EXECUTIVE FUNCTION (EF) ASSESSMENT POST-STROKE

EF definition:

High-level cognitive functions responsible for initiation, planning, sequencing, and monitoring of complex goal-directed and purposeful behaviours[1]

Prevalence of post-stroke executive dysfunction: 19-75%[2]

Can a middle cerebral artery stroke lead to EF problems?

Yes, because the lateral **prefrontal cortex** is affected.[3]

Other brain lesions that may affect EF:

- Deep structures connected with frontal cortex[3]
- Posterior damage[3]
- Diffuse lesions[3]

Best practices:

- Patients should be screened for cognitive impairment (including EF) using a validated tool.[4]

Traditional screening tests

Cognitive screening test with an EF component

- Montreal Cognitive Assessment (MoCA)[5]

EF screening test

- Trail Making Test A and B[5]
- Executive Interview-25 (EXIT-25) and Quick EXIT[5]
- Frontal Assessment Battery (FAB)[5]

References:

1. Royall DR, et al. (2002). *J Neuropsychiatry Clin Neurosci, 14*(4), 377-405.
2. Poulin V, et al. (2012). *Top Stroke Rehabil, 19*(2), 158-171.
3. Stuss DT, et al. (2008). *Cognitive Neurorehabilitation: Evidence and Application* (2nd ed.) (pp. 464-486).
4. http://www.strokebestpractices.ca/index.php/cognition-mood/vascular-cognitive-impairment-and-dementia/
5. http://www.medicine.mcgill.ca/strokengine-assess/
6. Poulin V, et al. (2013). *Aust Occup Ther J, 60*, 3-19.

To obtain a copy of this pocket card, please contact us at:
strokengine@gmail.com
Find the latest updates on www.strokengine.ca

Assessments that reflect real-world activities & everyday behaviors[5,6]

Tools taking less than 20 minutes

Functional assessment with an EF component

- Kettle Test[5,6]

EF-specific assessment

- Dysexecutive Questionnaire from the Behavioural Assessment of the Dysexecutive Syndrome[5]

Tools taking more than 30 minutes

Functional assessments with an EF component

- Assessment of Motor and Process Skills[5,6]
- ADL Profile[5,6]
- Functional Assessment of Verbal Reasoning and Executive Strategies[5,6]

EF-specific assessments

- Executive Function Performance Test[5,6]
- Multiple Errands Test[5,6]
- Naturalistic Action Test[5,6]
- Cooking task from Chevignard et al. (2008)[5,6]

EXECUTIVE FUNCTION (EF) TREATMENT POST-STROKE

Effective interventions[1, 2]	Evidence
Remedial interventions	
computerized dual-task training	Limited (2b)
computerized working memory training	Limited (2a)
verbal working memory training	Limited (2b)
Cognitive strategy training*	
analogical problem-solving training	Limited (2a)
goal management training	Limited (2b)
External compensatory approach**	
paging system	Limited (2a)
task-specific checklist	Limited (2b)

* The Cognitive Orientation to daily Occupational Performance (CO-OP) approach[3] has shown promise to improve motor and functional skills post-stroke. Further research is required to evaluate its impact on executive functioning post-stroke.

** Further research is needed to evaluate the effectiveness of new technologies (e.g. smartphone applications).

Remedial interventions

Computerized dual-task training[1]

- The tasks involve coordinating the execution of 2 responses; patients have to identify the position (right or left) of 2 letters on the computer screen, and determine whether the 2 letters are the same or different
- 1 session per week for 5 weeks

Computerized training of working memory[1]

- Computerized training for working memory; the tasks involve presentations of auditory and visuo-spatial stimuli.
- 40 to 60 minute sessions, 5 days per week, for 5 weeks

Verbal working memory training[1]

- Training of storage and processing components of verbal working memory (e.g. oral spelling and word sorting in alphabetic order)
- 60 minute sessions, 3 days per week over 6 months

References:

1. Poulin V, et al. (2012). *Top Stroke Rehabil, 19*(2), 158-171.
2. www.strokengine.ca
3. http://www.ot.utoronto.ca/coop/
4. Levine B, et al. (2011). *Front. Hum. Neurosci*. 5:9. (also see http://research.baycrest.org/gmt)

Current as of March 2013

To obtain a copy of this pocket card: strokengine@gmail.com

Cognitive strategy training

Goal management training[4]

- Patients learn to stop ongoing behavior to monitor and adjust goals; this is achieved through instructional material, interactive tasks, discussion of patients' real-life deficits, and homework assignments
- weekly 2-hour sessions over 7 weeks

Analogical problem-solving training[1]

- Patients are presented with problems commonly encountered in daily life and are taught to draw analogies to solve other similar problems.
- 20 sessions of 45 minutes

External compensatory approach

Task-specific checklist[1]

- Task-specific paper and pencil checklist: patients tick off each task once it has been done and record the total time taken to complete the task

Paging system[1,2]

- Paging system (neuropager) involving reminders sent to standard pagers to assist with memory & planning
- Duration: 7 weeks