CLINICAL *review*

Stroke: Activities of Daily Living

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Indexing Metadata/Description

- **Title/condition**: Stroke: Activities of Daily Living
- **Synonyms**: Cerebrovascular accident (CVA), cerebral infarct
- **Anatomical location/body part affected**: Brain, cerebral cortex/contralateral side of body is primarily affected (hemiplegia)
- **Description**
  - Sensorimotor impairments (paralysis, weakness, sensory loss) and functional disability in activities of daily living (ADLs) resulting from corticospinal transsynaptic degeneration
  - Types of cerebrovascular accidents
    - **Ischemic** cerebrovascular accident, related to atherothrombotic disease, embolism, or venous sinus thrombosis[1]
    - **Hemorrhagic** cerebrovascular accidents, including:[1]
      - Hypertensive hemorrhage
      - Subarachnoid hemorrhage
      - Vascular malformations
      - Atherosclerotic aneurysms
      - Mycotic aneurysms
    - **Cryptogenic** cerebrovascular accident (CVA) is defined as a CVA of unknown cause[2]
- **ICD-9 codes**
  - 438.30 monoplegia of upper limb (438.31 affecting dominant side, 438.32 affecting nondominant side)
  - 438.40 monoplegia of lower limb (438.41 affecting dominant side, 438.42 affecting nondominant side)
  - 438.6 alterations of sensations
- **ICD-10 codes**
  - I69.4 sequelae of stroke, not specified as hemorrhage or infarction
- **Reimbursement**: Reimbursement for therapy will depend on insurance contract coverage; no special agencies or specific issues regarding reimbursement have been identified for stroke rehabilitation
- **Presentation/signs and symptoms**[3]
  - Predominately unilateral paresis, poor coordination, and spasticity
  - Impaired ROM of affected limb
  - Sensory deficits (numbness, position sense)
  - Post-stroke pain (commonly involving the shoulder/arm in upper limb monoplegia)
  - Functional disability requiring increased dependence in:
    - Basic ADLs – activities that involve motor skills in personal care (transfers, sitting, dressing, toileting, reaching, holding, feeding, etc.)
    - Instrumental ADLs – activities that involve process skills (preparing a meal, light housework, taking medications as prescribed, shopping, using a telephone, etc.) and enable independence
  - Compensatory postures and movements in ADLs (e.g., one-handed techniques)
  - Reduced self-esteem and quality of life
  - Depressive affect

Causes & Risk Factors

- **Causes**
  - Ischemic CVA (cerebral anoxia resulting from vascular ischemia)
    - Thrombus – blood clot formed in a cerebral artery (main cause is atherosclerosis)
    - Cardioembolic – occlusion of a cerebral artery by clot/embolus formed elsewhere
    - Arteriolar disease – occlusion of small brain arteries resulting in lacunar stroke
    - Systemic – underperfusion due to cardiac failure
  - Intracerebral hemorrhage – physical deformation of brain tissue caused by hematoma
    - ~20% of cerebral infarcts are of the hemorrhagic type[1]

- **Pathogenesis**
  - Acute anoxia in and/or below the sensorimotor cortex triggers a cascade of events leading to brain infarction
  - Monoparesis/hemiparesis results from transsynaptic degeneration in the affected cortical and/or subcortical (white matter) areas that represent the contralateral upper extremity
  - Improved paretic movements found in chronic (>1 year) stroke are associated with neural activation in the ipsilateral motor cortex, suggesting that some central motor learning may transfer to the unaffected hemisphere[4]
  - Cortical reorganization, i.e., neuroplasticity, provides a rational basis for stroke rehabilitation strategies that restrict use of the less-affected ipsilateral limb, such as constraint-induced movement therapy[5]
  - Reorganization of white matter in the affected hemisphere may also contribute to motor recovery[6]
  - Impairment of basic ADLs and cognitive function has been correlated with the degree of white matter lesions found on neuroimaging[7]
  - Severe white matter lesions are associated with poor scores in instrumental ADLs,[7, 8] perhaps because executive processing skills and planning cognition are impaired
  - Side of the lesion does not appear to determine ADL skills after a stroke[9]
- **Risk factors for stroke**
  - Age – stroke risk doubles for each decade after age 55[3]
  - Increased age is associated with a decline in ADL ability after stroke[9]
  - Gender (male > female)[3]
  - Race (African American 2x > White > Asian)[3]
  - Family history of stroke[3]
  - Hypertension[3]
  - Heart disease[3]
  - Diabetes[3]
  - Cigarette smoking[3]
  - Carotid stenosis[3]
  - Alcohol/cocaine abuse[3]
  - Hypercoagulable states (polycythemia, sickle-cell anemia, cancer)[3]
  - Hyperlipidemia[3]
  - Post transient ischemic attack (TIA)[1]
  - Arteritis, vasculitis, and head/neck trauma[1]
  - CVA secondary to embolism – risk factors include atrial fibrillation, myocardial infarction, valvulitis, endocarditis, mitral stenosis, mitral regurgitation, mitral valve prolapse[1]

Contraindications/Precautions

- Pediatric patients < 18 years of age
- Brain trauma
- Signs of acute illness: fever, chills, night sweats, nausea, vomiting, diarrhea
- Radicular neck/upper extremity pain
- Unexplained weight loss
- Comorbidity that may restrict vigorous exercise
- Non-finalized litigation regarding work disability
- Deep vein thrombosis (DVT) is a contraindication to exercising the involved limb
- Avoid pulling on hemiplegic arm
- See specific **Contraindications/precautions to examination** and **Contraindications/precautions** under Assessment/Plan of Care

Examination

- **Contraindications/precautions to examination**
  - Notify referring physician on positive findings for conditions that may require a special prescription, including the following:
    - Post-stroke shoulder pain that increases with movement; causes may include:
      - Adhesive capsulitis
      - Subacromial impingement
      - Rotator cuff pathology
      - Glenohumeral subluxation or acromioclavicular separation
    - Brachial plexus/peripheral nerve "traction" injury
    - Impaired joint mobility of the elbow (heterotropic ossification), wrist, or hand
    - Upper motorneuron disease (Hoffman's sign)
    - Complex regional pain syndrome, reflex sympathetic dystrophy
  - Severe cachectic appearance
- **History (Depending on the individual's stage of recovery at time of evaluation, the history section may vary slightly)**
  - **History of present condition**

- **Mechanism of injury**[1]
  - CVA secondary to thrombosis
    - Onset – progression of symptoms over hours to days
    - Medical history often significant for TIA
    - Time of presentation – often occurs during the night while the individual is sleeping; typically the patient awakes with a slight neurological deficit that gradually progresses
  - CVA secondary to embolism
    - Onset – very fast (seconds)
    - Medical history significant for TIA is uncommon
    - Time of presentation – individual is typically awake and active
    - 10% of the cases are associated with seizures
  - CVA secondary to hypertensive hemorrhage
    - Onset – sudden
    - Risk factors are akin to those for a CVA caused by a thrombosis
    - Time of presentation – usually during periods of activity
- **Course of treatment**
  - **Medical management**: Was thrombolytic intervention tried in the acute stage? Was a fall-related fracture treated operatively?
  - **Medications for this condition**: Determine what medications were prescribed and whether these are currently being taken. Baclofen, botulinum toxin, or dantrolene is commonly used to control hypertonicity. Is the patient medicated for post-stroke depression, seizures, pain, or hypercoaguability?
  - **Diagnostic tests completed**: Document the results of any plain radiographs, imaging studies, or other diagnostic testing
    - The process of diagnosing a CVA may include (but not limited to) CT scans, MRI, blood tests, ECG, echocardiography, and ultrasound[1]
  - **Home remedies/alternative therapies**: Document any treatment at home or alternative therapies (e.g., massage, acupuncture) and whether or not they helped. Does the patient use a shoulder sling?
  - **Previous therapy**: Has patient had occupational or physical therapy for this or related conditions. If so, what specific treatments were helpful or not helpful?
- **Aggravating/easing factors**: Document factors that aggravate symptoms such as pain or hypertonicity during ADLs and factors that improve them
- **Body chart**: Use body chart to document location and nature of symptoms
- **Nature of symptoms**: Ask the patient to describe symptoms (e.g., pain, tingling, numbness, stiffness, edema, spasticity) and where these symptoms are located
- **Rating of symptoms**: Use a visual analog scale (VAS) or 0-10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present **now** and **how much**)
- **Pattern of symptoms**: Document changes in symptoms throughout the day and night, if any (AM, mid-day, PM, night); also document changes in symptoms due to weather or other external variables
- **Sleep disturbance**: If present, document the usual number of wakings/night
- **Other symptoms**: Document other symptoms patient may be experiencing that could exacerbate an already impaired ability to complete ADLs and/or indicate need for medical consultation (e.g., severe headaches, night sweats, new edema, rash)
- **Barriers to learning**
  - **Are there any barriers to learning? Yes ❑ No ❑**
  - **If Yes, describe** (e.g., cognitive impairment, speech deficit, speaks foreign language)
- **Past medical history**
  - **Previous history**: Document any prior transient ischemic attack, stroke, angina, myocardial infarction, sleep apnea, or history of asthma attacks
  - **Comorbid diagnoses**: Ask patient about coexisting problems, including diabetes, cancer, heart disease, pregnancy, psychiatric disorders, musculoskeletal disorders, chronic lung disease, etc.
  - **Medications previously prescribed**: Obtain a comprehensive list of medications prescribed and/or being taken for other problems (including over-the-counter drugs)
  - **Other symptoms**: Ask about other symptoms that have affected the patient's mobility in ADLs

- **Social/occupational history**
  - **Patient's goals**: Document what specific ADL skills the patient hopes therapy will improve
  - **Vocation/avocation and associated repetitive behaviors**: Is the patient currently on work disability? Did the patient participate in vigorous recreational activities or sports?
  - **Functional limitations/assistance with ADLs/adaptive equipment**: Does the patient use a wheelchair, ambulatory assistive device, knee brace, AFO, shoulder sling, or arm/wrist brace?
  - **Living environment**: Identify barriers to independence in the home and whether any modifications are necessary (stairs, number of floors in home, lack of caregivers)

- **Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to**

patient medical condition, functional status, and setting.) Tests and measures commonly used by neurological specialist physical therapists when examining patients with stroke have been reported[10]

- **Activities of daily living**: Assess level of assistance, equipment used, and quality of movement with feeding, grooming, bathing, dressing, toileting, toilet transfers, tub/shower transfers. If appropriate (e.g., if performing a home evaluation), assess ability to manage household, including shopping, light cleaning, meal preparation, yard work, heavy cleaning, bed making, and money management
- **Assistive and adaptive devices**: Assess need for wheelchair, ambulatory assistive device, splint, or brace, if applicable, and fit if currently used
- **Balance**: Assess balance in sitting and standing. May use the Berg Balance Scale, the Functional Reach Test, or the Postural Assessment Scale for Stroke[11]
- **Circulation**: Assure that peripheral pulses are present in the affected limb and compare
- **Cranial nerve integrity**: Assess for deficits in cranial nerve function
  - Olfaction (CN I): Can the patient smell coffee or soap with each nostril?
  - Vision (CN II): Can the patient see an eye chart equally with each eye?
  - Extraocular movements (CN III, IV, VI): Can the patient look in all directions, keeping the head still, without experiencing any double vision?
  - Facial sensation (CN V): Can the patient feel a cotton wisp equally on each side of the face?
  - Facial expression (CN VII): Assess for asymmetry in facial contour and wrinkles when patient is asked to smile, puff out cheeks, clench eyes tight
  - Articulation (CN V, VII, IX, X, XII): Is the patient's speech slurred, quiet, breathy, nasal, low or high pitched?
  - Tongue protrusion (CN XII): Can the patient stick tongue straight out and move it equally from side to side?
- **Functional mobility**: Assess sitting and standing endurance. Assess ability to perform transfers and bed mobility. Assess upper extremity function in bed mobility, transfers, reaching, grasping, and holding. Assess lower extremity function in bed mobility, transfers, gait, thresholds, and stairs. Possible assessment tools include:[11]
  - The Barthel Index – superior reliability and validity, but limited at the upper functional levels
  - The Motor Assessment Scale (MAS) – good reliability and easy to use; primarily an assessment of mobility
  - The Functional Independence Measure (FIM) – good to superior reliability; evaluates function (including ADLs) and communication/cognition
  - The Rivermead Mobility Index – evaluates functional mobility; quick
  - The Assessment of Motor and Process Skills (AMPS) – evaluates instrumental ADLs
- **Gait/locomotion**: Assess ability to walk and gait pattern, with assistance or assistive ambulatory device, if indicated. Tests to consider include the Functional Ambulation Profile and the Timed Up & Go Test[11]
- **Joint integrity and mobility**: Assess joint mobility in cases with impaired upper extremity and/or lower extremity function
- **Motor function (motor control/tone/learning)**: Assess upper extremity grasp and release, and coordination (opposition, finger to nose, and diadochokinesis). Clinicians may consider using the Fugl-Meyer Assessment as it is reported to have good validity and reliability.[11] Modified Ashworth Scale for spasticity may be used during muscle tone assessment
- **Muscle strength**: Manually assess functional upper extremity strength (shoulder, elbow, wrist, and handgrip), trunk strength, and functional lower extremity strength (hip, knee, and ankle)
- **Observation/inspection/palpation**
  - Inspect the limbs for signs of injury, inflammation, or DVT
  - Inspect the skin for breakdown
  - Palpate for dependent edema or muscle contractures
- **Pain/tenderness**: Assess with VAS
- **Perception**: Assess visual field, visual attention, right/left discrimination, body awareness, depth perception, motor planning, spatial relations, and figure ground discrimination
- **Posture**: Assess for asymmetric posture in sitting and standing
- **Range of motion**: Assess functional ROM of the extremities and spine
- **Reflex testing**: Test reflexes bilaterally and compare
- **Sensory and peripheral nerve integrity testing**: Assess for sensory changes (proprioception, kinesthesia, deep pressure, light touch, thermal) in affected limbs

Assessment/Plan of Care

- **Precautions/recommendations**
  - Avoid aggressive stretching in favor of gentle movement therapy techniques (pain-free range)
  - Evidence is lacking to support the used of thermal modalities (cold or heat) for treating pain or hypertonicity in chronic stroke
  - Discourage routine use of shoulder sling to avoid contractures and flexor synergy pattern
  - **Cryotherapy** contraindications include:[12]
    - Raynaud's syndrome
    - Medical instability
    - Cryoglobulinemia

  - Cold urticaria
  - Paroxysmal cold hemoglobinuria
  - Avoid applying cold over superficial nerves, areas of diminished sensation or with poor circulation, or slow-healing wounds
- **Cryotherapy** precautions include:[12]
  - Use caution with patients who are hypertensive as cold can cause a transient increase in blood pressure; discontinue treatment if there is an elevation in blood pressure
  - Use caution with patients who are hypersensitive to cold
  - Avoid aggressive treatment with cold modalities over an acute wound
  - Use of cryotherapy with patients who have an aversion to cold may be counterproductive if being used to promote muscle relaxation and decrease pain
- **Superficial heat** is contraindicated with:[12]
  - Decreased circulation
  - Decreased sensation
  - Acute/subacute traumatic and inflammatory conditions
  - Skin infections
  - Impaired cognition or language barrier
  - Malignant tumors
  - Tendency for hemorrhage or edema
  - Heat rubs
- **Electrotherapy** contraindications/precautions include (in some cases, **when approved by the treating physician**, electrotherapy may be used under some of the circumstances listed below when benefits outweigh the perceived risk):[12]
  - Stimulation through or across the chest
  - Cardiac pacemakers
  - Implanted stimulators
  - Over carotid sinuses
  - Uncontrolled hypertension/hypotension
  - Peripheral vascular disease
  - Thrombophlebitis
  - Pregnancy
  - Over pharyngeal area
  - Diminished sensation
  - Acute inflammation
  - Seizure history
  - Confused patients
  - Immature patients
  - Obesity
  - Osteoporosis
  - Used in close proximity to diathermy treatment

- **Diagnosis/need for treatment**: Stroke with residual paresis/paralysis, restricted mobility, pain, and impaired ability in ADLs
- **Rule out**
  - Traumatic brain injury
  - TIA if < 24 hours[1]
  - Reversible ischemic neurological deficit (RIND) if > 24 hours but < 3 weeks[1]
  - Tumor[1]
  - Brain abscess[1]
  - Cerebritis[1]
  - Subdural hematoma[1]
  - Epidural hematoma[1]
  - Focal seizure activity[1]
  - Myasthenia gravis[1]
  - DVT
  - Upper extremity conditions that may impair ADLs (e.g., adhesive capsulitis, shoulder joint subluxation, brachial plexus injury, complex regional pain, heterotropic ossification at elbow)
- **Prognosis**
  - The majority of individuals post CVA (particularly lacunar infarcts) get better; however, they have a higher mortality rate than that seen in the general population[1]
    - During the acute stage of CVA the rate of mortality is up to 25%
    - Post CVA the rate of mortality is 31% at 1 year, and even greater in the elderly
    - The number one cause of death in patients who have suffered a CVA is a recurrent CVA

  - Two-thirds of individuals die within 12 years of their initial CVA
  - Long-term mortality rates are higher in men
- An individual's functional level at 6 months post ischemic stroke predicts his/her survival[13]
  - Based on the collective results of 3 prospective cohort studies
  - 7,710 individuals were evaluated at 6 months post CVA onset and followed for up to 19 years
  - Median survival
    - Based on all 3 cohorts:
      - 9.7 years in 2,525 individuals independent in daily living
      - 6 years in 3,436 individuals dependent in daily living
    - Based on 2 of the cohorts: (modified Rankin scale was used)
      - > 15 years in 311 individuals with a Rankin score of 0
      - 11.7 years in 540 individuals with a Rankin score of 1
      - 8.4 years in 576 individuals with a Rankin score of 2
      - 6 years in 433 individuals with a Rankin score of 3
      - 3.7 years in 189 individuals with a Rankin score of 4
      - 2.5 years in 136 individuals with a Rankin score of 5
- Predictors of poor motor recovery and ability in ADLs
  - Prolonged flaccidity period
  - Severe arm weakness in acute stage
  - Weak or no handgrip strength at 4 weeks after stroke
  - Severe proximal spasticity
  - Severely impaired cognition
  - Poor sitting balance
  - Bladder dysfunction, including impaired awareness of bladder needs
- The Hemispheric Stroke Scale score during inpatient rehabilitation was a valid predictor of ADL outcome at 6 months after discharge[14]
- Predictors of long-term participation in ADLs include age, comorbidity, cognitive affect, upper extremity ability, and lower extremity coordination[15]
- Clinical instruments predict functional outcome after stroke with better accuracy than lesion size and location.[16] For example, sitting balance (trunk control test), motor functioning (Motricity Index), and ADL assessment (Barthel Index) in the second week after stroke predicted independency in ADLs at 1 year, while MRI imaging did not have added predictive value[17]

- **Referral to other disciplines**: Physician for management of heart disease, hypertension, diabetes, hypercoagulable state, hyperlipidemia; nurse for smoking cessation program; occupational therapist for limitations with personal ADLs; speech therapist; social service
- **Other considerations**: Stroke rehabilitation practice has generally focused on the first 6 months. Current evidence suggests that positive functional outcomes may diminish with intervention after 1 year or more[18]
- **Treatment interventions**
  - A common goal of rehabilitation team services after stroke is to achieve functional outcomes that reduce disability in ADLs. Focused functional tasks in occupational therapy are clearly effective for improving ability in personal ADLs after stroke.[19] However, it was concluded in a recent systematic review that the exact nature of the occupational therapy intervention to achieve maximum benefit in personal ADLs after stroke has yet to be defined.[20] In multidisciplinary therapy-based teamwork to improve ADLs, physical therapists may assess and treat deficits in sitting, standing, or gait that underlie disability in personal care.[21, 22] Functional training in physical therapy may also independently enhance ability in ADLs. For example, the addition of repetitive locomotor training to standard physical therapy resulted not only in better gait ability, it also improved competence in basic ADLs in a randomized controlled trial[23]
  - Conventional physical therapy for stroke rehabilitation includes positioning, ROM, strengthening, functional mobilization, gait training, compensatory techniques and aerobic exercise (e.g., arm cranking, treadmill walking, or stationary recumbent cycling). Several treatment approaches for regaining motor control, such as proprioceptive neuromuscular facilitation, Bobath neurodevelopmental technique, Brunstrom movement therapy, and Rood sensorimotor technique, are also commonly used. In addition, the physical therapist may implement motor learning/relearning techniques employing task-specific practice with feedback. No single approach has been shown to be more effective than others for recovery of postural control and lower limb function following stroke; using a "mix" of components taken from different approaches deserves consideration[24]
  - Moderately strong evidence supports the effectiveness of constraint-induced movement therapy (CIMT) for improving upper extremity function in daily activities after stroke (see *Clinical Review… Stroke: Upper Extremity*; Accession Number: 5000008656). In one study, the CIMT group that wore a mitt on the less-affected hand while the more-affected UE received intensive training 2 hours/day, 5 days/week for 3 weeks improved planning and movement control strategies in reaching and bimanual tasks, as well as functional independence measures vs. the control group[25]
  - Repetitive task-related training shows promise for improving function in daily living, but the available evidence is insufficient to determine its effectiveness compared to other interventions.[26] For example, task-oriented intervention did not improve manual dexterity (Box and Block Test) of the affected arm in chronic stroke.[27] However, further research is indicated because this type of training is an attainable home-based intervention
  - Increased intensity of exercise has slight but beneficial impact on ADL[28]

  - Based on a systematic review of trials of low to moderate quality
  - Review analyzed 20 randomized trials with a total of 2,686 individuals post CVA
  - Small but statistically significant results were obtained in the meta-analysis of 17 trials that examined the impact of augmented exercise intensity during the initial 6 months post CVA
  - Statistically significant changes were not observed in 3 trials that examined increased exercise intensity in the chronic phase of stroke recovery
  - Cumulative meta-analysis indicates that a minimum of 16 hours of extra treatment time during the initial 6 months is required to achieve significant improvements in ADLs
- For therapy specifically related to gait, see *Clinical Review ... Stroke: Gait Training*; Accession Number: 5000008657

Problem	Goal	Intervention	Expected Progression	Home Program
Pain and dependent edema	Resolution of pain and edema	**Therapeutic modalities** Massage for dependent edema **Physical agents and mechanical modalities** Cryotherapeutic agents, arm elevation; trials of compression glove and pneumatic compression for edema	Allow several weeks for pain/edema management	Apply cold pack and mechanical modalities, as tolerated, to reduce pain
Contractures, decreased ROM	Resolution of contractures and improved ROM of extremities	**Therapeutic modalities** Manual joint mobilizations and stretching of tight tissues Active-assisted, active ROM exercises. Movement therapy techniques	Allow up to 12 weeks to achieve goals	ROM exercises in high functioning patients. Daily repetition of exercises
Cardiovascular deconditioning	Improve aerobic fitness	**Therapeutic exercise** Recumbent cycling, treadmill walking (if safely tolerated), and aquatic therapy as indicated and appropriate	Allow up to 12 weeks to achieve goals	Provide patient's parent/caregiver with written instructions regarding activities that can be safely performed at home
Atrophy, weakness, and impaired motor control	Improve activation and strength of affected muscles	**Therapeutic exercise** Strengthening exercises. Movement therapy techniques	Allow up to 12 weeks to achieve goals	Strengthening exercises in high functioning patients. Daily repetition of exercises
Dependence in ADLs	Greater independence in ADLs with the use of adaptive techniques and devices	**Functional training** Educate the patient on one-handed techniques in daily activities[29] **Prescription, application of devices and equipment** Numerous devices for improving basic and instrumental ADLs[29] Educate patient that routine use of shoulder sling is not indicated Discontinue shoulder sling except when ambulating	Allow up to 12 weeks to achieve functional goals	Patient/caregiver education on practicing tasks; provide patient's parent/caregiver with written instructions regarding exercises and functional activities that can be performed at home. Patient/caregiver education on use of adaptive devices
Poor posture in ADLs	Improved posture during ADLs	**Therapeutic exercise** Positioning/postural exercises Functional postural control tasks	Allow up to 12 weeks to achieve functional goals	Patient/caregiver education on practicing tasks; provide patient's parent/caregiver with written instructions regarding exercises and functional activities that can be performed at home

Favorable Outcomes/Outcome Measures

- Outcomes
  - Reduced or resolved pain
  - Resolved contractures and improved ROM
  - Improved aerobic fitness
  - Improved strength
  - Improved motor control in ADLs
  - Improved posture during ADLs
- Outcome measures
  - Action Research Arm (ARA) Test[30]
  - Functional Reach Test or The Postural Assessment Scale for Stroke[11]
  - Barthel Index[11, 31]
  - Motor Assessment Scale (MAS)[11]
  - Functional Independence Measure (FIM)[11, 32]
  - Rivermead Mobility Index[11]
  - Assessment of Motor and Process Skills (AMPS)[11]
  - Functional Ambulation Profile and the Timed Up & Go Test[11]
  - Fugl-Meyer Assessment[11, 33]
  - Modified Ashworth Scale for spasticity

Maintenance or Prevention

- Maintain the highest achievable ROM, strength, and function of the affected limbs
- Reduce modifiable stroke risk factors

Patient Education

- American Stroke Association - http://www.strokeassociation.org

Coding Matrix

References in this Clinical Review are rated using the following codes, listed in order of strength:

M Published meta-analysis	**RV** Published review of the literature	**PP** Policies, procedures, protocols
SR Published systematic or integrative literature review	**RU** Published research utilization report	**X** Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	**QI** Published quality improvement report	**GI** General or background information/texts/reports
R Published research (not randomized controlled trial)	**L** Legislation	**U** Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	**PGR** Published government report	
G Published guidelines	**PFR** Published funded report	**CP** Conference proceedings, abstracts, presentations

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