



DEPARTMENT OF HEALTH
Republic of South Africa

FOREWORD

It is my pleasure to introduce the National Guideline on Stroke and Transient Ischaemic Attack Management. This is one of the stepping-stones of the Department of Health towards improving quality of care at all levels of the health system, especially preventive and promotive health.

I would like to thank all the role players who have given many hours of their valuable time to the development of this Guideline.

Stroke is a devastating disease that causes death and disability and confers a huge financial burden on the individuals, the families and the state. This document provides valuable information on preventing Stroke and Transient Ischaemic Attack, empowering patients and their families and assisting health professionals in caring for stroke patients.

Let us be pro-active and provide effective stroke management with early and active rehabilitation, guidance and support for the stroke patients.

A handwritten signature in black ink, appearing to read 'Mantobalala'.

DR MANTO TSHABAIAIA-MSIMANG
MINISTER OF HEALTH



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NATIONAL GUIDELINE ON STROKE AND TRANSIENT ISCHAEMIC ATTACK MANAGEMENT

1. INTRODUCTION

Stroke is a brain attack!

Stroke is a word used to describe a cerebrovascular haemorrhage, embolus or thrombosis that results in damage to neuronal tissue. Strokes are defined as minor/reversible or major/irreversible. Minor strokes include Transient Ischaemic attacks, reversible stroke and minor residual neurological signs. Major stroke is any cerebrovascular event resulting in permanent disability or death. Stroke or "Brain attack" remains one of the biggest challenges facing modern medicine. Early diagnosis is essential to enable appropriate intervention, which can reduce mortality, morbidity and disability.

There is a worldwide swing to managing acute stroke aggressively and effectively. A number of new developments have caused a shift in attitude from a nihilistic approach to stroke to one of justified-therapeutic and preventive intervention. Stroke is one of the commonest causes of disability and death in South Africa.

In South Africa, stroke is the third most frequent cause of all deaths reported in the country and in 1990 accounted for 9,6% of all reported deaths. Of all the deaths reported in the age group 25-64 years, 7.45% were due to stroke.

The highest documented stroke rates are found in the Coloured and Indian communities of South Africa, with age-standardised mortality rates (1984-1986) of approximately 125-175 per 100 000 per annum. The lowest rates were found in the white community at the rate of about 70 per 100 000 per annum. Stroke mortality rates were similar in men and women in South Africa, but incidence is approximately 30% higher in men than in women. Very few figures are available for African communities but are assumed to be much higher, a suggested figure of 300 per 100 000. What is now known is that black patients present much younger with stroke than white patients, the cause among black patients is mainly related to small vessel disease (hypertension) and morbidity is higher in this group.

It can be estimated that there are about 6 million hypertensive people, 7 million smokers and 3-4 million diabetic patients in South Africa who are at risk for having a stroke.

2. MAIN OBJECTIVES

- 2.1 To establish a comprehensive programme to optimise the prevention and management of stroke
- 2.2 To facilitate optimum patient care by early diagnosis and appropriate therapy to prevent secondary complications.
- 2.3 Education of patients and their families, the community and health professionals to enhance adherence.
- 2.4 Most effective use of resources in relation to different types of stroke.
- 2.5 To evaluate and monitor policy outcomes.

3. RISK FACTORS FOR STROKE

3.1 NON-MODIFIABLE RISK FACTORS:

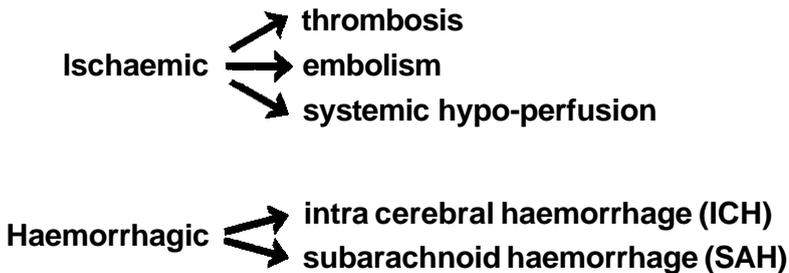
Age	Incidence of stroke more than doubles in each decade after 55 years.
Gender	Incidence is approximately 30% higher in men than in women.
Race	Affects all groups and is a high cause of overall mortality in South Africa. Family history of stroke.

3.2 MODIFIABLE RISK FACTORS FOR STROKE:

✓ Blood Pressure	Major risk factor. The higher the blood pressure the higher the risk. Refer to national hypertension guideline.
✓ Diabetes mellitus	Major risk factor. Refer to national guideline for diabetes.
✓ Tobacco smoking	Major risk factor. Give every patient information on why smoking should be stopped.
✓ Alcohol	Heavy alcohol intake is a stroke risk factor and is synergistic with hypertension in causing both haemorrhage and infarction of the brain.
✓ Atheroma	Most patients with stroke caused by atheroma will have higher probability of having coronary artery disease (CAD)
✓ Hypercholesterolaemia	Major risk factor for atheroma in coronary and cerebral blood vessels.
✓ Heart disease / arrhythmia	Major risk factor underlying heart disease usually causing embolic stroke
Atrial fibrillation	In atrial fibrillation without valvular disease the risk of stroke increases with increasing age and increases further if atheroma or other risk factors are present.
Non-atherosclerotic vasculopathies	Connective tissue disorders, giant cell arthritis, drug hypersensitivity, cocaine addiction, infection and infective vasculitis (TB, syphilis, AIDS).
Hyper coagulable states	May be important in young patients: hereditary / congenital forms.
Intra cerebral haemorrhage	Risk factors for haemorrhage must be recognised (e.g. aneurysm, arteriovenous malformation and coagulation defects) Anticoagulant therapy may predispose to cerebral haemorrhage.

4. DIAGNOSIS OF STROKE

A correct diagnosis is needed. The diagnosis is made mainly through a detailed history, general neurological examination, supported by brain and vascular imaging, cardiac evaluation and coagulation tests.



A stroke from ischemic results from impaired circulation in one or more blood vessels of the brain, usually due to thrombosis, embolism, or systemic hypo-perfusion. The most common cause of stroke is thrombosis, which is usually related to arteriosclerosis. Plaque and atheromatous deposits gradually occlude the artery. With embolism, fragments usually break off from a mural thrombus in the left atrium or ventricle or from bacterial vegetations affecting heart valves. These emboli travel through the carotid artery and typically lodge in the smaller cerebral vessels, most often in the left middle cerebral artery. Ischemic may occur suddenly, often followed by necrosis and oedema.

Stroke due to haemorrhage occurs when a cerebral vessel ruptures and blood flows into brain tissue or the subarachnoid space. Haemorrhagic strokes are usually caused by rupture of an arteriosclerotic vessel due to prolonged hypertension, a cerebral aneurism, or an arteriovenous malformation. Effects may be severe. More than 50% of patients die of brain herniation within the first 3 days. Recent studies in South Africa have indicated that HIV/ AIDS related infective vasculitis increases haemorrhagic stroke in young black males.

5. PRIMARY PREVENTION

Primary prevention of stroke involves modifying modifiable risk factors, early identification and clinical management of the modifiable stroke risk factors.

6. EARLY DETECTION

All health professionals should be trained to do clinical assessment and to identify risk factors for stroke.

6.1 5 MAJOR WARNING SIGNALS OF STROKE

- Weakness, numbness or paralysis **of** the face and arm or leg on one or both sides of the body.
- ▶ Sudden blurred or decreased vision in one or both eyes. Sudden onset of double vision.
- Difficulty in speaking or understanding.
- Dizziness, **loss** of balance or any unexplained fall or unsteady gait.
- Headache usually severe and abrupt onset or unexplained changes in the pattern **of** headache.

Swallowing difficulties are a separate but an important symptom

6.2 COMMON PATTERNS OF STROKE (REFER TO ANNEXURE A)

- The signs of a stroke vary according to the site in the brain (left or right hemisphere or brainstem).
- The signs usually follow the symptoms in the pattern of:
 - swallowing disorders
 - speech and language problems
 - motor and/or sensory dysfunction
 - disturbances in vision
 - gait and balance
 - cognitive loss

6.3 TRANSIENT ISCHAEMIC MINOR STROKE ATTACK (TIA)

Any cerebral vascular event lasting less than 24 hours, with full recovery, should be treated as a minor stroke (TIA). Ideally patients should be evaluated within 6 hours and therefore the TIA in the future may be treated as an acute stroke because therapy will be recommended early.

6.4 MAJOR SYMPTOMS AND SIGNS OF TIA OR MINOR STROKE

SYMPTOMS

- ▶ Transient weakness of an arm and/or leg. Transient sensory loss in an arm and/or leg. Both or either may occur.
- ▶ Visual disturbance. This may be transient loss of vision in one eye (amaurosis fugax) or permanent loss of vision in one eye. There may also be loss of vision in both eyes or double vision.
- Speech disturbances. Aphasia or dysarthria.
- ▶ Balance distortion and/or vertigo. They may be other associated symptoms, e.g. visual, swallowing, motor or sensory loss.

SIGNS

- ▶ Disorientation
- Restlessness
- ▶ Decreased attention span
- ▶ Difficulties with comprehension
- ▶ Forgetfulness
- Impaired judgement
- Lack of motivation
- ▶ Emotional difficulties, such as anxiety or mood swings

6.5 OBJECTIVES OF TREATMENT OF TIA AND MINOR STROKE

The objectives of TIA treatment are to:

- ▶ treat as an emergency since **TIA** is a warning sign of an impending stroke.
- prevent progression to an established cerebral ischaemic by initiating early therapy.
- treat any patient with a history of a TIA or who rapidly recovers in hospital after a stroke.

All health professionals should be able to identify signs and symptoms of minor stroke.

Minor Stroke is **a** powerful predictor **of** stroke.

DO NOT IGNORE A MINOR STROKE (TIA) OR SEND THE PATIENT HOME.

It is essential to find the cause and institute risk factor management and secondary prevention.

7. MANAGEMENT OF ACUTE STROKE (MINOR OR MAJOR)

Time is of utmost importance. Acute stroke **is** a medical emergency. Acute stroke is a cerebrovascular event with neuronal damage - temporary or permanent.

7.1 IMMEDIATE EMERGENCY CARE FOR PERSONS WITH NEUROLOGICAL SIGNS

PATIENT'S INITIAL ACCESS TO STROKE CARE

Patients with stroke should be treated as an emergency preferably within **3** hours. Time lost in emergency care will result in 20% more loss of cerebral function in a stroke. Remember time = brain.

Where possible the initial contact with the patient should be in a hospital or health care centre. Avoid home management as the first point of entry because it causes unnecessary delays.

Every stroke patient, no matter where first seen, needs basic urgent **emergency care** to improve cerebral perfusion.

- ▶ Remember A,B,C -Airway, Breathing, Circulation.
- ▶ Ensure clear airway, give oxygen, and maintain cardiovascular integrity.
- ▶ Treat patient lying down rather than sitting.
- ▶ Keep nil per mouth till swallowing problems are excluded.
- ▶ Maintain normoglycaemia. Treat hyper or hypoglycaemia.
- ▶ Treat pyrexia if relevant.
- ▶ Rehydrate with intravenous (IV) normal saline if dehydrated.
- Treat seizures with anticonvulsants. (As available on EDL)
- ▶ **Do not lower blood pressure.** Acceptable blood pressure levels:
Systolic blood pressure (SBP) = $SBP \leq 230 \text{ mmHg}$
Diastolic blood pressure (DBP) = $DBP \leq 120 \text{ mmHg}$
- ▶ Only lower blood pressure in situations of emergency hypertensive complications e.g. aortic dissection or pulmonary oedema. A blood pressure drop of **more than 15% in 24 hours** is likely to extend the infarct. Avoid parenteral and sublingual routes.
- ▶ Give Aspirin 300 mg tablet stat or within 48 hours except in intra cerebral haemorrhage (ICH) and subarachnoid haemorrhage (SAH).
- ▶ Do triage

7.2 TRIAGE (REFERTO ANNEXURE E)

- a) If a *haemorrhage* is suspected liaise immediately with a neurosurgeon and discuss transfer to appropriate level of care. **Do not perform a lumbar puncture or transfer the patient without consultation.** In the event of deep coma, immediate transfer and moving the patient may be more dangerous than supportive nursing care.

If a computed tomography (**CT**) scan is available and feasible this, plus carotid angiography should be done in every patient as soon as possible, preferably within 48 hours but not later than 7 days.

Indications for CT scan are:

- the immediate detection of intra cerebral haematoma or haemorrhagic infarct
- ▶ to exclude treatable causes if diagnosis is in doubt, e.g. subdural haematoma
- to exclude mimics of stroke, e.g. tumour or SAH
- to exclude cerebellar haemorrhage, especially where cerebellar signs and symptoms may point to a cerebellar haemorrhage or infarct
- in cases of doubtful diagnosis, e.g. asymptomatic carotid stenosis, (to decide whether a silent infarct is present). If an **ischaemic stroke** is present the patient should be referred for hospitalisation for a CT scan plus angiography, if feasible.

- b) If a **TIA** or **Minor Stroke** is present, the patient must be assessed for the cause and treated appropriately. A minor stroke may be an emergency. If so, give emergency care.

Unless contraindicated, start therapy with Aspirin 300 mg tablet daily, long term for all minor stroke patients. Fast track the patient to a facility that can do a CT scan, angiogram, carotid artery doppler, full cardiac evaluation and appropriate thrombotic screening, ideally within 24 hours.

- c) Arrange for secondary prevention treatment after the cause of the minor stroke has been established.

It is very important to treat TIA or Minor Stroke to prevent a second stroke and permanent disability.

- d) Young patients (<55 years) with stroke, especially minor stroke (TIA), should ideally be referred to a tertiary institution unless cause is obvious. The causes are often unusual and require specialised investigations.

Additional investigations proposed for young patients and high-risk patients:

- Lipid profile
- Uric acid
- ▶ Antinuclear factor (ANF)
- ▶ Prothrombotic states
- Transoesophageal echocardiography (TEE)
- Human immunodeficiency virus (HIV) status
- Rapid plasma reagin (RPR)
- Erythrocyte sedimentation rate (ESR)

7.3 ASSESS BASIC UNDERLYING CAUSES IN ALL STROKE PATIENTS:

- ▶ Full history of event and previous health status/history
- Previous minor stroke (TIA)
- Activity at onset - very few thrombolytic strokes occur with physical activity
- Course of stroke
 - maximal at onset
 - rapid improvement
 - gradual, stepwise improvement
- Associated symptoms
 - headache
 - loss of consciousness
 - seizure

Do a full physical examination. Focus on risk factors.

- Blood Pressure - both arms in a lying position or sitting position (when ambulatory)
- ▶ Pulses - assess all pulses, note arrhythmias, and auscultate neck for bruits.
- Assess for cardiovascular disease
- ▶ Assess for pulmonary disease
- ▶ Assess for neurological abnormalities, refer to Annexure A
 - site of the lesion
 - how **the** brain is effected
 - what caused the lesion
- Assess for infection

All patients require an electrocardiograph (ECG), chest X-Ray, full blood count including platelets (FBC), international normalised ratio (**INR**), urea and electrolytes (**U & E**) and glucose levels. Other investigations to confirm cause of stroke may be needed, e.g. Doppler studies and electroencephalography (EEG) if focal seizure is suspected.

- ▶ If there are no facilities for a CT scan, the patient should always receive the best appropriate assessment for diagnosis and nursing care. A rehabilitation programme including counselling, psychiatric care if needed, social support, health promotion and therapeutic training of the family should start early.
- Although examples of exceptional recovery despite days or weeks of deep coma - Glasgow Coma Scale <5 (Annexure C) - do exist, it is recommended that unsalvageable cases should be identified at 48 - 72 hours i.e. persistent coma, bladder incontinence or eyes remaining deviated to one side. In these patients avoid over investigation and inappropriate involvement of the rehabilitation team. Establish links with appropriate community support services, train caregivers in basic home care. Counsel the caregivers and family and provide support for them at all times.
- If a haemorrhage, previously unsuspected, is found on CT scan, refer to a neurosurgeon i.e. if there is a subarachnoid or subdural haemorrhage, cerebellar bleed or large intraparenchymal bleed with evidence of pressure and shift.
- ▶ In a tertiary institution with an acute stroke unit and/or intensive care unit (I.C.U), 1 in 20 patients may be eligible for advanced neuroprotective therapy provided all investigations have been completed within 3-6 hours of the stroke.

For thrombolysis CT scan is essential and should be used 3-6 hours after stroke onset. All patients should return as soon as possible to primary care level for health promotion, secondary prevention and rehabilitation.

The ultimate aim of all stroke therapy is to "convert" a stroke into a minor stroke.

7.4 STANDARDS FOR MANAGEMENT OF STROKE PATIENTS

- ▶ An accurate diagnosis of type of stroke.
- ▶ Patients with stroke or threatened stroke have the right of access to appropriate levels of care, resources permitting.
- ▶ Emergency management of acute stroke to be available in all health care services.
- ▶ Information of risk factors for stroke and methods of prevention of modifiable major risk factors to be available at all levels of care.
- ▶ Rehabilitation service should be made available to every patient with a stroke.
- Therapeutic education and health promotion of the patient and family/caregiver to be available.
- ▶ Glasgow Coma Score on every patient caregiver to be available (Refer to Annexure C).
- ▶ Every health care facility to identify either a centre with a CT scan facility and/or a neurosurgeon.
- ▶ A stroke protocol based on this guideline to be available in all health facilities.
- Resources are identified for stroke programme.
- ▶ Multi-disciplinary stroke management team at hospital level.
- ▶ Long-term follow-up system.
- Activities of daily living (Refer to Annexure D).

7.5 SECONDARY STROKE PREVENTION

After a vascular event has occurred, it is important to identify and treat all important causes and risk factors of that event. The purpose of secondary prevention is to prevent or decrease the risk of another stroke. Secondary prevention is of major importance in all TIAs, reversible or minor strokes. A patient who presents with an initial transient or minor stroke is at risk for a second stroke. The second stroke is most likely to occur within 1-2 weeks of the first stroke, especially if the first event was an embolus arising from the heart or stenosis of the carotid artery. The second stroke may result in severe disability.

8. TREATMENT OF STABLE ISCHAEMIC OR TIA STROKE AFTER EMERGENCY CARE (Secondary Prevention)

Treatment will be based on individual diagnosis and riskfactor management

Riskfactor management

Modifiable riskfactors should be targeted.

- ▶ Disease management of hypertension, diabetes and other diseases according to National Guidelines.
- ▶ Cessation of smoking and alcohol misuse.
- ▶ Appropriate treatment for severe infections.
- ▶ Health education of people at risk for stroke is essential.
- Health promotion and therapeutic education for patients and caregivers.

Re-perfusion

Brain ischaemia is due to blockage of the vascular supply of a local region of the brain except in a case of general circulatory failure and systemic hypertension.

- **Antiplatelet therapy**
In prior ischaemic stroke or TIA
75-300mg aspirin long term
- ▶ **Anticoagulant therapy**
In patients with chronic atrial fibrillation
Long-term warfarin with a target international normalised ratio (INR) of 2-3
- **After cardio-embolic stroke from valvular heart disease and recent myocardial infarction.**
 - ▶ Warfarin with a target INR of 3-4
 - ▶ Also consider usage of anticoagulant therapy in patients with mechanical heart valves.

Surgical management for ischaemic stroke Symptomatic patients

According to specialist decision, skills, safety and effectiveness of the procedure

- ▶ carotid endarterectomy with severe carotid artery stenosis of > 50%.

Treatment of minor stroke

Refer back to the primary health care facility / home with a case management plan:

- 75 - 300 mg aspirin long term
- ▶ lifestyle modification
- ▶ management and control of modifiable risk factors e.g. diabetes, hypertension
- ▶ basic rehabilitation programme
- ▶ follow-up is very important.

8.1 COMPONENTS OF A COMPREHENSIVE STROKE SERVICE

Definition - A stroke unit in its broadest context may be defined as a unit in which the multi disciplinary team is knowledgeable about the care of the stroke patient and provides care for such a patient. It does not necessarily imply more or new resources, only a reorganisation of existing resources.

The ideal to aim for throughout the country at provincial and tertiary level is a dedicated stroke unit in each hospital composed of a disease-specific service e.g. a geographically defined ward or mobile team dedicated exclusively to the management of stroke patients.

Stroke care protocols or generic treatment plans should be available to commence acute management from the day of admission incorporating optimal care principles to improve patients' outcomes.

The term "Stroke Service" is broad and should incorporate the range of facilities required to improve comprehensive care for stroke.

The team should include:

- ▶ Specialised nursing staff - ICU/trauma trained
- At least one physician (ideally but not necessarily a neurologist) with interest and expertise in stroke management.
- ▶ Other health professionals - social worker, occupational therapist, physiotherapist and speech and language therapist, psychologist and psychiatrist.

The objectives and aims of a stroke unit are:-

- * Accurately diagnose stroke
- ▶ Early effective treatment of stroke
- Improved outcomes
- Early rehabilitation
- Prevention of second stroke.
- Prevention of complications and treatment of other related medical conditions
- ▶ Develop a rehabilitation and discharge plan for the patient and family
- Improved opportunities for learning and research
- Optimal utilisation of multi-disciplinary team

Comprehensive assessment of all aspects of the patient's illness and disability requires close collaboration between the disciplines involved. All members of the stroke team should play a role in training, education and research on stroke.

There is no evidence of increased cost with a comprehensive stroke service/unit.

8.2 RECOMMENDATIONS FOR INSTITUTING A STROKE SERVICE

- It is a shared responsibility.
- Personnel of each hospital should evaluate how best to improve stroke services. Provincial and national health authorities, the private sector and communities will require support and commitment.
- Develop stroke units involving multi-disciplinary stroke teams.
- Set admission criteria to a stroke unit/service.
- Education and training programme to be in place for emergency (casualty) personnel to evaluate stroke patients, rapidly and effectively.
- Develop standardised management protocols for use in line with the national guidelines.
- Define and implement a referral system.
- Develop case management plan for patients and carers.
- Encourage support systems at community level e.g. care groups.
- Develop outcome indicators to assess stroke units.
- Basic home care training for caregivers.

9. REHABILITATION (POST ACUTE)

9.1 INTRODUCTION

Rehabilitation starts as soon as the patient's condition permits and continues until the individual has reached his or her maximum ability to function within the family and the community. Rehabilitation of stroke is an interdisciplinary process and a variety of professional staff should contribute to the overall management of patients and their families. The multi-disciplinary team is most often made up of doctors, nurses, physiotherapists, occupational therapists, speech and language therapists and, where resources permit, other professionals. Ideally such team members should have specialisation in stroke rehabilitation.

9.2 OBJECTIVES OF THE REHABILITATION GUIDELINES

- ▶ To encourage the effective integration of a comprehensive rehabilitation plan into the formal and informal care system.
- ▶ To define referral mechanisms and systems.
- To facilitate human resource development for all rehabilitation workers.
- To integrate appropriate rehabilitation technology and assisting devices technology.
- To increase accessibility to available services for persons suffering from stroke.
- To sensitise the public and raise awareness of the abilities of persons with stroke.
- To enhance the rights and equalisation process of persons with stroke.

9.3 SERVICE ORGANISATION AT ALL LEVELS OF CARE:-

- * Preventative services.
 - Early detection, diagnosis and intervention.
 - Care, treatment and/or rehabilitation.
 - Social, psychological and other types of counselling.
 - Procurement and provision of technical, mobility aids as well as maintenance services.
 - Follow-up and re-assessment.

- ▶ Referral systems.
- Training services for therapeutic education, including mobility, communication and daily living skills as needed. (Refer to Annexure D).
- ▶ Awareness raising/health promotion.

9.4 ROLES OF TEAM MEMBERS

Rehabilitation of stroke is a multi-disciplinary process and a variety of professional staff should contribute to the overall management of the patients.

Ideally such team members should have specialisation in stroke management. The broad roles of each **professional member** of the team could be elaborated as follows:

Role of doctor: Where feasible, a neurologist or consultant physician with a specific interest in stroke rehabilitation should be involved in the initial rehabilitation stage.

Role of nursing staff: The nursing staff has a pivotal role in all stages of hospital rehabilitation and ensuring adequate care for both patient and the family. Nurses have the responsibility for the prevention and detection of complications, which may compromise the patient's recovery and should be involved in the provision of rehabilitation services when other team members are unavailable.

Role of physiotherapists/assistants: The physiotherapist promotes recovery of motor control, independence in functional tasks, optimises sensory stimulation and assists in the prevention of secondary complications such as soft tissue shortening and chest infections.

Role of speech-language therapist/workers: The speech and language therapist will be involved in all cases where there are communication problems following stroke. Such therapy should include augmentative communication systems in cases where intelligible speech is not a reasonable goal. The role of the speech therapist includes diagnosis and treatment of swallowing disorders.

Role of social worker: The social and emotional sequela to stroke for the patients and the family are the focus of concern for the social worker that may be involved at all stages of rehabilitation and will assist with the reintegration of the stroke patient into the community. If the patient is in need of other social services e.g. grants, the social worker should assist in obtaining those.

Role of other disciplines: A number of other members of the team may be involved with the complex and varied impairments following stroke, including cognitive and perceptual deficits. Among team members commonly identified are: dietician, neuropsychologist, psychiatrist, pharmacist and occupational therapist.

Non-Professional Team

- ▶ Patient
- Family/friends
- ▶ NGOs -volunteers
- ▶ Community workers

9.5 DIFFERENT LEVELS OF CARE:

9.5.1 Institution- Based Rehabilitation

Early intervention has proven the most effective in terms of physical and functional outcomes for the stroke patient.

- ▶ All those involved with stroke patients should be aware of the possibility of dysphagia and patients should be screened before being given food and drinks.
- ▶ Early screening and subsequent comprehensive evaluation of the patient by all relevant team members should be conducted as soon as possible, and on an ongoing (preferably weekly) basis and prior to discharge.
- ▶ A rehabilitation management programme should be developed according to individual need.

Prevention of Complications:

Preventative measures for complications should be initiated at this stage and should be continued throughout care, rehabilitation and after return to the community.

- Patients with persistent functional deficits may be taught compensatory methods for performing important tasks and activities. However, the opportunity to realistically regain movement of the affected side should be taught before adopting the compensatory approach. Never create expectations that cannot be met.
- ▶ Discharge planning is an essential component of this stage and should occur well before discharge. Include all members of the team, as well as the family and community rehabilitation services.
- Adaptive and assistive devices (including wheelchairs and orthotic devices) should be provided where necessary prior to discharge.
- Evaluation of family and care giving functions should take place and the family should be given practical skills on management of the patient's physical and emotional needs (basic maintenance of assistive devices should be given as well).
- ▶ Information on all support services should be provided.

9.5.2 Outreach Rehabilitation Services

- Referral to outreach services will be determined by the patient's response to rehabilitation in the hospital and other variables such as health status, nature and extent of functional disabilities and the context into which the patient will be discharged.
- Discharge from rehabilitation programme or transfer to a different type of programme should be considered when reasonable treatment goals have been achieved or when no further measurable progress is found.
- Some patients at first may not be recommended for rehabilitation, but should be monitored carefully for changes in status by outreach team.
- Outreach services should include the following:
 - The family/friends and the patient as an integral part of outreach services.
 - Multi-disciplinary rehabilitation at clinics, community health centres, individual therapy services, day programmes, group therapy or home visits by members of the stroke team/home-based care team are all important.

- Depression should not be overlooked. Patients should be treated appropriately and/or referred.
- Sexual counselling and advice should be made available.
- Vocational training should be an important part for this phase.
- Referral system.
- Support system.
- Health promotion/Education.

9.5.3 Community - Based Rehabilitation

The patient is the team leader.

Family, voluntary community members and/or NGOs or other available professional staff, may continue stroke rehabilitation at a community level. Such services should include:

- Channels of communication: refer to relevant members of the stroke support team/systems.
- Monitoring and maintenance of assistive devices.
- Self care activities.
- Basic ongoing rehabilitation.
- Inclusion of patient into mainstream.
- Health promotion/education.
- Empowerment of caregivers.
- Development of support system for practical support, social security, spiritual support and counselling. Protection of rights of the patient.
- Monitoring of the patient's participation in treatment plan.
- Referral system.

9.6 CASE MANAGEMENT AT ALL LEVELS

9.6.1 Basic principles

- ▶ Cost effective, sustainable and cultural sensitive management.
- Limited resources and local conditions (including geographic variables) may require that the same person fulfil more than one of the roles, but the process should be holistic.
- ▶ Ideally, an identified member of the team (case manager) should ensure the co-ordination and continuity of rehabilitative services.

- ▶ The important training and development function of each of the team members is acknowledged.
- Rehabilitation should be goal-orientated, individualistic and person centred.
- Acknowledge different levels of severity, different cultural practices and different approaches towards rehabilitation.
- Ensure continuity of care.
- Successful rehabilitation requires community co-operation and close co-ordination between all role-players.
- Access to comprehensive support services.
- The timing, intensity and duration of rehabilitation will vary according to the severity of impairment. (Patients who had Minor Strokes are unlikely to require intensive rehabilitation. On the other hand, those with moderate or major impairments will require multi-disciplinary rehabilitation).
- ▶ Decisions need to be taken when to terminate direct involvement.
- ▶ A lifetime commitment to managing risk factors, is the therapeutic requirement for all patients.

9.6.2 Objectives of Case Management

- To avoid unnecessary referrals to and from higher levels.
- ▶ To avoid premature discharge of patients without adequate rehabilitation plan.
- ▶ To allow the patient to participate in his/her own rehabilitation.
- ▶ To allow the patient to express his/her feelings.
- ▶ To exercise control in decision-making. Every partner's role should be defined.
- ▶ Acceptance of support and ensure availability of support.
- ▶ Patient satisfaction.

9.6.3 Activities to be included

- ▶ Assessment
- ▶ Continuing of rehabilitation and basic care
- ▶ Education and training (empowering)
- ▶ Counselling
- Referral
- Palliation

10. PRACTICAL AFTERCARE HINTS AT PRIMARY LEVEL

When the patient has been discharged from hospital or stroke unit to a primary health care facility or home, the following intervention is of importance. Care will depend on the patient's condition e.g. he/she may be semi-mobile or paralysed.

- Lifestyle modification.
 - ▶ Management and control of diseases e.g. diabetes, hypertension.
 - ▶ Basic rehabilitation.
- Plan a rehabilitation schedule if not done at hospital. Inform the patient and family members about the adapted glasses, cups, plates, and utensils that can make eating easier and more enjoyable.
 - ▶ Counselling of caregivers and family.
 - ▶ Involve the patient, caregiver and/or family in the care and rehabilitation of the patient.
 - ▶ Provide support at all times and recommend a support group for the patient and family.
 - ▶ Establish a bowel training programme and bladder control programme.
 - ▶ Provide / recommend a nutritious diet.
 - ▶ Adjust diet according to swallowing problems. Give adequate fluids.
 - ▶ Clean mouth and/or dentures at least twice a day.
 - ▶ Eye-care with sodium chloride solution, topical eye drugs and eye exercises if prescribed.
- Medication if needed. Observe for adverse reactions.
 - ▶ Prevent deep vein thrombosis by active and passive exercise.
 - ▶ Prevent drop foot and contractures by using a cradle or splints.
 - ▶ Prevent pressure sores by turning the patient at least every 2 hours - keep patient dry.
 - ▶ Control dependent oedema by elevating the affected hand, arm and/or leg by placing it in a functional position.
 - ▶ Use bedside rails if needed to protect the patient from falling or put mattress on the floor, or nurse the patient on the floor.
- Place a call button or bell on unaffected side of patient.
- If the patient has receptive (Wernicke's) aphasia, speak slowly, using simple sentences. If the patient has expressive (Broca's) aphasia or dysarthria with difficulty in speaking, give him/her enough time to speak. Never hasten the person but be patient with him/her. Create

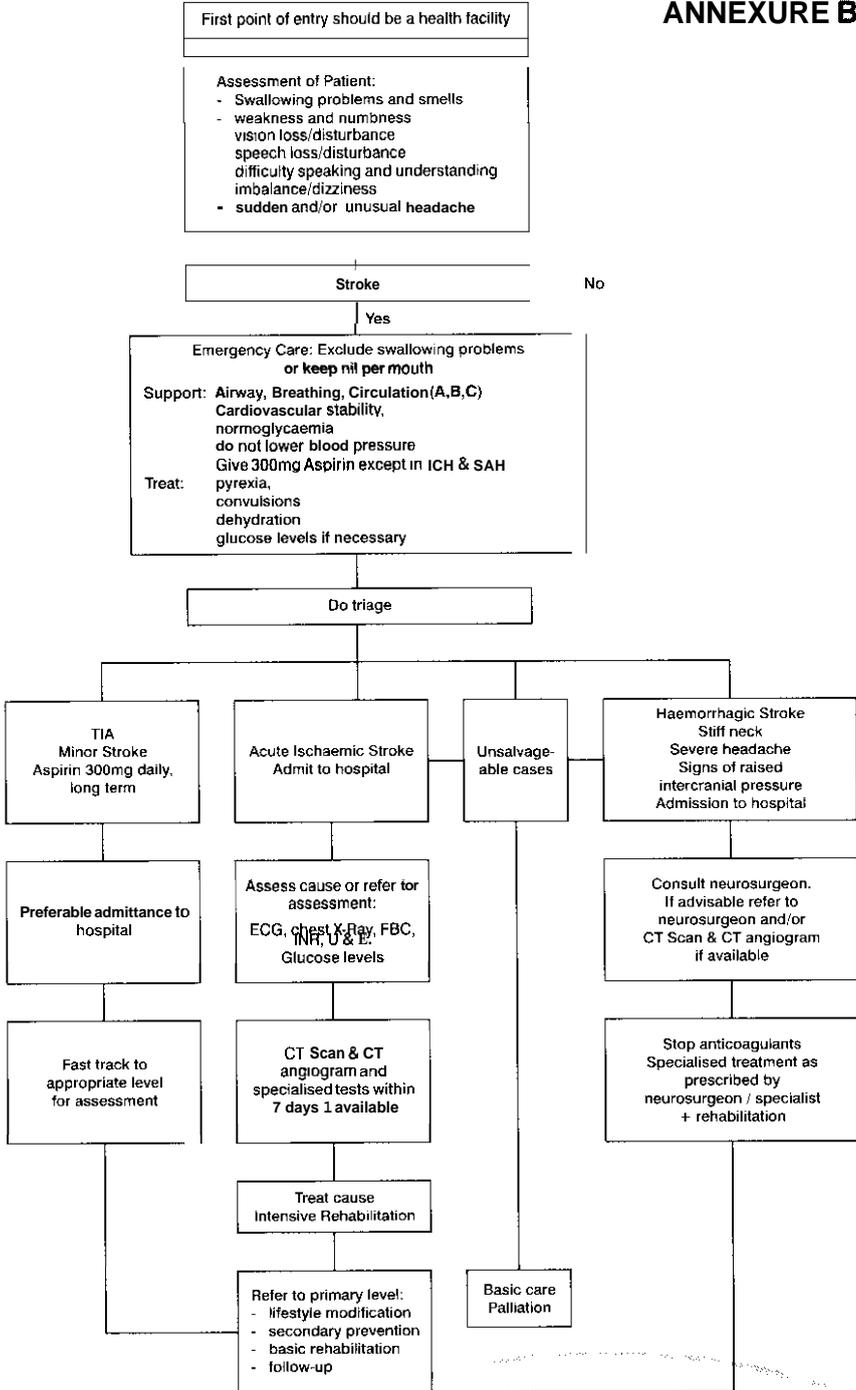
conversation cards by printing simple messages on index cards, encourage the patient to express him or herself.

- Encourage the patient to be as independent as possible. Develop a consistent daily routine for performing activities of daily living (ADL), allowing sufficient time for completion.
 - ▶ Deal with depression.
-

Common patterns of neurological abnormalities in acute ischaemic stroke

	Symptoms and signs	Left hemisphere	Right hemisphere	Brain stem Cerebellum Posterior hemisphere
1	Speech and language	Aphasia * Occasionally dysarthria	Aphasia * Occasionally dysarthria	Dysphagia
2	Swallowing	Occasionally swallowing problem. Severe if bilateral cortical stroke.	Occasionally swallowing problem. Severe if bilateral cortical stroke.	Dysphagia
3	Motor	Right hemiparesis	Left hemiparesis	Power loss in all limb Crossed signs, or weakness any limb combinations
4	Sensory	Right sensory loss	Left sensory loss	Sensory loss in all four limbs or crossed signs or any limb combinations
5	Vision	Amaurosis fugax. Right visual field defect. Poor right conjugate gaze	Amaurosis fugax. Left visual field defect. Poor left conjugate gaze.	Dysconjugate gaze. Double vision. Nystagmus. Bilateral visual field defect.
6	Gait	Limp of right leg.	Limp of left leg.	Ataxia
7	Cerebellar signs	Nil	Nil	May be unilateral or bilateral.
8	Cognitive loss	Difficulty reading, writing, calculating. Memory dysfunction. Behavioural abnormalities.	Neglect of left visual space. Spatial disorientation. Extinction of left sided stimuli. Memory dysfunction. Behavioural abnormalities.	Amnesia. May lose consciousness

* Depends on whether left or right sided.



GLASGOW COMA SCORE

The GCS is scored between 3 and 15, 3 being the worst and 15 the best. It is composed of three parameters: Best Eye Response, Best Verbal Response, Best Motor Response, as given below:

Best Eye Response. (4)

1. No eye opening.
2. Eye opening to pain.
3. Eye opening to verbal command
4. Eyes open spontaneously.

Best Verbal Responses. (5)

1. No verbal response.
2. Incomprehensible sounds,
3. Inappropriate words.
4. Confused.
5. Orientated.

Best Motor Response (6)

1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain.
5. Localising pain.
6. Obeys commands.

Note that the phrase 'GCS of 11' is essentially meaningless, and it is important to break the figure down into its components, such as E3V3M5 = GCS 11.

A Coma Score of 13 or higher correlates with a mild brain injury, 9 to 12 is a moderate injury and 8 or less a severe brain injury.

Teasdale G., Jennett B., LANCET (ii) 81-83, 1974

Activities of Daily Living (ADL)

1. Mobility	<ul style="list-style-type: none"> - Permanently confined to bed even though there may be help to get up. - Confined to house/flat and garden. - Utilisation of mobility devices.
2. Locomotion	<p>What is the furthest the person can walk on own Without stopping and without severe discomfort?</p> <ul style="list-style-type: none"> - only a few steps - more than a few Steps but less than 200 metres - 200 metres or more
3. Transfer	<p>Can person get in and out of bed on his/her own?</p> <ul style="list-style-type: none"> Without difficulty with some difficulty or only with someone's help/assistive device <p>Can person get in and out of a chair on his/her own?</p> <ul style="list-style-type: none"> - without difficulty - with some difficulty - or only with someone's help/assistive device
4. Dressing	<p>Can person dress and undress on his/her own?</p> <ul style="list-style-type: none"> - without difficulty - with some difficulty - or only with someone's help/assistive device
5. Washing	<p>Can person wash his/her hands and face on his/her own?</p> <ul style="list-style-type: none"> without difficulty with some difficulty or only with someone's help/assistive device
6. Feeding	<p>Can person feed his/her including cutting up food?</p> <ul style="list-style-type: none"> - without difficulty - with Some difficulty - or only with someone's help/assistive device
7. Toilet	<p>Can person get to and use the toilet on his/her own?</p> <ul style="list-style-type: none"> - without difficulty - with some difficulty - or only with someone's help/assistive device
8. Continence	<p>Does person ever lose Control of bladder/bowels?</p> <ul style="list-style-type: none"> - No <p>if yes: Does person lose control of bladder and/or bowels:</p> <ul style="list-style-type: none"> - at least once a week - less than once a week, but at least once a month - less than once a month - how often
9. Hearing	<p>Is hearing good enough to follow a TV/Radio programme at a volume turned up or With a hearing aid if necessary?</p> <ul style="list-style-type: none"> Yes <p>If No: Can person follow a TV/Radio programme with the volume turned up or with a hearing aid necessary?</p> <ul style="list-style-type: none"> Yes - No
10. Seeing	<p>Can person see well enough to recognize a friend at a distance of four metres (across a road)?</p> <ul style="list-style-type: none"> - Yes - No <p>Can person see well enough to recognize a friend at a distance of one metre (at arm's length)?</p> <ul style="list-style-type: none"> Yes No <p>Will it be improved by spectacles?</p>

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Compiled by the Directorate: Chronic Diseases,
Disabilities and Geriatrics

**NATIONAL GUIDELINE ON STROKE AND
TRANSIENT ISCHAEMIC ATTACK (TIA)**

The Department of Health wishes to thank all the people who were involved in the development of the guideline on Stroke and Transient Ischaemic Attack Management.
Special thanks to the following stakeholders:
Department of Health: National and Provincial offices,
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The Stroke Foundation of South Africa.

ACKNOWLEDGEMENTS

<p>1. Stairs Can person walk up and down a flight of stairs without resting? - Yes - No If No: Can person do this if he/she holds on and takes rests? - Yes - No</p>	
<p>2. Retrieval Can person (when standing) bend down and pick up a shoe from the floor? - Yes - No</p>	
<p>3. Speaking Can person speak without difficulty? - Yes - No</p>	

OPTIMAL ITEMS

