

***Guidelines Abstracted from the VA/DoD Clinical Practice Guideline for the Management of Stroke Rehabilitation.***

On behalf of the AGS Clinical Practice Committee, the following authors abstracted this guideline:

**Miriam Rodin, MD, PhD**

Assistant Professor of Clinical Medicine, University of Chicago

**Debra Saliba, MD, MPH**

Assistant Professor and Research Associate, UCLA Multicampus Program in Geriatrics

Commentary provided by

**Kenneth Brummel-Smith, MD**

Chair, Department of Geriatrics, Florida State University College of Medicine

**Address correspondence and reprint requests to:**

Sara Reinthaler

American Geriatrics Society

The Empire State Building

350 Fifth Avenue, Suite 801

New York, NY 10118

Fax: 212-832-8646

[info.amger@americangeriatrics.org](mailto:info.amger@americangeriatrics.org).

**Objectives:** To assist facilities in identifying those evidence-based processes of post-stroke care that enhance measurable patient outcomes. The guideline(s) should be used by facilities (hospitals, sub acute-care and providers of long-term care) to implement a structured approach to best rehabilitative practices; and by clinicians to determine best interventions to achieve improved patient outcomes.

**Options:** The guideline considers five elements of post-stroke rehabilitation care: interdisciplinary teams; use of standardized assessments; intensity, timing and duration of therapy; involvement of patients' families and caregivers in decision-making; and educational interventions for patients, families, and caregivers. Evidence, benefits, harms, and recommendations for each of the five designated elements and specific annotated recommendations for post-stroke managements are presented separately.

**Outcomes:** The overall guideline considers improvement in functional status measures as the primary outcome. Achieving community dwelling status and preventing complications, death and rehospitalization are also important outcomes. Costs are not specifically addressed.

**Participants:** The VA/DoD Stroke Rehabilitation Working Group consisted of 28, largely VA and military hospital, representatives of medical and allied professions concerned with stroke diagnosis, management and rehabilitation. Nine additional members with similar credentials served as the editorial committee. Technical consultation was contracted from ACS Federal Health Care, Inc. and Evidence appraisal was conducted by the Center for Evidence-Based Practice, SUNY-Upstate Medical University, Department of Family Medicine. Consensus was achieved over several years' of facilitated group discussion and iterative evaluation of draft documents and supporting evidence.

**Sponsor:** The guideline was prepared under the auspices of the Department of Veterans' Affairs/ Department of Defense. No other source of support was identified in the document, or supporting documents.

This guideline abstract summarizes the contents of the Veterans Administration / Department of Defense Clinical Practice Guideline for Stroke Rehabilitation.(1) Electronic copies are available at: [www.oqp.med.va.gov/cpg/](http://www.oqp.med.va.gov/cpg/) and print copies are available from the Office of Quality and Performance (10Q), Veterans Health Administration, Department of Veterans Affairs, 810 Vermont, NW, Washington, DC 20420.

## **GUIDELINE RECOMMENDATIONS**

The panel identified 14 practices with the highest evidence, level A (Table 1). A level A recommendation was defined as “a strong recommendation based on randomized controlled trials that the intervention is always indicated and acceptable.” Other recommendations were also included across multiple rehabilitation and post-stroke topics. The VA conducted a feasibility study of an earlier version of the clinical algorithms contained in the post-stroke rehabilitation guideline.

### **Interdisciplinary Stroke Team Care:**

#### ***Evidence***

One meta-analysis of nine clinical trials (CT), two randomized clinical trials (RCT), three reports from a single clinical trial and three systematic reviews (SR) all published since 1995 were reviewed. Two of the three SR were based on the Stroke Unit Trialists’ Collaborative studies. All studies supported improved acute stroke survival, improved short-term functional status and greater likelihood of discharge home among patients treated in dedicated stroke units compared to “usual care.” However, the reasons for improved outcomes were not clear, as the study interventions, measures, timing, location and size of several of the studies varied considerably. Quality of the evidence for interdisciplinary stroke team care (ISTC) was evaluated as I (Good).

### ***Benefits***

Benefits are identified by selection of the outcome measures. No harms are identified.

### **RECOMMENDATION**

The panel strongly (A-level recommendation) recommended that all stroke patients who are candidates for rehabilitation receive post-stroke care “in a setting where rehabilitation care is formally coordinated and organized.” Consideration of the use of interdisciplinary teams was also recommended but the evidence was rated as less strong. C level recommendations, largely due to absence of empiric data, were made to identify and disseminate information about community resources for stroke patients; referral to a dedicated ISCT if none is available at the referring facility; physicians and other rehabilitation specialists involved in the care of stroke patients should have at least some specialized experience. An additional A level recommendation urged that outpatient rehabilitation “be continued in the setting where they can most appropriately and effectively be carried out.” Determination of appropriate setting should consider medical condition, access and function.

### **Standardized Assessments**

#### ***Evidence***

The Guideline cites AHCPR Clinical Guideline No. 16 rating of “expert opinion strong consensus” to support early, standardized stroke severity evaluation in order to assess prognosis and potential for rehabilitation. Predictive validation studies of 2 instruments, NIHSS and SIS are reviewed. Technical advisors rated the evidence I (Good.) Evidence for other standardized assessments for stroke complications was rated less strong and was derived from previously published guidelines including AHCPR, the Scots SIGN and the RCP guidelines, each of which

had extensive independent evaluations of evidence. In addition, literature is cited for all screening/assessment recommendations and follow-up interventions, with those noted as A below being supported by RCT evidence.

### ***Benefits***

Benefits of using standardized assessment instruments include ensuring reliable documentation of patient performance, assets and progress. No harms were identified or discussed.

## **RECOMMENDATIONS**

A strong recommendation (level A) for stroke severity assessment using the NIHSS on admission or within 24 hours of onset. Additional, C-level recommendations are made for standardized screening and follow-up assessments as needed to identify existing impairments such as swallowing disorders, depression, cognitive impairment, functional and social impairments, and assessment of skin integrity. Secondary prevention of recurrent stroke and prevention of complications (e.g., falls, DVT, malnutrition) was emphasized with a strong recommendation that patients participate in a secondary prevention program.

Specific strong, or A level, recommendations included: 1) Persons with impaired mobility after an ischemic stroke, should receive Low dose unfractionated heparin or for DVT prevention 2) Patients meeting criteria should be offered carotid endarterectomy at low-mortality treating centers, 3) Persons with high risk sources for cardiogenic thrombi (atrial fibrillation, mechanical heart valve, mural thrombus) should be anti-coagulated to target INR 2-3 (unless contraindicated), 4) Persons with non-cardioembolic ischemic stroke should be prescribed antiplatelet therapy (aspirin as first line, alternatives include Clopidogrel or aspirin plus dipyridamole), 5) For patients having a stroke while on aspirin, consider alternative antiplatelet

treatment 6) treat blood pressure after acute period, 6) For persons with ischemic stroke, treat hypercholesterolemia, (consider HMG CoA Reductase Inhibitors) 7) All stroke patients should be evaluated and treated by the speech and language pathologist for residual communication difficulties, 8) For persons whose cognitive screen reveals attention deficits, provide cognitive retraining, 9) For person diagnosed with depression or severe, persistent or troublesome tearfulness, provide a trial of antidepressant medication

## **INTENSITY AND TIMING OF THERAPY**

### **Evidence**

#### ***Timing for Initiation of Therapy***

The guideline cites one qualitative review of 38 RCTs that concluded that early rehabilitation was associated with improved functional outcomes. The timing for the initiation of therapy, i.e., the exact definition of “early” rehabilitation, was not specified and varied considerably among the reviewed studies. One historical cohort study did find a relationship between start date and functional outcomes but with a higher drop out rate in the early intervention group ((2) Another study assigned one group to physiotherapy immediately after stroke while another delayed start of therapy for 3 months. At the end of therapy, the early initiators had more improvement, but the difference was not sustained after therapy was discontinued ( 3) ***Intensity of Therapy***

The guideline points the heterogeneity of studies related to this question. This lack of comparability and other design limitations made it difficult to interpret the suggestion of better outcomes with more intense therapy. Ability to tolerate more intense therapy was cited as an issue. Nonetheless, three systematic reviews summarized in the guideline concluded that greater intensity was associated with slightly better outcomes. The guideline also summarizes eight

clinical trials related to this question and concludes that these provide weak support for a dose-response effect for rehabilitation intensity, but there is insufficient evidence to support specific guidelines for duration or intensity.

## **RECOMMENDATIONS**

The guideline strongly recommends (level A) that therapy be initiated as early as medically possible and recommends (level B) that “as much appropriate therapy” be delivered as the patient can “tolerate.”

### **Patients’ Family and Caregivers:**

#### ***Evidence***

The guidelines identify a significant lack of research on the physical, financial and psychological burdens of caring for stroke victims. Although one cited study showed that strong social support was associated with better outcomes (4), no studies of interventions to improve support or decrease caregiver burden are cited. A prior guideline emphasized the need for clinicians to work with caregivers to enhance return to the home setting after a stroke.

#### ***Benefits***

Benefits and harms are assumed.

## **RECOMMENDATIONS**

The guidelines recommend including family caregivers at all stages of decision-making and care planning. Treatment team members are advised to be alert and continuously review caregiver stress and needs for support. Databases and referral information on community and national resources should be current and available to families and caregivers.

## **Patient, Family and Caregiver Education**

### ***Evidence***

Good quality evidence from 3 SR and 7 CT demonstrates that educational interventions can improve knowledge about stroke among patients and caregivers; but the evidence does not support that improved knowledge translates into improved functional or quality of life outcomes for patients or caregivers. The 3 Cochrane SRs evaluated 24 trials of the effectiveness of decision aids, 9 studies of printed material with and without additional education, and 19 studies of any intervention designed to improve self-management of medications. 2 of the 7 CT, none designed specifically for stroke patients and their families, had positive results for various outcome measures of health utilization and quality of life. The quality of evidence to support any specific method for delivering or documenting education is poor.

### ***Benefits***

Benefits were assumed. However, one study of decision aids suggested mixed effects on decision related anxiety, and satisfaction with the process of decision-making and with the decision itself.

## **RECOMMENDATIONS**

The guidelines give B level (fair) recommendations to providing written and interactive education to family. Other recommendations, summarized with C level (poor) evidence, include delegating one ISCT member to deliver information regarding stroke, stroke management, rehabilitation process, and expected outcomes; using Family conferences to provide educational information; and documenting patient and family education in patients' charts.

**Table 1: Summary of A-Level Recommendations from the Va/DOD Clinical Guideline for Post-Stroke Rehabilitation**

---

**Organization of Post Stroke Care**

---

- Start rehabilitation as soon as medically stable.
- All eligible stroke patients should receive post-stroke care in a setting where rehabilitation is coordinated and organized.
- Outpatient rehabilitation should be continued in the most appropriate and effective setting, based on an assessment of the patient's status, support and access.

---

**Assessment**

---

- Perform a standardized stroke severity evaluation using the National Institutes of Health Stroke Scale within 24 hours of presentation.
- All stroke patients should be evaluated by a speech and language pathologist to uncover subtle disorders of communication.
- Assess for cognitive deficits and offer cognitive re-training to all patients exhibiting attentional deficits.

---

**Secondary Prevention and Treatment of Conditions**

---

- All patients should receive appropriate secondary prevention measures.
  - Patients with impaired mobility and ischemic stroke should receive low dose unfractionated heparin for DVT prophylaxis.
  - Patients meeting criteria should be offered carotid endarterectomy at high volume, low mortality centers.
-

- 
- Patients at high risk for cardiogenic thrombi should be anticoagulated to an INR of 2-3.
  - Antiplatelet therapy should be given to patients with non-cardiogenic ischemic stroke.
  - After the acute period, hypertension should be optimally treated.
  - Patients with ischemic stroke should be treated for hypercholesterolemia. HMG CoA Reductase Inhibitors (statins) should be considered.
  - Post-stroke depression or severe, persistent or troublesome tearfulness should be treated with antidepressant medication.
- 

#### **COMMENTARY**

As always, applying clinical guidelines in practice requires specific knowledge of a particular patient's needs and consummate medical judgment. To put these guidelines into perspective, the Clinical Practice Committee solicited the following commentary from Dr. Kenneth Brummel-Smith, MD.

Stroke is a quintessential geriatric problem. The incidence of stroke is highest in advanced age (7<sup>th</sup> and 8<sup>th</sup> decades), it affects functional abilities, it is the second leading cause of death in older persons, and it is expensive. Fifteen thousand veterans have a stroke each year. Nationally, 750,000 persons have a new or recurrent stroke each year and approximately 4 million people in the United States have experienced a stroke. The cost of care for patient with stroke has been estimated at \$20 billion per year. Stroke is the most common medical condition leading to medical rehabilitation services. (5) The guideline for the management of stroke rehabilitation, developed by the Veterans Administration and the Department of Defense (1) is an important update to a previously published stroke

rehabilitation guideline from AHCPR.(6) The former guideline was also reviewed by the AGS Clinical Practice Committee. (7) In the nine years since the publication of the AHCPR guidelines, our knowledge of the value of interventions has increased. In the original publication, there were only 5 recommendations made at the “A” level of evidence. In the current guidelines, 14 recommendations are made at the “A” level. Of course, a direct correlation is impossible as the two panels addressed some different aspects of care.

Once again, the importance of providing rehabilitation in a “coordinated and organized” setting is emphasized. The panel reviewed a variety of studies and systematic reviews and it appears the largest difference in outcomes is seen when comparing dedicated stroke rehabilitation units to “usual care.” The difference in outcomes is less when comparing dedicated to general rehabilitation units, or interdisciplinary to multidisciplinary care, though still positive in favor of dedicated units. The evidence is increasing that dedicated stroke units are beneficial but we still face the fact that many communities do not have them. While the guideline recommends referring patients to a dedicated unit if none is available in the patient’s community, I doubt that option is viable for many frail elders. The prospect of transferring an impaired older patient who has just experienced the most debilitating medical occurrence of his or her life to a completely different city, far removed from one’s support system for a treatment that may last weeks, seems difficult at best and perhaps even contraindicated socially. Rather, in those communities without specialized centers, stroke rehabilitation is likely to be provided in the best of circumstances in a general rehabilitation unit, and in smaller communities in a skilled nursing facility.

Unfortunately, there is little guidance regarding the value of rehabilitation provided in a skilled nursing facility. Some subacute rehabilitation facilities may even provide more

rehabilitation services than hospital-based rehabilitation units.( 8) The role of outpatient or home rehabilitation either as an alternative to in-patient care or as a primary site of treatment is addressed only to a limited degree in the guideline. This question is of critical importance to geriatricians and deserves further study. This is the unfortunate state of the science in which we practice. How does the team recognize candidates for continued outpatient or home rehabilitation? How long should such care be continued? What is the role of “re-rehabilitation long after the initial stroke? How does the well-known problems with transitions in care affect rehabilitation outcomes? These are all questions left to further study.

Rehabilitation is often designated as tertiary prevention – prevention of further functional decline when a medical condition is fully established. Yet, when viewed as part of a comprehensive approach to the patient, it is appropriate that secondary prevention plays an important part of stroke rehabilitation guidelines. Seven of the 14 level A recommendations speak to secondary prevention topics, such as DVT prophylaxis, antiplatelet therapy, anticoagulation, hypertension treatment, and cholesterol management. It is also important to recognize that the reason “A” level evidence exists for these preventive strategies is because most of the studies demonstrating their effectiveness are well-funded by pharmaceutical companies with some thing to gain. What evidence would be found if hundreds of millions of dollars a year were spent on testing the effectiveness of various physical or occupational therapy interventions at reducing the risk of complications?

Less strong recommendations were made regarding the discipline of the physician and the training of the other health care providers. This is probably best – obviously it is best if all providers have training and expertise in the problem they are treating, one doesn't need

a guideline to know that. Unfortunately, too many communities suffer from a lack of trained personnel available to treat all stroke survivors. As in much of the rest of geriatric care, internists, family physicians, ward and home nurses, and general rehabilitation therapists will provide the bulk of care across the country. This fact highlights the critical importance of excellent training in geriatrics for all health care providers.

An improvement seen in this guideline, as compared to the earlier one from AHCPR, is the attention to the specific types of treatments for specific deficits the patient has. Stroke rehabilitation is often spoken of as a unified process. Yet on a daily basis, multiple individual functional deficits are addressed, and in a variety of ways depending on the expertise and the training of the rehabilitation therapist. Sitting balance, apraxia, shoulder subluxation, standing and walking balance, aphasia, and a myriad other deficits seen after a stroke are approached in a wide variety of manners. The guideline offers an excellent review of a wide variety of problems encountered in stroke rehabilitation.

The benefit of early and intensive rehabilitation received more attention here than in the earlier guideline. While it is wise advice, its implementation with a frail, older population may be difficult to achieve. Higher rates of post-stroke delirium, more frequent development of secondary complications, and the fact that the stroke may cause an older person whose care has been neglected to finally present him or herself to medical treatment all conspire to delay early intensive rehabilitation. Many clinicians have noted that a period of good quality geriatric care oriented to stabilizing the patient and preparing for a more intensive rehabilitation intervention can be beneficial in some. This is particularly important given that even in the early rehabilitation studies gains seen initially were not sustained after the therapy was discontinued. Similarly, the intensity of the rehabilitation program must be

carefully monitored in frail elders. While unnecessary bed rest is certainly to be avoided, one must recognize that too intensive a treatment plan can likewise be dangerous. The dictum, “Above all, do no harm” should protect us from either error. It is also important that third party payers do not reject such well-considered approaches because a guideline has stated early and intensive rehabilitation is preferred.

Support and education of the patient and caregiver was addressed, though it was noted that research in this area is “limited and of variable quality.” I wonder whether part of the problem with the lack of evidence to support educational approaches is that the right approach has not been extensively studied? The chronic disease self-management model was associated with significant improvements in patient self-management and health outcomes in at least one clinical trial (9). Unfortunately, in this study, the subjects did not include patients with stroke. Clearly, more research is needed in this important area. As was noted in the guideline, little research on the role or mechanism of social supports exists. It is unlikely there will ever be sufficient funding to adequately study these issues. Hence, the hope for level A evidence may go unfulfilled. However, it is worthwhile to recall Sackett’s model of evidence-based medicine which ascribes critical importance to patient’s values in determining good practice. (10) Those with extensive clinical experience in rehabilitation fully appreciate the role of the patient’s values and the caregiver in spite of the lack of evidence from randomized trials.

It will be interesting to see whether the VA and DoD develop a specific plan for implementing the guidelines. There is a plethora of evidence that simply creating and disseminating guidelines has little likelihood of changing practice. Even educating providers about the guidelines doesn’t often help (11) the VA, with its comprehensive health system

and electronic medical record system, may be particularly positioned to lead a successful implementation of these guidelines.

While we would like to think that the provision of good medical care is simply a matter of acquiring better evidence and experience, unfortunately the fact is that science may actually play a small role in the bigger scheme of things. The VA/DoD Guideline points out how there are only 45 rehabilitation bed units (RBU) in the VA today. Rehabilitation units are closing all over the country, and many do not accept patients of advanced age.

Rehabilitation is very much a socio-political issue. In some ways, the field has itself partly to blame as earlier in its life there was a dearth of evidence supporting its value. But as noted above, in just 9 years since the last guideline on stroke rehabilitation was published, the number of level A recommendations has risen from 5 to 14. We may all be faced with the unacceptable circumstance of having a wealth of knowledge attesting to the value of stroke rehabilitation and a lack of payment for the service. If that happens, disabled people are once again handicapped by our failed health care “system.”

## **ACKNOWLEDGMENT**

***Financial Disclosure(s):*** The authors - Miriam B. Rodin, Debra Saliba, and Kenneth Brummel-Smith, have no financial support for research, consultantships, and speakers forum, as well as any company holdings.

***Author Contributions:***

Miriam B. Rodin and Debra Saliba conducted literature searches to identify current guidelines, participated in authors conferences on selection of the guideline eventually chosen, drafted a summary of the guideline and participated in the writing of the final guideline abstract.

Kenneth Brummel-Smith wrote and edited the commentary.

***Sponsor's Role:*** There is no sponsor for this document.

## REFERENCES

1. Management of Stroke Rehabilitation. Washington, DC: VA/DoD Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs and Health Affairs, Department of Defense, February 2003. Office of Quality and Performance publication 10Q CPG/STR-03.
2. Paolucci S, Antonucci G, Grasso MG, Morelli D, Troisi E, Coiro P, Bragoni M. Early versus delayed inpatient stroke rehabilitation: a matched comparison conducted in Italy. *Arch Phys Med Rehabil.* 2000 Jun;81(6):695-700.
3. Wade DT, Collen FM, Robb GF, Warlow CP. Physiotherapy intervention late after stroke and mobility. *BMJ.* 1992 Mar 7;304(6827):609-13.
4. Glass TA, Matchar DB, Belyea M, Feussner JR. Impact of social support on outcome in first stroke. *Stroke.* 1993 Jan;24(1):64-70.
5. [www.americanheart.org](http://www.americanheart.org), accessed 05/10/04.
6. Gresham GE, Duncan PW, Season WB et al. Post-Stroke Rehabilitation (Clinical Practice Guideline, no. 16). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1995. AHCPR Publication No. 1995:95-0662.
7. Boulton C, Brummel-Smith K. Post-stroke rehabilitation guidelines. The Clinical Practice Committee of the American Geriatrics Society. *J Am Geriatr Soc* 1997; 45: 881-883.
8. Chen C C, Heinemann AW, Granger CV et al. Functional gains and therapy intensity during subacute rehabilitation: A study of 20 facilities. *Arch Phys Med Rehabil* 2002; 83:1514-23.

9. Lorig KR, Sobel DS, Stewart AL et al Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: A randomized trial. *Med Care* 1999; 37:5-14.
10. Sackett DL, Straus SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: how to practice and teach EBM, 2000, Churchill Livingstone Pubs, Edinburgh, 2<sup>nd</sup> Edition, Page 1.
11. Reuben DB. Guidelines, evidence-based medicine, and glidepaths: Talking the talk. *J Am Geriatr Soc* 2002;50:1905-1906.