Guidelines for Adult Stroke Rehabilitation and Recovery

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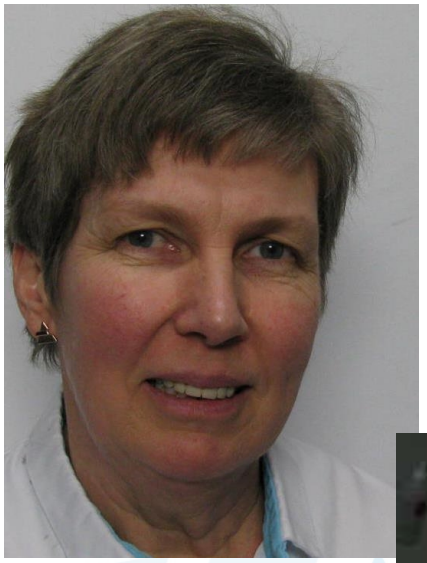
Rehabilitation medicine

Aim: to maximise function and to minimise limitation of activity and restriction of participation resulting from a disease, trauma or a congenital disorder

Rehabilitation medicine

- Stabilisation of the primary problem
- Prevention of secondary complications
- Maximising functions
- Adaptation of a person to his/her environment
- Adaptation of the environment to the person
- Stimulation of the family to come to a joint effort

The rehabilitation team



Incidentie in België

- CVA
  - 185/100000 inwoners (vrouwen 192/ 100000, mannen 179/ 100000)
  - 20350 nieuwe CVA's per jaar
- TIA
  - 93/100000 of 10230 TIA's in België per jaar

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)

Organization of Post-Stroke Rehabilitation Care

- Determination of post-acute rehabilitation needs should be based on assessments of residual neurological deficits, activity limitations, cognitive, communicative and psychological status, swallowing ability, determination of previous functional ability and medical comorbidities, the level of family/caregiver support, the capacity of family/caregiver to meet the care needs of the stroke survivor, the likelihood of returning to community living, and the ability to participate in rehabilitation. (Class I, LOE C)

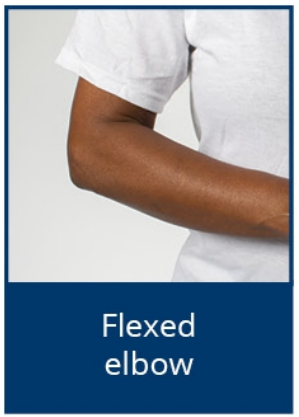
- no single functional assessment with measurement properties is used throughout the entire clinical course of stroke care (acute hospital, inpatient rehabilitation, and outpatient care) for tracking stroke rehabilitation outcome.

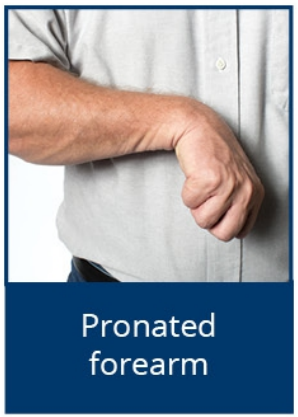
- Standardized assessments such as the **Barthel Index** appear to be useful –strong predictor of discharge functional status, discharge destination following inpatient rehabilitation, and length of rehabilitation.

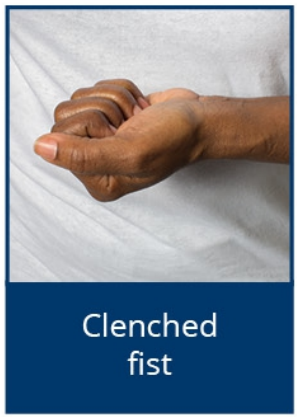
- **Others:** NIHSSS, cognition, instrumental adl, balance, gait speed, aphasia, emotional, social

Specific recommandations: Spasticity

- Spasticity is classically defined as a velocity-dependent resistance to stretch of a muscle and is one component of the upper motor neuron syndrome.
- Spasticity is correlated with activity limitations associated with hygiene, dressing, and pain.
- These activity limitations increase caregiver burden and reduce quality of life as measured by the EuroQol-5.







Specific recommendations: Spasticity

- 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)

Mobility Recommendations

- Intensive, repetitive, mobility-task training is recommended for all individuals with gait limitations after stroke. (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)
- Virtual reality may be beneficial for the improvement of gait. (Class IIb, LOE B)
- An ankle-foot orthoses (AFO) following stroke is recommended in individuals with remediable gait impairments (e.g., foot drop) to compensate for foot drop, and to improve mobility and paretic ankle and knee kinematics, kinetics and energy cost of walking. (Class I, LOE A)

Balance Recommendations

- Persons with stroke should be evaluated for balance, balance confidence, and fall risk. (Class I, LOE C)
- Persons with stroke who have poor balance, low balance confidence, fear of falls, and/or are at risk for falls should be provided with a balance training program. (Class I, LOE A)
- Persons with stroke should be prescribed and fit with an assistive device and/or orthosis if appropriate to improve balance. (Class I, LOE A)

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 I, 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 I, LOE A)

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)

Social and Family Caregiver Support

- It may be useful for the family/caregiver to be an integral component of stroke rehabilitation. (Class IIb, LOE A)
- It may be reasonable that family/caregiver support provide some or all of the following on a regular basis: (Class IIb, LOE A)
  - Education
  - Training
  - Counseling
  - Development of a support structure
  - Financial assistance

- It may be useful to have the family/caregiver involved in decision making and treatment planning as early as possible, and throughout the duration of the rehabilitation process. (Class IIb, LOE B)

Transition in care

- It is reasonable to consider individualized discharge planning in the transition from hospital to home. (Class IIa, LOE B)

- Patients with stroke receiving comprehensive ADL, IADL, and mobility assessments, including evaluation of the discharge living setting, should be considered candidates for community or home-based rehabilitation when feasible. Exclusions include persons with stroke who require daily nursing services, regular medical interventions, or specialized equipment or inter-professional expertise. (Class I, LOE A)

- It is reasonable that care-givers, including family members, be involved in training and education directly related to home-based rehabilitation programs and be included as active partners in the planning and implementation or treatment activities under the supervision of professionals. (Class IIa, LOE B)

Recommendations for Recreational and Leisure Activity

- It is reasonable to promote engagement in leisure and recreational pursuits, particularly through the provision of information on the importance of maintaining an active and healthy lifestyle. (Class IIa, LOE B)
- It is reasonable to foster the development of self-management skills for problem solving regarding overcoming barriers to engagement in active activities. (Class IIa, LOE B)
- It is reasonable to start education and self-management skill development about leisure/recreation activities during and in conjunction with in-patient rehabilitation. (Class IIa, LOE B)

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)
- A driving simulation assessment may be considered for predicting fitness-to- drive. (Class IIb, LOE C)

Prevention of Skin Breakdown and Contractures

- Regular assessment of skin -objective scales are valuable in the prevention of skin injury and should be followed by regular skin inspection with documentation. (Class I, LOE C recommendation)

- It is recommended to minimize or eliminate skin friction, minimize skin pressure, provide appropriate support surfaces, avoid excessive moisture, and maintain adequate nutrition & hydration to prevent skin breakdown. Regular turning (at least every 2 hours), good skin hygiene, use of specialized mattresses and wheelchair cushion and seating are recommended until mobility returns (Class I, LOE C recommendation)

- Patients, staff, and caregivers should be educated about the prevention of skin breakdown (Class I, LOE C)

- 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.

Prevention of Deep Venous Thrombosis

- Recommendations for prevention of DVT and PE in ischemic stroke are described in great detail in the American College of Chest Physicians (ACCP) Antithrombotic Therapy and Prevention of Thrombosis. (9th ed.)
- Overall, the ACCP guidelines found an estimated reduction in overall mortality of 12 deaths per 1000 individuals receiving either UFH or LMWH compared with no anticoagulation. No form of prophylaxis is 100%,
- In the case of ICH: it may be reasonable to use prophylactic-dose SQ heparin (UFH or LMWH) started between days 2 and 4 over no prophylaxis. (Class IIb, LOE C)

Treatment of Bowel and Bladder Incontinence

- Recommend assessment of bladder function in acutely hospitalized stroke patients. Specifically:
  - A history of urological issues prior to stroke should be obtained. (Class I, LOE 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)
- 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)
  - Prompted voiding;
  - 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)
  - Stool consistency, frequency, and timing (pre-stroke).
  - Bowel care practices prior to stroke.

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)

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)

Secondary Stroke Prevention

- Stroke shares many risk factors with other forms of cardiovascular disease, such as hypertension, smoking, hyperlipidemia, and inactivity.
- With hospitalization for acute stroke brief, it is particularly important to address secondary prevention of stroke and other cardiovascular diseases during the post-acute rehabilitation phase of care.
- See the 2014 AHA/ASA secondary stroke prevention guidelines:

– Kernan WN, Ovbiagele B, Black HR, Bravata DM, Chimowitz MI, Ezekowitz MD, Fang MC, Fisher M, Furie KL, Heck DV, Johnston SC, Kasner SE, Kittner SJ, Mitchell PH, Rich MW, Richardson D, Schwamm LH, Wilson JA. Guidelines for the prevention of stroke in patients with stroke and transient ischemic attack: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke.* 2014;45:2160-2236.

Hypertension

*Initiation of BP therapy is indicated for previously untreated patients with ischemic stroke or TIA who, after the first several days, have an established BP ≥140 mm Hg systolic or ≥90 mm Hg diastolic (*Class I; Level of Evidence B).*Initiation of therapy for patients with BP <140 mm Hg systolic and <90 mm Hg diastolic is of uncertain benefit *(Class IIb; Level of Evidence C*).

*See also RIVIZ report Hypertension

http://www.riziv.fgov.be/SiteCollectionDocuments/consensus_lange_tekst_20151105.pdf

Dyslipidemia

- Initiation of a high-intensity statin is recommended up to age 75, and initiation of a moderate-intensity statin is recommended if age >75 years or if there are safety concerns with a high-intensity statin such as a history of hemorrhagic stroke, poorly controlled hypertension, or other serious comorbidities.

Dandapat, S. & Robinson, J.G. Curr Neurol Neurosci Rep (2016) 16: 24. https://doi.org/10.1007/s11910-016-0621-1

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.