Special Section: Guidelines for the
MANAGEMENT OF ANEURYSMAL SUBARACHNOID HEMORRHAGE

MANAGEMENT OF ANEURYSMAL SUBARACHNOID HEMORRHAGE

I. DIAGNOSIS OF SUBARACHNOID HEMORRHAGE (SAH)

Clinical – may present with sudden, severe headache (thunderclap headache), loss of consciousness or adult-onset seizures.

Neurological examination – signs of meningeal irritation (i.e., neck rigidity), altered or decreased level of consciousness, CN III or VI nerve palsy. Patients may or may not have focal neurological deficits

Emergent referral to a neurologist/neurosurgeon and transfer to a facility with capabilities of managing acute stroke are recommended.

II. NEURODIAGNOSTIC EXAMINATIONS

1. Non-contrast cranial CT scan should be done and interpreted immediately. Hyperdense blood in the basal cisterns is usually diagnostic, but parenchymal clot in the temporal or basal frontal, and intraventricular hemorrhage are also suggestive of an underlying aneurysm.

2. Lumbar tap with CSF analysis in the absence of focal neurological signs is an option in the following cases:
   - Cranial CT scan is negative
   - Cranial CT scan is unavailable
   - Special circumstances (e.g., issues with CT scan cost)

   Multiple specimens (at least 3 tubes) should be collected to rule out traumatic tap. Opening pressures should be measured.

3. Cerebral angiogram is the gold standard in determining the cause of SAH. Early angiography should be performed in all cases, whether poor- or good-grade SAH. If the initial angiogram is negative, a repeat angiogram should be performed after 2 weeks.

4. Good-quality CT angiogram and MR angiography are other options.

III. SAH GRADING

1. Hunt and Hess Classification is recommended for the clinical grading of SAH.

Table 9: Hunt and Hess Classification

Grade	Description
1	Asymptomatic, or mild headache, slight nuchal rigidity
2	Moderate to severe headache, nuchal rigidity, no neurologic deficit other than cranial nerve palsy
3	Drowsiness, confusion, or mild focal signs
4	Stupor, moderate to severe hemiparesis, possibly early

	decerebrate signs
5	Deep coma, decerebrate rigidity, moribund appearance

2. Fisher grading may be used as a guide in considering therapeutic options.

Table 10: Fisher Grading

Grade	Description (Blood on CT)
1	No subarachnoid blood detected
2	Diffuse or vertical layers <1 mm thick*
3	Localized clot or vertical layer $\geq$1 mm thick*
4	Intracerebral or intraventricular clot with diffuse or no SAH

*"Vertical layer" refers to blood in the subarachnoid spaces including in the interhemispheric fissure and cisterns

IV. GENERAL SYMPTOMATIC TREATMENT

1. Absolute bed rest in a quiet, comfortable environment
2. Cardiac monitoring and frequent assessment of neuro-vital signs
3. Soft diet for alert patients, nasogastric-tube (NGT) feedings if with impaired consciousness
4. Analgesics, including opiates for headache. Avoid aspirin and other NSAIDs
5. Paracetamol and cooling blankets, if febrile
6. Maintenance of euglycemia
7. Sedatives, if agitated
8. Antiemetics, as needed for nausea and vomiting
9. Stool softeners

V. EARLY SPECIFIC TREATMENT

1. Nimodipine: A systematic review showed a significant reduction in poor outcomes with calcium antagonists for SAH. The evidence rests mainly on one large trial with oral nimodipine. It is uncertain whether nimodipine acts through neuroprotection or through reduction of the frequency of vasospasm, or both. Nimodipine 60 mg every 4 hours by mouth or NGT for 3 weeks is recommended.
2. Anticonvulsants: Short-term anticonvulsants are recommended for patients with documented seizures in the acute phase of SAH. Although no randomized trial has proven that prophylactic anticonvulsants in SAH is effective, they can be considered in patients with significant cortical damage, thick cisternal clot, parenchymal hemorrhage, or those in coma. Phenytoin is the recommended anticonvulsant, given as a 15 mg/kg IV loading dose followed by 3 to 5 mg/kg/day in divided doses.
3. Steroids: Corticosteroids have no proven role and are not recommended for use in SAH.

4. Antifibrinolytic agents are not recommended. Although they reduce the risk of rebleeding, they are associated with a higher rate of cerebral ischemia.
5. Manage increased ICP
6. BP management: Although the best antihypertensive agent and BP remains unsettled, IV nicardipine to a target SBP<150 in the pre-operative phase is reasonable.

VI. PREVENTION AND MANAGEMENT OF VASOSPASM

1. Monitoring: Serial transcranial Doppler (TCD) is recommended for the diagnosis and monitoring of vasospasm.
2. Maintenance of euvolemia: Evidence on the use of blood volume expansion alone or in combination with induced hypertension and hemodilution (triple H therapy) in the prophylaxis and management of secondary ischemia (vasospasm) following aneurysmal SAH is lacking.
3. Endovascular angioplasty (chemical +/- mechanical) is a effective way of managing vasospasm. Intervention has to be early before clinical signs suggesting irreversible infarction (i.e., hemiplegia) are present.
4. Treatment strategies undergoing current investigation include intravenous magnesium sulfate and statins.

VII. TREATMENT OF SAH

Excluding the aneurysm from the circulation is the main goal of treatment. Obliteration the aneurysm can be achieved through surgical clipping or endovascular coiling.

VIII. TIMING OF SURGERY

1. Definitions:

   Early surgery is surgery performed within 72 hours from ictus

   Late surgery is surgery performed more than 3 days from ictus.

2. Indications:
   a. Early, immediate surgery is recommended for good- to moderate-grade (Hunt and Hess I-III) aneurysmal SAH patients to minimize the chance of a devastating rebleed.
   b. For poor grade patients (Grade IV-V), early surgery is recommended in the presence of:
      - Hematoma
      - Hydrocephalus

      Surgery may be delayed in the presence of:
      - Ischemia or infarction
      - Severe angiographic vasospasm

- Casted ventricles
- Diffuse SAH (Fisher Grade III) Complex aneurysm on angiography.

c. A maximum cut-off age for early surgical management (for the elderly) is not recommended in the absence of organ failure.

IX. COILING

1. Can be performed early in both good- and poor-grade patients.
2. Reduces the rebleed rate for poor-grade patients who would otherwise be treated conservatively.
3. Vasospasm is not a contraindication and can be dealt with endovascularly during coiling
4. Can be performed under local anesthesia if needed.

X. WHERE TO ADMIT

SAH patients should be admitted at the Stroke Unit or Intensive Care Unit. In the absence of an ASU/ICU, patients may be placed in a quiet, regular room with very close monitoring.

XI. NURSING ISSUES: SOLICITUDE, THOUGHTFULNESS, PROTECTIVENESS

1. Acute Phase
    a. Care must be exercised to prevent further ICP increase
    b. There should be close monitoring of fluid status and for possible secondary cardiac, respiratory or metabolic insults.
    c. Persistent headache, deteriorating level of consciousness, other signs of increased ICP and development of focal neurological deficits should be recognized for urgent referral to a neurologist or neurosurgeon.

2. Convalescent Phase
    a. Presence of sensory or perceptual alterations, motor deficits, and impaired verbal communication and physical mobility should be addressed in nursing care.
    b. Feelings of depression should be monitored. Emotional support and encouragement should be provided.
    c. Upon discharge, patients and relatives should be educated on continuity of care, medication intake and follow-up

XII. REHABILITATION

1. Supportive rehabilitation is done initially in the pre-operative phase.

2. Early rehabilitation is recommended for all SAH patients in the post-operative period.

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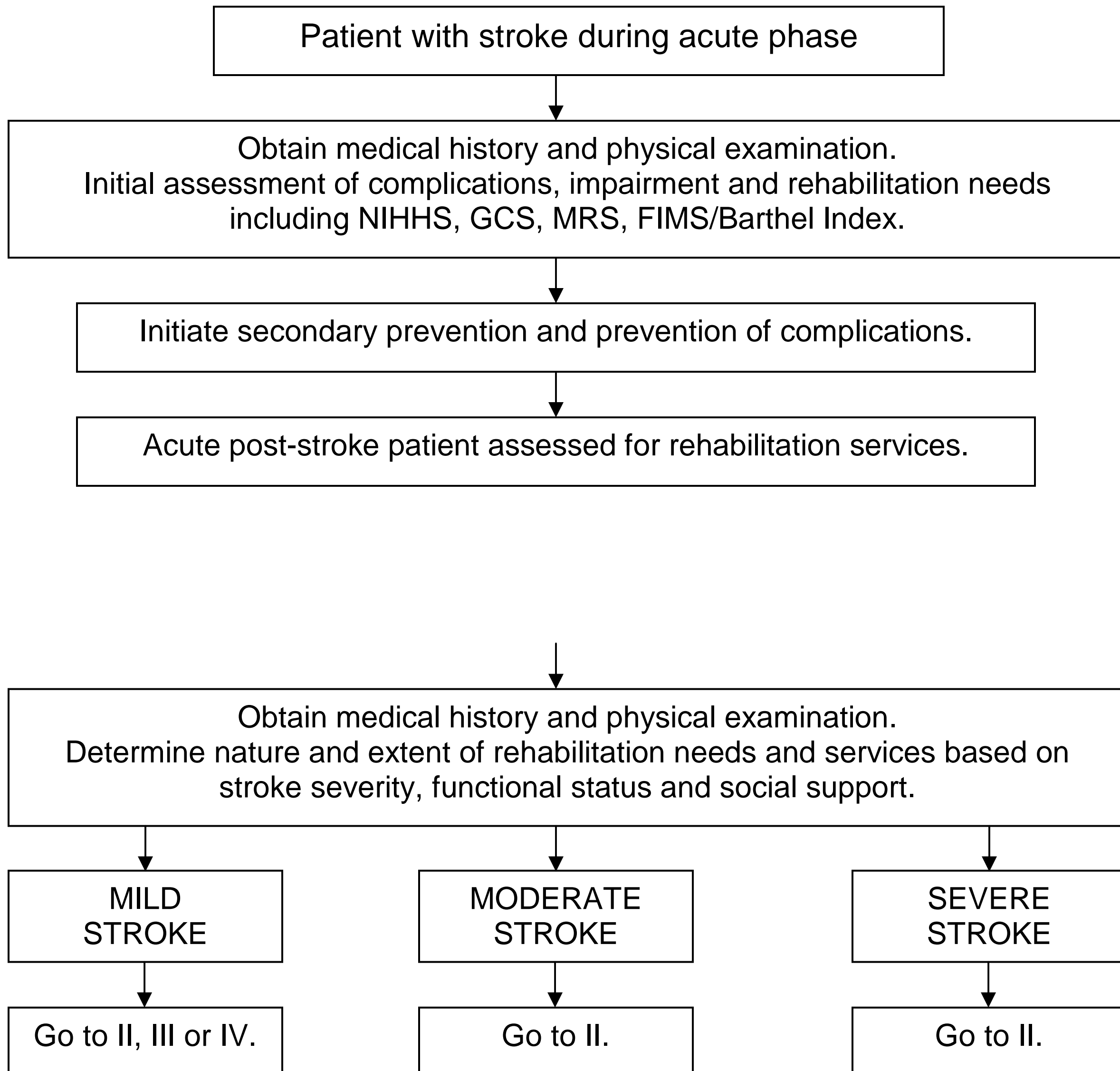
Guidelines for STROKE REHABILITATION

STROKE REHABILITATION

I. ACUTE POST-STROKE REHABILITATION



A. Initial Brief Assessment

Assessment for complications and prior and current impairment:

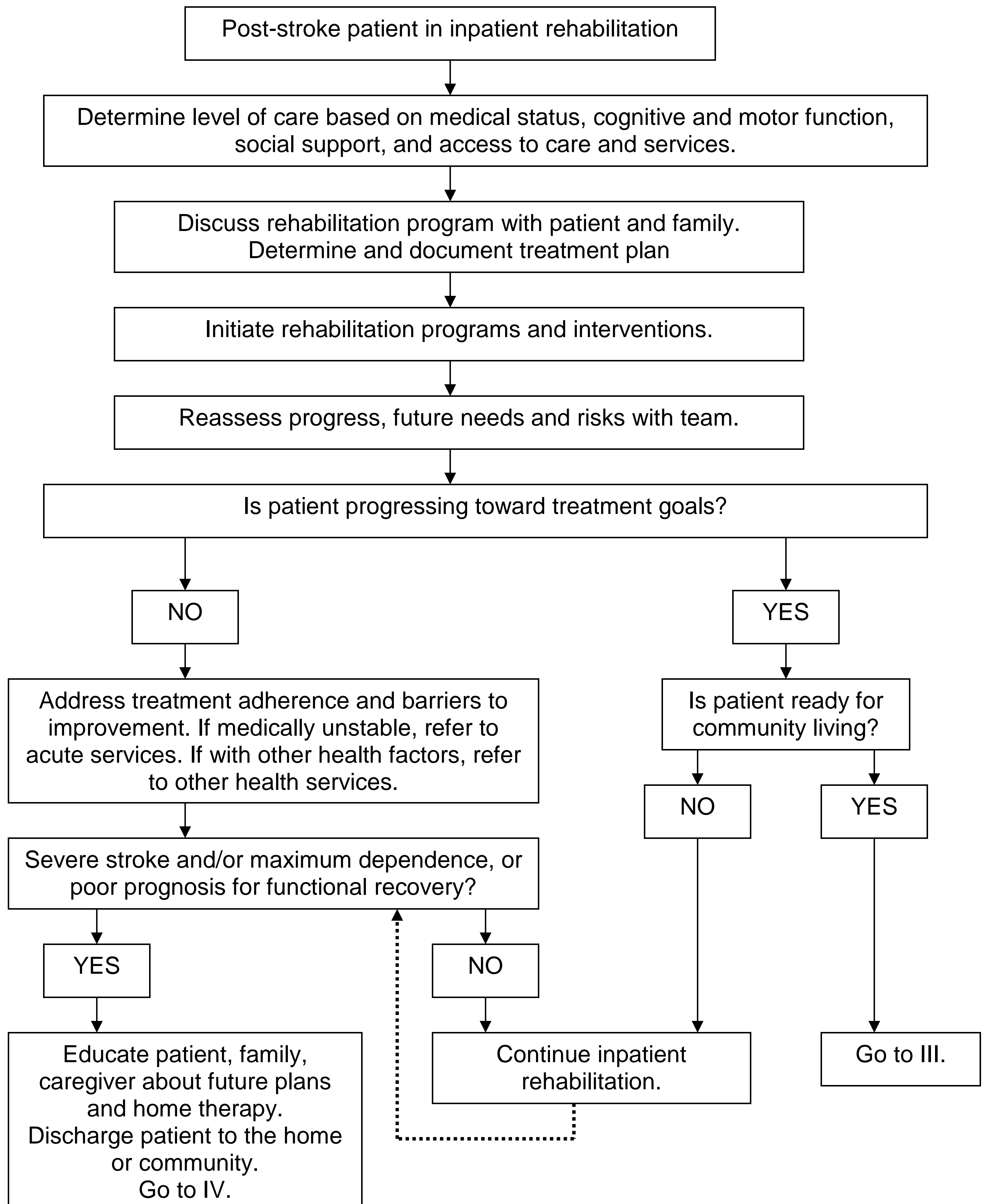
1. Risk factors for recurrent stroke and coronary heart disease
2. Medical comorbidities (DM, hypertension, increase ICP, re-bleed, re-stroke)
3. Consciousness and cognitive status
4. Brief swallowing assessment
5. Skin assessment and pressure ulcers
6. Mobility and need for assistance of movement

7. Deep-vein thrombosis (DVT) risk assessment

B. Assessment of Rehabilitation Needs

1. Prevention of complications: swallowing problems, skin breakdown, DVT, bowel and bladder dysfunction, malnutrition, pain, contractures, SHS/CRP, pulmonary.
2. Assessment of impairments: communication impairments, motor impairment, cognitive deficits, visual and spatial deficiency, psychological or emotional deficits, sensory deficits.
3. Psychosocial assessment and family or caregivers support
4. Assessment of function (e.g., functional independence measure or FIM).
5. Financial support.

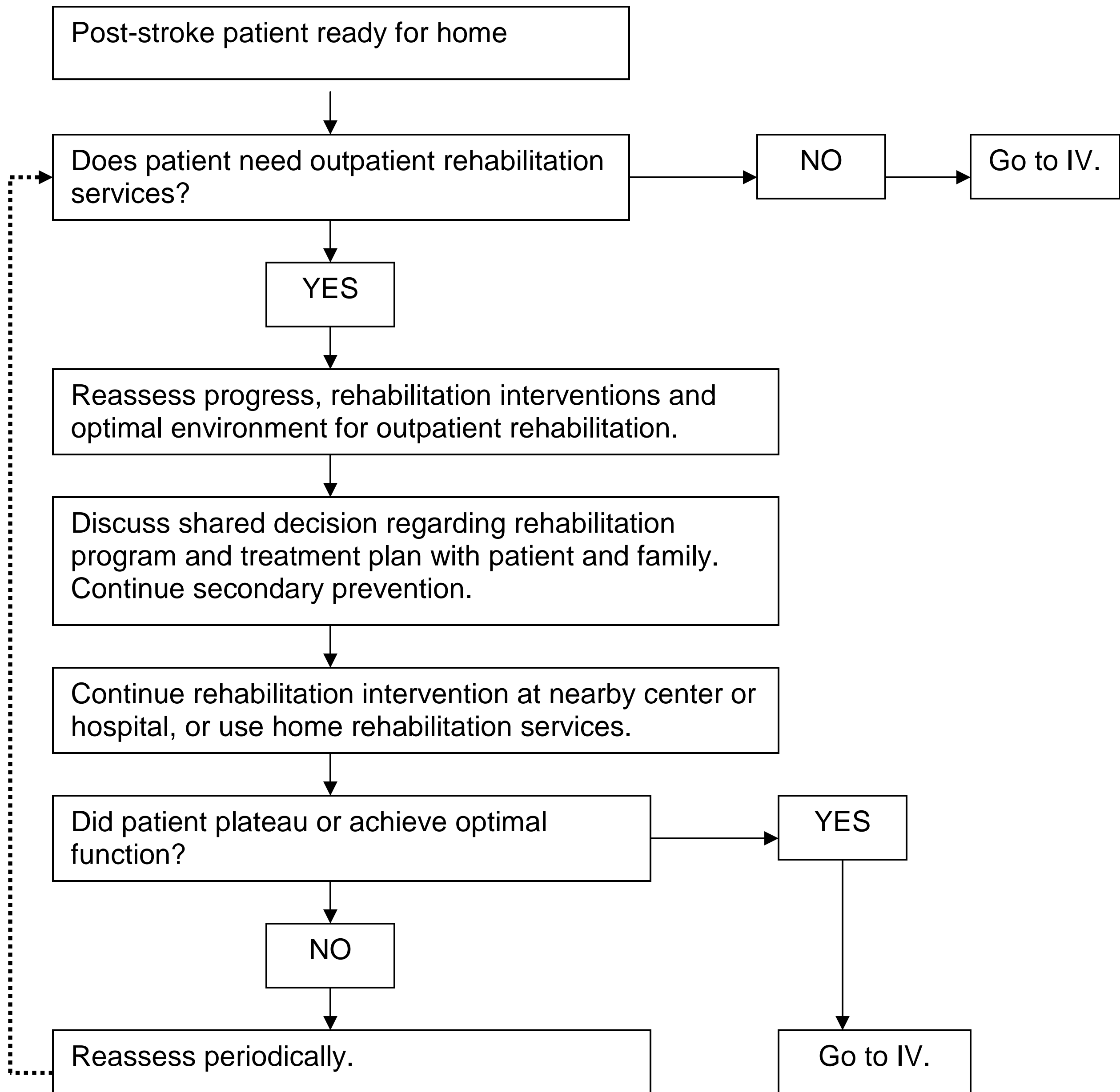
II. INPATIENT REHABILITATION



A. Reassessment of Rehabilitation Progress

1. General (medical status)
2. Functional status (FIM, etc.): Mobility, activities of daily living (ADL) and instrumental ADLs, communication, nutrition, cognition, mood/affect/motivation, sexual function
3. Family support: Resources, caretaker, transportation
4. Patient and family adjustment
5. Reassessment of goals
6. Risk for recurrent cerebrovascular events

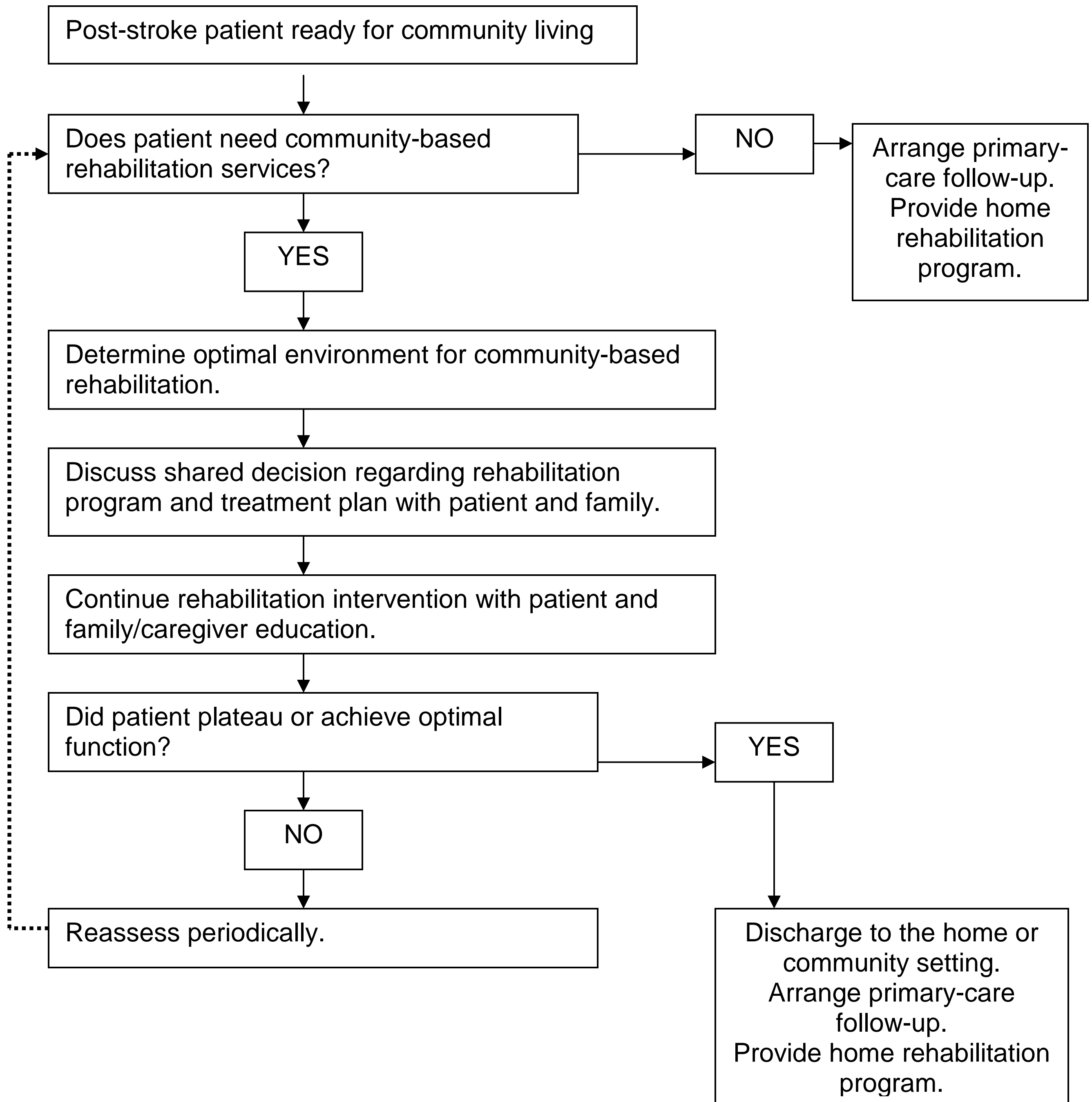
III. OUTPATIENT REHABILITATION



A. Assessment of Discharge Environment

1. Functional needs
2. Motivation and preferences
3. Intensity of tolerable treatment: Equipment, duration
4. Availability and eligibility
5. Transportation
6. Home assessment for safety

IV. COMMUNITY–BASED REHABILITATION



A. Assessment of Discharge Environment

1. Functional needs
2. Motivation and preferences
3. Intensity of tolerable treatment: Equipment, duration
4. Availability and eligibility
5. Transportation
6. Home assessment for safety
7. Maximal patient functioning

Guidelines for the
NURSING MANAGEMENT of STROKE PATIENTS

NURSING MANAGEMENT OF STROKE PATIENTS

I. PREVENTIVE CARE

General Objective	Specific Objectives	Process	Outcome
1. Nurses will provide preventive care through health education activities based on identified learning needs.	Provide information on stroke, risk factors, lifestyle modification and regular medical check-ups.	1. A nurse will implement a health education program (HEP) approved or published by a duly accredited or recognized health agency. 2. A nurse will implement the HEP appropriate for the people's level of understanding. 3. A nurse will use appropriate, available teaching material. 4. A nurse will actively participate in fora on health education on stroke prevention.	1. People understand risk factors and show interest in modifying lifestyle. 2. Incidence of stroke decreases. 3. Awareness increased. 4. Use of published materials increase participation in stroke prevention fora.
2. Nurses will actively identify patients with risk factors.	Identify people who are at risk for developing stroke.	1. The nurse will implement assessment based on established guidelines on stroke risk factors and will use a risk-assessment nursing framework. 2. The nurse will appropriately refer identified people high risk for stroke. 3. The nurse will report and document identified people high risk for stroke.	1. Early detection, referral and management of identified at-risk people. 2. Risk identification implemented in a standardized manner. 3. Contribute factual, accurate data due to existing

			stroke data banks.
3. Nurses will be actively involved in HEP regarding lifestyle modification.	Identify, promote and participate in available programs regarding lifestyle modification.	1. The nurse will identify agencies in the community that have programs for lifestyle modification for stroke prevention. 2. The nurse will recommend available programs for lifestyle modifications. 3. The nurse will facilitate referral to appropriate community or health care agency regarding lifestyle modification.	1. Increased awareness of available facilities and programs regarding lifestyle modification. 2. Increased adherence to lifestyle modification.

II. CURATIVE CARE

General Objective	Specific Objectives	Process	Outcome
1. Nurses will promptly identify patient's needs by performing proper health assessment with emphasis on neurological assessment techniques.	1. Promptly identify and prioritize patient's needs. 2. Use and perform proper neurological assessment techniques.	1. Nurses will assess patients comprehensively using current and acceptable neurological assessment tools. 2. Nurses will correlate patient's history with signs and symptoms. 3. Nurses will identify priority patient needs based on assessment. 4. Nurses will prioritize and facilitate series of diagnostic examinations according to stroke guidelines and will have nursing responsibilities	1.Early needs identification and prioritization. 2. Immediate initiation of management. 3. Early transfer and admission to hospital with stroke or intensive care unit.

		before, during and after the procedure, including patient safety and informed consent.	
2. Nurses will provide quality nursing care based on the identified patient needs in collaboration with other member of the health team, utilizing a holistic approach.	Plan and manage nursing care based on patient's condition, needs and priorities: a. Physiologic care b. Safe Measures c. Comfort Measures d. Therapeutic environment e. Prevention of complications and infections f. Spiritual and psychosocial care	1. Nurses will implement emergency nursing measures if needed. 2. Nurses will closely monitor, document and report neuro-vital signs. 3. Nurses will provide safety measures, such as a. Aspiration precautions b. Fall precautions c. Use of restraints d. Seizure precautions 4. Nurses will provide comfort measures, such as: a. Linen changes b. Personal hygiene c. Turning d. Proper positioning e. Range of motion (ROM) 5. Nurses will provide a therapeutic environment a. Proper ventilation and lighting b. Minimize noise c. Proper orientation to time, place and person d. Provisions of window murals in every room 6. Nurses will prevent complications and possible infections by: a. Establishing patent airway b. Monitoring and maintaining BP c. Observing and	1. Early identification and assessment of disease progression 2. No incidence of falls and aspirations. 3. No bedsores, contractures and muscular atrophy. 4. Healing environment attained. 5. Complications and infections prevented 6. Psycho-emotional and spiritual upliftment 7. No medication errors; medications adhere to. 8. Self expression using alternative means, if

		providing catheter and tube care d. Monitoring input and output e. Monitoring and prevention of increased ICP f. Nutrition and hydration 7. Nurses will provide spiritual and psychosocial care: a. Alleviation of anxiety by encouraging verbalization of feelings b. Guidance in identifying positive coping mechanisms c. Respect of patient's beliefs and culture d. Facilitation of patient's spiritual needs 8. Nurses will apply the principles of Bioethics in the Practice of Nursing Care. 9. Nurses will administer medications observing the 10 R's. 10. Nurses will establish alternative means of communication if necessary. 11. Nurses will assess patient's capabilities in performing ADLs and assist in identifying alternative means.	needed. 9. Patient's independent functions maximized; disabilities correctly addressed. 10. Cooperation and active participation of clients and significant others. 11. Complete, accurate records 12. Early medical intervention 13. Utilization of other health and community resources.

III. REHABILITATIVE AND PROMOTIVE CARE

General Objective	Specific Objectives	Process	Outcome
1. Nurses will focus on early rehabilitation and discharge planning.	1. Assist the patient towards maximum functional capacity. 2. Discuss the care plan with the patient and significant others. 3. Involve the patient's family and significant others in decision making and the care plan.	1. Nurses will initiate rehabilitation upon admission. 2. Nurses will assist the patient in performing ADLs in collaboration with other health team members. 3. Nurses will educate patient on alternative, physiologically safe sexual practice (as indicated). 4. Nurse will include significant others in providing specific nursing care, such as provisions of hygiene, nutrition, turning, positioning, pulmonary toile, ROM exercises, and other care. 5. Nurses will ensure good compliance to medications and provide options for compliance to outpatient follow-up 6. The nurse will collaborate with the family and significant others in the care plan.	1. Performance of simple ROM exercises and ADLs by patient with minimal or no supervision. 2. Maintenance of sexual function. 3. Performance of simple nursing procedures by significant others with minimal or no supervision from nurses. 4. Compliance to treatment regimen and adherence to outpatient follow-up 5. Active participation of patient and family in care plan.
2. Nurses will assist in sustaining and maintaining patient's healthy, productive lifestyle.	1. Provide guidelines for home care. 2. Guide patient in lifestyle modification based on identified risk	1. Nurses will provide a discharge care plan containing the following: a. Activity and exercise b. Medication regimen c. Symptoms needing referral d. Prescribed diet e. Medical follow-up	1. Adherence of patient and family to prescribed discharge care plan. 2. Compliance to alternative

	factors. 3. Assist patient in accepting and adapting to disability.	schedule f. Special care to be provided 2. Nurses will facilitate referrals to community resources. 3. Nurses will identify appropriate lifestyle modification suited to the patient’s current status. 4. Nurses will involve patient in diversion activities that will enhance self-esteem. 5. Nurses will involve family member in the care plan.	lifestyle. 3. Motivation and stimulation of patient’s interest in self-enhancing activities. 4. Maximal patient potential. 5. Active participation of family members.

Guidelines for the ESTABLISHMENT and OPERATION of STROKE UNITS

ESTABLISHMENT and OPERATION of STROKE UNITS

I. THE STROKE CENTER
A. Major Aspects of Acute Stroke Care in Stroke Center

1. **Acute Stroke Teams:** Hospital-based stroke teams should be available round-the-clock, seven days a week in order to evaluate within 15 minutes any patient who may have suffered a stroke.
2. **Written Care Protocols:** The availability of written protocols is key in reducing time to treatment and treatment complications.
3. **Emergency Medical Services:** Emergency medical services (EMS) are vital in the rapid transport and survival of stroke patients.
4. **Emergency Department:** The emergency department staff should be trained in diagnosing and treating stroke and have good lines of communication with both EMS and the acute stroke team.
5. **Stroke Unit:** Where patients can receive specialized monitoring and care.
6. **Neurosurgical Services:** These should be provided to stroke patients within two hours of when the services are deemed necessary.
7. **Support of the Medical Organization:** The facility and its staff, including administration, should be committed to the Stroke Unit
8. **Neuroimaging:** There must be capability to perform an imaging study within 25 minutes of the physician¹s order. A physician should evaluate the image within 20 minutes of completion.
9. **Laboratory Services:** Standard laboratory services should be available round-the-clock, seven days per week at a Primary Stroke Center.
10. **Outcomes/Quality Improvement:** Primary Stroke Centers should have a database or registry for tracking the type and number of stroke patients seen, their treatments, timelines for treatments, and some measurements of patient outcome.
11. **Educational Programs:** The professional staff should receive at least eight hours per year of continuing medical education credits. In addition to professional education, the Stroke Center should plan and implement at least two annual programs to educate the public about stroke prevention, diagnosis and availability for emergency treatment.

B. Definition of a Stroke Unit

A Stroke Unit is a hospital unit that cares for stroke patients exclusively or almost exclusively, with specially trained staff and a multidisciplinary approach to treatment and care.[1]

C. Characteristics of a Stroke Unit

Organization

- Coordinated multidisciplinary team care
- Nursing integration with multidisciplinary care

- Involvement of caregivers in rehabilitation process

Specialization

- Medical and nursing interest
- Expertise in stroke and rehabilitation

Education

- Education and training program for staff, patients and caregivers

D. Goals of a Stroke Unit

1. Improve chances of survival
2. Reduce disability
3. Shorten length of hospital stay
4. Shorten length of rehabilitation

E. Types of Stroke Units

E1. Acute Admission Units:

1. Intensive Care Units – dedicated stroke unit with facilities such as ventilators and intensive invasive and non-invasive monitoring equipment. The units focus on the very acute care for a selected group of acute stroke patients and have little or no focus on rehabilitation.

2. Acute stroke unit – dedicated stroke units that accept patients acutely but discharge them early (within 7 days) and have no or at best a modest focus on rehabilitation. The units usually do not have intensive care facilities, but usually have facilities for non-invasive monitoring of vital signs.

3. Combined acute/rehabilitation stroke unit – dedicated stroke units which accept stroke patients acutely for acute treatment combined with early mobilization and rehabilitation for an average period of at least one to two weeks.

4. Mixed acute units – units that treat stroke patients and patients with other diagnoses. The units accept patients acutely. Some have a program of care similar to acute stroke units while others have a program similar to a combined unit.

E2. Delayed admission unit

1. Rehabilitation stroke unit – dedicated units that accept patients after a minimum delay of seven days after stroke onset. The units focus on rehabilitation.

2. Mixed assessment/rehabilitation unit – wards or units which have an interest and expertise in the assessment and rehabilitation of disabling illness, but do not exclusively manage stroke patients.

E. Effects of Stroke Unit Care on Recovery

Analysis on Cochrane Data Base involving 23 trials showed significant reduction of death (OR; 0.88), death or dependency (OR; 0.75) and death or institutionalization (OR; 0.77) when patients were treated in a stroke unit compared with those treated in general wards.[2]

Two trials evaluated the long-term effects of stroke unit care. On the 5-year follow-up, admission in combined acute/rehabilitation stroke units reduced death (OR; 0.59, NNT=9), death or dependency (OR; 0.36, NNT=6) and death or institutionalization (OR; 0.48, NNT=9). Ten-year follow-up of patients admitted in combined acute/rehabilitation stroke units similarly showed a reduction in death (OR; 0.45), death or dependency (OR; 0.45) and death or institutionalization (OR;0.42).[3-5]

Patients admitted in a rehabilitation stroke unit even after a minimum delay of seven days post-stroke resulted in reduced death (OR; 0.66, NNT=10) and death or dependency (OR; 0.83, NNT=90).[6]

The stroke unit benefits stroke patients of both sexes, all ages, and those with mild, moderate or severe strokes.[2, 7]

Comparing the different stroke unit models, the unit with the strongest evidence of benefit is the combined acute/rehabilitation stroke-unit model, and to some extent the dedicated rehabilitation stroke unit. [2]

II. STROKE UNIT ORGANIZATION

A. The Stroke Unit:

Basic Equipment:

1. 4 to 8 beds
2. Cranial computerized tomography (available 24 hours)
3. Angiography (available 24 hours)
4. Ultrasound (continuous-wave, TC Duplex, transthoracic echocardiogram; transesophageal echocardiogram)
5. Monitoring (RR, Respiration, Holter, O_2 saturation)
6. Emergency laboratory

Monitoring:

1. Basic – Holter, blood pressure, O_2 saturation, respiration, temperature
2. Special – Transcranial Doppler, embolus detection, electroencephalography, central breathing patterns (sleep apnea)

B. Tasks

1. Admission within the unstable phase (in general, <24 hours)
2. Monitoring of vital and neurological parameters
3. Immediate diagnosis (etiology, pathogenesis)
4. Immediate treatment and secondary prevention
5. In general, length of stay not longer than seven days

C. Patient Selection

1. Indications for Admission to the Stroke Unit
    a. Acute stroke (< 24 hours)
    b. Awake, somnolent patient
    c. Symptoms fluctuating or progressive
    d. TIAs with high stroke risk (non-valvular AF, stenosis)
    e. Vital parameters unstable
    f. Thrombolysis, Anticoagulation
    g. New investigational treatment or procedure

2. Admission to Acute Stroke Unit Not Indicated
    a. Patients with severe consciousness impairment (should be admitted to intensive care unit instead)
    b. Severely disabled patients by previous strokes
    c. Very old patients or those with multiple comorbidities

3. Patients with the following should be admitted to the intensive care unit instead of the acute stroke unit:
    a. Stupor and coma
    b. Central respiratory disorders requiring artificial ventilation
    c. Space-occupying cerebral infarctions with risk of herniation
    d. Severe cardiopulmonary insufficiency
    e. Hypertensive-hypervolemic treatment

A. The Stroke Team

1. Personnel
    a. Medical doctors
    b. Nurses
    c. Physiatrists
    d. Occupational therapists
    e. Speech pathologist
    f. Nutritionists
    g. Social workers

2. Personnel with special interest in stroke are medical doctors or other paramedical people who:
    a. Have undergone continuing education on stroke and other related activities or subspecialties on stroke
    b. Have been attending at least one national or international meeting on stroke in a year
    c. Have undergone stroke fellowship or preceptorship training on stroke
    d. Is a member or officer of a national or international organization devoted to stroke

III. HOSPITALS IN THE PHILIPPINES WITH ACUTE STROKE UNITS

Table 11.

Hospitals	Stroke Unit Type	Contact Number
Metro Manila		
East Avenue Medical Center	Mixed acute units	9280611 loc.503
Jose Reyes Memorial Medical Center	ASU	7119491 loc 262
Makati Medical Center	ASU	
Manila Adventist Medical Center	Mixed acute units	5259191 loc 324
Manila Doctors Hospital	ASU	5243011
Manila Central University	Mixed acute units	3672031 loc 1127
Philippine General Hospital	ASU	5218450 loc 2406
Philippine Heart Center	Mixed acute units	9252401 loc 2483
San Juan de Dios Medical Center	Mixed acute units	8319731 loc 1226
St. Luke's Medical Center	ASU	7230101 loc 7399
Sto. Tomas University Hospital	ASU	7313001 loc 2368
The Medical City	Mixed acute units	6356789 loc 6281
Luzon		
Mt. Carmel Diocesan General Hospital, Lucena	Mixed acute units	042-7102576
Lorma Medical Center, San Fernando, La Union	Mixed acute units	072-700-0000
Lucena United Doctors Hospital	ASU	042-3736161
Cebu		
Cebu Doctors Hospital	ASU	032-2555555
Chong Hua Hospital	Mixed acute units	032-2541461

ASU, acute stroke unit.

IV. RECOMMENDATIONS

Stroke patients should be treated in stroke units (Level I). Admission to stroke unit decreases death, dependency and institutionalization.

Stroke units should provide coordinated multidisciplinary care provided by medical, nursing and therapy staff who specialize in stroke care (Level I).

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STRATEGY FOR IMPLEMENTATION OF GUIDELINES

To effectively implement the guidelines set forth in the previous sections, it is recommended that Stroke Centers be established in every region. Stroke Centers shall be designated according to levels as follows:

STROKE CENTER LEVEL	REQUIREMENTS	ACTIVITIES
I	Basic: Physician/Municipal Health Officer Optional: Nurse/Midwife Barangay Health Worker Facilities: Municipal Health Clinic	Stroke prevention and public education Recognition of stroke Acute treatment of TIA and mild stroke Referral of moderate and severe strokes to Levels II or III centers Referral to Levels II or III centers for diagnostic tests Rehabilitation Secondary prevention of stroke and follow-up visits
II	Basic: Neurologist (If not available, other physicians with special training in stroke) Neurosurgeon Stroke nurse Radiologist Physiatrist Facilities*: CT scan Electrocardiogram Laboratory Stroke Team/Unit Operating Room	Stroke prevention and public education Recognition of stroke Acute treatment of TIA, mild, moderate, and severe strokes Referral of complicated strokes to Level III centers Referral to Level III centers for further diagnostic tests Rehabilitation Secondary prevention of stroke and follow-up visits

III	Basic: Neurologist Neurosurgeon Stroke nurse Neuroradiologist Vascular surgeon Cardiologist Neurosonologist Physiatrist Facilities: CT scan, MRI Cardiac diagnostic services (including ECG, Doppler, echocardiogram) Laboratory Angiography Stroke Unit Rehabilitation Unit Operating Room	Stroke prevention and public education Recognition of stroke Acute treatment of TIA, mild, moderate, and severe strokes Rehabilitation Secondary prevention of stroke and follow-up visits Training of stroke personnel Research in stroke

LEVELS OF STROKE CARE

	STROKE CENTER LEVEL		
STROKE SEVERITY	**I**	**II**	**III**
TIA or Mild Stroke	√	√	√
Moderate Stroke		√	√
Severe Stroke		√	√

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Theme: Thinking Globally, Acting Locally
October 1-2, 1999
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3rd Philippine Congress on Brain Attack
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