

Cognition Canadian Best Practice Recommendations in Stroke Update 2013

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A Stroke affects the Brain Potentially Causing Deficits in

- Physical
- Cognitive/Perceptual
- Communication
- Mood
- Personality
- Behaviour



A stroke is a sudden loss of brain function. It is caused by the interruption of flow of blood to the brain (ischemic stroke) or the rupture of blood vessels in the brain (hemorrhagic stroke). The interruption of blood flow or the rupture of blood vessels causes brain cells (neurons) in the affected area to die. The effects of a stroke depend on where the brain was injured, as well as how much damage occurred. A stroke can impact any number of areas including your ability to move, see, remember, speak, reason and read and write. **(from the Heart and Stroke Foundation of Canada)**

Reasons we care about cognitive impairment in stroke patients

- 2/3 or 66% of stroke patients experience cognitive impairment
- Cognitive impairment is an important predictors of functional outcome
- Cognitive impairments are often the most persistent results of brain injury in people with good to moderately good neurological recovery
- Greater mortality one year post-stroke for those stroke patients with cognitive impairment
- Stroke-related cognitive can be permanent and progressive
- Post-stroke cognitive impairment is associated with ↑ risk of dementia – new estimates are as high as 25% of post-stroke patients with cognitive impairment demonstrate a dementia 3-months after their stroke
- ↓ percentage of stroke patients return home when cognitive impairment is present

Cognitive impairment is associated with

- ↓ ADLs
- ↓ IADLs
- ↑ length of hospital stay
- ↓ number of stroke patients returning home

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Purpose:

- ↓ practice variations in the care of stroke patients across Canada
- ↓ the gap between knowledge and practice
- ↑ the occurrence of the best care within the most appropriate setting

Accomplish by:

- Emphasizing cognitive screening throughout the continuum of care
- Revised vascular cognitive impairment definitions
- Updates on medications in vascular cognitive impairment

Vascular Cognitive Impairment Defined

- A syndrome affecting at least one cognitive ability
- On a continuum from mild cognitive deficits to dementia
- Can result from any aspect of cerebrovascular disease including small white matter disease, TIAs, strokes

Most Prevalent Cognitive Deficits with Stroke Patients

□ Global

- Attention
- Executive functioning
- Speed of thinking

□ Focal stroke-related deficits

- Unilateral inattention
- Language/communication – aphasia

Rehabilitation Approaches

the remedial or restorative approach: remedial strategies are designed to repair processes and restructure or rebuild damaged neural networks e.g., unilateral inattention

the adaptive or compensatory approach: compensatory strategies focus on adaptive behaviours e.g., attention, memory

Acute, Rehabilitation, Community

Acute - Screening & general identification of possible cognitive impairments

Rehabilitation – Multidisciplinary assessment and treatment development and implementation

- Facilitating recovery
- Individual and family education
- Shift to determining the longer term problems

Community – Treatment shifts to the use of compensatory strategies to minimize negative effects of stroke-related deficits

Cognitive Screening – When

- When suspect cognitive impairment
- When vascular risk factors for cognitive deficits are present (hypertension, diabetes, TIAs, stroke, white matter disease, atrial fibrillation & other cardiac diseases, & sleep apnea)
- Throughout the stages of stroke care - ER, acute care, inpatient rehabilitation, community rehab
- During the transitions between different healthcare settings (because people can recover or decline during their stroke process & without cognitive screening changes would be unknown)

Strengths of Cognitive Screening Tools

- Quick and easy to administer and score
- Different professionals/disciplines can be trained to administer
- Most not copyrighted so inexpensive and accessible
- Help with directing resource use

Weaknesses of Cognitive Screening Tools

- Cannot provide information about specific cognitive skills or problems (individual items should not be used as if subtests or to describe individual cognitive abilities)
- Problems with reliability means that each person's score needs to be approached with caution
- Performance significantly affected by age and education which can cause misdiagnosis

Cognitive Screening Tools

- Requires clinical judgment including an understanding of the tool being used and the disease or problem being investigated
- There are more "grey" areas in interpretation than with most medically/technology based tools (e.g., blood pressure versus MoCA score)

Cognitive Assessment- Purpose

- Determine the nature and severity of cognitive impairments and ongoing cognitive strengths
- (Identify mild disturbances in cases where screening is unclear)
- Anticipate impact of cognitive changes on ADLs, IADLs, vocational and/or educational involvement, driving, discharge destination and decision-making capacities
- Facilitate rehabilitation by making restorative and/or compensatory strategy recommendations
- Identification and monitoring of improvements due to recovery/rehabilitation
- Educate individual and family about cognitive change and implications, compensatory strategies, and the recovery process

Stroke, Cognitive Impairment & Depression

- Depression contributes to cognitive impairment in stroke patients (and cognitive impairment contributes to post-stroke depression)
- So when screening for cognitive impairment also screen for mood
- Remission of depression after antidepressant medication is associated with ↑ cognitive function
- **All Recommended Cognitive Screenings for Vascular Cognitive Impairment also include a Mood and a Behaviour Screening**

Hachinski et al (2006) Canadian Stroke Network Vascular Cognitive Impairment Harmonization Standards – Stroke (2006) 37, pgs 2220-2241

Found online

stroke.ahajournals.org/content/37/9/2220.full

Recommended Cognitive Screenings for Vascular Cognitive Impairment

- ☐ **60 minute protocol** suggested when a summary of cognitive impairment by ability is needed

60-Minute Protocol

- COWAT
- Animal naming
- WAIS III Digit Symbol Coding
- Trails A & B
- Boston Naming 2nd Ed – short form & Recognition
- Rey-Osterrieth Complex Figure
- CVLT II or Hopkins Verbal Learning Test (HVLТ)
- Neuropsychiatric Inventory – Questionnaire Version
- Centre for Epidemiologic Studies-Depression Scale (CES-D)

- ☐ **30 minute protocol** suggested with people suspected of having vascular cognitive impairment

30-Minute Test Protocol

- Semantic Fluency (Animal Naming)
- Phonemic Fluency (Controlled Oral Word Association Test)
- Digit Symbol-Coding from the Wechsler Adult Intelligence Scale, Third Edition
- Hopkins Verbal Learning Test
- Center for Epidemiologic Studies-Depression Scale
- Neuropsychiatric Inventory, Questionnaire Version (NPI-Q)
- Supplemental: MMSE, Trail Making Test

- ☐ **5 minute protocol** suggested as a quick at bedside or physician office screening and for research

5-Minute Protocol

5-Word Memory Task (registration, recall, recognition)

6-Item Orientation

1-Letter Phonemic Fluency

Supplemental: Remainder of the MoCA, Semantic Fluency (Animal Naming), Trail Making Test, MMSE (to be administered at least 1 hour before or after the above tests).

MoCA - Montreal Cognitive Assessment

- 10 minute cognitive screening tool
- Developed in Montreal
- Validation study published in JAGS 2005; Nasreddine et al., 2005
- Developed to screen patients who present with mild cognitive impairment but score normal on the MMSE
- Score out of 30
- 26 or above is normal
- Add 1 point to total if less than or equal to 12 years of education
- No norms for stroke population
- Little information on its reliability and validity (important information for objective tests)

Vascular Cognitive Impairment Management

- Aggressively medically manage patient's vascular risk factors
- Tailor rehabilitation goals to patient's values & focus and account for cognitive deficits and strengths
- Cognitive rehabilitation relies on compensatory and remedial strategies
- Patients with evidence of cognitive impairment, mood issues, or behavioural changes on screening should be referred to an appropriate healthcare professional for additional investigation and treatment

Vascular Cognitive Impairment Performance Measures

- ↑ in control of high blood pressure and other risk factors
- ↑ in number of patients screened cognitively at CVA occurrence, and three, six and 1 year following rehabilitation
- ↑ in number of patients screened cognitively at each transition point along the stroke care continuum when cognitive status changes are suspected
- ↑ in number of stroke patients referred for in-depth neuropsychological assessments

Test Descriptions and Non-copyrighted Norms

REY COMPLEX OR REY-OSTERRIETH FIGURE TEST

- a test of visual memory
- assesses multiple memory processes such as immediate recall, delayed recall, ability to learn and ability to use cues to retrieve information
- assesses both perceptual organization, executive functioning and visual memory
- is able to detect constructional impairment

CALIFORNIA VERBAL LEARNING TEST AND HOPKINS VERBAL LEARNING TEST REVISED

- are tests that assesses initial attention to material, learning over practice trials, use of spontaneous strategies to facilitate recall, and effects of interfering information
- these tests also assesses how much information can be retained over time and can be recalled spontaneously, recalled with cuing, or recognized

Test Descriptions and Non-copyrighted Norms

HOPKINS VERBAL LEARNING TEST NORMS

found from the Psychological Assessment resources, Inc Professional Manual by Jason Brandt & Ralph H B Benedict (2001)

DIGIT SYMBOL CODING

- assesses visual search and visual scanning, sustained attention, visual scanning, shifting visual set, mental processing and motor speed, visual short-term memory, and the ability to follow directions

COWA (CONTROLLED ORAL WORD ASSOCIATION TEST)/ANIMAL NAMING/VERBAL FLUENCY

- a task which requires that words within a given category (usually animals) be generated quickly within a minute (category or semantic fluency)
- a task which requires that words which start with a specific letter (usually F, A & S or C, F & L) be generated quickly within a minute for each letter (letter or phonemic fluency)
- assesses both language and executive functioning

CANADIAN NORMS

Tombaugh, Tom N., Kozak, J., & rees, L. (1999) **Normative data stratified by age and education for two measures of verbal fluency: FAS and animal naming.** Archives of Clinical Neuropsychology, 14 (2), pgs 167-177. PubMed 14590600

TRAIL MAKING TEST

- a task measuring divided attention and visual spatial scanning abilities requiring flexibility of planning and ability to shift between cognitive sets

Trails A: the individual is asked to draw a line connecting numbers scattered across a page

Trails B: the person is required to alternate between numbers and letters

CANADIAN NORMS

Tombaugh, Tom N (2004) Trail Making Test A and B: Normative data stratified by age and education. Archives of Clinical Neuropsychology, 19, pgs 203-214.

Found available on internet either by Googling Tombaugh Trail Making or www.usz.ch/non_cms/neurologie/HealthPro/Davos/normen_tmt.pdf

BOSTON NAMING TEST

- assesses confrontation naming, the ability to pull out the correct word at will
- this test consists of 60 large ink drawings of items ranging in familiarity from such common ones as "tree" and "pencil" to "sphinx" and "trellis"

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NORMS

Nasreddine, Z.S., Phillips, N.A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., Cummings, J.L., & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *Journal of American Geriatric Society*, 53, 695–699
Can be found available online at
<http://onlinelibrary.wiley.com/doi/10.1111/j.1532-5415.2005.53221.x/abstract>
or ordered
15817019 [PubMed - indexed for MEDLINE]

www.mocatest.org

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Resources

www.strokebestpractices.ca
www.canadianstrokenetwork.ca
www.heartandstroke.ca
www.ontariostrokenetwork.ca
www.strokengine.ca
www.stroke.org (National Stroke Association [American])
www.ebrsr.com (Evidence Based Review of Stroke Rehabilitation [Canadian])

Hachinski et al (2006) Canadian Stroke Network Vascular Cognitive Impairment Harmonization Standards – *Stroke* (2006) 37, pgs 2220-2241
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