BEST PRACTICE GUIDELINES FOR THE MANAGEMENT AND REHABILITATION OF STROKE IN THE NORTH WEST REGION OF CAMEROON

PREPARED BY

THE NWR BEST PRACTICES IN STROKE REHABILITATION GROUP

BAMENDA COORDINATING CENTRE FOR STUDIES IN DISABILITY AND REHABILITATION

BAMENDA, NORTH WEST REGION, CAMEROON

AND

INTERNATIONAL CENTRE FOR DISABILITY AND REHABILITATION

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Guideline Title:

Best Practice Guidelines for the Management and Rehabilitation of Stroke in the North West Region of Cameroon

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The NWR Best Practices in Stroke Rehabilitation Group

This guideline was developed by the NWR Best Practices in Stroke Rehabilitation group who came together specifically for the purpose of creating the guideline.

Members of the group:

1. Mr. Timothy Fanfon – Leader, Best Practices in Stroke Rehabilitation Group, Head of Physiotherapy Department at Banso Baptist Hospital, Cameroonian Baptist Convention Health Board, North West Region, Cameroon
2. Dr. Lynn Cockburn – Best Practice Guideline Project Leader, Department of Occupational Science and Occupational Therapy, and International Centre for Disability and Rehabilitation, University of Toronto, Toronto, Canada
3. Mr. Emmanuel Anjonga – Board Member and Project Assistant at the Bamenda Coordinating Centre for Studies in Disability and Rehabilitation, North West Region, Cameroon
4. Sister Petra Muso– Physiotherapist, St. Elizabeth Catholic General Hospital, Shisong - Banso, North West Region, Cameroon (previously at SAJOCAH, Bafut)
5. Miss Sylvian Teboh – Physiotherapist, SAJOCAH, Mambo, Bafut
6. Mr. Trivedi Navjyot – Head Physiotherapist (2010 – 2013), St. Louis Institute, Bamenda
7. Dr. Julius Sama - North West Regional Chief of Unit, Expanded Program on Immunisation EPI), NW Regional Delegation of Public Health (MinSante), Bamenda
8. Dr. Pius Kuwoh – District Medical Officer, Batibo
9. Mrs. Brenda Mangwi Epse Difang - Physiotherapist, Regional Hospital, Bamenda
10. Dr. Eta Mbong - Ministry of Public Health, Yaoundé
11. Dr. Alexa Bramall – Volunteer researcher (2012) at the Bamenda Coordinating Centre for Studies in Disability and Rehabilitation, North West Region, Cameroon, and Medical Student, University of Toronto

With input from:

Mr. Fopoussi Anatole – Physiotherapist, Regional Hospital, Bamenda
Dr. Fon Edwin Atunji – GP, Regional Hospital, Bamenda
Ms. Shirin Kiani - Occupational Therapist, Canada and volunteer at the Bamenda Coordinating Centre for Studies in Disability and Rehabilitation (2011)

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External reviewers are listed on page 12.

Guidelines Status: The first version of the guidelines was developed over 2009-2012 and disseminated in 2013. These guidelines can be added to and developed further based on interest, need, and availability of persons to do so.
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Statement of Intent

These guidelines are intended to **guide** health care practices, services, and systems in the North West Region of Cameroon. The Best Practices group recognizes that human, financial, and system resource limitations can make it difficult to implement all of the recommendations in this document. However, these recommendations are presented as good practice benchmarks toward which all organizations and health systems should strive. We have based the contents of the guideline on the best available evidence at the time of development ***and*** our understandings of the realities of practice in the region.

Additionally, this guideline can be used as a valuable tool and information source for educators, managers, administrators, and for anyone advocating for improved stroke care services and for providers in similar settings. Adherence to these guidelines may not ensure a successful outcome in every case. These guidelines should neither be seen as including all proper methods of care, nor do they exclude other acceptable methods of care. For an individual patient, standards of medical, nursing, and rehabilitation care are determined on the basis of all clinical data available for that individual case and are subject to change as knowledge advances and patterns of care evolve. Each health care provider is ultimately responsible for the management of his/her unique patient, in the light of the clinical data presented by the patient and the diagnostic and treatment options available.

We hope that these guidelines will assist in the provision of the best possible services for people who have experienced stroke in the region, and will also encourage providers to continue to learn and grow in their professional practices.

Scope of these Guidelines

Objective: To provide best practice recommendations related to rehabilitation for the acute stages of stroke in the North West Region of Cameroon. In this document, the acute stages refer to the time that stroke occurs to approximately 6 months post-cerebrovascular accident (CVA). The scope of the guidelines includes practices related to assessment, referrals, management, and rehabilitation.

The recommendations in this guideline focus on initial assessment and initial treatment protocols in acute care facilities, the provision and monitoring of services, and discharge planning. While these guidelines include references to medical management, detailed medical management is not the primary focus of this guideline.

Pharmaceutical treatment is important in stroke management but is outside of the scope of these guidelines and therefore is not included in these guidelines.

Rehabilitation settings that can use these guidelines: In-patient hospitals, Out-patient hospitals, and Community-based rehabilitation programs.

Disease(s) and/or condition(s): Stroke and Transient Ischemic Attack (TIA)

Age group(s): adults (>16 years)

Intended users of the guideline: Acute care management team and front-line staff involved in client care 0 to 6 months post-CVA

Physical therapists, nurses, doctors, people who have experienced stroke and their family members and caregivers, community workers, other health workers if applicable.

Current Situation and Current Practices in the NWR

As of 2012, there were 337 Health Units in the Region, made up of hospitals, integrated health centres, and medicalized health centres (health centres with a doctor). All of these health units can receive patients who have experienced a stroke.

Sources of information for this statement of current practices include the professional experiences of members of the Best Practices group, interviews with providers, and interviews with clients and their family members.

Client Group

Clients needing stroke services in the region are in all age groups from infancy to old age. The people who receive rehabilitation services are often identified in hospitals and health centers where the initial diagnosis is made. From the doctors or nurses they are then referred to physical therapists or rehabilitation centers after stabilization.

There are still many health institutions that do not refer patients for rehabilitation; patients may be simply discharged from the hospitals and sent home. At times they are sent for rehab from home by community-based rehab workers, well-wishers, or family members who know where rehab for stroke takes place. Many clients are actually left on their own and develop many complications or die unduly. There is a need for more research about incidence and prevalence of stroke in various population groups.

What assessments are currently used in the acute stages of stroke (0 to 6 months post-CVA) in the acute care settings?

The assessment process which is mainly used is based on general physical assessment involving voluntary muscle testing, strength testing, sensory testing, and range of motion. These assessments are not standardised, so there is a lot of variation from institution to institution, and from therapist to therapist. As far as we are aware, there have been no published studies on stroke assessment in the NWR. There appears to be a need for more attention on stroke assessment.

Are there any treatment protocols for CVA in the acute care facilities?

We are not aware of any standardized treatment protocols for CVA in acute care facilities. The basic procedures involve exercises, ambulatory devices such as walker, crutches, or wheelchair, posture and positioning, and splinting.

Are there any guidelines in place for discharge planning?

There are no standardized guidelines in place for discharge planning. Upon discharge, some physiotherapists (PT) and doctors give the clients a home exercise program and a review/follow up date. In a few cases, community based rehabilitation (CBR) is involved and the CBR worker collaborates with the PT on rehabilitation provision in the client's home. CBR is only available in a few places in the NWR.

Where and how are best practices currently occurring in the region?

At the time of writing this guideline, we were not aware of any stroke unit in the region, or any place that has made CVA the focus of its program. In the provider organizations mentioned below, CVA is handled alongside other conditions. Given the apparent high numbers of stroke in the region, there appears to be a need for one or more stroke units.

What services are provided?

Services: Provider Perspective

As of the end of 2012, rehabilitation service provision in this region is mainly done by the professional groups described in Table 1. Anecdotal reports are that many patients will see traditional healers prior to seeking treatment from a medical facility. The terminology and numbers here just provide a snapshot, and it is recognized that there are constant changes so this chart should not be seen as static.

Physical Therapy is a non-regulated profession in the country. PTs receive training abroad or at private schools within the country. Some PTs work in two or more centres.

Prior to 2010, the term PT Aid was used; as of approximately 2010, the term PT Aid had fallen out of use. As of 2012, the term PT Assistant was recognized as someone with one or two years of training. The government is not currently providing any formal PT or PT Assistant training.

Table 1: Providers of stroke rehabilitation in the NWR

Profession	Education	Approximate number available overall	Approximate number with CVA expertise
Physical therapists (PT)	Trained for at least 3 years university	There are between 1 – 8 PTs in each of the following locations (numbers fluctuate): Regional Hospital, Bamenda Mbingo Baptist Hospital Njinikim Catholic Hospital SAJOCAH Bafut Banso Baptist Hospital Shisong Hospital Mezam Polyclinic There are a few private PTs.	4-5

Profession	Education	Approximate number available overall	Approximate number with CVA expertise
Assistant physical therapists (APT)	At least 2 years training	There are between 1 – 7 APTs in each of the following locations (numbers fluctuate): Regional Hospital, Bamenda Banso Baptist Hospital Mbingo Baptist Hospital Njinikim Catholic Hospital SAJOCAH, Bafut Shisong Hospital, Kumbo There are also a few APTs in private clinics.	20
Medical doctors (MD)	University training (4 – 6 years, depending on location) CVA is addressed in medical school curricula, although in-depth coverage of rehabilitation for CVA is variable in schools.	All hospitals have doctors with varying levels of experience and specialities; in terms of rehabilitation related, there is 1 Orthopaedic surgeon at Mbingo hospital, Njinikom hospital, and others in some other places. There are visiting orthopaedic surgeons and other doctors, depending on the year at Njinikom and some of the other hospitals.	There are no neurology residents in the region. Occasionally, there are visiting specialists for short periods of time.
Community Based Rehabilitation workers (CBR)	Few weeks training, mostly experiential	CBR workers are based from Mbingo Baptist Hospital and Banso Baptist Hospital but work in various divisions.	
Nurses (N)	No formal rehab training in nursing schools	There are hundreds of nurses in the region. Many nurses have some experience with stroke patients.	Not clear how many have expertise in CVA; we are not aware of any reports or research on this topic in NW
Family members (FM)	As directed by PTs and other health professionals	No family support groups or education that we are aware of in the region.	
Traditional healers/practitioners	Variable, Non-conventional As a profession, are recognized by the Ministry of Public Health.	In all communities, difficult to estimate numbers.	Many people visit traditional healers before coming to medical centres. Some are known for their expertise in dealing with stroke clients.

- PTs and PTAs provide interventions such as Proprioceptive Neuromuscular Facilitation, strengthening exercises, massage, electrotherapy, gait training, splinting, use of ambulation devices.
- CBR does a follow up of the work of PTs above when available and there is a linkage; CBR also provides services independently of PT.
- Doctors and Nurses are involved in medical follow up, catheter care, and are much less involved in rehab practices.
- Several informants recognized the need for occupational therapy and speech therapy in the region. At the time of writing, these services were not available in the region.
- There is recognition that there are traditional healers who provide assessment and treatment. We have decided that their approach is not within the scope of this document, and therefore their numbers and practices are not included in this document.

Services: Organizational Perspective

This chart provides an overview of the organizations providing stroke/CVA rehabilitation services in the region. The Region has 19 health districts and each health district has at least one hospital, although not all provide stroke rehabilitation. The Community Based Rehabilitation program of the Cameroon Baptist Convention Health Board, is available in many districts of the region.

Table 2: Organizations providing <u>stroke rehabilitation</u> in the region

Institution/Organization	Location
Bamenda Regional Hospital	Mezam Division
SAJOCAH Bafut	Mezam Division
Mbingo Baptist Hospital	Boyo Division
Njinikim Catholic Hospital	Boyo Division
Banso Baptist Hospital	Bui Division
St. Elizabeth's Catholic Hospital, Shisong	Bui Division

We are not aware of other CBR programs provided by other organizations.

CVA assessment and treatments are given in hospital through in-patient care, hospital out-patient care, home-based follow up care, and rehab center based care with follow up visits in communities.

What are the costs of services?

Generally the cost is borne by the clients. There is no government support for health or rehabilitation services. A few health insurance schemes are emerging.

Transportation to a hospital is at the expense of the client. This in itself can prevent or discourage many patients from coming to a hospital or clinic.

A consultation in a government hospital is subsidized, and there are minimal costs to the patient/client. There can also be related costs that may be incurred.

A consultation (first visit) in a private or non-governmental hospital is usually between 800 and 2,500 francs CFA (approximately $1.50 to $5.00 USD; 1 – 4 Euros). Follow-up visits are less.

In-patient hospital care costs between 2000 and 5000 francs CFA per day (in a non-private room) (approximately $4.00 to $10.00 USD).

Outpatient hospital care costs between 500 and 3000 francs CFA per visit (excluding transportation) (approximately $1.00 to $6.00 USD).

Rehab center care costs between 500 and 5000 francs CFA per visit (approximately $1.00 to $10.00 USD).

All home based treatments (e.g. CBR) done by faith-based providers are free or subsidized. Specialized treatments and equipment might be an additional cost.

Referrals

There is no systematic or detailed referral process related to CVA at the current time. In a few hospital settings, referrals are done to the PT service by the medical doctors. Family members who know the available service providers might also do a referral personally.

Discharge and follow up

It is unusual for a team to do a comprehensive discharge plan. In a few cases, the doctor does the discharge from the hospital together with the PT. However, in most cases the clients are discharged home by the medical doctors alone without PT advice or support, or a home program, or a referral for continuation of care in other centers. We are not aware of any published research or reports which explore the discharge and follow-up experiences of stroke clients in the NWR.

Program evaluation

We are not aware of any evaluation process for the stroke services provided in the region. It is usually the individual therapist who does a follow up and evaluation of the process and outcomes.

Current Challenges

- There is not an adequate/good referral system in place in the region.
- 5 years ago there was no networking of service providers. Now there is an emerging informal network of service providers who have an interest in stroke but there are difficulties in maintaining communication and meetings.
- There seems to be some lack of information and adequate knowledge on the part of some medical/health workers with regard to stroke rehabilitation.
- Many health centres are staffed solely by a nurse, who might not have adequate training in dealing with stroke.
- There is a lack or absence of rehabilitation departments in most hospitals.
- There is a lack of/very limited equipment for diagnosis and management of stroke.
- Inadequate training for rehabilitation workers is reflected in inadequate assessments and sometimes wrong diagnoses.

- Poor management of clients in acute/hospital care resulting in complications such as bed sores, contractures, and disuse of affected parts.
- There is poor integration of physiotherapy services with general ward services.
- Sometimes over-protection by family members predisposes patients to complications – for example, the belief that the patient should be cared for entirely and not have to struggle through a rehabilitation process.
- There is considerable blame and belief in superstition and witchcraft that result in neglect of clients. These issues could be further explored to better understand their impact on stroke services.
- Misinformation, misdirection, and misguidance by traditional practitioners.
- Premature discharge home by patient request or lack of client cooperation.
- Difficulty reversing certain complications, such as contractures, due to lack of resources and trained personnel.
- The cost of rehabilitation remains a significant challenge for most patients as they cannot afford the fees. Many people live in poverty, without any health insurance.
- There are very limited community based rehabilitation services in the region.

Methodology used for this Guideline

Method used to collect evidence: Evidence was collected using a search of the following electronic databases:

- Google Scholar (http://scholar.google.co.uk/)
- Medline and Pubmed
- The CIRRIE database of International Rehabilitation Research (http://cirrie.buffalo.edu/search/index.php)
- National Guideline Clearinghouse (http://www.guidelines.gov)
- Guidelines International Network (http://www.g-i-n.net)
- Scottish Intercollegiate Guidelines Network

Search words entered: best practices, stroke rehabilitation, Africa, Cameroon.

These guidelines were formulated based on existing guidelines as well as information in the literature. The final synopsis of the process of evaluating and selecting existing template guidelines is described below.

The AGREE II instrument was used as an assessment tool of guidelines that could be used for this project.

The AGREE II assessment is described in more detail in Appendix 1.

Guidelines that were used to formulate these recommendations:

19 Canadian Best Practice for Stroke (Lindsay et al, 2010) – based on a comprehensive survey of existing guidelines

20 South Africa Stroke Guidelines (Breyer et al, 2010)

21 Singaporean Stroke Guidelines (Singapore Ministry of Health, 2009) – note that these guidelines were modified based on the Scottish Intercollegiate Guidelines Network Clinical Practice guidelines on the management of patients with stroke.

22 Philippines Stroke Guidelines (http://www.strokesocietyphil.org/files/SSPHandbook.pdf)

Users of the guidelines presented here (which have been adapted for use in the North West Region of Cameroon) are encouraged to also read and become familiar with these source documents, and with other guidelines.

In addition, some evidence from primary research studies was used. To assess the quality and strength of the research evidence, we followed international standards, categorizing each piece of research based evidence according to the levels listed below. During the literature search, a variety of evidence with the highest strength was sought out.

Level of evidence	Type of evidence
A	Strong recommendation. Evidence from randomized controlled trials or meta-analyses of randomized controlled trials. Desirable effects clearly outweigh undesirable effects, or vice versa.
B	Single randomized controlled trial or well-designed observational study with strong evidence; or well-designed cohort or case–control analytic study; or multiple time series or dramatic results of uncontrolled experiment.
C	At least one well-designed, non-experimental descriptive study (e.g., comparative studies, correlation studies, case studies) or expert committee reports, opinions and/or experience of respected authorities, including consensus from development and/or reviewer groups.
D	Expert opinion, formal consensus

Method for formulating recommendations: A comparison table was developed using the format below to help determine appropriate recommendations to make. The idea of this table was to compare current practices identified in the North West Region as per the scope statement (e.g. initial assessment, initial treatment protocol, discharge planning) to recommendations made in the literature on those areas, while ensure that levels of evidence of articles for each recommendation is noted and considered.

Comparison Table

Current practices	Recommendations from Evidence	Author and Level of Evidence
1. In-patient rehabilitation		
2. Outpatient rehabilitation		
3. Rehabilitation and CBR Interventions		

Recommendations were then presented to the working group and discussed in terms of feasibility within the local NWR context, for applicability within the short and long term, considering the existing and potential resources at hand, and possibilities appropriate to the context. Based on these discussions, the first draft of the guidelines was developed, discussed in detail by the working group members and then second and third drafts were developed.

Method of guideline validation: The third draft of the guidelines underwent further review, using a two-step process of validation by experts and practitioners.

1. Expert Review: Members of the group who developed these guidelines were experienced practitioners and leaders in the field of stroke rehabilitation in the North West Region of Cameroon. To further validate the recommendations formulated by these persons, several experts were sought out who could further validate and confirm appropriateness of recommendations made. Experts were deemed persons who had worked in the field of stroke rehabilitation for at least a 5 year period, preferably who had produced written work (published and unpublished) in the area of stroke rehabilitation, who had possibly presented on the topic of stroke rehabilitation at conferences/seminars, and lastly who had received some type of education/formal learning on the area of stroke rehabilitation to substantiate their knowledge base.
2. Practitioner Review: To ensure the format used to present these guidelines was at least somewhat user friendly, a small group of practitioners in the area of stroke rehabilitation were also shown the third draft of these guidelines and asked their input on how relevant, understandable and feasible these guidelines could be in their work.

The final guidelines incorporated as much as possible the input from this esteemed group. We express our immense gratitude to the following reviewers who provided helpful feedback on the draft guidelines.

Name	Location and contact information	Represents what Division?	Professional Background
1. Dr. Ndiforchu	Bamenda	Regional	Medical doctor
2. Dr. Awasom	Bamenda	Mezam/ Region	Medical doctor; Administrator
3. Dr. Ndo	Regional Hospital, Bamenda	Mezam/ Region	Medical doctor
4. Dr. Venasius	Hospital, Mambo, Bafut	Mezam	Medical doctor
5. Sr. Victorine	SAJOCAH, Mambo, Bafut	Mezam	Physiotherapist
6. Dr. Pius Tih	Bamenda	NWRegion	
7. Mr. Ezekiel Benuh	Bamenda	NWRegion	
8. Dr. Formunyan	Mbingo	Boyo	Medical doctor
9. Mr. Kenchi Joseph	Mbingo/Banso	Regional	CBR Supervisor
10. Mr. Yuh Simon	Mbingo	Regional	CBR Supervisor
11. Dr Beyiah Kamsang Pius	BBH	Bui	Doctor
12. Mr Mbah Glenn	Burkitts Lymphoma Program BBH	Bui	Research Assistant; Nurse
13. Mr Nkwan Jacob	CBC Private Training School for Health Personnel, Kumbo	Bui	Principal, Nurse
14. Dr. Helene Anshomo	Shisong Hospital	Bui	Doctor
15. Mr. Donatus Ndiyum	Shisong		Director of Nursing School
16. Dr. Njamnshi	Yaounde	National	Doctor/Researcher
17. Ms. Jennifer Tham	Vancouver		Physical Therapist

Recommendations

The recommendations are presented for three types of practice situations (service provision): In-patient, Outpatient, and Community Based Rehabilitation (CBR).

There are three sets of additional recommendations specifically for dysphagia, depression, and shoulder pain which are applicable and should be used in all three types of settings. These three areas were chosen as they were identified as priority areas in the region, and are key areas for intervention in the stroke literature.

The recommendations have been given unique numbers to allow users to refer specifically to each them.

Recommendations	**Corresponding Recommendation Numbers**
Recommendations for In-patient Stroke Rehabilitation	Recommendations #1 – 18 apply to *in-patient primary health services* Recommendations #19 – 35 apply to *in-patient services in secondary and tertiary centres*
Recommendations for Outpatient Stroke Rehabilitation	Recommendations #36 – 47 apply to *outpatient services*
Recommendations for Community Based Rehabilitation	Recommendations #48 - 61 apply to *community based rehabilitation services*
Recommendations for Dysphagia	Recommendations #62 - 65 apply to management and rehabilitation about *dysphagia and swallowing disorders*
Recommendations for Depression	Recommendations #66 – 73 apply to *depression* and stroke
Recommendations for Shoulder Pain	Recommendations #74 – 83 apply to the management of *shoulder pain* following stroke
Recommendations for Implementation	

Recommendations for In-patient Stroke Rehabilitation

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
Screening and Assessment	1) Health care workers should use standardized, valid screening tools to evaluate the patient's stroke-related impairments and functional status within 24 – 48 hours (or as soon as possible) when a patient presents with signs and symptoms of a possible stroke [Evidence Level C] (CMAJ) and to identify the need for full assessment and possible referral. (examples in Appendix 2) 2) All acute stroke patients should have an initial assessment by an on-site health care worker as soon as possible after admission [Evidence Level A] (CMAJ), preferably within the first 24 to 48 hours [Evidence Level C] (CMAJ) 3) Basic education about stroke should be available to all key health workers in primary care services. 4) Each health centre should know contact phone numbers, and have maps or clear directions showing the nearest appropriate Causality or Emergency Department for stroke patients so that	19) All acute stroke patients should have an initial assessment by at least one rehabilitation professional, health care worker trained in rehabilitation, or other health care worker (if a rehabilitation specialist is not available) as soon as possible after admission [Evidence Level A] (CMAJ), preferably within the first 24 to 48 hours [Evidence Level C] (CMAJ) 20) Clinicians should use standardized, valid assessment tools to evaluate the patient's stroke-related impairments and functional status [Evidence Level C] (ASA, CMAJ). 21) Assessment should include specific assessment for dysphagia and depression.	• The first interdisciplinary assessment after admission must identify physical, cognitive, or communication complications of the stroke (CMAJ) • Early consultation with rehab professionals contributes to reductions in complications from immobility such as joint contracture, falls, aspiration pneumonia and deep vein thrombosis and allows for early discharge planning from acute care (CMAJ) • Early assessment should reduce the overall cost of episode of care through improved outcomes and reduced time to discharge (CMAJ)

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
	they can be easily directed. 5) If transporting a patient, the people transporting the patient should make contact with the destination health service or hospital. Simply notifying the receiving hospital that a potential acute stroke will be arriving has been shown to shorten the eventual time between delivery to the hospital and receipt of treatment. Describing the patient's condition, time of onset of symptoms, and medical history allows the mobilized doctors, nurses, imaging specialists, and pharmacists of the receiving hospital to better plan when receiving the patient.		
Multidisciplinary and Team Care	6) Referral to a secondary/tertiary care centre for interdisciplinary care as soon as possible (within 24 – 48 hours) for all persons who have experienced a stroke is recommended. 7) The primary health worker or team should develop a comprehensive individualized plan which reflects the severity of the stroke and the needs and goals of the stroke patient, and should include rehabilitation. [Evidence Level C] (HSFO, CMAJ). 8) Survivors of a severe or moderate	22) Post–acute stroke care should preferably be delivered in a setting in which rehabilitation care is formally coordinated and organized [Evidence Level A] (ASA). 23) Post–acute stroke care should be delivered by a variety of treatment disciplines, experienced in providing post stroke care, if possible, to ensure consistency and reduce the risk of complications [Evidence Level C] (CMAJ). 24) The interdisciplinary rehabilitation	• When post-acute stroke patients receive coordinated, interdisciplinary evaluation and intervention on a stroke rehabilitation unit, there is a reduction in death and disability (CMAJ) • Examples of members of a multidisciplinary team in Cameroon may include: ➢ Specialized **nursing care** promotes early recognition of complications and management of skin, bowel and bladder problems ➢ **Physical therapy** may promote better

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
	stroke should be reassessed at regular intervals for their rehabilitation needs [Evidence Level C] (HSFO). 9) Patients and their families should be educated about the risk and prevention of pressure sores.	team may consist of physician, nurse, physiotherapist, social worker, and chaplain, and should include the patient and family/caregivers as key members of the team. Occupational therapy and speech therapy should also be provided whenever possible. [Evidence Level A] (ASA). 25) If possible, inpatient rehabilitation on a rehabilitation unit (i.e., where interdisciplinary care is provided to patients disabled by a range of disorders including stroke) is preferable [Evidence Level B] (CMAJ; SIGN 118) 26) The interdisciplinary rehabilitation team should develop a comprehensive individualized rehabilitation plan which reflects the severity of the stroke and the needs and goals of the stroke patient. [Evidence Level C] (HSFO, CMAJ) The team leader can be a PT, doctor, nurse, or other health care provider familiar with rehabilitation. It is not necessary for a doctor to be team leader.	recovery through early mobilization of the patient and management of any lung problems caused by immobility ➢ **Medical specialists** in physical medicine and rehabilitation address complications such as pain, spasticity, and bowel and bladder incontinence ➢ **Social work, chaplains** and other health professionals may help with the social, financial, cognitive and psychological consequences of stroke

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
Rehabilitation Therapy	*In the North West region, many organizations providing primary health services are not able to provide therapy. These recommendations are intended for those services where rehabilitation can be provided. This therapy should be seen as part of multidisciplinary, team-based care.* 10) All patients with stroke should begin rehabilitation therapy as early as possible once medical stability is reached [Evidence Level A] (ASA). 11) Patients should receive the intensity and duration of clinically relevant therapy defined in their individualized rehabilitation plan and appropriate to their needs and tolerance levels [Evidence Level A] (HSFO, CMAJ). The duration of therapy being dependent on stroke severity [Evidence Level C] (EBRSR). Better results can be obtained if Physical therapy takes place 2X a day (morning and afternoon) for 45-60 min. depending on patient's tolerance. 12) The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner [Evidence Level A] (CMAJ). 13) Therapy should include repetitive and	27) All patients with stroke should begin rehabilitation therapy as early as possible once medical stability is reached [Evidence Level A] (ASA). 28) Patients should receive the intensity and duration of clinically relevant therapy defined in their individualized rehabilitation plan and appropriate to their needs and tolerance levels [Evidence Level A] (HSFO, CMAJ). The duration of therapy being dependent on stroke severity [Evidence Level C] (EBRSR). Better results can be obtained if physical therapy takes place 2X day (morning and afternoon) for 45 – 60 minutes depending on patient's tolerance. 29) The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner [Evidence Level A] (CMAJ). 30) Therapy should include repetitive and intense use of novel tasks that challenge the patient to acquire necessary motor skills to use the involved limb during functional tasks and activities [Evidence Level A] (SCORE). 31) At least one formal interdisciplinary	• Early initiation of rehabilitation interventions is associated with improved outcome at discharge from hospital and at follow-up (1) [Bryer et al 2010] • Recommended rehabilitation techniques for managing patients following stroke include: prevention of pressure sores, breathing exercises, therapeutic exercise, task-oriented training, biofeedback, gait training, balance training, constraint-induced movement therapy, treatment of shoulder subluxation. • Patients with subacute stroke benefited from enhanced upper-limb treatment, enhanced physiotherapy. • Inpatient therapy is often preferable where necessary because outpatient therapy rarely achieves the same intensity of inpatient units; where patients require three modalities of intervention, in-patient therapy is justified [Bryer et al 2010]

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
	intense use of novel tasks that challenge the patient to acquire necessary motor skills to use the involved limb during functional tasks and activities [Evidence Level A] (SCORE).	meeting per week should be conducted to discuss the progress and problems, rehabilitation goals and discharge arrangements for patients on the unit [Evidence Level B] (CMAJ; SIGN 118). Individualized rehabilitation plans should be regularly updated based on patient status reviews [Evidence Level C] 32) Survivors of a severe or moderate stroke should be reassessed at regular intervals for their rehabilitation needs [Evidence Level C] (CMAJ; HSFO)	
Discharge Planning	14) The care management plan should include a pre-discharge needs assessment to ensure a smooth transition from the primary health service back to the community. Elements of discharge planning should include a home visit by a health care professional or CBR worker, ideally before discharge, to assess home environment and suitability for safe discharge, determine equipment needs and home modifications, and begin caregiver training for how the patient will manage activities of daily living and instrumental activities of daily	33) The care management plan should include a pre-discharge needs assessment to ensure a smooth transition from rehabilitation back to the community. Elements of discharge planning should include a home visit by a health care professional or CBR worker, ideally before discharge, to assess home environment and suitability for safe discharge, determine equipment needs and home modifications, and begin caregiver training for how the patient will manage activities of daily living and instrumental activities of daily living	• Ideally, communication between the rehabilitation team, family and patient should be formalised at a family meeting within the first week of therapy, with the aim of educating the patient and family on the circumstances of the particular patient and the anticipated outcomes (SA) • Early discharge planning promotes efficient transition back to the community (CMAJ) and will enable families to implement changes that may be necessary within the home, such as alterations to toilet and bath facilities and the construction of

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
	living in their environment [Evidence Level C 15) Early discharge is possible in medically stable patients with mild or moderate impairment, providing that rehabilitation is delivered in the community by a multidisciplinary team with stroke expertise [Evidence Level A] (SA), or, if this does not exist, a CBR worker with experience in rehabilitation.	in their environment [Evidence Level C] 34) Early discharge is possible in medically stable patients with mild or moderate impairment, providing that rehabilitation is delivered in the community by a multidisciplinary team with stroke expertise [Evidence Level A] (SA), or, if this does not exist, a CBR worker with experience in rehabilitation	ramps, where necessary. Special consideration should be given to patients who lack basic amenities at home (SA) • Discharge planning should include the possibility of returning to work and implementing changes in the workplace; liaison between the rehabilitation team and employers is important, if possible (SA) • At the time of discharge, appropriate referral to various health care professional and support groups is important (SA) • Discharge planning may also include: regular family and team meetings, care plans, caregiver training, post-discharge follow-up and regular review of patient and caregiver psychosocial and support needs (CMAJ) • **If it is not possible to have a home visit by a health care** professional, patients may be allowed to go home for one or two nights prior to their discharge so that the patient and family can assess any difficulties that might be encountered in the home environment, regardless of whether or

	Recommendations suitable for institutions/organizations providing primary health services	Recommendations suitable for institutions/organizations providing secondary and tertiary health services	What evidence supports this recommendation? Explanation of rationale for the recommendation
			not they live in an urban or rural environment (SA).
Referrals	16) Appropriate referrals for therapy should be made before the time of discharge from the inpatient ward. 17) If patients who are being treated for stroke in primary health service are being referred to any other service, including secondary or tertiary service, the patient should be given a written referral form to take. An example referral from is in Appendix 3. 18) Organizations should develop protocols for the use of telecommunication to consider factors such as consent, confidentiality, type of information, follow-up (e.g. use of telephones, email, web-based systems).	35) If patients who are being treated for stroke in secondary or tertiary health service are being referred to another service, (e.g. primary care centre, CBR, or vocational training) the patient should be given a written referral form to take with them. An example referral form is in Appendix 3.	• There should be specific training for established protocols of referral for selected patients to higher level of care according to defined criteria. (SA, 5.3.1) • There should be a protocol for referral and transfer of selected stroke patients from primary care to secondary, tertiary and/or community based facility\ies. Where there are large distances between level 1 and level 2 or level 3 hospitals, the use of telemedicine or other telecommunication links should be explored. (SA, 5.3.1) • A meta-analysis showed that continued rehabilitation after discharge from inpatient settings during the first year after stroke reduces the risk of deterioration in function and improves daily living activities. (Legg and Langhorne, 2004)

Recommendations for Outpatient Stroke Rehabilitation

In the North West Region, outpatient rehabilitation is usually provided by institutions providing secondary or tertiary health services, or by community based rehabilitation services. It is rare that organizations providing only primary health services will be able to provide out-patient stroke rehabilitation. Therefore, we are not including recommendations for institutions/organizations providing primary health services in this section. However, these recommendations are also relevant for institutions/organizations providing out-patient rehabilitation services as part of a primary health service.

	Recommendations suitable for community based rehabilitation services, and institutions/organizations providing secondary and tertiary health services	**Supporting Evidence and Explanation**
Outpatient Services	36) The interdisciplinary rehabilitation team should develop a comprehensive individualized rehabilitation plan which reflects the severity of the stroke and the needs and goals of the stroke patient [Evidence Level C] (HSFO, CMAJ) 37) A multidisciplinary team approach is recommended. 38) People who have difficulty in activities of daily living, including self-care, productivity and leisure, should receive therapy or multidisciplinary interventions targeting activities of daily living [Evidence Level A] (AU; CMAJ) 39) People with difficulties in mobility should be offered an exercise program and monitored throughout the program [Evidence Level B] 40) Patients with aphasia should be taught supportive conversation techniques [Evidence Level A] 41) Patients with dysphagia should be offered swallowing therapy and opportunity for reassessment as required [Evidence Level A]	• Stroke survivors who receive outpatient stroke rehabilitation have been found to have greater improvement in key outcomes compared with patients in the community who do not participate in outpatient rehabilitation (SA) • Exercise therapy may provide significant benefit irrespective of the phase of stroke (i.e. acute, subacute, chronic) (CMAJ) • There is moderate evidence that a supportive conversation technique is associated with enhanced conversational skill for both the trained partner and the individual with aphasia and moderate evidence that rehabilitative strategies for dysphagia are associated with enhanced swallowing function (CMAJ) • Physiotherapists can ensure appropriate positioning of hemiplegic patients and help with early mobilisation and mobility, ensuring the safety of the patient and prevention of falls and injury • Issues of neglect, spatial perception and visual difficulties should be considered along with the

		resumption of daily activities such as washing and grooming (SA) • Identification of assistive devices such as wheelchairs and walking aids is also helpful (SA) • Swallowing safety should be assessed early and should investigate alternative modes of communication with aphasic patients and their families (SA)
Monitoring and Follow-up	42) Rehabilitation should be continued after discharge from inpatient services during the first year after stroke [Level A Evidence] (SA) 43) All people with acute stroke with any residual stroke-related impairment who are not admitted to hospital should undergo a comprehensive outpatient assessment(s) for functional impairment, which includes a cognitive evaluation, screening for depression, screening of fitness to drive (if appropriate), as well as functional assessments for potential rehabilitation treatment [Evidence Level A] (CMAJ), preferably within 2 weeks [Evidence Level C]. 44) Survivors of a severe or moderate stroke should be reassessed at regular intervals for their rehabilitation needs [Evidence Level C] (HFSO) 45) Post–acute stroke patients should be followed up by a primary care provider to address stroke risk factors, ongoing rehabilitation needs, and to continue treatment of comorbidities and other sequelae of stroke [Evidence Level C] (ASA). 46) Stroke survivors and their caregivers should have their individual psychosocial and support needs reviewed on a regular basis [Evidence Level A] (CMAJ). 47) Any stroke survivor with declining activity at 6 months or later after stroke should be assessed for appropriate targeted rehabilitation [Evidence Level A] (CMAJ).	• Continued rehabilitation after discharge during the first year after stroke reduces the risk of deterioration in function and improves daily living activities (SA) • Motivation and hope for improvement are critical factors for functional improvement (CMAJ) • Early evaluation of physical and cognitive disability is key to preventing avoidable complications and to planning rehabilitation (CMAJ)

Recommendations for Community Based Rehabilitation (CBR)

"Community-based rehabilitation (CBR) was initiated by the World Health Organization (WHO) following the Declaration of Alma-Ata in 1978. It was promoted as a strategy to improve access to rehabilitation services for people with disabilities in low-income and middle-income countries, by making optimum use of local resources. Over the past 30 years through collaboration with other UN organizations, on governmental organizations and disabled people's organizations, CBR has evolved into a multisectoral strategy to address the broader needs of people with disabilities, ensuring their participation and inclusion in society and enhancing their quality of life." (p.1, WHO, 2010, CBR Introductory Book). CBR is currently available in some communities in the North West Region and is provided by non-governmental providers.

	Recommendations	**Supporting Evidence and Explanation**
Referral and Initial Assessment	48) Community based rehabilitation services should be available in all parts of the region. 49) Every person who has survived a stroke, and their families, should have access to CBR services. 50) People who have received stroke services in an in-patient or out-patient setting who are being referred to CBR should have a detailed, written referral to provide to the CBR program. 51) The CBR worker should provide feedback to the referring source and seek medical advice when necessary. 52) The assessment by the CBR worker should include all of the usual aspects of a CBR assessment, and can also include stroke specific assessment if indicated (e.g. dysphagia, balance, one-sided neglect).	Consensus of the working group.
CBR services	53) Multifaceted interventions which address all CBR components (e.g. social inclusion, empowerment, education, livelihood) should be provided in the community. These services should include an individually prescribed exercise program. 54) People who are at risk of falling should have an individualized care plan in order to prevent or reduce the number and severity of falls [Evidence Level A] (AU). 55) People who have difficulty in activities of daily living, including self-care, productivity and leisure, should receive therapy	• Issues of neglect, spatial perception and visual difficulties should be considered along with the resumption of daily activities such as washing and grooming (SA) • Identification of assistive devices such as wheelchairs and walking aids is also helpful (SA)

	interventions targeting activities of daily living [Evidence Level A] (AU; CMAJ) 56) The recommendations for dysphagia, depression and shoulder pain which are included in this guideline are also applicable to CBR services.	
Monitoring and Follow-up	57) Rehabilitation should be continued after discharge from in-patient and outpatient services during the first year after stroke [Level A Evidence] (SA) at a frequency appropriate to the needs of the client. 58) Education for stroke survivors and their families: A model of community-based stroke care should include a system of stroke education for caregivers and patients, and should implement structures that strengthen the level of home-based care and training Stroke survivors and their families should be provided with timely, up-to-date information in conjunction with opportunities to learn from members of the team and other appropriate community service providers. Simple information provision alone is not effective [Evidence Level A] (AU) (GCP) (SA) 59) Patients and their caregivers should be offered education programs to assist them in adapting to their new role [Evidence Level B] (CMAJ). 60) The identification and management of post-stroke depression should also be considered as part of follow-up and evaluation of stroke survivors in the community [Evidence Level C].	• Comprehensive understanding and involvement of the person, family/caregiver, and environmental system are required for stroke rehabilitation. Without adequate resources and support, it is difficult for patients to sustain gains made during inpatient care or to make further progress in the community (CMAJ)
Training	61) CBR workers and volunteers should be provided with training and opportunities to become familiar with the application of these guidelines.	

Recommendations for Dysphagia

Dysphagia	62) Patients with stroke should have their swallowing ability screened using a simple, valid, reliable bedside testing protocol as part of their initial assessment, and before initiating oral intake of medications, fluids or food [Evidence Level B] (CSQCS), SCORE, SIGN 119). See Appendix for possible tools. 63) Patients who are not alert within the first 24 hours should be monitored closely and dysphagia screening performed when clinically appropriate [Evidence Level C]. 64) Patients with stroke presenting with features indicating dysphagia or pulmonary aspiration should receive a full clinical assessment of their swallowing ability by an appropriately trained specialist who should advise on safety of swallowing ability and consistency of diet and fluids [Evidence Level A] (CSQCS, CMAJ, SCORE). 65) Assessment of nutritional status should include the use of validated nutrition assessment tools or measures [Evidence Level C].	• Dysphagia occurs in approximately half of new onset strokes and may lead to poor nutrition, dehydration and aspiration leading to pneumonia (CMAJ) • A systematic program for the screening, diagnosis and treatment of dysphagia in acute stroke patients may yield dramatic reductions in pneumonia rates, feeding tube dependency and length of hospital stay (CMAJ) • Patients who have problems identified on the initial swallowing screen should be referred for specialized assessment and management to a trained nurse, physician or other health care worker as soon as possible • The management program should include compensatory techniques (such as texture modifications and swallowing postures) and rehabilitative techniques

Recommendations for Depression

Depression	66) All patients with stroke should preferably be screened for depression using a validated tool [Evidence Level A] (SCORE) Screening should take place at all transition points and whenever clinical presentation indicates. 67) It is preferable that patients who screen positive for mental health concerns or depression should be assessed by a medical doctor or other health care provider with specialized mental health training. 68) In adult patients with severe, persistent or troublesome tearfulness, SSRIs are recommended as the antidepressant of choice [Evidence Level A] (ASA). Treatment should be monitored and should continue for a minimum of 6 months, if a good response is achieved [Evidence Level A] (CMAJ). 69) All patients with apparent depressive symptoms should be carefully screened for the presence of hypoactive delirium [Evidence Level C]. 70) Routine use of prophylactic antidepressants is not recommended in post-stroke patients [Evidence Level A] (ASA, CMAJ). 71) Patients should be given information and advice about the impact of stroke, and the opportunity to talk about the impact of illness upon their lives [Evidence Level B] (CMAJ). 72) Patients with marked anxiety should be offered psychological therapy, if possible [Evidence Level B] (CMAJ). 73) Patients and their caregivers should have their individual psychosocial and support needs reviewed on a regular basis as part of the longer-term recovery and management of stroke [Evidence Level A] (CMAJ). Referrals for counselling or other interventions should be made when indicated.	• Post-stroke depression may affect as many as 1 in every 4 individuals with a significant stroke (CMAJ) • Depression may affect a patient's ability to participate in therapy and is associated with slower progress in rehabilitation and increased length of stay (CMAJ) • Risk factors include being female, past history of depression or other psychiatric illness, social isolation, functional impairment and cognitive impairment (CMAJ) • Issues that contribute to depression include fear of further strokes, loss of independence, loss of earning power, altered social dynamics (lack of inclusion in social gatherings) and loss of function (SA) • Sexuality can also be adversely effected after a stroke and should be discussed with patients, preferably by an appropriately trained professional (SA) • We were not able to identify a realistic and appropriate best practice tool for screening/assessing for depression in the NW Region. This is an area that requires further research.

Recommendations for Shoulder Pain

Shoulder Pain	74) All stroke patients should be assessed for shoulder pain and, when symptoms present, have strategies implemented to minimize shoulder joint pain and trauma [Evidence Level A] (Ottawa Panel, CMAJ, SCORE). 75) Staff and caregivers should be educated about correct handling of the hemiplegic arm [Evidence Level B] (CMAJ, SCORE). 76) If the patient has shoulder pain, there should be minimal passive movement, and should always be handled carefully. 77) The use of supports for the arm may also be considered [Evidence Level A] (CMAJ) 78) The shoulder should not be passively moved beyond 90° of flexion and abduction unless the scapula is upwardly rotated and the humerus is laterally rotated [Evidence Level A] (SCORE). 79) Overhead pulleys should not be used [Evidence Level A] (Ottawa Panel). 80) The upper limb must be handled carefully during functional activities [Evidence Level B] (SCORE). 81) Staff should position patients, whether lying or sitting to minimize the risk of complications such as shoulder pain [Evidence Level B] (CMAJ). 82) Shoulder pain and limitations in range of motion should be treated through gentle stretching and mobilization techniques focusing especially on external rotation and abduction [Evidence Level B] (SCORE). 83) Patients and their caregivers should be educated on how to take care of the upper extremity and shoulder.	• Shoulder subluxation (instability) should be taken seriously as it can lead to other conditions such as pain. • Shoulder pain can delay rehabilitation and recovery of function; the pain may mask improvement of movement and function or may inhibit patient participation in rehabilitation activities such as therapy or activities of daily living (CMAJ)

Recommendations for Implementation

These recommendations for implementation have come from discussions within the working group. The working group will also continue to look for ways to implement the guidelines.

Implementation can be seen to occur in 3 phases: 1) adapting guidelines to local context (which this guideline does for the NWR); 2) assessing barriers to knowledge use; and 3) tailoring, selecting, and implementing interventions (Castiglione & Ritchie, 2012). Each organization implementing these guidelines can consider in more detail how they can be adapted to their particular context, how to overcome possible barriers, and selecting the interventions that are most appropriate for their context.

Overall

- There should be a Task Force or Technical Group established to oversee the implementation of the guidelines, and to ensure that implementation is carried out.
- Leadership of relevant organizations (e.g. Ministries, hospitals, clinics) should be adequately informed about the guidelines so that they can support their use.
- Select and tailor implementation strategies for practice change.
- The Task Force could review the most relevant barriers and facilitators at the regional level, then decide on which implementation strategies best address the barriers.

Within healthcare organizations

- All health units should be provided with both hard and electronic copies of the guidelines.
- Organizations should go through the guidelines to discuss and identify the recommendations which they can implement. Ideally, this would be done by an interdisciplinary committee and evaluation would be part of the process. The selected implementation strategies should correspond to local understandings of the characteristics of the situation, including the barriers and facilitators found in the region. Planners should provide rationale for decisions made.
- Workshops and in-service training session should be held to assist practitioners and administrators to understand how to use the guidelines.
- Visual reminders of the guideline could be developed to assist practitioners to use them. Choose multiple strategies from a list of implementation strategies.
- Involve stakeholders (practitioners, stroke survivors, family members) in the process.

- Build on successes by expanding implementation efforts whenever possible.

Individual practitioners

- Each practitioner working in the area of stroke should review their practice to how they can implement the recommendations in their practice.

Research and Evaluation

- There should be continued research about the guidelines. For example, information and data should be collected about the implementation of the guidelines. This research should include information about the successes and difficulties in using them.
- Summary of relevant recommendations, key contact information and assessment tools should be easily available in all health units.
- An impact evaluation should be done to assess how the guidelines are used and how they affect client outcomes.

Education

- A manual and training program for the Cameroon Stroke Screening Scale should be developed.
- Health professional training programs within the Region should use the guidelines as part of their teaching.

References

Castiglione, S.A. & Ritchie, J.A. (2012). Moving into action: We know what practices we want to change, now what? An implementation guide for health care practitioners. Ottawa, ON: Canadian Institutes of Health Research. http://www.cihr-irsc.gc.ca/e/45669.html

National Collaborating Centre for Methods and Tools (2013). Implementation guide: CIHR module. Hamilton, ON: McMaster University. Retrieved from http://www.nccmt.ca/registry/view/eng/159.html

References and Bibliography

ASA Adams, H. P., del Zoppo, G., Alberts, M. J., Bhatt, D. L., Brass, L., Furlan, A. et al. (2007). Guidelines for the Early Management of Adults With Ischemic Stroke: A Guideline From the American Heart Association/ American Stroke Association (ASA) Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: Stroke, 38, 1655-1711.

AGREE Collaboration. (2003). Development and validation of an international appraisal instrument for assessing the quality of clinical practice guidelines: the AGREE project. *Quality and Safety in Health Care*, 12(1), 18-23. [PMID: 12571340] *See also*: http://www.agreetrust.org/

Ajayi, A. O. & Ojo, O. O. (2007). Knowledge and perception of stroke among at risk medical out-patients in a tertiary health institution in Nigeria. *Annals of African Medicine.* 6(2):51-3.

Atkins, D., Best, D., Briss, P.A., Eccles, M., Falck-Ytter, Y., Flottorp, S., et al; GRADE Working Group. (2004). Grading quality of evidence and strength of recommendations. *BMJ*, 328,1490. [PMID: 15205295] doi: http://dx.doi.org/10.1136/bmj.328.7454.1490

AU Australia National Stroke Foundation. Clinical Guidelines for Stroke Management. Melbourne, Australia. Available from http://strokefoundation.com.au/site/media/Clinical_Guidelines_Acute_Management_Recommendations_2010.pdf

Bonny, A., Epacka, M., Mandengue, S. L., Ellong, A., Nana, A., Moumbe, S. et al. (2011). Macrovascular complications of diabetes mellitus and risk factors in Cameroon: The Douala registry. *Cardiovascular Journal of Africa.* May/June, Supp. 22, No.3. Conference: 10th Pan African Society of Cardiology Conference and the Uganda Heart Association Kampala Uganda. Available from http://www.cvja.co.za/onlinejournal/vol22/CVJA_PASCAR_Abstracts_2011.pdf

Bryer, A., Connor, Haug, P., Cheyip, B., Staub, H., Tipping, B., Duim, W.B. and Pinkney-Atkinson, V. (2011). The South African guideline for the management of ischemic stroke and transient ischemic attack: Recommendations for a resource-constrained health care setting. *International Journal of Stroke & 2011 World Stroke Organization*. 6, 349–354. DOI: 10.1111/j.1747-4949.2011.00629.x

Bryer, A., Connor, M.D., Haug, B., Cheyip, H., Staub, B., Tipping, W., Duim, V., & Pinkney-Atkinson (2010). South African guideline for management of ischaemic stroke and transient ischaemic attack 2010: A guideline from the South African Stroke Society (SASS) and the SASS Writing Committee. *South African Medical Journal*, 100(11), 750 – 778.

Chiasseu, M. M. & Mbahe, S. (2011). [Descriptive study of cerebrovascular accidents in Douala, Cameroon]. [French]. *Medecine Tropicale*.71(5):492-4.

CMAJ Lindsay, M.P., Gubitz, G., Bayley, M., Hill. M.D., Davies-Schinkel, C., Singh, S., & Phillips, S. *Canadian Best Practice Recommendations for Stroke Care (Update 2010).*

On behalf of the Canadian Stroke Strategy Best Practices and Standards Writing Group. 2010; Ottawa, Ontario Canada: Canadian Stroke Network.

CSQCS Bayley M, Lindsay P, Teasell R, et al. (2006). Canadian Stroke Quality of Care Study: quality indicators for stroke rehabilitation (in collaboration with SCORE). Toronto (ON): Canadian Stroke Network, Ontario Ministry of Health and Long-Term Care and Institute for Clinical Evaluative Sciences.

EBRSR *Evidence-Based Review of Stroke Rehabilitation* (2013). Teasell, R., Foley, N., Salter, K. Available from http://www.ebrsr.com/

Echouffo-Tcheugui, J. B. & Kengne, A. P. (2011). Chronic non-communicable diseases in Cameroon - burden, determinants and current policies. *Globalization and Health*.7, 44. doi:10.1186/1744-8603-7-44

Grimshaw, J., Eccles, M., & Russell, I. (1995). Developing clinically valid practice guidelines. *Journal of Evaluation in Clinical Practice*.1(1), 37-48. [PMID: 9238556]

Hoppe, C. (2006). Stroke may appear to be rare in Saudi-Arabian and Nigerian children with sickle cell disease, but not in Cameroonian sickle cell patients - Response to Njamnshi et al [2]. *British Journal of Haematology*.133 (2), 211.

HSFO Heart and Stroke Foundation of Ontario (2007) Consensus Panel on the Stroke Rehabilitation System to the Ministry of Health and Long-Term Care. *Consensus Panel on the Stroke Rehabilitation System: time is function*. Toronto (ON): Heart and Stroke Foundation of Ontario. Available from http://www.heartandstroke.on.ca/atf/cf/%7B33C6FA68-B56B-4760-ABC6-D85B2D02EE71%7D/SRSCP_FULL_REPORT_FINAL20070430%5B1%5D.pdf

Kengne, A. P., Amoah, A. G., & Mbanya, J. C. (2005). Cardiovascular complications of diabetes mellitus in sub-Saharan Africa. *Circulation,* 112, 3592-3601.

Kengne, A. P., Ntyintyane, L. M., & Mayosi, B. M. (2012). A systematic overview of prospective cohort studies of cardiovascular disease in sub-Saharan Africa. *Cardiovascular Journal of Africa, 23,* 103-112.

Kengne, A.P., & Anderson, C.S. (2006).The neglected burden of stroke in Sub-Saharan Africa. *International Journal of Stroke*. 1(4), 180–90.

Kolapo K. O. and Vento, S. (2011). Stroke: a realistic approach to a growing problem in sub-Saharan Africa is urgently needed. *Tropical Medicine and International Health* 16 (6) 707–710. doi:10.1111/j.1365-3156.2011.02759.x

Legg L, and Langhorne P. (2004). Rehabilitation therapy services for stroke patients living at home: systematic review of randomised trials. *Lancet*; 363:352-356.

Lewin, S., Oxman, A.D., Lavis, J., Fretheim, A., Marti S. G., & Munabi-Babigumira, S. (2009). SUPPORT Tools for evidence-informed policymaking in health 11: Finding and using evidence about local conditions. *Health Research Policy and Systems*, 7(Suppl 1):S11. doi:10.1186/1478-4505-7-S1-S11. Available from http://www.health-policy-systems.com/supplements/7/s1

Mensah, G.A. (2008). Epidemiology of stroke and high blood pressure in Africa. *Heart*. 94(6), 697-705. doi: 10.1136/hrt.2007.127753

NICE National Institute for Health and Clinical Excellence (2007). *The Guideline Manual*. http://www.nice.org.uk/guidelinesmanual

Njamnshi, A. K., Blackett, K. N., Mbuagbaw, J. N., Gumedze, F., Gupta, S., & Wiysonge, C. S. (2006). Chronic Chlamydia pneumoniae infection and stroke in Cameroon: a case-control study. *Stroke*, 37, 796-799.

Njamnshi, A. K., Lekoubou, A. Z., Djientcheu, V., Nkam, M., & Muna, W. F. T. (2009). Predicting 30-day mortality in patients admitted with spontaneous parenchymal brain haemorrhage (SPBH) in the intensive care unit of the Yaounde University Hospital Center. *Journal of the Neurological Sciences*. Conference: October 2009.

Njamnshi, A. K., Mbong, E. N., Wonkam, A., Ongolo-Zogo, P., Djientcheu, V. D., Sunjoh, F. L. et al. (2006). The epidemiology of stroke in sickle cell patients in Yaounde, Cameroon. *Journal of the Neurological Sciences*, 250(1-2), 79-84.

Njamnshi, A. K., Wonkam, A., Djientcheu, V. P., Ongolo-Zogo, P., Obama, M. T., Muna, W. F. et al. (2006). Stroke may appear to be rare in Saudi-Arabian and Nigerian children with sickle cell disease, but not in Cameroonian sickle cell patients. *British Journal of Haematology*, 133(2), 210.

Njamnshi, A. K., Wonkam, A., Ongolo-Zogo, P., Mbong, E. N., Acho, A., Ruffieux, N. et al. (2009). The risk of stroke in sickle cell subjects in Cameroon: The first report. *Journal of the Neurological Sciences*. Conference.

Njankouo, Y.M., Luma, H.N., Ngahane, H. B. M., Mbahe, S., Doumbe, J., Tchaleu, B., Halle, M. P., Ba, H., and Njamnshi, A.K. (2012). Prévalences des acteurs de risqué d'accident vasculaire cérébral en milieu a Douala, Cameroun. *Revue de Médicine et de Pharmacie*, 2 (1), 143 – 151.

Ntep-Gweth, M., Zimmermann, M., Meiltz, A., Kingue, S., Ndobo, P., Urban, P. et al. (2010). Atrial fibrillation in Africa: clinical characteristics, prognosis, and adherence to guidelines in Cameroon. *Europace*, 12(4), 482-487.

Ntusi, N. B. A. & Mayosi, B. M. (2009). Epidemiology of heart failure in sub-Saharan Africa. *Expert Review of Cardiovascular Therapy, 7*, 169-180.

Ottawa Panel, Khadilkar A, Phillips K, et al. (2006). Ottawa Panel evidence-based clinical practice guidelines for post-stroke rehabilitation. *Topics in Stroke Rehabilitation*, 13(2): 1269

Qaseem, A., Forland, F.; Macbeth, F., Ollenschlager, G., Phillips, S., and van der Wees, P. for the Board of Trustees of the Guidelines International Network. 2012 Guidelines International Network: Toward International Standards for Clinical Practice Guidelines. *Annals of Internal Medicine*, 156, 525-531.

SCORE (Stroke Canada Optimization of Rehabilitation through Evidence) evidence- based recommendations for the upper and lower extremities and risk assessment post-stroke 2007. Ottawa (ON): Canadian Stroke Network; 2007. Available: http://www.canadianstrokenetwork.ca/wp-content/uploads/2010/03/SCORE_EBR_Aug2307.pdf

Shey Wiysonge, C. U., Ngu, B. K., & Mbuagbaw, J. N. (2004). Risk factors and complications of hypertension in Yaounde, Cameroon. *Cardiovascular Journal of South Africa*, 15(5), 215-219.

SIGN 50: A guideline developers' handbook. Scottish Intercollegiate Guideline Network; 2004. Available from http://www.sign.ac.uk/guidelines/fulltext/50/index.html

SIGN 118 Scottish Intercollegiate Guidelines Network (2010). Management of patients with stroke: Rehabilitation, prevention and management of complications, and discharge

planning: A national clinical guideline. Available from http://www.sign.ac.uk/pdf/sign118.pdf

SIGN 119 Scottish Intercollegiate Guidelines Network (2010). Management of patients with stroke: identification and management of dysphagia: A national clinical guideline. Available from http://www.sign.ac.uk/pdf/sign119.pdf

Singapore Ministry of Health. (2009). *MOH Clinical Practice Guidelines 2. Stroke and Transient Ischaemic Attacks Assessment, Investigation, Immediate Management and Secondary Prevention*. Published by the Singapore Ministry of Health, Singapore 169854 ISBN 978-981-08-3686-3. Available from the MOH website: http://www.moh.gov.sg/cpg

Sobngwi, E., Kengne, A. P., Balti, E. V., Fezeu, L., Nouthe, B., Djiogue, S. et al. (2011). Metabolic Profile of Sub-Saharan African Patients Presenting with First-ever-in-lifetime Stroke: Association with Insulin Resistance. *Journal of Stroke and Cerebrovascular Diseases*. 21(8):639-46. doi: 10.1016/j.jstrokecerebrovasdis.2011.02.009

Turner, T., Misso, M., Harris, C., & Green, S. (2008). Development of evidence-based practice guidelines: Comparing approaches. *Implementation Science*, 3,45, doi: 10.1186/1748-5908-3-45. Available from http://www.implementationscience.com/content/3/1/45

World Health Organization. (2010). Community-based rehabilitation: CBR Guidelines. ISBN 9789241548052. Available from http://www.who.int/disabilities/cbr/en/

Appendix 1: The AGREE Process

The AGREE Process (http://www.agreetrust.org/) was used to guide our development of these guidelines. The Appraisal of Guidelines for Research and Evaluation (AGREE) Instrument evaluates the process of practice guideline development and the quality of reporting. Rationale for using these guidelines for the AGREE process:

1) Our priority was to look for guidelines from LMIC (low and middle income countries) to reflect as closely as possible to the context of Cameroun. Guidelines from Africa, specifically sub-Saharan, would be most relevant, followed by guidelines from other LMIC, such as in parts of Asia and South America. As far as we are aware, the South African guidelines are the only existing, published guidelines from Africa.
2) Another problem was to find guidelines that were accessible and available to be downloaded online. Although there are guidelines from China and other Asian regions, these are not available to the public. We were able to access guidelines from the Philippines as well as from Singapore.
3) A second priority was also to incorporate a document that is not from LMIC but is an example of a guideline that is of very high quality and is also recent. The Stroke Canada guidelines have been drafted in the last five years and represent a synopsis of existing guidelines from the American Academy of Neurology, other Canadian and American organizations, Chinese stroke trials, and guidelines from Australia, New Zealand and the Scottish Intercollegiate Guidelines Network. We therefore chose this guideline because it covers a very broad range of guidelines from around the world and likely incorporates important points from multiple sources and different international perspectives. The authors of this guideline also followed the AGREE process for drafting the full Canadian stroke guidelines.

Guidelines should be assessed by at least two appraisers. The appraisers were Alexa Bramall and Tim Fanfon.

Conclusions of AGREE II Assessment

Final Domain Scores

Domain	Canada	SA	Singapore	Philippines
1. Scope and purpose	20	18	15	13
2. Stakeholder involvement	18	10	16	8
3. Rigour of development	42	32	26	25
4. Clarity of presentation	19	19	16	18
5. Applicability	28	20	16	18
6. Editorial independence	13	14	6	4
7. Total	140	113	95	86

Final Synopsis:

- The Canada guidelines exceed other guidelines in the **quality** of the recommendations, the summary of evidence for each recommendation, the addition of specific implementation strategies and performance measures at the end of each recommendation and the specificity of the recommendations themselves. This is not surprising, since this group actually used the AGREE tool to formulate their own guidelines and recommendations. The number of reference guidelines was large, and the working group was also extremely sizeable and diverse.
- The problem with the Canada guidelines, is the applicability, which is not included in the AGREE scores, but which is essentially one of the most important aspects in the ADAPTE process. Therefore, although the Canada guidelines are superior in terms of rigour, they are the least applicable, being devised for use in a country without significant technology limitations and with many tertiary care centres
- The guidelines from SA also follow a rigorous process and come in a close second in the overall AGREE score --- it would make sense to try to synthesize recommendations from the Canada and the SA guidelines as the SA guidelines could possibly make up for the applicability problems of the Canada guidelines. The SA and Canada guidelines can form the **primary** sources for development of the Cameroonian guidelines
- Although the Singapore and Philippine guidelines do not conform as well to the stringent requirements of the AGREE tool, this does not mean that there is not important information that can be garnered from these guidelines. These can therefore be used for a **secondary** analysis of the recommendations, and parts of these guidelines that are deemed to be superior can be incorporated into the draft Cameroonian guidelines (e.g. the format in the Philippine guidelines for acute stroke management is exceptionally easy to follow in tabular format).

Guideline Document	Year	Major Advantages	Major Disadvantages	How the guideline was used
Canada	2008	Rigorous, outcome measures, implementation information, comprehensive recommendations which are unambiguous	Applicability to the Cameroonian context	Primary source for development taking into consideration resource limitations
South Africa	2010	Clear, comprehensive guidelines, context of Africa	Implementation measures and barrier information somewhat lacking	Primary source for development
Singapore	2009	Better description of stakeholder involvement	Recommendations more ambiguous, applicability may be an issue	Secondary source
Philippines	2006	Clarity of presentation in certain areas, context closer to Cameroon	Does not follow a number of requirements in the AGREE process	Secondary --- the format used in part of this guidelines is superior and takes into consideration resource limitations → this was used as a model for the development of the draft Cameroonian guidelines

Appendix 2: The Cameroon Stroke Screening Scale (CSSS)

The CSSS is an approach used to diagnose the presence of a possible stroke in a patient. It tests signs for abnormal findings which may indicate that the patient is having a stroke**. If there are abnormal findings, the patient may be having a stroke and should be transported to a hospital as soon as possible.**

STEP 1: Get Basic Information Time that screening performed (use 24hr clock)

1. **Patient Name** (family name) (given name) (other name)

2. **Information/History from**: [ ] Patient [ ] Family Member [ ] Other (include name - if other than patient)
(phone number – include all family/friends that are important)

3. **Last known time patient was at baseline or deficit free and awake**: (use 24 hour clock) (date) When did this incident happen, and when did symptoms begin? When was the last time that the patient was fine?

STEP 2: Get Screening Information

SCREENING CRITERIA	Yes	Not known	No
Is he/she unconscious? (if the person is unconscious, consider other possible causes)			
Age > 45 Increased risk if over 45 years old			
History of seizures or epilepsy (Increased risk if there is a history of seizures)			
Symptom duration less than 24 hours?			
Prior to the incident, did the person use a wheelchair or was bedridden? Consider the person's previous condition			
Has the person suddenly fallen down, with no reason? (Increased chance if there have been recent falls)			
Does the person have a history of diabetes? Blood glucose between 60 and 400? Increased risk with history of diabetes; hypoglycemia can mimic stroke			
Does the person have a history of diagnosed hypertension?			
Is the pulse strong and slow? If yes, then there is increased risk that it is stroke.			

STEP 3: If the person is conscious, ask him/her to do the following:

1. ***"Can you show me your teeth?"*** *Facial droop:* Have the person smile or show his or her teeth. If one side doesn't move as well as the other or it seems to droop, that could be sign of a stroke.
Stroke less likely if both sides of face move equally, and if the sides of the face look the same.
Stroke more likely if one side of face does not move as well as the other, does not move at all, or if the sides of the face look different.
2. ***Arm drift:*** **"Please hold both arms out in front of you"** Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds.
Stroke less likely: Both arms move equally the same or both arms do not move at all.
Stroke more likely if one arm drifts down compared with the other side or one arm doesn't move at all.
3. ***Speech:*** Have the person say, "**I wan chop achu" or "I wan chop njamanjama**" or some simple, familiar saying.
Stroke is less likely if the patient uses correct words with no slurring.
Stroke more likely if the person slurs the words, gets some words wrong, or is unable to speak.
4. ***Hand grip*** **Right** Normal Weak No grip **Left** Normal Weak No grip
Based on exam, patient has only one (not both sides) weakness: [ ] YES [ ] NO
Stroke more likely with one sided weakness. Stroke is less likely if both hands have grip strength.

Other symptoms (e.g. visual impairment)? Summary, Plan, Other Impressions/Comments:

Is referral required? If so, to where?

Form Completed by (print name and sign):

The Cameroon Stroke Screening Scale has been developed for use in the North West Region. It is adapted from current practices in the region and well-known scales: The Cincinnati Prehospital Stroke Scale (CPSS) a three-item scale based on a simplification of the National Institutes of Health (NIH) Stroke Scale. It uses the mnemonic, FAST ("Face", "Arm", "Speech", "Time"); The Los Angeles Prehospital Stroke Screen (LAPSS) is an instrument designed to allow personnel to rapidly identify acute stroke patients in the field; The Ontario Pre-Hospital Stroke Screening Tool has been widely used in Canada.

Supporting Information about Screening for Health Care Providers dealing with patients who are experiencing stroke

Patients with 1 of the first 3 key findings (face, arm drift, speech) **as a new event** have a 72% probability of an ischemic stroke. If all 3 findings are present the probability of an acute stroke is more than 85%.A stroke that affects the motor system can cause weakness in the muscles of only one side of the face. The request "Please smile" is an attempt to gauge whether the facial muscles contract with equal strength on the right and left sides; to make this assessment, some health professionals ask potential stroke victims to try to smile. However, the normal smile of a healthy person is often asymmetric, and an asymmetric smile in a patient can be the result of habit rather than a sign of a stroke.

Instead of asking for a smile, neurologists ask potential stroke victims to "show me your teeth" while demonstrating a grin that bares both sides of their upper teeth. This task requires the patient to strongly contract facial muscles on both the right and the left sides of the mouth. Weakness on one side produces a lopsided grin that reveals more upper teeth on the stronger side. The public is often told to use "Please smile" because its use requires less explanation, but "Show me your teeth" is the preferred stroke test.

It is important to COLLECT CRITICAL BACKGROUND INFORMATION

The first responder should attempt to collect essential information about the patient. Because time is of the essence, responders gather telephone numbers of relatives and witnesses. If knowledgeable people are available, they are asked to meet responders at the receiving hospital, or, if necessary, to travel with the patient. For emergency treatments, it will be helpful if next-of-kin are immediately available for consent.

Written records should be made and then passed on to the medical team at the receiving hospital. Ideally, each centre will have pre-prepared checklists with the essential questions and with blank spaces available for all the critical information.

Put the person in bed with the head a little higher than the feet. If the patient is unconscious, roll her head back and to one side so her saliva (or vomit) runs out of her mouth, rather than into her lungs. While she is unconscious, give no food, drink, or medicines by mouth (see the Unconscious Person, p. 78, in the book Where There is No Doctor). If possible, seek medical help.

TRANSPORTING THE PATIENT

If there is a need to transport the person, carefully consider how this will be done. Maintaining airway, breathing, and circulation are the first priorities. For strokes, keeping the head flat (i.e., supine or 0° elevation) usually offers better brain circulation than keeping the head elevated, when the flat position does not impair the ABCs.

After stabilizing the patient, time is very important. As soon as possible, begin transporting the patient to the appropriate Causality/Emergency Department if possible and continue the rest of the pre-hospital care en route.

Each health centre should know and have maps or clear directions showing the nearest appropriate Emergency Department for stroke victims in any area (Adams et al., 2007; Crocco et al., 2007).

Whenever possible, the receiving hospital should be notified by the referring health professional or a accompanying care provider that a person with potential acute stroke will be arriving. This has been shown to shorten the eventual time between delivery to the hospital and receipt of treatment. Describing the patient's condition, time of onset of symptoms, and medical history allows the mobilized doctors, nurses, imaging specialists, and pharmacists of the receiving hospital (and the acute stroke team if there is one) to begin planning.

Information goes both ways between the field team and the causuality/emergency department. The hospital can advise the people transporting the patient about managing complications, such as severe hypertension, hyperglycemia, or cardiac dysfunction.

Oxygen. Strokes are crises of insufficient oxygen delivery to the brain, so it is important to keep the patient's blood oxygen saturation at normal levels. Attach a pulse oximeter and treat hypoxemia (in this case, oxygen saturation <95%) with supplemental O_2. Currently, there is no indication that supplemental oxygen will benefit a patient who already has a normal blood oxygen saturation.

When acute resuscitation is needed, insert an IV line immediately. Otherwise, consider starting an IV en route after consulting the destination hospital. Some key brain imaging studies require large bore IV lines that must be inserted proximally (i.e., no more distal than the antecubital fossa). If the receiving hospital will need a specialized IV line, time can be saved by having the appropriate line in place in advance.

IV fluids. Treat shock or significant dehydration with balanced salt solutions (isotonic crystalloids, such as normal saline). Otherwise, saline lock the IV or set the IV to drip the minimum amount of balanced salt solution to keep the line open. In general, the goal is to add only a minimal amount of extra fluid, because overhydration can cause cerebral edema. (Another concern is hyperglycemia, which can worsen the injury in a stroke. Therefore, do not use dextrose solutions unless you are correcting hypoglycemia.)

Blood glucose level. Hypoglycemia produces symptoms that look like stroke, and persistent hypoglycemia will cause brain injury. Therefore, as soon as possible, check the patient's capillary blood glucose level and treat hypoglycemia with glucose. Diabetic hypoglycemia and other metabolic disorders can mimic (look like) stroke, as well as cause seizures. Similar symptoms may occur in patients with hypoglycemia secondary to alcoholism. Those with hyperglycemic nonketotic hyperosmolar states, severe hyponatremia, and hepatic encephalopathy may also present with focal stroke-like symptoms. Neurologic changes associated with metabolic disorders generally resolve rapidly with the administration of IV glucose, but on rare occasions may take several hours to resolve.

While ECG is desirable, it is not currently realistic in the NWR, therefore recommendations about ECG use are not included here. However, responders should be 1) watching for serious cardiac consequences. The brain's reaction to stroke includes an increase in the body's sympathetic tone, and this predisposes a person to arrhythmias and myocardial infarctions. And 2) Screen for cardiac causes: Strokes can be caused by preexisting atrial fibrillation or by atherosclerosis.

Hypertension management. Hypertension is a common finding in acute stroke. However, blood pressure management is an art in stroke victims, and the choice of treatment depends on a detailed diagnosis that can only be made in a hospital.

References for Screening

Adams HP Jr., et al. (2007). Guidelines for the early management of adults with ischemic stroke: A guideline from the American Heart Association. *Circulation*, 115, e478–e534.

Crocco TJ, et al. (2007). EMS management of acute stroke—Prehospital triage (Resource document to NAEMSP position statement). *Prehospital Emergency Care*, 11(3), 313–317.

Hurwitz AS, Brice JH, Overby BA, Evenson KR (2005). "Directed use of the Cincinnati Prehospital Stroke Scale by laypersons". *Prehospital Emergency Care* **9** (3): 292–6. doi:10.1080/10903120590962283. PMID 16147478.

Kothari, R.U., Pancioli, A., Liu, T., Brott, T., & Broderick, J. (1999). Cincinnati Prehospital Stroke Scale: Reproducibility and validity. *Annals of Emergency Medicine*, 33(4), 373–378 doi:10.1016/S0196-0644(99)70299-4. PMID PMID 10092713.

Nau, K.C., Crocco, T., Biola, J., & Larrabee, H. (2010). Is it stroke, or something else? *Journal of Family Practice*, 59(1), 26-30

Werner, D. (1992). *Where there is no Doctor*. Hesperian. Available from http://hesperian.org/

Appendix 3: Example Referral Form

(Adapted from Cameroon Baptist Convention CBR Referral)

Date of Referral: _____ Name of person making the referral_____

CLIENT DETAILS

Name _____ Sex_____ Age /DOB_____

Address_____ Cell phone_____

Guardian or parent's name (if nec):_____ Resident of_____

DIAGNOSIS: _____

REFERRED TO_____

REASON FOR REFERRAL_____

_____

_____

_____

Expected return visit date to person making referral: _____

Signature and phone number of staff person referring: _____

****

Counter referral form:

Please complete the following information after you have seen the patient, and then send it back to the referral source with the client/patient or send directly to the person who made the referral.

Name of patient _____

Date client/patient was seen: _____

Diagnoses _____

Follow-up advice/comments _____

_____

Signature of consultant _____

Appendix 4: Example Assessments for Dysphagia

A recent review by Schepp and colleagues (2012) identified 4 tools that can be used to screen after acute stroke. Three are available through publications (see citations below). These tools would need to be adapted and tested in the North West context. We include them here to assist practitioners to consider the importance of dysphagia in their work with people who have experienced stroke.

Schepp, S. K., Tirschwell, D. L., Miller, R. M., & Longstreth, W. T., Jr. (2012). Swallowing screens after acute stroke: a systematic review. Stroke, 43, 869-871.

Barnes Jewish Hospital Stroke Dysphagia Screen (previously titled the Acute Stroke Dysphagia Screen, ASDS)

Edmiaston J, Connor LT, Ford AL. SWALLOW-3D, a simple 2-minute bedside screening test, detects dysphagia in acute stroke patients with high sensitivity when validated against video-fluoroscopy (abstract). Stroke. 2011;42:e352

Edmiaston J, Connor LT, Loehr L, Nassief A. Validation of a dysphagia screening tool in acute stroke patients. Am J Crit Care. 2010;19: 357-364

STROKE DYSPHAGIA SCREEN

Date: _____

To be completed on all patients upon admission with diagnosis of stroke.
If any of the following questions are answered with a yes, stop and refer to speech pathology.

	YES	NO
1) Is the Glascow Coma Scale LESS than 13?	☐	☐
2) Is there Facial Asymmetry/Weakness?	☐	☐
3) Is there Tongue Asymmetry/Weakness?	☐	☐
4) Is there Palatal Asymmetry/Weakness?	☐	☐
5) Are there signs of aspiration during the 3 oz water test?	☐	☐

- If all findings for the first 4 questions are **NO**, proceed to the 3 oz water test.
- Administer 3 oz of water for sequential drinks, note any throat clearing, cough or change in vocal quality immediately after and 1 minute following the swallow. If clearing, coughing or change in vocal quality is noted, refer to speech therapy.
- If all of the answers to the above questions are **NO**, then start the patient on a regular diet.

_____
R.N. signature

Assessment methodology and form developed by Barnes Jewish Hospital, Speech Pathology Services

Modified Mann Assessment of Swallowing Ability (MMASA)

Antonios N, Carnaby-Mann G, Crary M, Miller L, Hubbard H, Hood K, et al. Analysis of a physician tool for evaluating dysphagia on an inpatient stroke unit: the Modified Mann Assessment of Swallowing Ability. Journal of Stroke and Cerebrovascular Diseases. 2010; 19:49-57.

INSTRUCTIONS:

Circle the most appropriate clinical findings for each indicator. Calculate the total score by adding the points for each indicator.

Patient Name_____

Date _____

1. Alertness

Task: Observe and evaluate the patient's response to speech, limb movement, or painful stimulation

Grade: 10 Alert
8 Drowsy-fluctuating awareness/alert level
5 Difficult to arouse by speech or movement
2 Coma or nonresponsive

2. Cooperation

Task: Gain patient's attention and attempt to initiate communication or activity.

Grade: 10 Cooperative–engages in some form of verbal or nonverbal exchange
8 Fluctuating co-operation
5 Reluctant co-operation
2 No co-operation/response

3. Respiration

Task: Assess status of patient's Task: Assess status of patient's

Grade: 10 Chest clear, no clinical or radiographic evidence of abnormality
8 Sputum in the upper airway or other respiratory condition (e.g., asthma/bronchospasm, chronic obstructive pulmonary disease)
6 Fine basal crepitations/self-clearing
4 Coarse basal crepitations
2 Suspected infection/frequent suctioning/respirator dependent

4. Expressive Dysphasia

Task: Assess for disturbances expression

Grade: 5 No abnormality
4 Mild difficulty finding words/expressing ideas
3 Expresses self in a limited manner/short phrases or words
2 No functional speech sounds or undecipherable single words
1 Unable to assess

5. Auditory Comprehension

Task: Ability to understand basic verbal communication

Grade: 10 No abnormality
8 Follows ordinary conversation with little difficulty
6 Follows simple conversation/instructions with repetition
4 Occasional response if cued
1 No response

6. Dysarthria

Task: Assess articulation

Grade: 5 No abnormality
4 Slow with occasional hesitation and slurring
3 Speech intelligible but obviously defective rate/range/strength/coordination
2 Speech unintelligible
1 Unable to assess

7. Saliva

Task: Observe patient's control of of saliva; note any escape of secretions from the side of the mouth

Grade: 5 No abnormality
4 Frothy/expectorated into cup
3 Drooling at times, during speech, while side lying or fatigued
2 Some drool consistently
1 Gross drooling, unable to control drooling

8. Tongue Movement

Task: Assess tongue movement

Protrusion: Have patient extend tongue as forward as possible, and then retract

Lateralization: Have patient touch each corner of the mouth, then repeat alternating lateral movements

Elevation: With mouth wide open, have patient raise tongue up to palate; alternate elevation and depression in this way

Grade: 10 Full range of movements/no abnormality detected
8 Mild impairment in range
6 Incomplete movement
4 Minimal movement
2 No movement or unable to perform

9. Tongue Strength

Task: Assess bilateral tongue strength Have patient push laterally and anteriorly against tongue blade

Grade: 10 No abnormality
8 Minimal weakness
5 Obvious unilateral weakness
2 Gross weakness or unable to perform

10. Gag

Task: Contact posterior pharyngeal wall on either side separately.

Grade: 5 No abnormality
4 Diminished bilaterally
3 Diminished unilaterally
2 Absent unilaterally
1 No gag response

11. Cough Reflex

Task: Ask patient to cough as strong as possible. Observe strength and clarity of cough

Grade: 10 No abnormality
8 Cough attempted, but hoarse in quality
5 Attempt inadequate
2 No attempt or unable to perform

12. Palate

Task: Ask patient to produce a strong ''AH'' several times and sustain each one for several seconds, Observe for hypernasality and note action of palate elevation

Grade: 10 No abnormality
8 Slight asymmetry noted; mobile palate
6 Unilaterally weak and inconsistently maintained
4 Minimal movement, nasal regurgitation, nasal air escape
2 No elevation of pal or unable to perform

MMASA Score: _____

Interpretation

Score > 95: Start oral diet and progress as tolerated. Monitor first oral intake and consult SPEECH PATHOLOGYif patient has difficulty eating or drinking.

Score< 94: Nothing by mouth and consult SPEECH PATHOLOGY for a formal swallow evaluation.

A swallowing screen conducted by emergency physicians

Turner-Lawrence DE, Peebles M, Price MF, Singh SJ, Asimos AW. A feasibility study of the sensitivity of emergency physician dysphagia screening in acute stroke patients. Ann Emerg Med. 2009; 54:344-348