



AHA/ASA Guidelines for Adult Stroke Rehabilitation and Recovery

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The University Hospital of Columbia and Cornell



**Weill Cornell
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Disclosures



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Slides Prepared by Members of the Stroke Professional Education Committee*

***These slides have been adapted for purposes of this presentation from the original set prepared by two members of the stroke professional educational committee**

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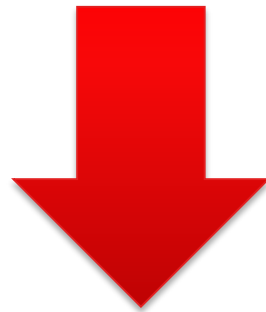


A GUIDELINE FOR HEALTHCARE PROFESSIONALS FROM THE AMERICAN HEART ASSOCIATION/AMERICAN STROKE ASSOCIATION



Number of individuals affected by stroke in the US annually.

800,000



Decline in the relative rate of stroke deaths from 2000 - 2010.

36%



Survivors who receive rehab services after hospitalization.

2/3



A GUIDELINE FOR HEALTHCARE PROFESSIONALS FROM THE AMERICAN HEART ASSOCIATION/AMERICAN STROKE ASSOCIATION

Endorsed by the American Academy of Physical Medicine and Rehabilitation and the American Society of Neurorehabilitation.
The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists and the American
Congress of Rehabilitation Medicine affirms the educational value of these guidelines for its members.

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Guidelines Recommendations Winstein, Carolee J., Joel Stein, Ross Arena, Barbara Bates, Leora R. Cherney, Steven C. Cramer, Frank Deruyter et al. "Guidelines for adult stroke rehabilitation and recovery." *Stroke* 47, no. 6 (2016): e98-e169. <https://doi.org/10.1161/STR.000000000000098> *Stroke*. 2016;STR.000000000000098



Stroke Rehabilitation Guidelines: By The Numbers



5/4/16

Date Published

18

Authors

72

Pages in Published Form

944

References

227

Specific Recommendations

78,000

Downloads as of August 2017

Rating of the Evidence: Classification of Recommendations and Levels of Evidence



SIZE OF TREATMENT EFFECT

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	CLASS I <i>Benefit >>> Risk</i> Procedure/Treatment SHOULD be performed/administered	CLASS IIa <i>Benefit >> Risk</i> <i>Additional studies with focused objectives needed</i> IT IS REASONABLE to perform procedure/administer treatment	CLASS IIb <i>Benefit ≥ Risk</i> <i>Additional studies with broad objectives needed; additional registry data would be helpful</i> Procedure/Treatment MAY BE CONSIDERED	CLASS III <i>No Benefit</i> or CLASS III <i>Harm</i>								
				<table border="1"> <thead> <tr> <th></th> <th>Procedure/ Test</th> <th>Treatment</th> </tr> </thead> <tbody> <tr> <td>COR III: No benefit</td> <td>Not Helpful</td> <td>No Proven Benefit</td> </tr> <tr> <td>COR III: Harm</td> <td>Excess Cost w/o Benefit or Harmful</td> <td>Harmful to Patients</td> </tr> </tbody> </table>		Procedure/ Test	Treatment	COR III: No benefit	Not Helpful	No Proven Benefit	COR III: Harm	Excess Cost w/o Benefit or Harmful
	Procedure/ Test	Treatment										
COR III: No benefit	Not Helpful	No Proven Benefit										
COR III: Harm	Excess Cost w/o Benefit or Harmful	Harmful to Patients										
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Sufficient evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Some conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Sufficient evidence from multiple randomized trials or meta-analyses 								
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Some conflicting evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Evidence from single randomized trial or nonrandomized studies 								
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Only expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Only diverging expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Only diverging expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Only expert opinion, case studies, or standard of care 								

Suggested phrases for writing recommendations

should
is recommended
is indicated
is useful/effective/beneficial

is reasonable
can be useful/effective/beneficial
is probably recommended
or indicated

may/might be considered
may/might be reasonable
usefulness/effectiveness is unknown/unclear/uncertain
or not well established

COR III:
No Benefit

is not recommended
is not indicated
should not be performed/administered/other
is not useful/beneficial/effective

COR III:
Harm

potentially harmful
causes harm associated with excess morbidity/mortality
should not be performed/administered/other

Comparative effectiveness phrases†

treatment/strategy A is recommended/indicated in preference to treatment B
treatment A should be chosen over treatment B

treatment/strategy A is probably recommended/indicated in preference to treatment B
it is reasonable to choose treatment A over treatment B

Outline: Highlight Recommendations



- I. Introduction
- II. The Rehabilitation Program
- III. Prevention and Medical Management of Comorbidities
- IV. Assessment
- V. Sensorimotor Impairments and Activities
- VI. Transitions in Care and Community Rehabilitation
- VII. Conclusion

II. THE REHABILITATION PROGRAM



Organization of Post-Stroke Rehabilitation Care

- ➔ Stroke patients who are candidates for post-acute rehab should receive organized, coordinated, inter-professional care (*Class I, LOE A*)
- ➔ Stroke survivors who qualify for and have access to IRF care should receive treatment in an IRF in preference to a SNF (*Class I, LOE B*)
- ➔ Organized community-based and coordinated inter-professional rehab is recommended in the outpatient and/or home-based settings (*Class I, LOE C*)
- Early Supported Discharge (ESD) services may be reasonable for people with mild to moderate disability (*Class IIb, LOE B*)

THE REHABILITATION PROGRAM: AN IN-DEPTH REVIEW



ORGANIZATION OF POST-STROKE REHABILITATION CARE: SETTINGS

INPATIENT REHABILITATION FACILITIES (IRF)

The most intense, 24/7 hospital-level care

- For patients likely to return to the community, rather than a SNF or long-care facility.
- CMS regulations generally specify providing at least 3 hours/day of therapy, at least 5 days/week.

SKILLED NURSING FACILITIES (SNFs)

Subacute rehab, less intense than an IRF

- For patients requiring skilled nursing service to maintain or prevent deterioration.
- CMS regulations generally specify RNs on site a minimum of 8 hours/day No requirement for daily supervision by a physician. Therapy typically provided 0.5-1.5 hours/day.
- Medicare will generally cover up to 100 days in a SNF.
- Not all SNF's are the same in terms of hours of care.

Nursing Homes

- Long-term residential care for individuals unable to live in the community.
- Longer term care generally paid out of pocket, by long-term insurance, or through the Medicaid program.

LONG-TERM ACUTE CARE HOSPITALS

- Extended care to stroke patients with complex medical needs due to a combination of acute and chronic conditions. Average LOS 25+ days.

HOME

- Provided by Home Health Care Agencies or in outpatient clinics.



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TRENDS IN UTILIZATION OF ACUTE AND POST-ACUTE STROKE REHAB IN THE US



Prior to discharge from the hospital, all patients should undergo a formal assessment of the patient's rehabilitation needs.



Major changes in Medicare reimbursement policies since the 1990s have dramatically impacted utilization patterns. Currently, ~70% of Medicare beneficiaries discharged for acute stroke use Medicare-covered post-acute services.



Multiple transitions in care are typical for stroke survivors, and pose particular challenges to maintain continuity of care and avoid lapses in the rehab program.



The 1st setting following acute hospitalization:

- SNF (32%)
- IRF (22%)
- Home Health (15%)

1. Prvu Bettger JA, Kaltenbach L, Reeves MJ, Smith EE, Fonarow GC, Schwamm LH, Peterson ED. Assessing stroke patients for rehabilitation during the acute hospitalization: findings from the Get With The Guidelines-Stroke program. *Arch Phys Med Rehabil.* 2013;94:38–45. doi: 10.1016/j.apmr.2012.06.029.

2. Buntin MB, Colla CH, Escarce JJ. Effects of payment changes on trends in post-acute care. *Health Serv Res.* 2009;44:1188–1210. doi: 10.1111/j.1475-6773.2009.00968.x.



IRF VS. SNF: PROVIDING THE RIGHT CARE FOR EACH PATIENT

IRF

What does the “3 hours of therapy” required for IRF participation really mean?

- Includes work on activities of daily living (ADL's) with an Occupational Therapist, such as dressing, brushing teeth
- May include speech therapy
- Does not mean 3 hours of aerobic exercise in the gym!

SNF

Who is appropriate for SNF (subacute) rehab?

- Limited rehabilitation potential
- Unable to tolerate intensive rehabilitation
- Don't require an intensive rehabilitation program
- Lack geographic access to IRF care
- Have completed a course of rehabilitation in an IRF, but unable to return directly home

II. THE REHABILITATION PROGRAM



Rehabilitation Interventions in the In-Patient Setting

- Unfortunately, the only large randomized clinical trials in stroke recovery and rehab have focused on the *chronic* recovery phase. Studies on interventions in the *acute* rehab phase are generally small and more limited.
- Timing and intensity of acute rehab are important issues, but remain controversial.
 - Example: *Early mobilization after stroke* -- recommended in many practice guidelines, but one meta-analysis in 2009 had insufficient evidence to support or refute its efficacy, and another randomized controlled trial (AVERT) showed high dose mobilization within 24 hours of stroke was detrimental to achieving a favorable outcome at 3 mos.
- Stroke survivors should receive rehab at an intensity commensurate with anticipated benefit and tolerance (*Class I, LOE B*)

➔ High dose, very early mobilization within 24 hours of stroke onset can reduce the odds of a favorable outcome at 3 months and is not recommended. (*Class III, LOE A*)

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Prevention of Skin Breakdown and Contractures

- 60% of patients develop joint contractures on the hemiparetic side within the 1st year. These contractures can cause pain and make dressing, hygiene, & other self-care difficult.
- Many clinicians recommend daily stretching to avoid contractures, and patients & their families should be taught proper stretching exercises to avoid injury and maximize effectiveness:
 - Positioning of hemiplegic shoulder in maximum external rotation either while sitting or in bed 30 minutes daily is probably indicated to prevent shoulder contractures. *(Class IIa, LOE B)*
- ➔ Resting hand/wrist splints along with regular stretching and spasticity management in patients lacking active hand movement may be considered. *(Class IIb, LOE C)*
 - Use of serial casting or static adjustable splints may be considered to reduce mild to moderate elbow and wrist contractures *(Class IIb, LOE C)*
 - Surgical release of brachialis, brachioradialis, and biceps muscles may be considered for substantial elbow contractures and associated pain *(Class IIb, LOE B)*
- ➔ Resting ankle splints used at night and during assisted standing may be considered for prevention of ankle contracture in a hemiplegic limb *(Class IIb, LOE B)*√

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Treatment of Bowel and Bladder Incontinence

- Recommend assessment of bladder function in acutely hospitalized stroke patients. Specifically:
 - a. A history of urological issues prior to stroke should be obtained. *(Class I, LOE B)*
 - ➔ b. Assessment of urinary retention through bladder scanning or intermittent catheterizations post voiding while recording volumes is recommended for patients with urinary incontinence or retention. *(Class I, LOE B)*
 - c. Assessment of cognitive awareness of need to void or having voided is reasonable. *(Class IIa, LOE B)*
- ➔ Removal of the foley catheter (if any) within 24 hours after admission for acute stroke is recommended, based on the CDC recommendations for *all* hospitalized patients. *(Class I, LOE B)*
- It is reasonable to use the following treatment interventions to improve bladder incontinence in stroke patients: *(Class IIa, LOE B)*
 - a. Prompted voiding;
 - b. Pelvic floor muscle training (after discharge home)
- It may be reasonable to assess prior bowel function in acutely hospitalized stroke patients and include the following: *(Class IIb, LOE C)*
 - a. Stool consistency, frequency, and timing (pre-stroke).
 - b. Bowel care practices prior to stroke.

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Assessment, Prevention and Treatment of Hemiplegic Shoulder Pain

- **Patient and Family education** (i.e., range of motion, positioning) is recommended regarding shoulder pain and shoulder care after stroke, particularly prior to discharge or transitions in care. *(Class I, LOE C)*
- **Botulinum toxin injection** can be useful to reduce severe hypertonicity in hemiplegic shoulder muscles. *(Class IIa, LOE A)* Results have been mixed in the management of shoulder pain in general.
- A trial of **neuromodulating pain medications** is reasonable for patients with hemiplegic shoulder pain who have clinical signs and symptoms of neuropathic pain manifested as sensory change in the shoulder region, allodynia, or hyperpathia. *(Class IIa, LOE A)*
- ➔ • It is reasonable to consider **positioning** and use of **supportive devices and slings** for shoulder subluxation *(Class IIa, LOE C)*
- A **clinical assessment** can be useful including: musculoskeletal evaluation, evaluation of spasticity, identification of any subluxation, testing for regional sensory changes *(Class IIa, LOE C)*
- ➔ • Neuromuscular **electrical stimulation (NMES)** may be considered (surface or intramuscular) for shoulder pain. *(Class IIb, LOE A)*

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Prevention of Falls

- The evidence specific for fall prevention and interventions in persons with stroke is limited. Most assessment tools and evidence-based recommendations are derived from studies on general population of older adults.
- ➔ • It is recommended that persons with stroke discharged to community participate in exercise programs with balance training to reduce falls. *(Class I, LOE B)*
- ➔ • It is recommended that persons with stroke be provided a formal fall prevention program during hospitalization. *(Class I, LOE A)*
- ➔ • It is reasonable that persons with stroke be evaluated for fall risk annually using an established instrument appropriate to the setting. *(Class IIa, LOE B)*
- It is reasonable that persons with stroke, and their caregivers, receive information targeted to home and environmental modifications designed to reduce falls. *(Class IIa, LOE B)*
- Tai Chi training may be reasonable for fall prevention. *(Class IIb, B)*

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Post-Stroke Depression Including Emotional and Behavioral State: *Screening and Non-Pharmacological Therapy*

- ➔ Administration of a structured depression inventory, such as the PHQ-2, is recommended to routinely screen for post-stroke depression. *(Class I, LOE B)*
- ➔ Periodic reassessment of depression, anxiety, and other psychiatric symptoms may be useful in the care of stroke survivors. *(Class IIa, LOE B)*
- Patient education about stroke is recommended. Patients should be provided with information, advice, and the opportunity to talk about the impact of the illness on their lives. *(Class I, LOE B)*
- Patient education, counseling, and social support may be considered as components of treatment for post-stroke depression. *(Class IIb, LOE B)*
- Consultation by a qualified psychiatrist or psychologist for stroke survivors with mood disorders causing persistent distress or worsening disability can be useful. *(Class IIa, LOE C)*.
- An exercise program of at least 4 weeks duration may be considered as a complementary treatment for post stroke depression. *(Class IIb, LOE B)*
- Early effective treatment of depression may have a positive effect on the rehabilitation outcome. *(Class IIb, LOE B)*

III. PREVENTION AND MEDICAL MANAGEMENT OF COMORBIDITIES



Post-Stroke Depression, including Emotional and Behavioral State: *Pharmacological Therapy*

- ➔ Patients diagnosed with post-stroke depression should be treated with antidepressants in the absence of contraindications, and closely monitored to verify effectiveness. *(Class I, LOE B)*
- ➔ No recommendation for the use of any particular class of antidepressants is made. SSRIs are commonly employed and generally well-tolerated in this patient population. *(Class III, LOE A)*
- ➔ A therapeutic trial of an SSRI or dextromethorphan/quinidine is reasonable for patients with emotional lability or pseudobulbar affect causing emotional distress *(Class IIa, LOE A)*
- ➔ The usefulness of routine use of prophylactic antidepressant medications is unclear. *(Class IIb, LOE A)*
- Combining pharmacologic and non-pharmacologic treatments of post-stroke depression may be considered. *(Class IIb, LOE A)*
- The efficacy of individual psychotherapy alone in the treatment of post-stroke depression is unclear. *(Class IIb, LOE B)*

IV. ASSESSMENT



Assessment of Communication Impairment

- By means of interview, conversation, observation, standardized tests, and/or non-standardized items, the communication assessment should:
 - evaluate speech, language, cognitive-communication, pragmatics, reading and writing,
 - identify communicative strengths & weaknesses,
 - identify helpful compensatory strategies. *(Class I, LOE B)*
- ➔ • Tele-rehabilitation is reasonable when face-to-face assessment is impossible or impractical. *(Class IIa, LOE A)* However, this requires adequate technology.
- The communication assessment may consider the individual's unique priorities utilizing the ICF framework, including quality of life *(Class IIb, LOE C)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Recommendations for Dysphagia Screening, Management, & Nutritional Support

- ➔ • Early dysphagia screening is recommended for acute stroke patients to identify dysphagia and/or aspiration that can lead to pneumonia, malnutrition, dehydration, and other complications. *(Class I, LOE B)*
- Dysphagia screening is reasonable by a speech-language pathologist or other trained healthcare provider. *(Class IIa, LOE C)*
- ➔ • Assessment of swallowing before the patient begins eating, drinking, or receiving oral medications is recommended. *(Class I, LOE B)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Recommendations for Dysphagia Screening, Management, & Nutritional Support

- ➔ • An instrumental evaluation is probably indicated for those patients suspected of aspiration to verify the presence/absence of aspiration and to determine the physiological reasons for dysphagia to guide the treatment plan. *(Class IIa, LOE B)*
- Selection of instrumental study (FEES, video-fluoroscopy, FEESST) may be based on availability or other considerations. *(Class IIb, LOE C)*
- Oral hygiene protocols should be implemented to reduce the risk of aspiration pneumonia after stroke. *(Class I, LoE B)*
- ➔ • Enteral feedings (tube feedings) should be initiated within 7 days of a stroke for patients who cannot safely swallow *(Class I, LOE A)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Recommendations for Dysphagia Screening, Management, & Nutritional Support

- ➔ • Nasogastric tube feeding should be used for short term (2-3 weeks) nutritional support for patients who cannot swallow safely. (*Class I, LOE B*)
- ➔ • Percutaneous gastrostomy (PEG) tubes should be placed in patients with chronic inability to swallow safely. (*Class I, LoE B*)
- Nutritional supplements are reasonable to consider for patients who are malnourished or at risk of malnourishment. (*Class IIa, LOE B*)
- Incorporating principles of neuroplasticity into dysphagia rehabilitation strategies/interventions is reasonable. (*Class IIa, LOE C*)

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Aphasia Recommendations

- ➔ • Speech and language therapy is recommended for persons with aphasia.
(Class I, LOE A)
- ➔ • Treatment for aphasia should include communication partner training.
(Class I, LOE B)
- ➔ • Intensive treatment is probably indicated but there is no definitive agreement on the optimum amount, timing, intensity, distribution or duration of treatment.
(Class IIa, LOE A)
- Computerized treatment may be considered to supplement treatment.
(Class IIb, LOE A)
- A variety of different treatment approaches for aphasia may be useful, but relative effectiveness is not known. *(Class IIb, LOE B)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Spasticity Recommendations

- ➔ Targeted injection of **botulinum toxin** into localized upper limb muscles is recommended to reduce spasticity, improve passive or active range of motion, and improve dressing, hygiene and limb positioning. *(Class I, LOE A)*
- ➔ Targeted injection of botulinum toxin into lower limb muscles is recommended to reduce spasticity that interferes with gait function. *(Class I, LOE A)*
- **Oral antispasticity agents** can be useful for generalized spastic dystonia, but may result in dose-limiting sedation or other side effects. *(Class IIa, LOE A)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Mobility Recommendations

- ➔ • Intensive, repetitive, mobility-task training is recommended for all individuals with gait limitations after stroke. *(Class I, LOE A)*
- ➔ • An ankle-foot orthoses (AFO) following stroke is recommended in individuals with remediable gait impairments (e.g., foot drop) to compensate for foot drop, improve mobility and paretic ankle and knee kinematics, kinetics and energy cost of walking. *(Class I, LOE A)*
- Group therapy with circuit training is a reasonable approach to improve walking. *(Class IIa, LOE A)*
- Incorporating cardiovascular exercise and strengthening interventions is reasonable to consider for recovery of gait capacity and gait-related mobility tasks. *(Class IIa, LOE A)*
- ➔ • Neuromuscular electrical stimulation (NMES) is reasonable to consider as an alternative to an AFO for foot drop. *(Class IIa, LOE A)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Mobility Recommendations

- The effectiveness of water-based exercise for motor recovery following an acute stroke is unclear. *(Class IIb, LOE B)*
- ➔ • The effectiveness of fluoxetine or other SSRI's to enhance motor recovery is not well established. *(Class IIb, LOE B)*
- The effectiveness of levodopa to enhance motor recovery is not well established. *(Class IIb, LOE B)*
- The use of dextroamphetamine or methylphenidate to facilitate motor recovery is not recommended. *(Class III, LOE B)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Upper Extremity Activity Recommendations

- Functional tasks should be practiced, i.e. task-specific training, where the tasks are graded to challenge individual capabilities, practiced repeatedly, and are progressed in difficulty on a frequent basis. *(Class I, LOE A)*
- All persons with stroke should receive ADL training, tailored to individual needs and eventual discharge setting. *(Class I, LOE A)*
- All persons with stroke should receive IADL training, tailored to individual needs and eventual discharge setting. *(Class I, LOE B)*
- Constraint-induced movement therapy (CIMT) or its modified version (mCIMT) is reasonable to consider for eligible stroke survivors. *(Class IIa, LOE A)*
- Robotic therapy is reasonable to consider to deliver more intensive practice for persons with moderate to severe upper limb paresis. *(Class IIa, LOE A)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Upper Extremity Activity Recommendations

- ➔ • Neuromuscular electrical stimulation is reasonable to consider for persons with minimal volitional movement within the first few months after stroke or for persons with shoulder subluxation. *(Class IIa, LOE A)*
- ➔ • Mental practice is reasonable to consider as an adjunct to upper extremity rehabilitation services. *(Class IIa, LOE A)*
- ➔ • Strengthening exercises are reasonable to consider as an adjunct to functional task practice. *(Class IIa, LOE B)*
- ➔ • Virtual reality is reasonable to consider as a method for delivering upper extremity movement practice. *(Class IIa, LOE B)*
- Somatosensory retraining to improve sensory discrimination may be considered for stroke survivors with somatosensory loss. *(Class IIb, LOE B)*
- Bilateral training paradigms may be useful for upper limb therapy. *(Class IIb, LOE A)*
- ➔ • Acupuncture is not recommended for the improvement of ADLs and upper extremity activity. *(Class III, LOE A)*

V. SENSORIMOTOR IMPAIRMENTS AND ACTIVITIES

Recommendations for Motor Impairment and Recovery: Deconditioning and Fitness

- ➔ • Following successful screening, an individually-tailored exercise program is indicated to enhance cardiorespiratory fitness and reduce the risk of stroke recurrence.
(Class 1, LOE A, for improved fitness; LOE B, for reduction of stroke risk)
- ➔ • After completion of formal stroke rehabilitation participation in a program of exercise or physical activity at home and/or in the community is recommended. *(Class 1, LOE A)*

VI. TRANSITIONS IN CARE AND COMMUNITY REHABILITATION



Recommendations: Return to Driving



- Individuals who appear to be ready to return to driving, as demonstrated by successful performance on fitness-to-drive tests, should have an **on-the-road test** administered by an authorized person. *(Class I, LOE C)*
- It is reasonable that individuals be assessed for cognitive, perception, physical, and motor abilities to ascertain readiness to return to driving, according to state and local laws. *(Class IIa, LOE B)*
- It is reasonable that individuals who do not pass an on-the-road driving test be referred to a **driver rehabilitation program** for training. *(Class IIa, LOE B)*
- A **driving simulation assessment** may be considered for predicting fitness-to-drive. *(Class IIb, LOE C)*

VII. CONCLUSION



- **Stroke rehabilitation requires a sustained and coordinated effort from a large team**, including the patient and his or her goals, family, and friends, other caregivers (e.g., personal care attendants), physicians, nurses, physical and occupational therapists, speech/language pathologists, recreation therapists, psychologists, nutritionists, social workers, and others.
- **Communication and coordination among these team members is paramount** in maximizing the effectiveness and efficiency of rehabilitation, and underlies this entire guideline.

VII. CONCLUSION



Treatment Gaps and Potential Future Directions in Research

- Optimal Physical, Occupational and Speech Therapy timing, intensity, and duration need further study
- Specific rehabilitation interventions – medications for recovery, brain stimulation, etc.
- Develop better predictive models to identify the optimal responders to various therapies.
- Develop better interventions for individuals with severe stroke.

AHA Guidelines – the app



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