Complete Summary

GUIDELINE TITLE

VA/DoD clinical practice guideline for the management of stroke rehabilitation in the primary care setting.

BIBLIOGRAPHIC SOURCE(S)

Veterans Health Administration, Department of Defense. VA/DoD clinical practice guideline for the management of stroke rehabilitation in the primary care setting. Washington (DC): Department of Veteran Affairs; 2003 Feb. Various p. [331 references]

GUIDELINE STATUS

This is the current release of the guideline.

**** REGULATORY ALERT ****

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- February 28, 2008, Heparin Sodium Injection: The U.S. Food and Drug Administration (FDA) informed the public that Baxter Healthcare Corporation has voluntarily recalled all of their multi-dose and single-use vials of heparin sodium for injection and their heparin lock flush solutions. Alternate heparin manufacturers are expected to be able to increase heparin production sufficiently to supply the U.S. market. There have been reports of serious adverse events including allergic or hypersensitivity-type reactions, with symptoms of oral swelling, nausea, vomiting, sweating, shortness of breath, and cases of severe hypotension.
- August 16, 2007, Coumadin (Warfarin): Updates to the labeling for Coumadin to include pharmacogenomics information to explain that people's genetic makeup may influence how they respond to the drug.
- May 2, 2007, Antidepressant drugs: Update to the existing black box warning on the prescribing information on all antidepressant medications to include warnings about the increased risks of suicidal thinking and behavior in young adults ages 18 to 24 years old during the first one to two months of treatment.
- April 11, 2007, Zanaflex (tizanidine hydrochloride): Changes to the product labeling for Zanaflex, a drug used to treat spasticity, to warn against its hypotensive and sedative effects when administered with fluvoxamine or ciprofloxacin (CYP1A2 inhibitors).

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

- Stroke
- Conditions and complications resulting from stroke

GUIDELINE CATEGORY

Evaluation
Management
Prevention
Rehabilitation
Risk Assessment
Treatment

CLINICAL SPECIALTY

Family Practice
Geriatrics
Internal Medicine
Neurology
Nursing
Pharmacology
Physical Medicine and Rehabilitation
Psychology
Speech-Language Pathology

INTENDED USERS

Advanced Practice Nurses
Nurses
Occupational Therapists
Pharmacists
Physical Therapists
Physician Assistants

Physicians
Psychologists/Non-physician Behavioral Health Clinicians
Social Workers
Speech-Language Pathologists

GUIDELINE OBJECTIVE(S)

- To provide a scientific evidence-base for practice interventions and evaluations related to stroke rehabilitation designed to achieve maximum functionality and independence and improve patient/family quality of life
- To serve as a guide that clinicians can use to determine best interventions and timing of care for their patients, better stratify stroke patients, reduce re-admission, and optimize healthcare utilization.

TARGET POPULATION

Veterans who suffer a stroke

INTERVENTIONS AND PRACTICES CONSIDERED

Assessment and Coordination of Care

1. Coordinated, multidisciplinary stroke-related evaluation and interventions, including organized and coordinated post-acute inpatient rehabilitation care, interdisciplinary team approach, coordination with the patient and family members/caregivers
2. Post-stroke assessment using standardized assessment instruments
    - Level-of consciousness scale (Glasgow Coma Scale)
    - Stroke deficit scales (National Institutes of Health Stroke Scale [NIHSS]; Canadian Neurological Scale)
    - Global disability scale (Rankin Scale)
    - Measures of disability/activities of daily living (Barthel Index; Functional Independence Measure [FIM™])
    - Mental status screening (Folstein Mini-Mental State Examination; Neurobehavioral Cognition Status Exam [NCSE])
    - Assessment of motor function (Fugl-Meyer; Motor Assessment Scale; Motricity Index)
    - Balance assessment (Berg Balance Assessment)
    - Mobility assessment (Rivermead Mobility Index)
    - Assessment of speech and language functions (Boston Diagnostic Aphasia Examination; Porch Index of Communicative Ability [PICA]; Western Aphasia Battery)
    - Depression scales (Beck Depression Inventory [BDI]; Center for Epidemiologic Studies Depression [CES-D]; Geriatric Depression Scale [GDS])
    - Measures of instrumental ADL (PGC Instrumental Activities of Daily Living; Frenchay Activities Index)
    - Family Assessment Device (FAD)
    - Health status/quality of life measures (Medical Outcomes Study [MOS] Item Short-Form Health Survey; Sickness Impact Profile [SIP])
3. Patient and family/caregiver education

Rehabilitation During The Acute Phase

1. Initial assessment during the acute phase, including a complete history and physical examination, with special emphasis on the following:
    - Risk factors for stroke recurrence
    - Medical comorbidities
    - Level of consciousness and cognitive status
    - Brief swallowing assessment
    - Skin assessment and risk for pressure ulcers
    - Bowel and bladder function
    - Mobility, with respect to the patient´s needs for assistance in movement
    - Risk of deep vein thrombosis (DVT)
    - History of previous antiplatelet or anticoagulation use, especially at the time of stroke
    - Emotional support for the family and caregiver
    - Measures to prevent skin breakdown (use of proper positioning, turning, and transferring techniques and judicious use of barrier sprays, lubricants, special mattresses, and protective dressings and padding)
2. Measures to prevent deep vein thrombosis (early mobilization; low-dose unfractionated heparin [LDUH]; low molecular weight heparin [LMWH] and heparinoids; alternating compression machines; graduated compression stockings)
3. Assessment of stroke severity using the National Institutes of Health Stroke Scale (NIHSS) in order to stratify patients according to severity and likely outcome
4. Measures to prevent complications and reduce the risk for stroke recurrence (carotid endarterectomy; warfarin for cardiogenic stroke; antiplatelet therapy; angiotensin-converting-enzyme [ACE] inhibitor; statin therapy; lifestyle modification)

Post-Stroke Rehabilitation

1. Assessment of post-acute stroke patient for rehabilitation services, such as inpatient rehabilitation, nursing facility rehabilitation, outpatient rehabilitation, home-based rehabilitation
2. Obtain medical history and physical examination, including risk of complications (skin breakdown, risk for deep vein thrombosis [DVT], swallowing problems, bowel and bladder dysfunction, malnutrition, falls, and pain), determination of impairment (swallowing, cognition, communication, motor, psychological, and safety awareness, psychosocial assessment (family and caregivers, social support, financial, and cultural support, assessment of prior and current functional status)
3. Determination of nature and extent of rehabilitation services based on stroke severity, functional status, and social support
4. Assessment of risk for complications
    - Assessment of swallowing (dysphagia) (bedside swallow screening; videofluoroscopy swallowing study [VFSS]; fiber-optic endoscopic examination of swallowing [FEES], fiber-optic endoscopic examination of swallowing with sensory testing [FEESST])

- Assessment of bowel and bladder function and treatment of bowel and bladder incontinence (bladder assessment/scanning; indwelling catheter; silver alloy-coated catheters; urodynamics; bladder training program; prompted voiding; bowel program)
- Assessment of malnutrition (nutrition and hydration evaluation; use of variety of methods to maintain and improve intake of food and fluids)
- Assessment and treatment of pain

5. Assessment of cognition and communication to identify areas of cognitive and communication impairment
6. Psychosocial assessment to provide comprehensive understanding of patient/caregiver psychosocial functioning, environment, resources, goals, and expectations for community integration
7. Assessment of function to provide baseline assessment of overall functional status using standardized assessment tool
8. Evaluation of need for rehabilitation interventions and identification of the optimal environment for providing rehabilitation interventions
9. Prior to discharge, evaluation of patient for activities of daily living (ADL) and instrumental activities of daily living (IADL) in order to determine appropriate discharge environment
10. Discharging patient to prior home/community and arranging for medical follow-up in primary care
11. Monitoring and addressing of patient´s continued medical and functional needs after discharge from rehabilitation services
12. Follow up, including exercise program, adaptive equipment, durable medical devices, orthotics, and wheelchairs
13. Referral to vocational counseling to evaluate returning to work
14. Evaluation of readiness to return to driving and referral to adaptive driving program as indicated
15. Addressing sexual functioning issues
16. Patient/family education; reach shared decision regarding rehabilitation program; determination of treatment plan
17. Rehab programs/interventions:
    - Treatment of dysphagia (enteral feeding for patients who are unable to orally maintain adequate nutrition; swallowing treatment and management)
    - Treatment of acute communication disorders and long-term communication difficulties
    - Motor Functioning – Strengthening for patients with muscle weakness following stroke
    - Partial body weight support for treadmill training
    - Constraint induced (CI) movement therapy
    - Functional electrical stimulation (FES)
    - Neuro developmental training for motor retraining
    - Treatment for spasticity (antispastic positioning, range of motion exercises, stretching, splinting, serial casting, or surgical correction for spasticity; medications, such as tizanidine, dantrolene, and oral baclofen, botulinum toxin and phenol/alcohol, intrathecal baclofen; use of certain neurosurgical procedures)
    - Biofeedback
    - Measures to prevent and/or treat shoulder pain (electrical stimulation; intra-articular injections; ROM- lateral rotation; exercise; positioning; strapping

    - Cognitive remediation (training to improve attention; training to compensate for visual neglect; formal problem solving strategies; multimodal intervention for multiple cognitive deficits; training to develop compensatory strategies for a mild short-term memory deficit
    - Treatment for mood disturbance, such as depression and emotionalism (pharmacotherapy; psychotherapy; information/advice)
    - Assessment and treatment for visual and spatial neglect
    - Use of pharmacologic agents to enhance stroke recovery including drugs to use and drugs to avoid using
18. Preparation of patient for community living (patient and family/caregiver education and information, equipment and training, vocation counseling, encouragement for leisure activities; case management as appropriate; resource listing)
19. Monitoring for adherence to treatments and barriers to improvement
20. Referral as appropriate (referral to acute services in medically unstable; referral to mental health services as indicated)

MAJOR OUTCOMES CONSIDERED

- Morbidity, mortality, and complications related to stroke
- Post-stroke functional ability and return to independent living
- Quality of life
- Rates of stroke recurrence and rehospitalizations
- Validity, reliability, and sensitivity of standardized instruments for post-stroke assessment

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The following three guidelines were identified by the Working Group as appropriate seed guidelines. They served as the starting point for the development of questions and key terms.

- Agency for Health Care Policy and Research (AHCPR) Post-Stroke Rehabilitation (1995)
- Royal College of Physicians (RCP) National Clinical Guidelines for Stroke (2000)
- Scottish Intercollegiate Guidelines Network (SIGN) Management of Patients with Stroke, 20 (1997)

Fifty-one researchable questions and associated key terms were developed by the Working Group after orientation to the seed guidelines and to goals that had been identified by the Working Group. The questions specified:

- Population – characteristics of the target population

- Intervention – diagnostic, screening, therapy, and assessment
- Control – the type of control used for comparison
- Outcome – the outcome measure for this intervention (morbidity, mortality, patient satisfaction, and cost)

A systematic search of the literature was conducted. It focused on the best available evidence to address each key question, and ensured maximum coverage of studies at the top of the hierarchy of study types: evidence-based guidelines, meta-analyses, and systematic reviews (Cochrane, EBM, and EPC reports). The seed guidelines evidence was carefully reviewed.

The search continued using well-known and widely available databases that were appropriate for the clinical subject. Limits on language (English), time (1990 through January 2002), and type of research (randomized controlled trials [RCTs]) were applied. The search included MEDLINE and additional specialty databases (DARE), depending on the topic.

The search strategy did not cast a wide net. Once definitive clinical studies that provided valid relevant answers to the question were identified, the search stopped. It was extended to studies/reports of lower quality (observational studies) only if there were no high quality studies.

The results of the search were organized and reported using reference manager software. At this point, additional exclusion criteria were applied. Typical exclusions were studies with physiological endpoints or studies of populations that were not comparable to the population of interest (e.g., studies of rehabilitation of patients with other diseases).

Evidence Appraisal Reports for each of the 51 questions were prepared by the Center for Evidence-Based Practice at the State University of New York, Upstate Medical University, Department of Family Medicine (these reports are available by request). Each report covered:

- Summary of findings
- Methodology
- Search terms
- Resources searched
- Articles critically appraised
- Findings

The Working Group suggested some additional references. Copies of specific articles were provided to participants on an as-needed basis. This document includes references through January 2002.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The following rating schemes are from the U.S. Preventive Services Task Force (USPSTF) (2001).

Quality of Evidence (QE)

I: Evidence obtained from at least one properly randomized controlled trial
II-1: Evidence obtained from well-designed controlled trails without randomization
II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group
II-3: Evidence obtained from multiple time series studies with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.
III: Opinions of respected authorities, based on clinical experience; descriptive studies and case reports; or reports of expert committees

Overall Quality

Good: High grade evidence (I or II-1) directly linked to health outcome
Fair: High grade evidence (I or II-1 linked to intermediate outcome or Moderate grade evidence (II-2 or II-3) directly linked to health outcome
Poor: Level III evidence or no linkage of evidence to health outcome

Net Effect of Intervention

Substantial:

- More than a small relative impact on a frequent condition with a substantial burden of suffering, or
- A large impact on an infrequent condition with a significant impact on the individual patient level

Moderate:

- A small relative impact on a frequent condition with a substantial burden of suffering, or
- A moderate impact on an infrequent condition with a significant impact on the individual patient level

Small:

- A negligible relative impact on a frequent condition with a substantial burden of suffering, or
- A small impact on an infrequent condition with a significant impact on the individual patient level

Zero or Negative:

- Negative impact on patients, or
- No relative impact on either a frequent condition with a substantial burden of suffering, or
- An infrequent condition with a significant impact on the individual patient level

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Evidence Appraisal Reports for each of 51 questions were prepared by the Center for Evidence-Based Practice at the State University of New York, Upstate Medical University, Department of Family Medicine (these reports are available by request). Each report covered:

- Summary of findings
- Methodology
- Search terms
- Resources searched
- Articles critically appraised
- Findings

The clinical experts and research team evaluated the evidence for each question according to criteria proposed by the U.S. Preventive Services Task Force (USPSTF) (2001). See "Rating Scheme for the Quality of the Evidence".

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

- The Guideline for the Management of Stroke Rehabilitation is the product of many months of diligent effort and consensus building among knowledgeable individuals from the Veterans Administration (VA), Department of Defense (DoD), academia, and guideline facilitators from the private sector. An experienced moderator facilitated the multidisciplinary Working Group that included internists, physiatrists, neurologists, geriatricians, nurse practitioners, occupational therapists, physical therapists, recreational therapists, speech and language pathologists, psychologists, social workers, kinesiotherapists, pharmacists, and rehabilitation/clinic coordinators, as well as consultants in the field of guideline and algorithm development.
- The Working Group participated in two face-to-face sessions to reach a consensus about the guideline recommendations and to prepare a draft

document. The draft was revised by the experts through numerous conference calls and individual contributions to the document.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The following rating scheme is from the U.S. Preventive Services Task Force (USPSTF) (2001).

Grade of Recommendation

A: A strong recommendation that the intervention is always indicated and acceptable
B: A recommendation that the intervention may be useful/effective
C: A recommendation that the intervention be considered
D: A recommendation that a procedure may be considered not useful/effective, or may be harmful
I: Insufficient evidence to recommend for or against; clinical judgment should be used

COST ANALYSIS

Published cost analyses were reviewed.

- One systematic review included cost-effectiveness analyses that suggested that routine screening for dysphagia with a preliminary bedside evaluation followed by either a full bedside evaluation or videofluoroscopy swallowing study (VFSS) when the preliminary study is abnormal may be cost-effective, if the assumptions used in the analyses are correct.
- A meta-analysis study published in 1998 concluded: "Silver alloy-coated urinary catheters are significantly more effective in preventing urinary tract infections than are silver oxide catheters. They are more expensive, but may reduce overall costs of care, as catheter related infection is a common cause of nosocomial infection and bacteremia." This analysis covered a diverse patient population, and was not specific to stroke.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The final draft was reviewed by experts from the Veterans Administration (VA) and Department of Defense (DoD) in physical medicine and neurology. Their feedback was integrated into the final draft.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The recommendations for the management of stroke rehabilitation in the primary care setting are organized into 3 major algorithms. The algorithms, the objectives, annotations, and recommendations that accompany them, and the evidence supporting the recommendations are presented below. The quality of evidence (I, II-1, II-2, II-3, III), overall quality (good, fair, poor), net effect of intervention (substantial, moderate, small, zero or negative), and strength of recommendation grading (A-D, I) are defined at the end of the "Major Recommendations" field.

Note: A list of abbreviations is provided at the end of the "Major Recommendations" field.

Algorithm A: Assessment

Algorithm B: Inpatient Rehabilitation

Algorithm C: Community Based Rehabilitation

The Provision of Rehabilitation Care

Organization of Post-Acute Stroke Rehabilitation Care

1. Better clinical outcomes are achieved when post-acute stroke patients who are candidates for rehabilitation receive coordinated, multidisciplinary evaluation and intervention.
    - Post-acute stroke care should be delivered in a setting where rehabilitation care is formally coordinated and organized. (Evans et al., 2001; Langhorne & Duncan, 2001) (***Quality of the Evidence [QE]*: I; *Overall Quality*: Good; *Recommendation [R]*: A**)
    - Post-acute care should be delivered by a variety of treatment disciplines, experienced in providing post-stroke care, to ensure consistency and reduce the risk of complications. (Agency for Health Care Policy and Research (AHCPR), 1995; Cifu & Stewart, 1999; Evans et al., 1995; Evans et al., 2001; Indredavik et al., 1997; Kalra et al., 2000; Langhorne & Duncan, 2001; Stroke Unit Trialists, 2002) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
    - The multidisciplinary team may consist of a physician, nurse, physical therapist, occupational therapist, kinesiotherapist, speech and language pathologist, psychologist, recreational therapist, patient, and family/caregivers. (***QE*: III; *Overall Quality*: Poor; *R*: I**)
2. If an organized rehabilitation team is not available in the facility, patients with moderate or severe symptoms should be offered a referral to a facility with such a team, or a physician or rehabilitation specialist with some experience in stroke should be involved in the patient´s care. (***QE*: III; *Overall Quality*: Poor; *R*: I**)
3. An organized team approach should also be continued in coordinating the outpatient or home-based rehabilitation care. Community resources for stroke rehabilitation services that include an organized team should be identified and provided to patients and families/caregivers. (***QE*: III; *Overall Quality*: Poor; *R*: I**)

The Use of Standardized Assessments

1. Strongly recommend to assess the stroke recovery using the National Institutes of Health Stroke Scale (NIHSS) at the time of presentation/hospital admission, or at least within the first 24 hours following presentation. (Adams et al., 1999; Frankel et al., 2000) (***QE*: I; *Overall Quality*: Good; *R*: A**)
2. Recommend that all patients should be screened for depression and motor, sensory, cognitive, communication, and swallowing deficits by appropriately trained clinicians, using standardized and valid screening tools. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
3. If depression and motor, sensory, cognitive, communication, and swallowing deficits are found, all patients should be formally assessed by the appropriate clinician from the coordinated rehabilitation team. (Royal College of Physicians [RCP], 2000; Scottish Intercollegiate Guidelines Network (SIGN), 1997) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
4. Recommend that the clinician use standardized, valid assessments to evaluate the patient´s stroke-related impairments and functional status and participation in community and social activities. (Duncan et al., 1999) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
5. Recommend that the standardized assessment results be used to assess probability of outcome, determine the appropriate level of care, and develop interventions.
6. Recommend that the assessment findings should be shared and the expected outcomes be discussed with the patient and family/caregivers.

Intensity/Duration of Therapy

1. Strongly recommend that rehabilitation therapy should start as early as possible, once medical stability is reached. (Cifu & Stewart, 1999 ; Ottenbacher & Jannell, 1993) (***QE*: I; *Overall Quality*: Good; *R*: A**)
2. Recommend that the patient receives as much therapy as "needed" to adapt, recover, and/or reestablish the premorbid or optimal level of functional independence. (Kwakkel et al., 1999; Langhorne, Wagenaar, & Partridge, 1996; Richards et al., 1993; Sivenius et al., 1985; Smith et al., 1981; van der Lee & Snels, 2001) (***QE*: I; *Overall Quality*: Fair; *R*: B**)

Patient´s Family and Caregivers

1. The family/caregiver of the stroke patient should be involved in decision making and treatment planning as early as possible, if available, and throughout the duration of the rehabilitation process.
2. The providers must be alert to the stress on the family/caregiver, specifically recognizing the stress associated with impairments (e.g., cognitive loss, urinary incontinence, and personality changes) and providing support, as indicated.
3. Acute care hospitals and rehabilitation facilities should maintain up-to-date information on community resources at the local and national level, provide this information to the stroke patient and families/caregivers, and offer assistance in obtaining needed services.
4. The patient and caregivers should have their psychosocial and support needs reviewed on a regular basis, by a social worker or appropriate healthcare worker, to minimize caregiver distress.

Patient and Family/Caregiver Education

1. Recommend that patient and family/caregiver education should be provided in an interactive and written format. (Forster et al., 2001) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
2. Consider identifying a specific team member to be responsible for providing information to the patient and family/caregiver about the nature of the stroke, stroke management rehabilitation and outcome expectations, and their roles in the rehabilitation process. (***QE*: III; *Overall Quality*: Poor; *R*: C**)
3. The family conference may be considered as a useful means of information dissemination. (***QE*: III; *Overall Quality*: Poor; *R*: C**)
4. Recommend that patient and family education should be documented in the patient´s medical record to prevent the occurrence of duplicate or conflicting information from different disciplines. (***QE*: III; *Overall Quality*: Poor; *R*: C**)

Rehabilitation During The Acute Phase

A. **Patient with Stroke During Acute Phase**

The Agency for Health Care Policy and Research (AHCPR) (1995) defines "acute care" as:

The period of time immediately following the onset of an acute stroke. A full-service hospital where patients with an acute stroke are treated either in a medical service or in a specialized stroke unit, and where rehabilitation interventions are normally begun during the acute phase.

Because of the nature of the neurological problems and the propensity for complications, most patients with acute ischemic stroke are admitted to a hospital. Outcome can be improved if a patient is admitted to a facility that specializes in the care of stroke. The goals of early supportive care after admission to the hospital are to:

1. Observe changes in the patient's condition that might prompt different medical or surgical interventions.
2. Facilitate medical and surgical measures aimed at improving outcome after stroke.
3. Institute measures to prevent subacute complications.
4. Begin planning for therapies to prevent recurrent stroke.
5. Begin efforts to restore neurological function through rehabilitation or other techniques.

After stabilization of the patient's condition the following can be initiated, when appropriate: rehabilitation, measures to prevent long-term complications, chronic therapies to lessen the likelihood of recurrent stroke, family support, and treatment of depression (American Heart Association [AHA], 1994).

B. **Obtain Medical History And Physical Examination. Initial Assessment of Complications, Impairment, And Rehabilitation Needs**

Objective

Obtain clinical data required to manage the stroke rehabilitation.

Recommendations

1. The National Institutes of Health Stroke Scale (NIHSS) should be used to assess severity of stroke in the initial stages as a predictor of mortality and long-term outcome (see Annotation C in the original guideline document).
2. The initial assessment should include a complete history and physical examination, with special emphasis on the following:
    - Risk factors for stroke recurrence
    - Medical comorbidities
    - Level of consciousness and cognitive status
    - Brief swallowing assessment
    - Skin assessment and risk for pressure ulcers (see Annotation B-1)
    - Bowel and bladder function
    - Mobility, with respect to the patient´s needs for assistance in movement
    - Risk of deep vein thrombosis (DVT) (see Annotation B-2)
    - History of previous antiplatelet or anticoagulation use, especially at the time of stroke
    - Emotional support for the family and caregiver

B-1 Risk for Skin Breakdown

Recommendations

1. Recommend that a thorough assessment of skin integrity should be completed upon admission and monitored, at least daily, thereafter. (AHCPR, 1995; Bates-Jensen & Sussman, 1998) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Recommend the use of proper positioning, turning, and transferring techniques and judicious use of barrier sprays, lubricants, special mattresses, and protective dressings and padding to avoid skin injury due to friction or excessive pressure. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)

B-2 Risk for Deep Vein Thrombosis (DVT)

Recommendations

1. Recommend that all patients be mobilized as soon as possible (the act of getting a patient to move in the bed, sit up, stand, and eventually walk). (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Strongly recommend the use of subcutaneous low-dose unfractionated heparin (LDUH) (5,000 units twice a day [BID], unless contraindicated) to prevent DVT/pulmonary embolism (PE) for patients with ischemic stroke and impaired mobility. (The International Stroke Trial [IST], 1997) (***QE*: I; *Overall Quality*: Good; *R*: A**) Low molecular weight heparin (LMWH) or heparinoids may be used as an

alternative to LDUH, especially in patients with a history of heparin-related side effects (such as thrombocytopenia). (Bath, Iddenden, & Bath , 2000; Bath, Bath, & Smithard, 2001; Bijsterveld et al., 1999) (***QE*: I; *Overall Quality*: Poor; *R*: C**)

3. Consider the use of graduated compression stockings. (Muir et al., 2000) (***QE*: I; *Overall Quality*: Fair; *R*: B**) or an intermittent pneumatic compression machine. (Kamran, Downey, & Ruff, 1998) (***QE*: II-3; *Overall Quality*: Fair; *R*: B**) as an adjunct to anticoagulation, or as an alternative to anticoagulation for patients with intracerebral hemorrhagic or for patients in whom anticoagulation is contraindicated.

C. Assessment of Stroke Severity (NIHSS)

Objective

Stratify patients according to severity and likely outcome.

Recommendations

1. Strongly recommend that the patient be assessed for stroke severity using the NIHSS at the time of presentation/hospital admission, or at least within the first 24 hours following presentation. (Adams et al., 1999; Frankel et al., 2000) (***QE*: I; *Overall Quality*: Good; *R*: A**)
2. Strongly recommend that all professionals involved in any aspect of the stroke care be trained and certified to perform the NIHSS.
3. Recommend that patients should be reassessed using the NIHSS at the time of acute care discharge.
4. Recommend that if the patient is transferred to rehabilitation and there are no NIHSS scores in the record, the rehabilitation team should complete an NIHSS.

D. Initiate Secondary Prevention and Prevention of Complications

Objective

Reduce the risk for recurrence of stroke.

Recommendations

1. Strongly recommend that patients with a symptomatic carotid stenosis of 70 to 99 percent who are surgical candidates and have a life expectancy of over 2 years should undergo carotid endarterectomy (CEA) if the surgical morbidity and mortality is under 5 percent at the treating center ("Beneficial effect of carotid endarterectomy," 1991). CEA may be considered in selected patients with carotid stenosis of 50 to 69 percent (number-needed-to-treat to prevent one stroke over 5 years = 15) (Barnett et al., 1998). Antiplatelet therapy should be instituted after post-operative recovery from CEA. (Barnett et al., 1998) (***QE*: I; *Overall Quality*: Good; *R*: A**)

2. Strongly recommend that patients with atrial fibrillation, mechanical heart valves, mural thrombi, or other high risk sources of cardiogenic emboli should be treated with warfarin at a target international normalized ratio (INR) of 2.5, range 2.0 to 3.0, if they are likely to be compliant with the required monitoring and are not at high risk for bleeding complications. (Albers et al., 2001). In cardioembolic patients who have had a large stroke, anticoagulation should not be started for 7 to 10 days due to the risk of cerebral hemorrhage. In non-cardioembolic ischemic stroke, warfarin has not been shown to be more effective than aspirin (Mohr et al., 2001). (Albers et al., 2001; Blackshear et al., 1999) (***QE*: I; *Overall Quality*: Good; *R*: A**)
3. Strongly recommend that patients with non-cardioembolic ischemic stroke should receive antiplatelet therapy after stroke if there is no bleeding contraindication. Aspirin at a dose of 81 to 325 mg is cost-effective and is the usual first-line agent. Clopidogrel at 75 mg/day, and the combination of 200-mg extended release dipyridamole with 25 mg of aspirin taken twice a day are acceptable alternatives to aspirin and may provide a greater degree of risk reduction than aspirin albeit at a higher cost. (CAPRIE Steering Committee, 1996; Diener et al., 1996; Zusman et al., 1999; Albers et al., 2001) (***QE*: I, III; *Overall Quality*: Fair, Good; *R*: A**)
4. Strongly recommend that patients having a stroke while on aspirin be considered for alternative antiplatelet agents (see Appendix A-Antiplatelet Pharmacotherapy in the original guideline document and also at www.vapbm.org/PBM/criteria.htm)
5. Strongly recommend that treatment of hypertension should be instituted after the acute period in patients who have consistently elevated blood pressure. Even borderline hypertension conveys an increased stroke risk. Target blood pressure should be in accordance with the VA/DoD Clinical Practice Guideline for the Diagnosis and Management of Hypertension in the Primary Care Setting. Several drugs have been studied and shown to be effective in stroke prevention such as angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, and thiazide diuretics. The ACE inhibitors, ramipril and perindopril, may exhibit beneficial effects on stroke prevention independent of blood pressure reduction. (Yusuf et al., 2000; "Randomised trial of a perindopril-based blood-pressure-lowering regimen," 2001) (***QE*: I; *Overall Quality*: Good; *R*: A**) Control of hypertension remains an essential cornerstone for stroke prevention. Avoid sudden or excessive drops in blood pressure which could exacerbate cerebral hypoperfusion (especially in the acute phase). Do not use fast-acting antihypertensive drugs, which could drop blood pressure too much and too fast.
6. Strongly recommend that patients who have had an ischemic stroke be treated for hypercholesterolemia according to the VA/DoD Clinical Practice Guideline for the Management of Dyslipidemia. (Blauw et al., 1997; Bucher, Griffith, & Guyatt, 1998; Byington et al., 2001; van Mil et al., 2000; Bloomfield Rubins et al., 2001; Jonsson & Asplund, 2001) (***QE*: I, II-2; *Overall Quality*: Good; *R*: A**)
7. Recommend that all patients after stroke should be counseled about smoking cessation, participation in a regular exercise program (as permitted by the patient´s physical limitations and general medical condition), maintaining a body-mass index within the desirable range,

and avoidance of heavy alcohol use (refer to the VA/DoD Clinical Practice Guideline for Management of Substance Use Disorders in the Primary Care Setting) and the VA/DoD Clinical Practice Guideline To Promote Tobacco Use Cessation in the Primary Care Setting). (Dunbabin & Sandercock, 1990; Goldstein et al., 2001) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)

8. Ongoing monitoring of anticoagulant or antiplatelet therapy, treatment of hypertension and hypercholesterolemia, and other secondary prevention strategies is a lifelong need of patients after stroke and should normally be performed by the patient´s primary healthcare provider

Post-Stroke Rehabilitation

E. **Post-Acute Stroke Patient Assessed For Rehabilitation Services**

Post-acute stroke is defined as the period of time immediately following discharge from acute care. The stroke patient has achieved medical stability and the focus of care now becomes rehabilitation. Stroke rehabilitation following discharge from acute care can be conducted in inpatient rehabilitation hospitals or rehabilitation units in acute care hospitals, nursing facilities, the patient´s home, or outpatient facilities. Some patients may recover from the acute phase with no need for rehabilitation services.

Inpatient rehabilitation:

*Rehabilitation performed during an inpatient stay in a freestanding rehabilitation hospital or a rehabilitation unit of an acute care hospital. The term **inpatient** is also used to refer generically to programs where the patient is in residence during treatment, whether in an acute care hospital, a rehabilitation hospital, or a nursing facility.*

Nursing facility rehabilitation:

Rehabilitation performed during a stay in a nursing facility. Nursing facilities vary widely in their rehabilitation capabilities, ranging from maintenance care to comprehensive and intense rehabilitation programs.

Outpatient rehabilitation:

Rehabilitation performed in an outpatient facility that is either freestanding or attached to an acute care or rehabilitation hospital. Day hospital care is a subset of outpatient rehabilitation in which the patient spends a major part of the day in an outpatient rehabilitation facility.

Home-based rehabilitation:

A rehabilitation program provided in the patient's place of residence (AHCPR, 1995).

F. **Obtain Medical History and Physical Examination. Determine Nature and Extent of Rehabilitation Services Based on Stroke Severity, Functional Status, and Social Support**

Objective

Obtain clinical data to determine the patient´s need for rehabilitation services.

Annotations

A thorough history and physical should be performed by the rehabilitation physician. The National Institute of Health Stroke Scale (NIHSS) score should be obtained at this time, if not previously determined by the referring team. The history, physical, and NIHSS score provides the framework to begin to determine the nature and extent of needed rehabilitation services.

The history and physical should cover the following areas:

- Risk of complications (skin breakdown, risk for DVT, swallowing problems, bowel and bladder dysfunction, malnutrition, falls, and pain) (see Annotations B and G)
- Determination of impairment (swallowing, cognition, communication, motor, psychological, and safety awareness) (see Annotations H and S)
- Psychosocial assessment (family and caregivers, social support, financial, and cultural support) (see Annotation I)
- Assessment of prior and current functional status (e.g., FIM™) (see Annotation J)

G. **Assess Risk for Complications**

G-1 Assessment of Swallowing (Dysphagia)

Recommendations

1. Recommend that all patients have their swallow screened prior to initiating oral intake of fluids or food, utilizing a simple valid bedside testing protocol. (ECRI, 1999; Perry & Love, 2001; Martino, Pron, & Diamant, 2000) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
2. Recommend that the swallow screening be performed by the Speech and Language Pathologist (SLP) or other appropriately trained personnel, if the SLP is not available. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
3. If the patient´s swallow screening is abnormal, a complete bedside swallow examination is recommended. The examination should be performed by the SLP, who will define swallow physiology and make recommendations regarding management and treatment. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*:I**)
4. Recommend that all patients who have a positive bedside screening be tested using videofluoroscopy swallowing study (VFSS)/modified

barium swallow. Patients with a high risk for aspiration and/or dysphagia (e.g., brainstem stroke, pseudobulbar palsy, and multiple strokes), regardless of screening results, should undergo VFSS. (Perry & Love, 2001) (***QE*: II-2: *Overall Quality*: Fair; *R*: B**)

5. Consider fiber-optic endoscopic examination of swallowing (FEES) as an alternative to VFSS. (ECRI, 1999) (***QE*: II-2; *Overall Quality*: Fair; *R*: C**)
6. There is insufficient evidence to recommend for or against fiber-optic endoscopic examination of swallowing with sensory testing (FEESST) for the assessment of dysphagia. (Aviv, 2000) (***QE*: II-3; *Overall Quality*: Poor; *R*: I**)
7. Recommend that the diagnostic assessment, whether VFSS or another modality, include a definition of swallow physiology with identification of the physiologic abnormality and treatment strategies to directly assess their effectiveness. (Martin-Harris et al., 2000) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
8. Consider addressing food consistency with dietetics to ensure standardization, consistency, and palatability.

G-2 Treatment of Bowel and Bladder Incontinence

Recommendations

1. Recommend assessment of bladder function in acute stroke patients, as indicated. Assessment should include:
    - Assessment of urinary retention through the use of a bladder scanner or an in-and-out catheterization
    - Measurement of urinary frequency, volume, and control
    - Presence of dysuria

    (Nwosu et al., 1998; Working Group Consensus) (***QE*: II-2, III; *Overall Quality*: Poor, Fair; *R*: C, B**)

2. Consider removal of the Foley catheter within 48 hours to avoid increased risk of urinary tract infection; however, if used, it should be removed as soon as possible. (Bjork, Pelletier, & Tight, 1984; Sabanthan, Castelden, & Mitchell, 1985; Warren et al., 1982) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
3. Recommend the use of silver alloy-coated urinary catheters, if a catheter is required. (Saint et al., 1998) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
4. There is insufficient evidence to recommend for or against the use of urodynamics over other methods of assessing bladder function. (Ramsay et al., 1995) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
5. Consider an individualized bladder training program be developed and implemented for patients who are incontinent of urine. (Roe, Williams, & Palmer, 2001; Berghmans et al., 2000) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
6. Recommend the use of prompted voiding in stroke patients with urinary incontinence. (Eustice, Roe, & Patterson, 2001) (***QE*: I; *Overall Quality*: Fair; *R*: B**)

7. Recommend a bowel management program be implemented in patients with persistent constipation or bowel incontinence. (Venn et al., 1992) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

G-3 Assessment of Malnutrition

Recommendations

1. Recommend that all patients receive evaluation of nutrition and hydration, as soon as possible after admission. Food and fluid intake should be monitored daily in all patients and body weight should be determined regularly. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
2. Recommend that a variety of methods be used to maintain and improve intake of food and fluids. This will require treating the specific problems that interfere with intake, providing assistance in feeding, if needed, consistently offering fluid by mouth to dysphagic patients, and catering to the patient´s food preferences. If intake is not maintained, feeding by a feeding gastrostomy may be necessary. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

G-4 Assessment and Treatment of Pain

Recommendations

1. Recommend pain assessment using the 0 to 10 scale. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
2. Recommend a pain management plan that includes assessment of the following: likely etiology (i.e., musculoskeletal and neuropathic), pain location, quality, quantity, duration, intensity, and what aggravates or relieves the pain.
3. Control pain that interferes with therapy.
4. Recommend the use of lower doses of centrally-acting analgesics, which may cause confusion and deterioration of cognitive performance and interfere with the rehabilitation process.

H. Assessment of Cognition and Communication

Objective

Identify areas of cognitive and communication impairment.

Recommendations

1. Assessment of cognition, arousal, and attention should address the following areas: learning and memory, visual neglect, attention, apraxia, and problem solving.
2. The Working Group does not recommend for or against the use of any specific tools to assess cognition. Several screening and assessment tools exist.

3. Assessment of communication ability should address the following areas: listening, speaking, reading, writing, and pragmatics.
4. The Working Group does not recommend for or against the use of any specific tools to assess communication. Several screening and assessment tools exist. Appendix B in the original guideline document includes standard instruments for assessment of communication.
5. Communication and cognitive problems are prevalent in stroke patients. Team members should be trained to recognize and manage the patient´s communication and cognitive problems.

I. Psychosocial Assessment

Objective

Provide comprehensive understanding of patient/caregiver psychosocial functioning, environment, resources, goals, and expectations for community integration.

Recommendations

1. Recommend that all stroke patients should receive a psychosocial assessment, psychosocial intervention, and referrals. (Tsouna-Hadjis et al., 2000) (***QE*: II-3; *Overall Quality*: Fair; *R*: B**)
2. Recommend that families, significant others, and caregivers should be included in the assessment process. (Tsouna-Hadjis et al., 2000) (***QE*: II-3; *Overall Quality*: Fair; *R*: B**)
3. Recommend that all stroke patients should be referred to a social worker for a comprehensive psychosocial assessment and intervention. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
4. The psychosocial assessment should include the following areas:
    - History of pre-stroke functioning (e.g., demographic information, past physical conditions and response to treatment, substance use and abuse, psychiatric, emotional, and mental status and history, education and employment, military, legal, and coping strategies)
    - Family/caregiver situation and relationships
    - Resources (e.g., income and benefits, housing, and social network)
    - Spiritual and cultural activities
    - Leisure time and preferred activities
    - Patient/family/caregiver understanding of the condition, treatment, and prognosis, as well as hopes and expectations for care

J. Assessment of Function

Objective

Provide baseline assessment of overall functional status.

Recommendations

1. Recommend that a standardized assessment tool be used to assess functional status of stroke patients.
2. Consider the use of the Functional Independence Measure (FIM™) as the standardized functional assessment (see Appendix D – Functional Independence Measure [FIM™] Instrument in the original guideline document).(Lin, 2001; Ottenbacher et al., 1996) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)

   Appendix B includes the list of other standard instruments for assessment of function and impact of stroke.

K. **Does Patient Need Rehabilitation Interventions?**

Objective

Identify the patient who requires rehabilitation intervention.

Recommendations

1. Strongly recommend that once the patient is medically stable, the primary physician consult rehabilitation services (i.e., physical therapy, occupational therapy, speech and language pathology, kinesiotherapy, and Physical Medicine), as indicated, to assess the patient´s rehabilitation needs and to recommend the most appropriate setting to meet those needs.
2. A multidisciplinary assessment, using a standard procedure, should be undertaken and documented for all patients. Patients with need of rehabilitation intervention should be referred to a specialist stroke rehabilitation team, as soon as possible.

L. **Is Inpatient Rehabilitation Indicated?**

Objective

Identify the optimal environment for providing rehabilitation interventions.

Recommendations

1. Strongly recommend that patients in need of rehabilitation services have access to a setting with a coordinated and organized rehabilitation care team, experienced in providing stroke services. The coordination and organization of inpatient post-acute stroke care will improve patient outcome. (*See Provision of Rehabilitation Care)* (***QE*: I; *Overall Quality*: Good; *R*: A**)
2. No conclusive evidence was found to demonstrate the superiority of one type of rehabilitation setting over another. (Cifu & Stewart, 1999; Early Supported Discharge Trialists, 2001; Evans et al., 1995; Rudd et al., 1997) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
3. The severity of the patient´s impairment, the availability of family/social support, and patient/family preferences will determine

the optimal environment for care. (Working Group Consensus) (***QE*: III; *Overall Quality*: Fair; *R*: I**)

4. Recommend that patients remain in an inpatient setting for their rehabilitation care if they are in need of skilled nursing services, regular physician care, and multiple therapeutic interventions. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

M. **Is Patient Independent in Activities of Daily Living (ADL) And IADL (Instrumental Activities of Daily Living)?**

Objective

Determine appropriate discharge environment.

Recommendations

1. Recommend that all post-stroke patients should be reassessed for ADL prior to discharge. (Nourhashemi et al., 2001) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
2. Recommend that all patients planning to return to independent community living should be assessed for IADL prior to discharge (including a community skills evaluation and home assessment). (Ginsberg et al., 1999) (***QE*: II-3; *Overall Quality*: Fair; *R*: B**)
3. Minimal IADL skills required to stay at home alone include the ability to: (1) prepare or retrieve a simple meal, (2) employ safety precautions and exhibit good judgment, (3) take medication, and (4) get emergency aid, if needed. Refer to Table 1 in the original guideline document as a guide to differentiate between ADL and IADL.

N. **Discharge Patient to Prior Home/Community; Arrange for Medical Follow-Up in Primary Care**

Objective

Ensure that the patient´s continued medical and functional needs are addressed after discharge from rehabilitation services.

Recommendations

1. Strongly recommend that every patient participate in a secondary prevention program (see Annotation D) (***QE*: I; *Overall Quality*: Good; *R*: A**).
2. Recommend that post-acute stroke patients be followed up by a primary care provider to address stroke risk factors and continue treatment of comorbidities.
3. Recommend that the patient and family be educated regarding pertinent risk factors for stroke.

N-1 Exercise Program

Recommendations

1. Recommend that the patient participates in a regular strengthening and aerobic exercise program at home or in an appropriate community program that is designed with consideration of the patient´s comorbidities and functional limitations. (Macko et al., 1997; Potempa et al., 1996; Rimmer et al., 2000; Teixeira-Salmela et al., 1999) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)

N-2 Adaptive Equipment, Durable Medical Devices, Orthotics, and Wheelchairs

Recommendations

1. Recommend that adaptive devices be used for safety and function if other methods of performing the task are not available or cannot be learned or if the patient´s safety is a concern. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Recommend that lower extremity orthotic devices be considered, if ankle or knee stabilization is needed to improve the patient´s gait and prevent falls. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
3. Recommend that a prefabricated brace be initially used and only patients who demonstrate long-term need for bracing have customized orthoses made. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
4. Recommend that wheelchair prescriptions be based on careful assessment of the patient and the environment in which the wheelchair will be used. (AHCPR, 1995; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
5. Recommend that walking assistive devices be used to help with mobility efficiency and safety, when needed.

N-3 Return to Work

Recommendations

1. Recommend that all patients, if their condition permits, should be encouraged to be evaluated for the potential of returning to work. (AHCPR, 1995) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Recommend that all patients who were previously employed be referred to vocational counseling for assistance in returning to work. (AHCPR, 1995; American Stroke Association) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
3. Recommend that all patients who are considering a return to work, but who may have psychosocial barriers (e.g. motivation, emotional, and psychological concerns) be referred for supportive services, such as vocational counseling or psychological services. (AHCPR, 1995; American Stroke Association) (***QE*: III; *Overall Quality*: Poor; *R*: C**)

N-4 Return to Driving

Recommendations

1. Recommend that all patients be given a clinical assessment of their physical, cognitive, and behavioral functions to determine their readiness to resume driving. In individual cases where concerns are identified by the family or medical staff, the patient should be required to pass the state road test as administered by the licensing department. Each medical facility should be familiar with their state laws regarding driving after a stroke. (Working Group Consensus). (***QE*: III; *Overall Quality*: Poor; *R*: I**)
2. Consider referring patients with residual deficits to adaptive driving instruction programs to minimize the deficits, eliminate safety concerns, and ensure that patients will be able to pass the state driving test. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

N-5 Sexual Function

Recommendations

1. Sexual issues should be discussed during rehabilitation and addressed again after transition to the community when the post-stroke patient and partner are ready.

O. Patient with Severe Stroke And/Or Maximum Dependence And Poor Prognosis For Functional Recovery

Annotation

Patients who have had a severe stroke or who are maximally dependent in ADL and have a poor prognosis for functional recovery are not candidates for rehabilitation intervention. Families and caregivers should be educated in the care of these patients. The family and caregiver education may include preventing recurrent stroke; signs and symptoms of potential complications and psychological dysfunction; medication administration; assisted ADL tasks (e.g., transfers, bathing, positioning, dressing, feeding, toileting, and grooming); swallowing techniques; nutrition and hydration; care of an indwelling bladder catheter; skin care; contractures; use of a feeding tube; home exercises (range of motion); and sexual functioning. Families should receive counseling on the benefits of nursing home placement long-term care.

P. Post-Stroke Patient in Inpatient Rehabilitation

Inpatient rehabilitation is defined as rehabilitation performed during an inpatient stay in a freestanding rehabilitation hospital or a rehabilitation unit of an acute care hospital. The term *inpatient* is also used to refer generically to programs where the patient is in residence during treatment, whether in an acute care hospital, a rehabilitation hospital, or a nursing facility.

Q. Determine Level of Care

Objective

Provide the optimal environment for rehabilitation care.

Recommendations

1. Strongly recommend that rehabilitation services be provided in an environment with organized and coordinated post-acute stroke rehabilitation care. (*See Provision of Rehabilitation Care*) (***QE*: I; *Overall Quality*: Good; *R*: A**)

R. **Educate Patient/Family; Reach Shared Decision Regarding Rehabilitation Program; Determine Treatment Plan**

Objective

Assure the understanding of common goals among staff, patient, and family/caregivers in the stroke rehabilitation process, and therefore, optimize the patient´s functional recovery and community reintegration.

Recommendations

1. Recommend that the rehabilitation team and family/caregiver should reach a shared decision regarding the rehabilitation program.
    - The rehabilitation team proposes the preferred environment for rehabilitation and treatments based on expectations for recovery.
    - The rehabilitation team describes to the patient and family/caregiver the treatment options, including the rehabilitation and recovery process, prognosis, estimated length of stay, frequency of therapy, and discharge criteria.
    - The patient, family/caregiver, and rehabilitation team should determine the optimal environment for rehabilitation and preferred treatment.
2. The rehabilitation program should be guided by specific goals developed in consensus with the patient, family, and rehabilitation team. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
3. Recommend that the patient´s family/caregiver should participate in the rehabilitation sessions, and be trained to assist the patient with functional activities, when needed.
4. Patient and family/caregiver education should be provided in an interactive and written format. Provide the patient and family/caregiver with an information packet that may include printed material on subjects such as the resumption of driving, patient rights/responsibilities, support group information, and audio/visual programs on stroke. (*See Provision of Rehabilitation Care*) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
5. Document the detailed treatment plan in the patient´s record to provide integrated rehabilitation care.

S. **Initiate Rehabilitation Programs and Interventions**

Objective

Provide the most appropriate interventions to optimize patient function and quality of life after an acute stroke.

S-1 Dysphagia Treatment

Recommendations

1. Recommend considering enteral feeding for the stroke patient who is unable to orally maintain adequate nutrition or hydration. (Finestone et al., 2001) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
2. Consider the use of a feeding tube; however, there is no evidence to recommend the use of one feeding route over another.
3. Recommend that the dysphagic stroke patient receive both direct swallowing treatment and management by the speech and language pathologist (SLP), when available, when a treatable disorder in swallow anatomy or physiology is identified. (Hinds & Wiles, 1998; Martin-Harris et al., 2000; Perry & McLaren, 2000) (***QE*: II-3; *Overall Quality*: Fair; *R*: B**)

S-2 Acute Communication Disorders

Recommendations

1. Recommend that patients with communication disorders receive early treatment and monitoring of change in communication abilities in order to optimize recovery of communication skills, develop useful compensatory strategies, when needed, and facilitate improvements in functional communication. (American Speech-Language Hearing Association [ASHA], 2001, 2002; Robey, 1994; Robey, 1998) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
2. Recommend that the SLP educate the rehabilitation staff and family/caregivers in techniques to enhance communication with patients who have communication disorders. (ASHA, 2001; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

S-3 Long-Term Communication Difficulties

Recommendations

1. Strongly recommend that all patients should be evaluated and treated by the SLP for residual communication difficulties (i.e., speaking, listening, reading, writing, and pragmatics). (Elman & Bernstein-Ellis, 1999; Katz & Wertz, 1997; Robey, 1994; Robey, 1998; Wertz et al., 1986; Whurr, Lorch, & Nye, 1997; Whurr, Lorch, & Nye, 1992) (***QE*: I; *Overall Quality*: Good; *R*: A**)

S-4 Motor Functioning - Strengthening

Recommendations

1. Recommend that strengthening be included in the acute rehabilitation of patients with muscle weakness following stroke. (Working Group Consensus). (***QE*: III; *Overall Quality*: Poor; *R*: I**)

S-5 Partial Body Weight Support for Treadmill Training

Recommendations

1. Recommend that treadmill training with partial body weight support be used as an adjunct to conventional therapy in patients with mild to moderate dysfunction resulting in impaired gait. (Kosak & Reding, 2000; Teixeira et al., 2001; Visintin et al., 1998) (***QE*: I; *Overall Quality*: Fair; *R*: B**)

S-6 Constraint Induced (CI) Movement Therapy

Recommendations

1. Consider the use of constraint induced (CI) therapy for a select group of patients (i.e., patients with 20 degrees of wrist extension and 10 degrees of finger extension, who have no sensory and cognitive deficits). To date the only demonstrated benefit occurs in individuals who received 6 to 8 hours of daily training for at least 2 weeks. (Kunkel et al., 1999; van der Lee et al., 1999) (***QE*: I; *Overall Quality*: Poor; *R*: C**)

S-7 Functional Electrical Stimulation (FES)

Recommendations

1. Recommend treatment with FES for patients who have demonstrated impaired muscle contraction, specifically with patients with ankle/knee/wrist motor impairment. (Glanz et al., 1996) (***QE*: I, *Overall Quality*: Fair; *R*: B**)
2. Recommend FES for patients who have shoulder subluxation. (Price & Pandyan, 2001) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
3. There is insufficient evidence to recommend for or against using multi-channel FES for severe hemiplegic patients with gait impairment. (Bogataj et al., 1995) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
4. Recommend FES for gait training following stroke. (Daly et al., 1993; Daly & Ruff, 2000; Daly et al., 2000, 2001) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)

S-8 Neuro Developmental Training (NDT) for Motor Retraining

Recommendations

1. There is insufficient evidence to recommend for or against using NDT in comparison to other treatment approaches for motor retraining following an acute stroke. (Bruhnam & Snow, 1992; Mulder, Hulstijn, &

van der Meer, 1986; Wagenaar et al., 1990) (***QE*: I; *Overall Quality*: Fair: *R*: I**)

S-9 Spasticity

Recommendations

1. Recommend that spasticity and contractures be treated with antispastic positioning, range of motion exercises, stretching, splinting, serial casting, or surgical correction. (AHCPR, 1995; RCP, 2000; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Consider use of tizanidine, dantrolene, and/or oral baclofen for spasticity resulting in pain, poor skin hygiene, or decreased function. Tizanidine should be used specifically for chronic stroke patients (refer to Annotation S-15). (Gelber et al., 2001; Ketel & Kolb, 1984; Milanov, 1992) (***QE*: II-1; *Overall Quality*: Fair; *R*: B**)
3. Recommend *against* diazepam or other benzodiazepines during the stroke recovery period due to possible deleterious effects on recovery (refer to Annotation S-15), in addition to deleterious sedation side effects. (Goldstein, 1995, 1998; Graham et al., 1999; Troisi et al., 2002) (***QE*: II-2; *Overall Quality*: Fair; *R*: D**)
4. Consider use of botulinum toxin or phenol/alcohol for selected patients with disabling or painful spasticity or spasticity resulting in poor skin hygiene or decreased function. (Bakheit et al., 2000; Kirazli et al., 1998; Kong & Chua, 1999; On et al., 1999; Richardson et al., 2000; Simpson et al., 1996) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
5. Consider intrathecal baclofen for chronic stroke patients for spasticity resulting in pain, poor skin hygiene, or decreased function. (Meythaler et al., 2001) (***QE*: ll-1; *Overall Quality*: Fair; *R*: C**)
6. Consider neurosurgical procedures, such as selective dorsal rhizotomy or dorsal root entry zone lesion, for spasticity resulting in pain, poor skin hygiene, or decreased function. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

S-10 Biofeedback

Recommendations

1. The Working Group makes no recommendation for or against routine use of biofeedback for post-stroke patients. The use of biofeedback is left to the consideration of the individual provider. (Schleenbaker & Mainous, 1993; Glanz et al., 1995; Moreland et al., 1998) (***QE*: I; *Overall Quality*: Poor; *R*: C**)

S-11 Shoulder Pain

Recommendations

1. Consider the following interventions to prevent shoulder pain in the involved upper extremity, following a stroke:

- Electrical stimulation to improve shoulder lateral rotation(Price & Pandyan, 2001 (***QE*: I; *Overall Quality*: Good; *R*: B**)
- Shoulder strapping (sling)
- Staff education to prevent trauma to the hemiplegic shoulder (Dean, Mackey, & Katrak, 2000) (***QE*: I; *Overall Quality*: Fair; *R*: B**)

2. Recommend avoiding the use of overhead pulleys which encourage uncontrolled abduction. (Kumar et al., 1990)(***QE*: I; *Overall Quality*: Fair; *R*: D**)
3. Consider the following interventions to treat shoulder pain:
    - Intra-articular injections (Triamcinolone) (Dekker et al., 1997) (***QE*: I; *Overall Quality*: Poor; *R*: B**)
    - Shoulder strapping (Ancilffe, 1992; Hanger et al., 2000) (***QE*: II-2; I; *Overall Quality*: Fair; *R*: C**)
    - Improve range of motion (ROM) through stretching and mobilization techniques focusing especially on external rotation and abduction, as a means of preventing frozen shoulder and shoulder-hand-pain syndrome (Bohannon et al., 1986) (***QE*: II-2; *Overall Quality*: Fair; *R*: B**)
    - Modalities: ice, heat, and soft tissue massage
    - Functional electrical stimulation (FES)
    - Strengthening

S-12 Cognitive Remediation

Recommendations

1. Recommend that patients be assessed for cognitive deficits and be given cognitive retraining, if any of the following conditions are present:
    - Attention deficits(Cicerone et al., 2000; Gray et al., 1992; Niemann, Ruff, & Baser, 1990; Sohlberg & Mateer, 1987; Strache, 1987) (***QE*: I, II; *Overall Quality*: Good; *R*: A**)
    - Visual neglect (Cicerone et al., 2000) (***QE*: I; *Overall Quality*: Good; *R*: B**)
    - Memory deficits
    - Executive function and problem-solving difficulties (Cicerone et al., 2000) (***QE*: II; *Overall Quality*: Fair; *R*: C**)
2. Patients with multiple areas of cognitive impairment may benefit from a variety of cognitive retraining approaches that may involve multiple disciplines. (Cicerone et al., 2000) (***QE*: III; *Overall Quality*: Fair; *R*: C**)
3. Recommend the use of training to develop compensatory strategies for memory deficits in post-stroke patients who have mild short term memory deficits. (Cicerone et al., 2000; Ryan & Ruff, 1988) (***QE*: I; *Overall Quality*: Good; *R*: B**)

S-13 Mood Disturbance: Depression and Emotionalism

Recommendations

Assessment

1. The Working Group makes no recommendation for the use of one specific diagnostic tool over another.
2. Recommend using a structured inventory to assess specific psychiatric symptoms and monitor symptom change over time.
3. Recommend assessing post-stroke patients for other psychiatric illnesses, including anxiety, bipolar illness, and pathological affect.

Treatment

4. Strongly recommend that patients with a diagnosed depressive disorder be given a trial of antidepressant medication, if no contraindication exists. (Andersen, 1995; Cole et al., 2001; Gill & Hatcher, 2000; Kimura, Robinson, & Kosier, 2000; Miyai & Reeding, 1998; RCP, 2000; Robinson et al., 2000; Wiart et al., 2000) (***QE*: I; *Overall Quality*: Good; *R*: A**)
5. The Working Group makes no recommendation for the use of one class of antidepressants over another; however, side effect profiles suggest that selective serotonin reuptake inhibitors (SSRIs) may be favored in this patient population.
6. Recommend that patients with severe, persistent or troublesome tearfulness be given a trial on antidepressant medications. (Brown, Sloan, & Pentland, 1998; Burns et al., 1999; Cole et al., 2001; Gordon, 1992; RCP, 2000; Robinson et al., 1993) (***QE*: I; *Overall Quality*: Good; *R*: A**)
7. Strongly recommend SSRIs as the antidepressant of choice in patients with severe, persistent, or troublesome tearfulness.
8. There is insufficient evidence to recommend for or against the use of individual psychotherapy alone in the treatment of post-stroke depression. (Grober et al., 1993; Lincoln et al., 1997) (***QE*: II; *Overall Quality*: Fair; *R*: C**)
9. Recommend that patients be given information, advice, and the opportunity to talk about the impact of the illness upon their lives. (RCP, 2000) (***QE*: I; *Overall Quality*: Fair; *R*: B**)
10. Routine use of prophylactic antidepressants is not recommended in post-stroke patients. (Dam et al., 1996; Palomaki et al., 1999; Raffaele et al., 1996; Robinson et al., 2000) (***QE*: I; *Overall Quality*: Good; *R*: D**)
11. Recommend that mood disorders causing persistent distress or worsening disability be managed by or with the advice of an experienced clinical psychologist or psychiatrist.

S-14 Visual and Spatial Neglect

Recommendations

1. Recommend that stroke patients be assessed for visual and spatial neglect, as indicated. (Agrell, Dehlin, & Dahlgren, 1997; Halligan, Marshall, & Wade, 1989; Jehkonen et al., 1998; Schubert & Spatt, 2001; Stone et al., 1991; Wilson, Cockburn, & Halligan, 1987; Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: C**)
2. Recommend that treatment for stroke patients with visual/spatial neglect focuses on functional adaptation (e.g., visual scanning,

environmental adaptation, environmental cues, and patient/family education). (Antonucci et al., 1995; Beis et al., 1999; Fanthome et al., 1995; Paolucci et al., 1996; Rossetti et al., 1998; Wiart et al., 1997) (***QE*: I; *Overall Quality*: Poor; *R*: B**)

S-15 Use of Pharmacologic Agents

Recommendations

1. Recommend against the use of neuroleptics, benzodiazepines, phenobarbital, and phenytoin during the stroke recovery period. These pharmaceutical agents should be used cautiously in stroke patients, weighing the likely benefit of these drugs against the potential for adverse effects on patient outcome. (Goldstein, 1995 & 1998) (***QE*: II-2; *Overall Quality*: Fair; *R*: D**)
2. Recommend against centrally acting alpha$_2$-adrenergic receptor agonists (such as clonidine and others) and alpha$_1$-receptor antagonists (such as prazosin and others) as antihypertensive medications for stroke patients because of their potential to impair recovery (see Annotation D). (Goldstein, 1995, 1998; Graham et al., 1999) (***QE*: II-2; *Overall Quality*: Fair; *R*: D**)
3. There is insufficient evidence regarding optimal dose and safety use of neurotransmitter-releasing agents and central nervous system stimulants. Consider stimulants/neurotransmitter-releasing agents in selected patients to improve participation in stroke rehabilitation or to enhance motor recovery. Dextroamphetamine has been the most tested stimulant at 10 mg per day, but insufficient evidence is available regarding optimal dosing and safety to support the routine use of central nervous system (CNS) stimulants during rehabilitation. Data remains sparse to consider routine use of neurotransmitter-releasing agents in stroke recovery. (Crisostomo et al., 1988; Dam et al., 1996; Grade et al., 1998; Nishino et al., 2001; Scheidtmann et al., 2001; Walker-Batson et al., 1995, 2001) (***QE*: I; *Overall Quality*: Fair; *R*: B**)

T. **Is Patient Ready For Community Living?**

Objective

Provide smooth transition back to community living following stroke.

Recommendations

1. Recommend that the patient and family/caregivers are fully informed about, prepared for, and involved in all aspects of healthcare and safety needs. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
2. Recommend that the family/caregivers receive all necessary equipment and training in moving and handling, in order to position and transfer the patient safely in the home environment. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

3. Recommend that the patient have appropriate vocational and income support opportunities. Stroke patients who worked prior to their strokes should be encouraged to be evaluated for the potential to return to work, if their condition permits. Vocational counseling should be offered when appropriate. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
4. Recommend that leisure activities should be identified and encouraged and the patient enabled to participate in these activities. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
5. Recommend that case management be put in place for complex patient and family situations. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)
6. Recommend that acute care hospitals and rehabilitation facilities maintain up-to-date inventories of community resources, provide this information to stroke patients and their families and caregivers, and offer assistance in obtaining needed services. Patients should be given information about, and offered contact with, appropriate local statutory and voluntary agencies. (Working Group Consensus) (***QE*: III; *Overall Quality*: Poor; *R*: I**)

U. **Address Adherence To Treatments And Barriers To Improvement:**
If Medically Unstable, Refer To Acute Services
If There Are Mental Health Factors, Refer To Mental Health Services

V. **Does Patient Need Community-Based Rehabilitation Services?**

Nursing facility rehabilitation:
Rehabilitation performed during a stay in a nursing facility. Nursing facilities vary widely in their rehabilitation capabilities, ranging from maintenance care to comprehensive and intense rehabilitation programs.

Outpatient rehabilitation:
Rehabilitation performed in an outpatient facility that is either freestanding or attached to an acute care or rehabilitation hospital. Day hospital care is a subset of outpatient rehabilitation in which the patient spends a major part of the day in an outpatient rehabilitation facility.

Home-based rehabilitation:
A rehabilitation program provided in the patient´s place of residence (AHCPR, 1995).

W. **Determine Optimal Environment for Community-Based Rehabilitation Services**

Objective

Determine if therapy following hospital discharge should be provided on an outpatient basis or in the home environment by home health services.

Recommendations

1. Strongly recommend continuing outpatient rehabilitation services in the setting where they can most appropriately and effectively be carried out. This is based on medical status, function, social support, and access to care. (Weir, 1999) (***QE*: I; *Overall Quality*: Good; *R*: A**)

Definitions:

Quality of Evidence (QE)

I: Evidence obtained from at least one properly randomized controlled trial
II-1: Evidence obtained from well-designed controlled trails without randomization
II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group
II-3: Evidence obtained from multiple time series studies with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.
III: Opinions of respected authorities, based on clinical experience; descriptive studies and case reports; or reports of expert committees

Overall Quality

Good: High grade evidence (I or II-1) directly linked to health outcome
Fair: High grade evidence (I or II-1 linked to intermediate outcome or Moderate grade evidence (II-2 or II-3) directly linked to health outcome
Poor: Level III evidence or no linkage of evidence to health outcome

Net Effect of Intervention

Substantial:

- More than a small relative impact on a frequent condition with a substantial burden of suffering, or
- A large impact on an infrequent condition with a significant impact on the individual patient level

Moderate:

- A small relative impact on a frequent condition with a substantial burden of suffering, or
- A moderate impact on an infrequent condition with a significant impact on the individual patient level

Small:

- A negligible relative impact on a frequent condition with a substantial burden of suffering, or
- A small impact on an infrequent condition with a significant impact on the individual patient level

Zero or Negative:

- Negative impact on patients, or
- No relative impact on either a frequent condition with a substantial burden of suffering, or
- An infrequent condition with a significant impact on the individual patient level

Grade of Recommendation (R)

A: A strong recommendation that the intervention is always indicated and acceptable
B: A recommendation that the intervention may be useful/effective
C: A recommendation that the intervention be considered
D: A recommendation that a procedure may be considered not useful/effective, or may be harmful
I: Insufficient evidence to recommend for or against; clinical judgment should be used

Abbreviations

ACE – Angiotensin-Converting-Enzyme
ADL - Activities of Daily Living
AFO - Ankle-Foot-Orthoses
AHCPR - Agency for Healthcare Policy and Research
ASHA - American Speech and Hearing Association
BI – Barthel Index
CAD - Coronary Artery Disease
CCC – SLP Certificate of Clinical Competence-Speech and Language Pathology
CEA - Carotid Endarterectomy
CI - Constraint Induced
CNS - Central Nervous System
CVA - Cerebrovascular Accident
DME - Durable Medical Devices
DoD - Department of Defense
DVT - Deep Vein Thrombosis
EMG – Electromyographic
FAI - Frenchay Activities Index
FDA - Federal Drug Administration
FEES - Fiber optic Endoscopic Examination of Swallowing
FEESST - Fiber optic Endoscopic Examination of Swallowing with Sensory Testing
FES - Functional Electrical Stimulation
FIM ™ - Functional Independence Measure
GAD - Generalized Anxiety Disorder
HDL - High-Density Lipoproteins
IADL - Instrumental Activities of Daily Living
KAFO - Knee-Ankle Foot-Orthoses
LDL - Low-Density-Lipoproteins
LDUH - Low-Dose Unfractionated Heparin
LMWH - Low Molecular Weight Heparin
MCA - Middle-Cerebral-Artery
NDT - Neuro Developmental Training

NHP -Nottingham Health Profile
NHSTA - National Highway Safety and Traffic Administration
NIH - National Institutes of Health
NIHSS - National Institutes of Health Stroke Scale
NOMS - National Outcomes Measurement System
PE - Pulmonary Embolism
PSD - Post-Stroke Depression
RBU - Rehabilitation Bed Units
RCP - Royal College of Physicians
RCT - Randomized Controlled Trial
ROM - Range of Motion
SIGN - Scottish Intercollegiate Guidelines Network
SLP - Speech and Language Pathologist
SSRI - Selective Serotonin Reuptake Inhibitor
TBI - Traumatic Brain Injury
USPTSF - U.S. Preventive Services Task Force
VA - Veterans Affairs
VAMC - Veterans Affairs Medical Center
VFSS -Videofluoroscopy Swallowing Study
VHA – Veterans Health Administration

CLINICAL ALGORITHM(S)

Algorithms are provided in the original guideline document for the management of stroke rehabilitation:

- Algorithm A: Assessment
- Algorithm B: Inpatient Rehabilitation
- Algorithm C: Community Based Rehabilitation

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for selected recommendations (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Overall Benefits

- Guideline implementation is intended to help clinicians determine best intervention and timing of care for their patients, better stratify stroke patients, reduce readmission, and optimize healthcare utilization.

- Goals of rehabilitation are to prevent complications, minimize impairments, maximize function, and improve patient/family quality of life.
- Secondary prevention is fundamental to preventing stroke recurrence.
- Standardized evaluations and valid assessment tools are essential to the development of a comprehensive treatment plan.
- Patient and family education improves informed decision-making, social adjustment, and maintenance of rehabilitation gains.
- Ongoing medical management of risk factors and comorbidities is essential to ensure survival.

Specific Benefits

- A considerable body of evidence indicates that better clinical outcomes are achieved when patients with acute stroke are treated in a setting that provides coordinated, multidisciplinary stroke-related evaluation and services.
- The National Institute of Health Stroke Scale (NIHSS) score strongly predicts the likelihood of a patient´s recovery after stroke.

POTENTIAL HARMS

- *Side effects and adverse effects of medication*. For example, anticoagulants used to prevent deep vein thrombosis (DVT) can cause hemorrhagic complications.
    - The development of thrombocytopenic purpura with clopidogrel therapy has been reported. The background rate is thought to be about four cases per million person-years.
    - If a patient is to undergo elective surgery and an antiplatelet effect is not desired, therapy with irreversible antiplatelet agents (aspirin and clopidogrel) should be discontinued 7 days prior to surgery. Since dipyridamole is a reversible antiplatelet agent, the immediate release product could be given until 24 hours prior to surgery.
    - In CAPRIE (1996), clopidogrel was associated with a rate of gastrointestinal bleeding of 2.0 percent, versus 2.7 percent on aspirin.
    - In a 1996 study, aspirin-extended release dipyridamole was associated with a rate of bleeding at any site of 8.7 percent, placebo 4.5 percent, aspirin alone 8.2 percent and extended release dipyridamole alone 4.7 percent.
- *False positive or false negative results of some standard instruments for post-stroke assessment*. For example, The Beck Depression Inventory (BDI) has a high rate of false positives, while the Geriatric Depression Scale (GDS0 has a high rate of false negative in minor depression (*see Appendix B titled "Standard Instruments for Post-Stroke Assessment" in the original guideline document for a list of weaknesses related to each test*)

CONTRAINDICATIONS

CONTRAINDICATIONS

There are contraindications to specific medications used to prevent complications of stroke or recurrence of stroke. For example, antiplatelet pharmacotherapy is contraindicated in active pathological bleeding or most intracranial hemorrhage.

Diazepam is relatively contraindicated in stroke patients, at least in the stroke recovery period, as reviewed in Annotation S15 of the guideline.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- *Antiplatelet pharmacotherapy*: Recommendations for antiplatelet pharmacotherapy are dynamic and will be revised as new clinical data become available.
- These guidelines are not intended to interfere with clinical judgment. Rather, they are intended to assist practitioners in providing cost effective, consistent, high quality care.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Outcome Measures

Effective rehabilitation improves functional outcome. An indicator for improvement is the positive change in the Functional Independence Measures (FIM™) score over a period of time in the post-acute care period. Within the Veterans Health Administration (VHA) this measure is captured in the Functional Status and Outcomes Database for rehabilitation. All stroke patients should be entered into the database, as directed by VHA Directive 2000-016 (dated June 5, 2000; Medical Rehabilitation Outcomes for Stroke, Traumatic Brain, and Lower Extremity Amputee Patients).

Additional indicators that should be measured at three months following the acute stroke episode may include the following:

- Functional status (including activities of daily living [ADL] and instrumental activities of daily living [IADL])
- Rehospitalizations
- Community dwelling status
- Mortality

The primary outcome measure for assessment of functional status is the FIM™ (see Appendix D in the original guideline document). The FIM™ has been tested extensively in rehabilitation for reliability, validity, and sensitivity, and is by far the most commonly used outcome measure. A return to independent living requires not only the ability to perform basic ADL, but also the ability to carry out more complex activities (i.e., IADL), such as shopping, meal preparation, use of the phone, driving a car, and money management. These functions should be evaluated as the patient returns to the community. New stroke-specific outcome measures, such as the Stroke Impact Scale, may be considered for a more comprehensive assessment of functional status and quality of life.

IMPLEMENTATION TOOLS

Clinical Algorithm
Pocket Guide/Reference Cards
Resources

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Veterans Health Administration, Department of Defense. VA/DoD clinical practice guideline for the management of stroke rehabilitation in the primary care setting. Washington (DC): Department of Veteran Affairs; 2003 Feb. Various p. [331 references]

ADAPTATION

The development process of the guideline incorporated information from several sources into a format intended to maximally facilitate clinical decision-making. The effort drew heavily from the following sources: 1996 Veterans Affairs Stroke/Lower Extremity Amputee Algorithms Guide, Agency for Health Care Policy and Research (AHCPR) Post –Stroke Rehabilitation (1995), Royal College of Physicians (RCP) National Clinical Guidelines for Stroke (2000), and Scottish Intercollegiate Guidelines Network (SIGN) Management of Patients with Stroke, 20 (1997).

DATE RELEASED

2003 Feb

GUIDELINE DEVELOPER(S)

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Department of Veterans Affairs - Federal Government Agency [U.S.]
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Stroke Rehabilitation Working Group

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Department of Veterans Affairs Web site.

Print copies: Department of Veterans Affairs, Veterans Health Administration, Office of Quality and Performance (10Q) 810 Vermont Ave. NW, Washington, DC 20420.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Management of stroke rehabilitation care. Washington (DC): National CPG Council; 2003. Various p.
- VHA/DoD clinical practice guideline for the management of stroke rehabilitation. Guideline summary. Washington (DC): Department of Veterans Affairs (U.S.); 2002 Oct. 27 p. See the related QualityTool summary on the Health Care Innovations Exchange Web site.
- VHA/DoD clinical practice guideline for the management of stroke rehabilitation. Pocket guide. Washington (DC): National CPG Council; 2002 Oct. 2 p. See the related QualityTool summary on the Health Care Innovations Exchange Web site.
- VHA/DoD clinical practice guideline for the management of stroke rehabilitation. Key points. Washington (DC): National CPG Council; 2002 Oct. 2 p. See the related QualityTool summary on the Health Care Innovations Exchange Web site.
- Management of stroke rehabilitation care algorithm: module A: initial assessment. Washington (DC): National CPG Council; 2002 Oct. See the related QualityTool summary on the Health Care Innovations Exchange Web site.
- Management of stroke rehabilitation care algorithm: module B: inpatient rehabilitation. Washington (DC): National CPG Council; 2002 Oct. See the

related QualityTool summary on the Health Care Innovations Exchange Web site.
- Management of stroke rehabilitation care algorithm: module C: community based rehabilitation. Washington (DC): National CPG Council; 2002 Oct. See the related QualityTool summary on the Health Care Innovations Exchange Web site.

Electronic copies available from the Department of Veterans Affairs (VA) Web site.

Print copies: Department of Veterans Affairs, Veterans Health Administration, Office of Quality and Performance (10Q) 810 Vermont Ave. NW, Washington, DC 20420.

The following is also available:

- Putting clinical practice guidelines to work [online tutorial]. Available from the Department of Veterans Affairs Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 5, 2004. This summary was updated by ECRI on February 11, 2005, following the release of a public health advisory from the U.S. Food and Drug Administration regarding Adderall and related products. This summary was updated by ECRI on August 15, 2005, following the U.S. Food and Drug Administration advisory on antidepressant medications. This summary was updated by ECRI on March 6, 2007 following the FDA advisory on Coumadin (warfarin sodium). This summary was updated by ECRI Institute on May 8, 2007, following the U.S. Food and Drug Administration advisory on Zanaflex (tizanidine hydrochloride). This summary was updated by ECRI Institute on June 22, 2007 following the U.S. Food and Drug Administration (FDA) advisory on heparin sodium injection. This summary was updated by ECRI Institute on September 7, 2007 following the revised U.S. Food and Drug Administration (FDA) advisory on Coumadin (warfarin). This summary was updated by ECRI Institute on November 6, 2007, following the U.S. Food and Drug Administration advisory on Antidepressant drugs. This summary was updated by ECRI Institute on March 13, 2008 following the updated FDA advisory on heparin sodium injection.

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