;38:2948 Michaela Trapl, SLT, MSc; Paul Enderle, MD, MSc; Monika Nowotny, MD; Yvonne Teuschl, PhD; Karl Matz, MD; Alexandra Dachenhausen, PhD Michael Brainin, MD

Tier 3 Document 4: FAST

Figure 1: FAST+- Presentation and Transport



NSW Agency for Clinical Innovation 2016

Tier 3 Document 5: Medically Stable

The patient is considered to be medically stable when:

- A confirmed diagnosis of stroke has been identified, although the mechanism or etiology may not be initially clear, such as in cryptogenic stroke; these situations should not cause delays in access to rehabilitation;
- All medical issues and/or comorbidities (e.g. excessive shortness of breath, and congestive heart failure) have been addressed;
- At the time of discharge from acute care, acute disease processes and/or impairments are not precluding active participation in the rehabilitation programme;
- Patient's vital signs are stable;
- All medical investigations have been completed or a follow-up plan is in place at time of referral and follow-up appointments have been made by time of discharge from acute care.

The patient is ready to participate in rehabilitation when:

- the patient meets the criteria of medical stability as defined in the guideline above;
- the patient is able to meet the minimum tolerance level of the rehabilitation programme, as defined by its admission criteria;
- there are no behavioural issues limiting the patient's ability to participate at the minimum level required by the rehabilitation programme.

Rehabilitation can commence when the patient demonstrates at least a minimum level of function, which includes:

- The patient has the stamina to participate in the programme demands/schedule.
- The patient is able to follow at minimum one-step commands, with communication support if required.
- The patient has sufficient attention, short-term memory, and insight to progress through rehabilitation process.

Rehabilitation should continue when:

- Patients demonstrate by their post-stroke progress the potential to return to premorbid/baseline functioning or to increase post-stroke functional level with participation in a rehabilitation programme.
- Goals for rehabilitation can be established and are specific, measurable, attainable, realistic and timely.
- The patient or substitute decision-maker has consented to treatment in the programme and demonstrates willingness and motivation to participate in the rehabilitation programme (Exceptions: patients with reduced motivation/initiation secondary to diagnosis e.g. depression).

Tier 3 Document 6: Recommended staffing levels of hyper-acute and acute stroke units (RCP 2016)

	Physio- therapist	Occupational therapist	Speech and language therapist	Clinical neuro- psychologist/ clinical psychologist	Dietitian	Nurse	Consultant stroke physician
	Whole-time equivalent (WTE) per 5 beds					WTE per bed	
Hyperacute Stroke Unit	0.73	0.68	0.34	0.20	0.15	2.9 (80:20 registered: unregistered)	24/7 availability; minimum 6 thrombolysis trained physicians on rota
Acute Stroke Unit	0.84	0.81	0.40	0.20	0.15	1.35 (65:35 registered: unregistered)	Consultant- led ward round 5 days/week

Tier 3 Document 7: ASSESSMENT FOR REHABILITATION TOOL (ART)

SA Health
Created
Sept
2014

☐ Binding margin - no writing ☐

ASSESSMENT FOR REHABILITATION (MR96)		Rehabilitation Recommended Date: ___/___/___ ☐ in home ☐ in-patient ☐ outpatient		Affix patient identification label in this box UR Number: Surname: Given name: Second given name: D.O.B: ___/___/___ Sex:	
		Rehabilitation Not Indicated ☐ full recovery ☐ palliative ☐ other reason (state why) ☐ patient refused ☐ non-responsive (coma)			
Hospital:					
Domain	Current level of function (brief description plus I A D*)	Assessment: Date Rehab (Y/N)			
Speciality needs (eg IV, PEGS)					
Swallowing					
Hydration, nutrition					
Eating and drinking					
Continence					
Mobility - transfer, gait					
Activities of daily living (incl personal +/- instrumental)					
Communication					
Level of alertness, engagement					
Cognition, insight					
Vision, sensory systems, perception					
Behaviour					
Emotional, psychological					
Other					

Ready for Rehab - Date: ___/___/___

Accepted for Rehab - Date: ___/___/___
☐ in home ☐ in-patient ☐ outpatient

ASSESSMENT FOR REHABILITATION (MR96)		MEDICAL SUMMARY:		Affix patient identification label in this box UR Number: Surname: Given name: Second given name: D.O.B: ___/___/___ Sex:	
Hospital:					
Participation (consistent with ICF Framework)	Role/s pre-stroke	Need for rehabilitation/intervention? Y/N and if yes, plan?			
Domestic					
Vocational					
Recreational					
Social					
Environment	Pre-stroke (note barriers and facilitators)	Need for intervention? Y/N and if yes, plan?			
Home					
Extended					

Tier 3 Document 8: Canadian inclusion criteria for rehabilitation, including DCP

GENERAL INCLUSION CRITERIA FOR STROKE REHABILITATION

All acute or recent stroke patients (less than one year post-stroke) or patient greater than one year post-stroke who requires:

- inpatient or outpatient inter-professional rehabilitation to achieve functional goals that will prevent hospital admission and/or improve independence;
- interdisciplinary rehabilitation assessment, treatment, or review from staff with stroke experience/expertise (including disciplines such as physical therapy, occupational therapy, speech-language pathology, nursing, psychology, and recreation therapy);
- and, whose stroke etiology and mechanisms have been clarified and appropriate prevention interventions started.

The patient is medically stable when:

- A confirmed diagnosis of stroke has been identified, although the mechanism or etiology may not be initially clear, such as in cryptogenic stroke, these situations should not cause delays in access to rehabilitation;
- all medical issues and/or comorbidities (e.g. excessive shortness of breath, and congestive heart failure) have been addressed;
- at the time of discharge from acute care, acute disease processes and/or impairments are not precluding active participation in the rehabilitation programme;
- patient's vital signs are stable;
- all medical investigations have been completed or a follow-up plan is in place at time of referral and follow-up appointments made by time of discharge from acute care.

The patient demonstrates at least a minimum level of function, which includes:

- the patient has the stamina to participate in the programme demands/schedule;
- the patient is able to follow at minimum one-step commands, with communication support if required;
- the patient has sufficient attention, short-term memory, and insight to progress through the rehabilitation process.
- The patient demonstrates by their post-stroke progress the potential to return to premorbid/baseline functioning or to increase post-stroke functional level with participation in the rehabilitation programme.
- Goals for rehabilitation can be established and are specific, measurable, attainable, realistic and timely.
- The patient or substitute decision-maker has consented to treatment in the programme and demonstrates willingness and motivation to participate in the rehabilitation programme (Exceptions: patients with reduced motivation/initiation secondary to diagnosis e.g. depression).

The patient is ready to participate in rehabilitation when:

- the patient meets the criteria for medical stability as defined in guideline above;
- the patient is able to meet the minimum tolerance level of the rehabilitation programme as defined by its admission criteria;
- there are no behavioural issues limiting the patient's ability to participate at the minimum level required by the rehabilitation programme.

Example discharge/team care plan

Hospital name:	
Hospital address:	
Hospital telephone number:	

Patient details	
Patient name	
CHI number	
Patient address	
Date of birth	

Hospital details	
Hospital name	
Ward name or number	
Ward direct dial telephone number	
Patient's named nurse	
Patient's key worker	
Date of admission	
Date of discharge	

Diagnosis(es)

Drug Name	Strength	Dosage	Duration	Amount Supplied	Pharmacy

Inpatient investigations		
Investigation	Date	Result

Current AHPs treatment	
Allied Health Professionals	Current treatment regime
Occupational therapy	
Physiotherapy	
SLT	
Other:	

Special needs