



Canadian Stroke Network

Réseau Canadien contre  
les accidents cérébrovasculaires

# SCORE

(Stroke Canada Optimization of Rehabilitation through Evidence)

## SCORE Evidence Based Recommendations for the Upper and Lower Extremities and Risk Assessment Post-Stroke 2005

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## HOW TO USE THIS DOCUMENT

The **SCORE Evidence-Based Recommendations** focus on upper and lower extremity treatments and risk assessment for patients post-stroke. The SCORE EBR have been developed for the rehabilitation of persons who have experienced stroke with residual disability, who are medically stable within the first six months after acute stroke. The primary users of the SCORE recommendations will be *nurses, physiotherapists, occupational therapists, and other assistants* who have daily or almost daily contact with patients. However, the recommendations may also be used by *general practitioners, physiatrists, neurologists, speech language therapists, social workers, and psychologists* who provide rehabilitation care for stroke patients. Ultimately this should assist clinicians to provide the most effective treatment based on the current best evidence. These recommendations are meant to serve as a guide for providers, and clinical discretion should be used by all who are following the SCORE EBR.

The SCORE evidence based recommendations are a result of a thorough search, review, and critical evaluation of currently published Clinical Practice Guidelines (CPG) by a panel of stroke rehabilitation researchers and clinicians. The goal was not to create new recommendations, but to select recommendations from currently published, high quality CPG that are most clinically relevant for health care in Canada. The phrasing of many of the recommendations have been modified slightly to standardize terminology or to make the recommendation more specific. Care was taken to not change the context in which the original recommendation was written. Any additions made by the SCORE panel that were beyond the original context of a recommendation have been referenced with the appropriate level of evidence. There are various systems used by each CPG for the level of evidence, so the SCORE team standardized this across guidelines by using the system outlined below.

SCORE Levels of Evidence	
<b>A</b>	At least one randomized controlled trial, meta-analysis, or systematic review.
<b>B</b>	At least one cohort comparison, case studies or other type of experimental study.
<b>C</b>	Expert opinion, experience of a consensus panel
<b>NE</b>	No evidence provided.

## SECTION A: BACKGROUND

The objectives of the SCORE (**S**troke **C**anada **O**ptimization of **R**ehabilitation through **E**vidence) knowledge translation project are to (i) develop a nationwide network of centres providing rehabilitation services to implement evidence-based recommendations (EBR) in stroke rehabilitation; and (ii) to identify the facilitators and barriers in implementing evidence-based practice with stroke teams.

In Fall 2003, the SCORE project team held a consensus conference to identify the top five research gaps in stroke rehabilitation, prioritize key areas for knowledge translation, and develop priorities for EBR for implementation. The top five research gaps for stroke rehabilitation were derived using an open voting process and small group discussions and include the evaluation of:

1. Multimodal program of community based support to enhance community reintegration
2. The benefit of rehabilitation for persons with severe strokes
3. The ideal timing and intensity of aphasia therapy
4. The benefit of cognitive/perceptual rehabilitation after stroke
5. The ideal timing and intensity of interdisciplinary rehabilitation for the mild and moderate stroke population.

The priority areas for an implementation of best practice were identified using an open voting process and summary discussion method. The panel determined that the following stroke rehabilitation areas had the strongest evidence and were suitable for development of EBR:

1. Lower extremity and gait rehabilitation
2. Upper extremity rehabilitation
3. Assessments of the stroke rehabilitation client to identify risk and potential sources of harm including pressure ulcers, falls, dysphagia, depression and cognitive impairment.

***Clinical Practice Guideline Search & Evaluation:*** To minimize repetition of previously completed work, the SCORE project leaders decided to review existing stroke guideline and adapt these to Canadian needs. A systematic search was completed to identify all guidelines for stroke rehabilitation and risk assessment of pressure sores, falls, dysphagia, depression and cognition from 1997 – 2003. A systematic search was also conducted to

identify assessment and screening tools used in stroke patients for each of the risk assessment areas.

The guideline development process and how well this was reported was evaluated by 4 panel members using the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument ([www.agreecollaboration.org](http://www.agreecollaboration.org)). The AGREE instrument assesses the quality of CPG for 6 domains including; (1) Scope and purpose, (2) Stakeholder involvement, (3) Rigour of development, (4) Clarity of presentation, (5) Applicability, and (6) Editorial independence. Recommendations, assessment tools, and AGREE scores were summarized and presented to the expert panels at two subsequent conferences in January and March 2004. In preparation for the expert conferences, all participants were given copies of relevant literature and evaluations developed by the stroke rehabilitation evidence based review group.

The panel members were selected to give a wide representation from all disciplines, to represent various geographic locations across Canada, and to gain perspective of individuals with stroke and some international perspectives. The expert panel consisted of stakeholders, a stroke survivor, stroke and rehabilitation researchers and clinicians from across Canada with expertise in multiple disciplines including Medicine (Physiatry, Neurology and Psychiatry) Physiotherapy, Occupational Therapy, Speech Language Therapy, Dysphagia, Psychology, Epidemiology, Motor Control and Knowledge Translation. The members of the project team and expert panel are listed in Appendix A. The panels participated in sessions that reviewed the evidence for each priority area followed by small group discussions and open voting process to arrive at the final SCORE EBR.

The SCORE EBRs are currently being piloted at six hospitals across Canada for 6 months. The SCORE EBR will be updated in 2006 using the provider feedback from the pilot, updated versions of the CPG originally used to create the recommendations and a review of the literature using the EBRSR ([www.ebrsr.com](http://www.ebrsr.com)).

## **SECTION B: TERMINOLOGY**

## SCORE TERMINOLOGY

*The following glossary of terms was developed by consensus of the expert panel to facilitate articulation of the evidence-based recommendations.*

### SCORE TERMINOLOGY

<b>TERM</b>	<b>DEFINITION</b>
<b>Assistive Technology</b>	Technology designed to help a patient with limitations to perform daily activities and social roles.
<b>Balance</b>	Acquisition and maintenance of postural stability at rest or during activities.
<b>Balance Training</b>	Sensory motor and cognitive intervention to promote postural stability.
<b>Biofeedback</b>	A technique monitoring physiological functions and providing extrinsic feedback, which may include somatosensory, visual and auditory input.
<b>Cardio Respiratory Fitness</b>	Related to the ability to perform large muscle, dynamic, moderate-to-high intensity exercise for prolonged periods. Improvements in cardiorespiratory fitness result in improvements of the heart to deliver oxygen to the working muscles and in the muscle's ability to generate energy with oxygen and result in better endurance performance. (ACSM, 2000)
<b>Community Based Rehabilitation Therapy</b>	Rehabilitation provided in the home or community based institutions.
<b>Compensatory Therapy</b>	Adaptive therapeutic interventions designed to enhance activity and participation (the focus is on function and not impairment).
<b>Constraint Induced Therapy</b>	Intervention designed to enhance recovery of function or a body part by restraining a less affected function or body part.
<b>Conventional Therapy</b>	The usual care offered in a particular setting and must be defined in terms of their intensity, frequency, and duration.
<b>Day Hospital</b>	A defined geographic outpatient unit dedicated to interdisciplinary care and rehabilitation of an individual.

## SCORE TERMINOLOGY

<b>TERM</b>	<b>DEFINITION</b>
<b>Executive Function</b>	A psychosocial construct comprising interactive component processes such as: (1) Selective and sustained attention, working memory, concept formation and set switching, all of which contribute to planning, organization decision making and problem solving. (2) Inhibition, self-awareness and theory, all of which contribute to social cognition and behaviours such as impulse control, mood, empathy and motivation.
<b>Exercise Therapy</b>	Intervention directed towards optimizing physical capacity.
<b>Gait</b>	The pattern of walking, which is often characterized by elements of progression, efficiency, stability and safety.
<b>Hemiparesis</b>	Weakness involving one side of the body (of mild, moderate or severe degree) that may be caused by stroke, and can be accompanied by sensory or other neurological deficits.
<b>Hemiplegia</b>	Refers to a complete paralysis. Complete loss of motor function on one side of the body that may be caused by stroke localized to the cerebral hemisphere opposite to the side of weakness.
<b>Hypertonia</b>	Abnormal increase in resistance while externally imposing movement about a joint.
<b>Intensity</b>	The level of effort demanded or required of the individual in relation to their current capacity (physical and mental).
<b>Muscular Endurance</b>	Ability of a muscle or muscle group to perform repeated muscle contractions over a period sufficient to cause muscular fatigue, or to maintain a specific percentage of the maximum voluntary contraction for a prolonged period of time. (American College of Sports Medicine Guidelines, 2000)
<b>Muscle Strength</b>	Maximal force that can be generated by a specific muscle or muscle group. (ACSM, 2000)
<b>Recovery</b>	The process whereby the person regains body structure, function, activity and participation. (Not time limited)
<b>Restorative (Remedial) Therapy</b>	Therapeutic interventions designed to restore body structure and function by targeting the underlying impairment to enhance recovery.
<b>Spasticity</b>	Velocity-dependent increase in muscle tone that often occurs in stroke.

## SCORE TERMINOLOGY

<b>TERM</b>	<b>DEFINITION</b>
<b>Stroke Unit</b>	A defined geographic dedicated to interdisciplinary care and rehabilitation of individuals with stroke.
<b>Task Oriented or Task Specific Therapy</b>	The practice of meaningful tasks to promote recovery.
<b>Timing of Stroke Rehabilitation</b>	The time following a stroke at which stroke rehabilitation interventions are initiated.
<b>Hyper Acute</b>	Arbitrarily defined as the first 72 hours.
<b>Acute</b>	Arbitrarily defined as the first week following a stroke in which medical stabilization usually occurs.
<b>Sub-Acute</b>	The time period during which the most rapid recovery occurs, usually from the 1st to 6th week.
<b>Post-Acute</b>	The time period during which continuing recovery occurs, usually from 6 weeks to 6 months.
<b>Chronic</b>	The time period following 6 months post stroke.
<b>Tone</b>	Resistance to passive stretch while the patient is attempting to maintain a relaxed state of muscle activity.
<b>Types of Stroke</b>	Ischemic or hemorrhage to the brain.

\* May vary according to severity of stroke and co-morbid conditions

**SECTION C: SCORE EVIDENCE BASED RECOMMENDATIONS**

## GENERAL RECOMMENDATIONS FOR THE CONTEXT OF STROKE REHABILITATION

1. Patients admitted to hospital because of acute stroke should be treated in a stroke unit by an interdisciplinary team. (*Adapted from SIGN 64 2.1 Level A*)
2. The core interdisciplinary team should consist of appropriate levels of medical, nursing, physiotherapy, occupational therapy, speech language therapy, social work staff (*Adapted from SIGN 64 3.1 Level A*) psychology, nutrition and ancillary services as required. (SCORE Level C)
3. A full interdisciplinary assessment should be undertaken for each acute stroke patient to define the nature of the event, the need for investigation, management, the need for rehabilitation (*Adapted from SIGN 13 3.2.2 Level C*) and the plan for discharge. (SCORE Level C)
4. The rehabilitation program should be guided by specific and realistic goals developed in conjunction with the patient, family and rehabilitation team. (*Adapted from VaDoD R-2 Level C*)
5. Formal interdisciplinary meetings should be conducted regularly, at which individual patient problems are identified, rehabilitation goals reviewed, progress monitored and discharge planned. (*Adapted from SIGN 64 3.1.2 Level A*)
6. Patients and carers should have an early active involvement in the rehabilitation process. (*SIGN 64 3.1.1, Level B*)
7. Comprehensive caregiver training and education is recommended for proper rehabilitative support. (*Adapted from SPREAD R9.11b Level C*) This comprehensive approach should include information about causes and consequences of stroke as well as the goals, process and prognosis of rehabilitation. Family members and carers should receive thorough training in techniques and problem-solving approaches required to provide effective support. (*Adapted from AHCPR pg.63 Level C*) This should consist of active counseling, providing written material alone is not sufficient. (SCORE Level A)

## COMMON RECOMMENDATIONS FOR THE REHABILITATION OF BOTH THE UPPER AND LOWER EXTREMITY

### ***Timing/Intensity/Frequency/Duration of Therapy***

8. Restorative therapy post stroke should start as early as tolerated and increase gradually as the medical condition permits. (SCORE Level C, Ottawa Panel 1.57 Level A)
9. The patient should receive as much therapy as can be provided and find tolerable. (*Adapted from RCP 4.5b Level A*)
10. While the evidence suggests that more therapy results in better mobility, functional and quality of life outcomes (Ottawa Panel 1.17/1.30 Level A), the optimal amount of therapy is not known. The SCORE Panel recommends at least 2 hours (SCORE Level C) of individualized

supervised direct therapy with a physiotherapist, occupational therapist, or delegate for the arm and leg per day (Level B) during the sub-acute phase (SCORE Level B).

### **EMG Biofeedback**

11. EMG Biofeedback systems should not be used on a routine basis. (*RCP 9.3.2a Level A*)

### **Training Techniques**

12. Exercise and functional training should be directed to enhance motor control for restoring sensorimotor and functional abilities. (Adapted from SPREAD R9.13 Level A, Ottawa Panel 3.8 Level A)
13. Engage in repetitive and intense use of novel tasks that challenge the patient to acquire necessary motor skills to use the involved limb during functional tasks and activities. (Adapted from HSF-AH 6.1 Level A)
14. Following appropriate medical evaluation; patients in the post-acute phase should participate regularly in an aerobic exercise program that is designed with consideration of the patient's co-morbidities and functional limitations. (Adapted from VaDoD N-1 Level B; Ottawa Panel 2.1, Level A)
15. Task-specific training is recommended to improve performance of selected tasks for the lower extremity. (Adapted from SIGN 64 4.2.1 – Level B; Ottawa Panel 3.1 Level A)
16. Therapy directed at postural control should be included in the patient's therapy program. (SCORE Level C)
17. An extra 11 – 13 reps/days of sit-to-stand should be included in the patient's therapy program. (SCORE Level A)

### **Compensatory vs. Remedial therapy**

18. There is insufficient evidence to recommend for or against NDT in comparison to other treatment approaches for motor retraining following an acute stroke. (*VaDoD S-8*)

### **Spasticity**

19. Spasticity and contractures should be treated/prevented by antispastic pattern positioning, range-of-motion exercises, stretching and/or splinting. (AHCPH p.73 Level C)
20. Spasticity in the arm or leg, should not limit the use of strength training. (Adapted from RCP 9.3.4b Level C)
21. In patients with disabling or symptomatically distressing spasticity (RCP 9.3.4b) consider use of tizanidine and/or oral baclofen for spasticity resulting in pain, poor skin hygiene or decreased function. Tizanidine should be used specifically for chronic stroke patients. (Adapted from VaDoD S-9.2 Level B)

22. For post-acute stroke patients with focal and symptomatically distressing spasticity consider use of Botox injection to increase ROM and decrease pain (Adapted from RCP 9.3.5a Level A). Recommend against diazepam or other benzodiazepines during stroke recovery period due to possible deleterious effects on recovery, in addition to deleterious sedation side effects. (VaDoD S-9.3 Level B)

## **RECOMMENDATIONS FOR LOWER EXTREMITY REHABILITATION**

### **Gait**

23. Body weight supported treadmill training may be used in selected clients. The literature is inconclusive as of yet. (SCORE Level C)
24. Gait re-education with or without treadmill walking should be offered to improve walking ability. (Adapted from RCP 9.6.1b, Level B; *Ottawa Panel Level B or A*)

### **Assistive Technology**

25. Recommend that wheelchair prescriptions be based on careful assessment of the patient and the environment in which the wheelchair will be used. (VaDoD N-2.4 Level C)
26. Assess the need for special equipment on an individual basis; once provided, equipment should be evaluated on a regular basis. (RCP 9.6.3a Level B)
27. Although ankle foot orthosis may help some patients with foot drop, they should not be used routinely without proper assessment prior to prescription and follow-up to establish their effectiveness in the individual. (SIGN 4.2.5 Level A)
28. Lower extremity orthotic devices should be considered if ankle or knee stabilization is needed to help the patient walk. Prefabricated bracing can be used initially, and more expensive customized bracing reserved for patients who demonstrate a long-term need. (AHCPR p.72 Level C)
29. Use adaptive devices for safety and function if other methods of performing the task are not available or cannot be learned. (Adapted from VaDoD N-2.1 Level C)
30. Walking assistive devices may be used to help with mobility, efficiency and safety, when needed. (*Adapted from VaDoD N-2.5 Level C*)

### **Functional Electrical Stimulation (FES) for the Lower Extremity**

31. Functional electrical stimulation (FES) should be considered for use in improving muscle force, strength and function (gait) in selected patients. FES must not be assumed to have sustained effects. (*Adapted from SIGN 4.2.6 Level A*)

## RECOMMENDATIONS FOR UPPER EXTREMITY REHABILITATION

### **Constraint-Induced Movement Therapy**

32. Consider the use of constraint-induced therapy for a select group of patients – that is patients with 20 degrees of wrist extension and 10 degrees of finger extension, who have no sensory or cognitive deficits. To date the only demonstrated benefit occurs in patients who received 6 to 8 hours of daily training for at least 2 weeks. (Adapted from VaDoD S-6 Level C)

### **Training Techniques**

33. For patients whose arm and hand are predicted to be less than stage 4 as measured by the Chedoke-McMaster Stroke Assessment (CMSA), enhance sensory-motor recovery of the upper limb by using sensory motor stimulation. This consists of passive and active-assisted range of movement (Level A) that also includes placement of the upper limb in a variety of positions within the patient's visual field (Level C) (Adapted from HSF-AH 1.2a Level A and C)
34. Enhance sensory-motor recovery in the upper limb by using visual imagery. (HSF-AH 1.2c Level C)

### **Prevention of Shoulder Pain**

35. The presence of pain in stroke patients should be identified early and treated appropriately. (SIGN 64 4.9 NE)
36. Identify factors that cause or exacerbate shoulder pain. (HSF-AH 2.1 Level C)
37. The following interventions to prevent shoulder pain should be considered:
- i) use of foam supports (*RCP 9.4.2a-ii Level A, Ottawa Panel 9.15 Level A*)
  - ii) passive assisted movement within the pain-free range (*SCORE Level C*)
  - iii) position and support the limb to minimize pain (*SCORE Level C, Ottawa Panel 9.14 Level A*)
  - iv) protect the limb during functional mobility tasks (*Adapted from HSF AH 2.3b Level C*)
  - v) teach patient to respect the pain. (*HSF-AH 2.3c Level C*)
  - vi) facilitate active movement of the upper limb and trunk (*HSF-AH 2.3d Level C*)
  - vii) use some means of external support to protect the upper limb during wheelchair use (e.g. hemi tray, arm trough) (*HSF-AH 5.1g Level C*)
  - viii) with analgesics (*SCORE Level C*)
38. Encourage joint protection and minimize joint trauma:
- a. careful handling of the upper limb during functional activities. (*Level B*)
  - b. shoulder should not be passively moved beyond 90 degrees of flexion and abduction unless the scapula is upwardly rotated and the humerus is laterally rotated. (*Level A*)
  - c. inappropriate to use overhead pulleys because they appear to contribute to shoulder tissue injury. (*Level A, Ottawa Panel 2.38 Level A*)
  - d. use of some means of external support to protect the upper limb (e.g. sling, pocket, by therapist) in Chedoke Stage 1 or 2 only during transfers and mobility. (*Level C, Ottawa Panel 9.14 Level A*)  
(Adapted from HSF-AH 1.1)

39. Maintain a comfortable, pain-free mobile arm and hand by instructions to the individuals or groups overseen by professional rehabilitation clinicians in an institutional or community setting that teach the patient and caregiver to perform self-range of motion exercises. (Adapted from HSF-AH 5.1b Level C)
40. To prevent shoulder pain educate staff and carers about correct handling of the hemiplegic arm. (Adapted from RCP 9.4.2iv Level B)
41. Instruct on proper positioning to reduce pain while sleeping. (Adapted from HSF-AH 3.3e Level C)

### ***ROM and Modalities***

42. Consider the following interventions to treat shoulder pain:
  - i) Improve ROM through gentle stretching and mobilization techniques focusing especially on external rotation and abduction, as a means of preventing frozen shoulder and shoulder-hand-pain syndrome. Level B)
  - ii) Modalities: Ice, heat and soft tissue massage (Level C)
  - iii) Strengthening (Level C) *(Adapted from VaDoD S-11.3, C,D,F)*
43. Maintain a comfortable, pain-free, mobile arm and hand: encourage caregiver supervised self-range of motion exercises in the home. Continue to identify task or movement characteristics that increase shoulder pain. (Adapted from HSF-AH 5.1c Level C)
44. Reduction of hand oedema by:
  - i) active self-range of motion exercises in conjunction with elevation (HSF-AH 8.2d Level C) to gain full range of movement of the fingers, thumb and wrist.
  - ii) retrograde massage. (HSF-AH 1.3b Level C)
  - iii) gentle grade 1-2 mobilizations for accessory movements of the hand and fingers. (HSF-AH 8.2b Level C)
  - iv) cold water immersion (B) or contrast baths (C). (HSF-AH 8.2e Level B/C)

### ***Functional Electrical Stimulation (FES) For Upper Extremity***

45. FES may reduce shoulder subluxation in the short term (i.e. mean 5 weeks) but not in the long-term in patients with Chedoke stages 1 and 2 recovery of upper extremity. (Adapted from HSF AH7.3 Level A)
46. Functional Electrical Stimulation (FES) used alone for the wrist and forearm can reduce motor impairment and improve functional motor recovery. (SCORE Level A, Ottawa Panel 10.3 Level A)
47. FES may increase pain free ROM of lateral rotation of the shoulder (SCORE Level A)

## RECOMMENDATIONS FOR RISK ASSESSMENT

### **Pressure Ulcer Risk Assessment**

1. A head to toe skin assessment should be carried out with all patients at admission, transfer of care, and any time there is a change in health status. Particular attention should be paid to bony prominences. (RNAO 1.1, p.24, Level C)
2. Patients who are restricted to bed and/or chair should be assessed daily for pressure, friction and shear in all positions and during lifting, turning and repositioning. (RNAO 1.4, p.24, Level C)
3. All data should be documented at the time of assessment and reassessment. (RNAO 1.5, p.24, Level C)
4. Assessment of a patient's risk for the development of pressure ulcers is recommended using the "Braden Scale for Predicting Pressure Sore Risk". Interventions should be based on Braden's categories (Sensory perception, mobility, activity, moisture, nutrition, friction, and shear), rather than a total score. In some specific cases, where population specific risk assessment tools are available and tested for validity and reliability, these can be used for assessment. (RNAO 1.2, p.24, Level C)
5. All pressure ulcers are identified and staged using the National Pressure Ulcer Advisory Panel (NPUAP) criteria. (RNAO 1.3, p.24, Level C)

### **Pressure Ulcer Screening Tool: Braden Scale for Predicting Pressure Sore Risk**

### **Dysphagia Risk Assessment**

6. Keep all patients NPO until a healthcare professional, trained to administer and interpret a simple, valid, bedside testing protocol screens all stroke survivors for swallowing difficulties within 24 hours of being awake and alert. (SCORE Level C)
7. Patients should be reassessed for changes in their medical conditions and their swallowing status. (*Adapted from* SIGN-D, 2.1.1, p.3 Level B)
8. The gag reflex alone is a poor predictor of swallowing function and should not be used for screening for dysphagia in stroke patients. (SIGN-D 2.2.2, p.4 Level B)
9. Screening may include the following:
  - a. Assessment of alertness and ability to participate in screening (SCORE Level C)
  - b. Direct observation of signs and symptoms of oropharyngeal swallowing difficulties. (SCORE Level C)
  - c. Administration of a 50-mL water swallowing test, as described by Kidd et al. 1994 (SCORE Level B)
  - d. Assessment of pharyngeal sensation (SCORE Level B)
  - e. Assessment of tongue protrusion (SCORE Level B)
  - f. If a patient fails, refer to appropriately trained dysphagia expert (SCORE Level B)

10. A Speech Language Pathologist (SLP) or a trained healthcare professional\* must demonstrate competencies in the following areas:
  - a. Administration and interpretation of a water swallow test
  - b. Recognition of the early signs and symptoms of dysphagia (abnormal tongue movement, wet voice quality, reduced sensation at posterior pharyngeal wall)  
(SCORE Level C)

*\* Where a SLP is not available, a health professional (trained in examination and interpretation of oral motor function, swallowing function, and videofluoroscopic swallowing assessments.)*

11. Any patient with an abnormal swallow should be seen by a SLP\* who will define swallow physiology making recommendations regarding management and treatment. (Adapted from VaDoD G 1.3, p.13, Level C) The SLP will further advise the patient/caregiver and staff on safe swallow and consistency of diet and fluids. (Adapted from RCP 8.2b, p.39 Level A)
12. The assessment includes a clinical bedside examination and, if warranted, an instrumental examination. (SCORE Level C)
13. Assessment should include:
  - a. Medical, developmental and swallowing history (such as medical diagnosis, nutrition, hydration and pulmonary status, etc. ) (CASLPO #3a, p.11, SCORE Level C)
  - b. Oral motor and sensory assessment (such as the structure, function, and sensation of the lips, tongue, velopharynx, etc.) (CASLPO #3b, p.11, SCORE Level C)
  - c. Determine risk factors for dysphagia (Including cognition and communication) and potential complications including airway obstruction, aspiration of food and liquid, inadequate nutrition, and hydration (HSF #4b, SCORE Level C)
14. Trials of swallowing food and or fluids may be included in clinical assessment. Swallowing strategies such as various textures, volumes, postures, maneuvers may be included. (SCORE Level C)
15. Patients should be reviewed for dysphagia at least once a week after the initial assessment. (Adapted from SIGN-D, 2.1.1, p.3 Level B)

### ***Nutritional Screening***

16. Patient's nutritional status, including risk factors, should be established within 48 hours of admission to hospital by appropriately trained personnel. (Adapted from SIGN-D, 2.1.2, p.3 Level B)
17. Results from the screening process should guide appropriate referral to the dietitian for assessment and management (SIGN-D, 2.1.2b, p.3 Level C) which includes:
  - a. Assess energy, protein, and fluid needs
  - b. Recommend alterations in diet to meet energy, protein, and fluid needs
  - c. Support alterations in food texture and fluid consistency, based on the assessment by a speech language pathologist or swallowing team.  
(HSF#6, p.8, Score Level C)
18. The patient's physician may monitor hydration status, initiate appropriate laboratory investigations and order supplementary intravenous fluid administration. (Adapted from HSF #4, p.7-8, SCORE Level C)

19. Nutritional assessment should be repeated at regular intervals throughout the episode of care. (Adapted from SIGN-D 2.1.2, p.3, Level B)

**Dysphagia Screening Tool : TOR-BSST**

**Falls Risk Assessment**

20. All patients post stroke should be screened for risk of falling by a clinician with appropriate skills\* and experience at admission and all changes of environment. (SCORE Level C)

\* Including nurses, Physiotherapists, or Occupational Therapist

21. The screening assessment for risk of falls should include identification of intrinsic and extrinsic risk factors associated with potential falls and fall injuries, as the basis for individual and environmental multi-factorial intervention strategies. (RNAO 3, p.23, Level B) Specifically the assessment should include:

Intrinsic: (AGS, SCORE Level C)

- a. History including the following questions:
  - i. How many prescription medications are you currently taking?
  - ii. Can you get up from a chair *without* using your arms?
  - iii. Do you ever feel that you are losing balance, but that the problem is in your legs, not your head?
  - iv. When was the last time you had your eyesight checked?
  - v. Do you have serious problems with you feet (corns, bunions, etc.)?
  - vi. Do you have any other chronic medical problems
- b. Examination of mobility
  - i. Gait and balance
  - ii. lower extremity function
  - iii. basic muscle strength
  - iv. proprioception
- c. Examination of vision and perception
- d. Examination of cardiovascular status
  - i. heart rate and rhythm
  - ii. postural pulse and blood pressure
  - iii. if appropriate, heart rate and blood pressure responses to carotid sinus stimulation

Extrinsic:

- e. Environmental risks (AGS#2, p.667, SCORE Level C)

22. Those found to be at risk must undergo a comprehensive assessment. (SCORE Level C)

23. All patients with a fall post stroke should have an assessment of circumstances surrounding the fall to identify precipitating factors. (SCORE Level C)

**Falls Screening Tools:** **Ambulatory Patients – Timed Up and Go**  
**Non-ambulatory Patients - STRATIFY**

## ***Depression Risk Assessment***

24. All patients with stroke should be viewed with a high level of suspicion for depression by the clinical team. Prior history of depression and previous risk factors of depression should be assessed as part of the initial screen. All patients with stroke should be screen for depression within 48 hours of gaining consciousness and prior to discharge throughout the continuum of care. (SCORE Level C)
25. The clinical team should be aware of the differences in the clinical features of delirium, dementia and depression. To facilitate this process the clinical team should use a structured tool to identify those stroke patients who are or at risk of depression. These tools include the Community Stroke Aphasic Depression Questionnaire (SADQ) (Sutcliffe & Lincoln. Clin Rehabil 1998; 12: 506-13) and the Hospital Anxiety Depression Scale. (SCORE Level C)

**Depression Screening Tools:  
Community Stroke Aphasic Depression Questionnaire  
Hospital Anxiety Depression Scale**

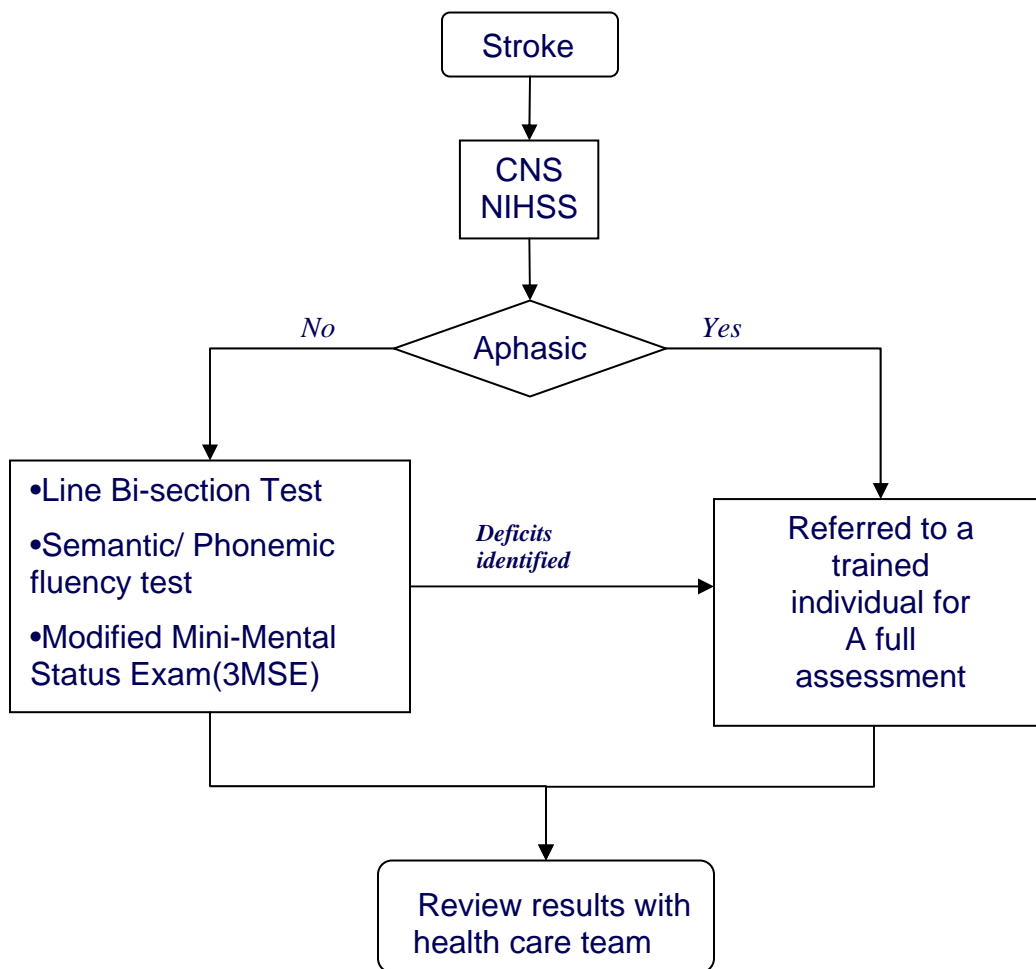
## ***Cognition Risk Assessment***

26. If screening suggests a cognitive deficit, a more detailed assessment by an appropriately trained individual\* should be performed. (SCORE Level C)

\* Psychologist or psychiatrist

27. All patients post stroke must undergo a screening of cognitive functions within 48 hours of regaining consciousness or change in care/facility by a trained individual. (SCORE Level C)
28. The screening should be done using a validated tool for the stroke population, which should include
  - a. Arousal/alertness;
  - b. Attention (sustains 5 seconds);
  - c. Language;
  - d. Orientation;
  - e. Neglect;
  - f. Memory (To flag for dementia);
  - g. Executive Dysfunction;
  - h. Apraxia (SCORE Level C)

**Cognition Screening Algorithm:  
Modified Mini-Mental Status Exam  
Line Bisection Test  
Semantic Fluency Test**



**Notes:**

***\*Patient needs to be alert to participate in the cognitive screen.***

***\*With changes in medical status and/or environment, a reassessment of patient’s cognition is warranted.***

Figure 1. Algorithm for Cognitive screening in stroke patients.

## **SECTION D: ASSESSMENT TOOLS**

## BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK

<b>Sensory Perception</b>  Ability to respond meaningfully to pressure-related discomfort	<b>1 Completely limited</b>  Unresponsive (does not moan, flinch or grasp) to painful stimuli due to diminished level of consciousness or sedation, or limited ability to feel pain over most of body surface.	<b>2 Very Limited</b>  Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness, or has a sensor impairment that limits the ability to feel pain or discomfort over ½ of body.	<b>3 Slightly Limited</b>  responds to verbal commands but cannot always communicate discomfort or need to be turned or has some sensory impairment that limits ability to feel pain or discomfort in 1 or 2 extremities.	<b>4 No Impairment</b>  Responds to verbal commands, has no sensory deficit that would limit ability to feel or voice pain or discomfort.	
<b>Moisture</b>  Degree to which skin is exposed to moisture	<b>1 Constantly moist</b>  Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	<b>2 Very Moist</b>  skin is often, but not always moist. Linen must be changed at least once a shift.	<b>3 Occasionally moist</b>  Skin is occasionally moist, requiring an extra linen change approximately once a day.	<b>4 Rarely moist</b>  Skin is usually dry, linen only requires changing at routine intervals.	
<b>Activity</b>  Degree of physical activity	<b>1 Bedfast</b>  Confined to bed.	<b>2 Chairfast</b>  Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	<b>3 Walks occasionally</b>  Walks occasionally during the day, but for very short distances with or without assistance. Spends majority of each shift in bed or chair.	<b>4 Walks frequently</b>  Walks outside the room at least twice a day and inside room at least every 2 hours during waking hours.	
<b>Mobility</b>  Ability to change and control body position	<b>1 Completely immobile</b>  Does not make even slight changes in body or extremity position without assistance.	<b>2 Very limited</b>  Makes occasional, slight changes in body or extremity position but unable to make frequent or significant changes independently.	<b>3 Slightly limited</b>  Makes frequent thought slight changes in body or extremity position independently.	<b>4 Walks frequently</b>  Makes major and frequent changes in position without assistance.	
<b>Nutrition</b>  <i>Usual</i> food intake pattern.	<b>1 Very Poor</b>  Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Take fluids poorly. Does not take a liquid dietary supplement, or is NPO and/or maintained on clear liquids or IVs for more than 5 days.	<b>2 Probably inadequate</b>  rarely eats a complete meal and generally eats only about 1.2 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement, or receives less than optimum amount of liquid diet or tube feeding.	<b>3 Adequate</b>  Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy) each day. Occasionally will refuse a meal, but will usually take a supplement if offered, or is on a tube feeding or TPN regimen, which meets most of nutritional needs.	<b>4 Excellent</b>  Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products daily. Occasionally eats between meals. Does not require supplementation.	
<b>Friction and Shear</b>	<b>1 Problem</b>  Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation lead to almost constant friction.	<b>2 Potential problems</b>  Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	<b>3 No apparent problem</b>  Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	<b>NOTE:</b> Patients with a total score of 16 or less are considered to be at risk of developing pressure ulcers. (15 or 16 = low risk; 13 or 14 = moderate risk; 12 or less = high risk)	
<b>TOTAL SCORE</b>					

# TOR-BSST

## The Toronto Bedside Swallowing Screening Test

(addressograph)

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 Number: \_\_\_\_\_

Patient \_\_\_\_\_

**A) Before water intake:** (Mark either normal, abnormal or unable to assess for each task.)

1. Have patient say 'ah' and judge voice quality.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____
2. Ask patient to stick their tongue out and then move it from side to side.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____
3. Stroke posterior wall of throat on each side and ask patient if they can feel it.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____

**B) Water Intake:** While the patient is sitting upright give **10 x 5ml (teaspoon)** boluses followed by a **sip from a cup**. Ask patient to **say "ah"** after each swallow. **If any coughing or change in voice quality occurs, stop the test and check appropriate box. Do not mark normal findings in this section. If you are unable to continue the water swallows to your satisfaction of patient safety, record the reason for terminating in the Unable to Assess box.**

1 TSP. SWALLOWS	Cough during/ after swallow	Wet voice after swallow	Unable to Assess (Give reason)
Swallow 1	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 2	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 3	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 4	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 5	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 6	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 7	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 8	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 9	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 10	<input type="checkbox"/>	<input type="checkbox"/>	_____
2) Free drinking from a cup	<input type="checkbox"/>	<input type="checkbox"/>	_____
3) Drool during water swallows?	<input type="checkbox"/>		

**C) After water intake:**

1. Have patient say 'ah' again and judge voice quality	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to Assess _____
--	------------------------------------	--------------------------------------	---------------------------

**D) Results:**  **Passed** (no abnormal results)  **Failed** (1 or more abnormal results)

If Failed initiate referral to SLP

Nurse's Signature: \_\_\_\_\_



## Some Guidelines and Tips for the TOR-BSST

Remember to have tongue depressors, swabs, a cup with water, a teaspoon and a flashlight ready before starting the screening test.

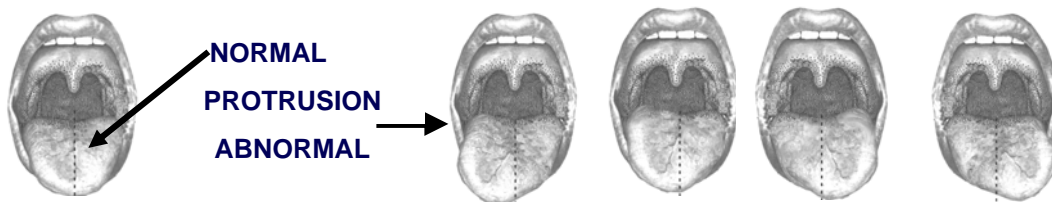
### A. Before water intake:

#### 1. "I want you to say "ah" for 5 seconds using your speaking voice."

- Model a clear "ah" for the patient.
- Remind them not to sing "ah" or use a quiet voice.
- Remember to take note of the patient's voice when speaking. If his/her voice sounds different when saying "ah" re-instruct the patient to use a normal voice using any of the suggestions above.
- **You are looking for any breathiness, gurgles, hoarseness, or whisper quality to the voice. If you perceive any of these, even to a mild degree, mark as abnormal.**
- **If you think that the patient sounds like a smoker, some one with a cold or sore throat, or has a creaky voice, mark ABNORMAL.**

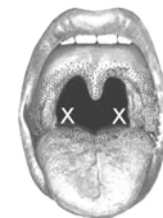
#### 2. "Open your mouth a little bit. Now stick out your tongue as far as it will go." then "Now move it back and forth across your mouth."

- You are looking for any deviation of the tongue towards one side on protrusion. If there is deviation, mark as abnormal and you do not have to look at tongue movement.
- If no deviation, look at movement from side to side. Any difficulty in moving the tongue to one side or preference of movement to one side, mark as abnormal.



#### 3. "I'm going to touch somewhere in your mouth and it may be a bit uncomfortable. After I touch with the stick, I want you to tell me where you felt it."

- You may need an extra tongue depressor to lower the body of the tongue and give you a view of the oropharynx.
- **If the patient shows an obvious gag or movement of the soft palate and walls of the oropharynx, mark as normal even if verbal responses are not accurate.**
- **In the absence of a gag response, judge the patient to have normal sensation if the responses are accurate.**



Targets for Pharyngeal Sensation

### B. Water Swallows: Mark any coughing, including delayed coughing, and any wetness of voice as abnormal.

- The patient can take the water unassisted if you judge that they are able.
- Ensure that full teaspoon amounts are given.
- Lightly palpate the throat to monitor for movement of the larynx on the first few swallows.
- **You are looking for any coughing or change in the patient's voice suggesting wetness. If you perceive this, mark accordingly and stop the water swallows.**
- **If you see what looks like a stifled or suppressed cough, mark this as a cough.**
- **If there is no coughing or wet voice, you don't have to mark in this section of the form.**
- **Note any drooling, and mark as abnormal. You do not have to stop the trials if there is drooling.**

### C. Voice after Water Swallows:

- Wait one minute after the end of the water swallows. (You can use this time to clear away the cup etc. and mark the form)
- Ask the patient to say "ah" as in the first part of the screen.

### D. Final Scoring:

If you have marked **any** of the *items* as **abnormal**, score the patient as **Failed**.

# STRATIFY

## SCORE

1. Did the patient present to hospital with a fall or **has he or she fallen on the ward since admission?** (Yes = 1, No = 0)

\_\_\_\_\_  
Score

Do you think the patient is:

2. Agitated? (Yes = 1, No = 0)

\_\_\_\_\_  
Score

3. Visually impaired to the extent that everyday function is affected? (Yes = 1, No = 0)

\_\_\_\_\_  
Score

4. In need of especially frequent toileting? (Yes = 1, No = 0)

\_\_\_\_\_  
Score

5. Transfer\* and mobility\*\* score of 3 or 4? (Yes = 1, No = 0)

\_\_\_\_\_  
Score

Transfer\* score \_\_\_\_\_ + mobility\*\* score: \_\_\_\_\_ = \_\_\_\_\_

\*Transfer Score:

0 = Unable to move

1 = Major Help needed

(1 or 2 people, physical aids)

2 = Minor Help (verbal and physical)

3 = Independent

\*\*Mobility Score:

0 = Immobile

1 = Independent with aid of wheelchair

2 = Walks with help of one person

3 = Independent

## Total Score

\_\_\_\_\_  
Total Score

***A patient who scores >2 is at risk of falls.***

Reference: Oliver, D., M. Britton, et al. (1997). "Development and evaluation of evidence based risk assessment tool (STRATIFY) to predict which elderly inpatients will fall: case-control and cohort studies." *BMJ* **315**(7115): 1049-53.

## **TIMED UP AND GO**

The timed up and go is a quick and practical method for testing basic mobility manoeuvres.

The test consists of one multiple phase task. The patient begins seated in a chair. He/she is asked to rise from an arm chair, stand still momentarily, walk to a line on the floor 3 metres away, turn, return, turn around and sits down again.

### **Scoring:**

1. Time.
2. The client is scored according to the time in seconds required to complete the task. The observer's perception of the client's risk of falling is rated on a 5-point ordinal scale.
  1. Normal
  2. Very slightly Abnormal
  3. Mildly abnormal
  4. Moderately abnormal
  5. Severely abnormal

Reference: Podsiadlo, D, Richardson S. The timed "up and go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society* 1991; 39: 142-148.

## COMMUNITY STROKE APHASIC DEPRESSION QUESTIONNAIRE

Please indicate how often in the past week the patient has shown the following behaviours.

Behaviour	Days this week			
	Every day	4-6	1-3	Not at all
1. Did his/her waking cause a disturbance in sleep patterns?	3	2	1	0
2. Did he/she have weeping spells?*	3	2	1	0
3. Did he//she have restless disturbed nights?*	3	2	1	0
4. Did he/she initiate activities?	0	1	2	3
5. Did he/she avoid eye contact when you spoke to him/her?*	3	2	1	0
6. Did he/she burst into tears?*	3	2	1	0
7. Did he/she smile when you spoke to him/her?	0	1	2	3
8. Did he/she complain of aches and pains?*	3	2	1	0
9. Did he/she refuse to eat meals?	3	2	1	0
10. Did he/she get angry?*	3	2	1	0
11. Did he/she refuse to participate in social activities?*	3	2	1	0
12. Did he/she laugh at a joke?	0	1	2	3
13. Is he/she restless and fidgety?*	3	2	1	0
14. Did he/she sit without doing anything?*	3	2	1	0
15. Did he/she concentrate on activities?	0	1	2	3
16. Did he/she take care of his/her appearance to the best of their ability?	0	1	2	3
17. Did he/she seem to enjoy social activities or outings?	0	1	2	3
18. Did he/she keep him/herself occupied during the day?*	0	1	2	3
19. Did he/she take sleeping tablets	3	2	1	0
20. Did he/she take interest in events around him/her?	0	1	2	3
21. Did he/she look at you when you approached him/her?	0	1	2	3

\* Questions included in the SADQ-10 questions

## **Scoring of the SADQ-H**

Tick appropriate box; add scores of boxes marked; total = 0 - 30 (SADQ 10) or 0-63 (SADQ 21); higher score indicates more depression.

### References:

*SADQ-H (Hospital version): Lincoln NB, Sutcliffe LM, Unsworth G. Validation of the Stroke Aphasic depression Questionnaire (SADQ) for use with patients in hospital. Neuropsychological Assessment 2000;1:88-96*

*SAD-Q-10 (Shorter version): Sutcliffe LM, Lincoln NB. The assessment of depression in aphasic stroke patients: the development of the Stroke Aphasic Depression Questionnaire. Clinical Rehabilitation 1998;12(6):506-13.*

## HOSPITAL ANXIETY DEPRESSION SCALE

Doctors are aware that emotions play an important part in most illnesses. If your doctor knows about these feeling he will be able to help you more.

This questionnaire is designed to help your doctor to know how you feel. Read each item and circle the reply, which comes closest to how you have been feeling in the past week.

Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought out response.

1. I feel tense of 'wound up':
  - a. Most of the time
  - b. A lot of the time
  - c. From time to time, occasionally
  - d. Not at all
2. I still enjoy the things I used to enjoy:
  - a. Definitely as much
  - b. Not quite as much
  - c. Only a little
  - d. Hardly at all
3. I get a sort of frightened feeling as if something awful is about to happen:
  - a. Very definitely and quite badly
  - b. Yes, but not too badly
  - c. A little, but it doesn't worry me
  - d. Not at all
4. I can laugh and see the funny side of things:
  - a. As much as I always could
  - b. Not quite as much now
  - c. Definitely not so much now
  - d. Not at all
5. Worrying thoughts go through my mind:
  - a. A great deal of the time
  - b. A lot of the time
  - c. From time to time but not too often
  - d. Only occasionally
6. I feel cheerful:
  - a. Not at all
  - b. Not often
  - c. Sometimes
  - d. Most of the time
7. I can sit at ease and feel relaxed:
  - a. Definitely

- b. Usually
  - c. Not often
  - d. Not at all
8. I feel as if I am slowed down:
- a. Nearly all the time
  - b. Very often
  - c. Sometimes
  - d. Not at all
9. I get a sort of frightened feeling like 'butterflies' in the stomach:
- a. Not at all
  - b. Occasionally
  - c. Quite often
  - d. Very often
10. I have lost interest in my appearance:
- a. Definitely
  - b. I don't take so much care as I should
  - c. I may not take quite as much care
  - d. I take just as much care as ever
11. I feel restless as if I have to be on the move:
- a. Very much indeed
  - b. Quite a lot
  - c. Not very much
  - d. Not at all
12. I look forward with enjoyment to things:
- a. As much as ever I did
  - b. Rather less than I used to
  - c. Definitely less than I used to
  - d. Hardly at all
13. I get sudden feelings of panic:
- a. Very often indeed
  - b. Quite often
  - c. Not very often
  - d. Not at all
14. I can enjoy a good book or radio or TV programme:
- a. Often
  - b. Sometimes
  - c. Not often
  - d. Very Seldom

FOR HOSPITAL USE ONLY     D = \_\_\_\_\_     A = \_\_\_\_\_

**How to score the hospital anxiety and depression scale.**

The hospital anxiety and depression scale gives measure of anxiety (7 items), depression (7 items) or emotional distress (all 14 items).

Anxiety: Odd number items (1, 3, 5, 7, 9, 11, 13)

Depression: Even number items (2, 4, 6, 8, 10, 12, 14)

SCORING:

Items: 1, 3, 5, 6, 8, 10, 11, 13

Score a = 3, b = 2, c = 1, d = 0

Items: 2, 4, 7, 9, 12, 14

Score a = 0, b = 1, c = 2, d = 3

Each sub-scale has a range of 1-21.

**For each sub-scale:**

**Normal = 0 – 7,**

**Borderline = 8 – 10,**

**Caseness = > 11 and should be referred for further assessment**

*References:*

*Zigmond, AS and Snaith, RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983; 67: 361-370.*

## MINI MENTAL STATUS EXAM/MODIFIED MINI MENTAL STATUS EXAM (MMSE/3MSE)

Patient \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Mo Day Year

Male  Female

Patient Age \_\_\_\_\_ Patient highest level of Education \_\_\_\_\_  
Years Years

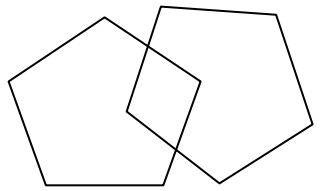
Normal or DX \_\_\_\_\_ 3MS \_\_\_\_\_ MMS \_\_\_\_\_  
100 30

Examiner Name \_\_\_\_\_

3MSE	MMSE	Mini Mental Status Exam (MMSE)/Modified Mini Mental Status Exam (3MSE)
5		<p><b>DATE AND PLACE OF BIRTH</b></p> <p><i>'Ask Patient the date and where are we?'</i></p> <p>Date: year _____ month _____, day _____</p> <p>Place: City (Town) _____ Province _____</p>
3	3	<p><b>REGISTRATION</b></p> <p><i>'Name 3 objects: One syllable words, 1 second to say each. Then ask the patient all 3 after you have said them.'</i></p> <p>(No of Presentations: _____)</p> <p>(ex. Shirt, Brown, Honesty; Shoes, black modesty, etc)</p>
7	5	<p><b>MENTAL REVERSAL</b></p> <p><i>'Ask patient to begin with 100 and count backwards by 7. Stop after 5 subtractions. 1 point for each correct. Alternatively spell "world" backwards.'</i> (100, 93, 86, 79, 72, 65 or DLROW)</p> <p>5 to 1</p> <p style="margin-left: 40px;">Accurate <span style="float: right;">2</span></p> <p style="margin-left: 40px;">1 or 2 errors/misses <span style="float: right;">0 1</span></p>

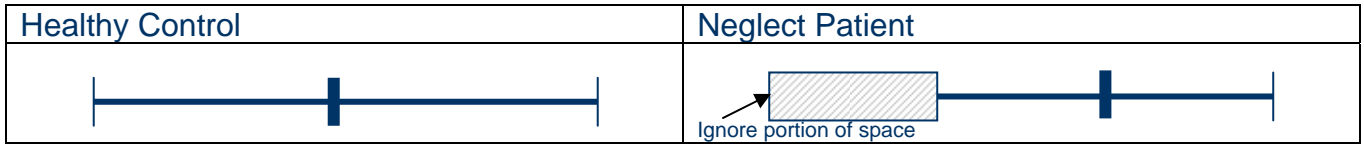
3MSE	MMSE	Mini Mental Status Exam (MMSE)/Modified Mini Mental Status Exam (3MSE)
		<b>FIRST RECALL</b> <i>'Ask patient if he can recall the three words you previously asked hi to remember.'</i>
9	3	Spontaneous recall 3 After "something to wear" 2 "Shoes, shirt, socks" 0 1 Spontaneous recall 3 After "a colour" 2 "Blue, Black, Brown" 0 1 Spontaneous recall 3 After "a good personality quality" 2 "Honesty, Charity, Modesty" 0 1
		<b>TEMPORAL ORIENTATION</b> <i>'Ask patient for the date. Then ask for part specifically omitted.'</i>
15	5	Year Accurate 8 Missed by 1 year 4 Missed by 2-5 years 0 2 Season Accurate or within 1 month 0 1 Month Accurate of within 5 days 2 Missed by 1 month 0 1 Day of Month Accurate 3 Missed by 1 or 2 days 2 Missed by 3-5 days 0 1 Day of Week Accurate 0 1
		<b>SPATIAL ORIENTATION</b> <i>'Ask in turn, Can you tell me the name of this place?'</i>
5	5	Province 0 2      Country 0 1 City (town) 0 1      Hospital 0 1

3MSE	MMSE	Mini Mental Status Exam (MMSE)/Modified Mini Mental Status Exam (3MSE)
5	2	<p><b>NAMING</b></p> <p><i>'Show the patient the following items and ask what it is.'</i></p> <p>(MMS: Pencil _____, Watch _____)</p> <p>Forehead _____, Chin _____, Shoulder _____, Elbow _____, Knuckle _____</p>
10		<p><b>FOUR-LEGGED ANIMALS (30 sec) 1 point each</b></p>
6		<p><b>SIMILARITIES</b></p> <p><i>Arm-Leg</i></p> <p>Body part; limb, etc. 2</p> <p>Less correct answer 0 1</p> <p><i>Laughing-crying</i></p> <p>Feeling, emotion 2</p> <p>Other correct answer 0 1</p> <p><i>Eating sleeping</i></p> <p>Essential for life 2</p> <p>Other correct Answer 0 1</p>
5	1	<p><b>REPETITION</b></p> <p><i>'Ask the patient to repeat the sentence after you.'</i></p> <p>"I would like to go home/out" 2</p> <p>1 or 2 missed/wrong words 0 1</p> <p>"NO IFS _____ ANDS _____ OR BUTS _____"</p>
3	1	<p><b>READ AND OBEY "CLOSE YOUR EYES"</b></p> <p><i>'Have the patient read the phrase "CLOSE YOUR EYES". The letters should be large and dark enough for the patient to read. Ask him to read the sentence and do what it says.'</i></p> <p>Obeys without prompting 3</p> <p>Obeys after prompting 2</p> <p>Reads aloud only 0 1</p> <p>(Spontaneously or by request)</p>

3MSE	MMSE	Mini Mental Status Exam (MMSE)/Modified Mini Mental Status Exam (3MSE)																
5	1	<p><b>WRITING</b></p> <p><i>'Give the patient a blank piece of paper and ask her to write a sentence for you. Do not dictate a sentence; it is to be written by the subject spontaneously. To score correctly, it must contain a subject and verb and be sensible. It should be a complete thought. Correct grammar and punctuation are not necessary.'</i></p> <p>(1) I WOULD LIKE TO GO HOME/OUT.</p> <p>(MMS. Spontaneous sentence: 0 1)</p>																
10	1	<p><b>COPYING TWO PENTAGONS (1 min)</b></p> <p><i>"On a piece of paper, draw intersecting pentagons, and ask to copy. To score correctly, all ten angles must be present and two must intersect. Tremor and rotation are ignored."</i></p> <p>Each Pentagon</p> <table> <tr> <td>5 approximately equal sides</td> <td>4</td> <td>4</td> </tr> <tr> <td>5 unequal (&gt;2:1) sides</td> <td>3</td> <td>3</td> </tr> <tr> <td>Other enclosed figure</td> <td>2</td> <td>2</td> </tr> <tr> <td>2 or more lines</td> <td>0</td> <td>1 0 1</td> </tr> </table> <p>Intersection</p> <table> <tr> <td>4 corners</td> <td>2</td> </tr> <tr> <td>No-4-corner enclosure</td> <td>0 1</td> </tr> </table> 	5 approximately equal sides	4	4	5 unequal (>2:1) sides	3	3	Other enclosed figure	2	2	2 or more lines	0	1 0 1	4 corners	2	No-4-corner enclosure	0 1
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4 corners	2																	
No-4-corner enclosure	0 1																	
3	3	<p><b>THREE-STAGE COMMAND</b></p> <p><i>'Give verbal instructions, then present a sheet of paper'</i></p> <p>___ Take this paper with your Right/left hand</p> <p>___ Fold it in half, and</p> <p>___ Hand it back to me</p>																
9		<p><b>SECOND RECALL</b></p> <p><i>'Ask patient if he can recall the three words you previously asked hi to remember.'</i></p> <table> <tr> <td>Something to wear</td> <td>0 1 2 3</td> </tr> <tr> <td>Colour</td> <td>0 1 2 3</td> </tr> <tr> <td>Good personality quality</td> <td>0 1 2 3</td> </tr> </table>	Something to wear	0 1 2 3	Colour	0 1 2 3	Good personality quality	0 1 2 3										
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Reference: Teng, EL and Chui HC. The Modified Mini-Mental State (3MS) examination. J Clin Psychiatry. 1987 Aug;48(8):314-8.

## LINE BISECTION



## APPENDIX A: SCORE EXPERT PANEL

### SCORE Project Leaders

**Mark Bayley MD, FRCPC**

Medical Director of the NeuroRehabilitation Program,  
Toronto Rehabilitation Institute  
*Specialty: Rehabilitation of acquired brain injury, stroke,  
multiple sclerosis, neurological pharmacology and  
functional outcome measurement after rehabilitation.*

**Margaret Harrison, RN, PhD**

Professor, School of Nursing, Queen's University  
*Specialty: Knowledge transfer,*

**Nicol Korner-Bitensky, OT, PhD**

Associate Professor, School of Physical and  
Occupational Therapy, McGill University

**Sharon Wood-Dauphinee, BPT, MSc, PhD**

Professor, School of Physical and Occupational Therapy,  
McGill University  
*Specialty: Stroke, Quality of Life, Methods and  
Measurement, Epidemiology*

**Robert. W Teasell, MD, FRCPC**

Professor, University of Western Ontario  
Chair and Chief, St. Joseph's Health Care, London  
*Specialty: Stroke Rehabilitation*

### Project Team

**Susan Barreca, PT (Dip), BA**

Research Clinician, Physiotherapist, McMaster  
University, Hamilton Health Sciences  
*Specialty: Upper Limb*

**Sandra Black, MD, FRCPC(C)**

Professor of Medicine, Head of Neurology, University of  
Toronto & Sunnybrook and Women's Health Science  
Center  
*Specialty: Stroke and Cognitive/Behavioural Neurology*

**Lucie Brosseau, PhD**

Associate Professor, University of Ottawa  
Ontario Ministry of Health Career Scientist  
*Specialty: University research chair in evidence based  
practice, guidelines development*

**Johanne Desrosiers OT, PhD**

Professor, University of Sherbrooke  
*Specialty: Upper Extremity, Participation, Older Adults*

**Ian Graham, PhD**

Senior Scientist, Clinical Epidemiology, Ottawa Health  
Research Institute  
*Specialty: Research Utilization, Knowledge Translation,  
Implementation Research, Practice Guideline quality  
appraisal and evaluation, adaptation and implementation*

**Susan Jaglal, PhD**

Professor, University of Toronto  
*Specialty: Epidemiology, Health Services*

**Jeffrey Jutai, PhD (Psychology), C. Psych.**

Associate Professor, University of Western Ontario,  
Department of Physical Medicine and Rehabilitation  
*Specialty: Assistive technology devices, Rehabilitation  
outcomes measures*

**Mary Lewis**

Senior Manager, Government Relations, Heart and  
Stroke Foundation of Ontario

**Rosemary Martino, SLP, PhD**

University Health Network and University of Toronto  
*Specialty: Dysphagia Assessment*

**Nancy Mayo, PhD**

Associate Professor, McGill University

**Carol Richards, BSc (PT), MSc, PhD**

Professor, Laval University  
*Specialty: Stroke Research (Gait)*

### Expert Panel

**Duane Bishop, MD**

Psychiatrist, Rhode Island, USA

**Anna Bluvoi, RN, MScN**

Nurse Clinician, St. Joseph's Health Care; Parkwood  
Hospital

**Dina Brooks, BSc (PT), MSc, PhD**

Assistant Professor, Department of Physical Therapy,  
University of Toronto  
*Specialty: Exercise in Chronic Populations*

**Brenda Brouwer, PhD**

Professor, Queen's University, School of Rehabilitation  
Therapy  
*Specialty: Motor Control, Stroke Rehabilitation*

**Karen Brunton, BSc, PT**

Clinical Educator, Toronto Rehabilitation Institute  
*Specialty: Stroke rehabilitation – Physiotherapy  
Management*

**Paul Comper, PhD**

Manager Neurology Stream/CPL Psychology, Toronto  
Rehabilitation Institute

**Helene Corriveau, PhD**

Professor, University of Sherbrooke  
*Specialty: Prevention of Falls*

**Nicholas E. Diamant, MD, FRCP(C)**

Professor of Medicine and Physiology  
University Health Network, University of Toronto  
*Specialty: Neuromuscular control of the gastrointestinal tract, swallowing physiology, GI motility disorders*

**Chantale Dumoulin, PhD,**

Post Doctoral, McGill University  
*Specialty: Urinary Incontinence*

**Lisa Durkin SLP, MHSc**

Practice Leader, Speech Language Pathology  
*Specialty: Medical speech language pathology*

**Janice Eng OT/PT, PhD**

Associate Professor, School of Rehabilitation Sciences,  
University of British Columbia  
*Specialty: Neurological rehabilitation, clinical trials, mobility*

**Andrea Fisher, RN**

Nurse Clinician, The Ottawa Hospital

**Louise Fullerton, RN****Joyce Fung, BSc (PT), PhD**

Associate Professor, School of Physical and  
Occupational Therapy, McGill University  
*Specialty: Motor control, Stroke rehabilitation, Neurophysiology*

**David J Gladstone, MD, FRCP(C)**

Assistant Professor (Neurology), University of Toronto  
Director, Inpatient Stroke Services  
Division of Neurology and Regional Stroke Centre  
Sunnybrook and Women's College Health Sciences  
Centre, Toronto  
*Specialty: Cerebrovascular Diseases, Restorative Neurology, Rehabilitation, Pharmacology, Clinical Trial Design, Outcome Measures, and Knowledge Translation*

**Antoine Hakim, MD PhD**

Scientific Director & CEO, Canadian Stroke Network

**Debbie Holtom CNN(C), BNSc, Med**

ACNP Neurosciences, Kingston General Hospital  
*Specialty: Acute Stroke Management*

**Linda Kelloway, BScN, CNN(C)**

Regional Stroke Education Consultant, The West GTA  
Stroke Network  
*Specialty: Education, Acute Rehabilitation*

**Laura Klassen, BPT, MSc.**

Assistant Professor, University of Saskatchewan, School  
of Physical Therapy  
*Specialty: Neurological Rehabilitation and Acute Care*

**Katie Lafferty**

Executive Director, Canadian Stroke Network

**Mindy Levin, BSc (PT), PhD**

Associate Professor, University of Montreal

*Specialty: Motor Control, Motor Learning, Recovery of arm function after stroke*

**Marilyn MacKay-Lyons, BSc (PT), MSC (PT), PhD**

Associate Professor, Dalhousie University  
*Specialty: Stroke Rehabilitation, Aerobic Conditioning, Gait recovery*

**Francine Malouin, PhD**

Professor, Laval University  
*Specialty: Gait assessment and training trials*

**Giselle Mann MPH, PhD**

Research Scientist, University of Florida  
*Specialty: Dysphagia, Epidemiology*

**Charmaine Martin, RN**

Hamilton Health Sciences

**Lise Poissant, PhD, Post-Doc Fellow**

Clinical and Health Informatics Research Group, McGill  
University

**Howard Rocket**

Individual 5 years post stroke

**Nancy Salbach, BSc (PT), PhD,**

Post Doctoral Fellow, University of Toronto  
*Specialty: Gait speed recovery, walking recovery, RCTs epidemiology, Stroke, Biostatistics*

**Abe Sniderman, MD**

Physician ABI/Neuropsychiatrist, Toronto Rehabilitation  
Institute

**Rosa Sourial, RN**

McGill University Health Centre

**Mark Speechley BA, MA, PhD**

Associate Professor, University of Western Ontario  
*Specialty: Fall prevention, elderly, injuries*

**Kim Staikos, RN CCN**

Nurse Clinician, Parkwood Hospital, London, ON  
*Specialty: Stroke Rehabilitation*

**Catriona Steele, SLP, PhD**

SLP, Scientist Toronto Rehabilitation Institute

**Scott G. Thomas, PhD**

Associate Professor, Faculty of Physical Education and  
Health, University of Toronto  
*Specialty: Exercise Physiology, Cardiovascular, and Rehabilitation*

**Molly Verrier, Dip P& OT MHSc**

Chair and Associate Professor,  
Department of Physical Therapy and Rehabilitation  
Science, University of Toronto  
*Specialty: Restorative motor control, service delivery, stroke, SCI*

**Shelley Yantha, RN**

Toronto Western Hospital



**Canadian Stroke Network**  
**Réseau Canadien contre**  
**les accidents cérébrovasculaires**