

Managing executive functioning difficulties using metacognitive strategy training: Recent advances in stroke rehabilitation

Central South Regional Stroke Network
Interprofessional Best Practices for Stroke
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Emily Nalder, PhD, OT Reg. (Ont.)



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Collaborators

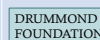
Deirdre Dawson
Sara McEwen
Beth Linkewich
Elizabeth Skidmore
Nicole Anderson
Malcolm Binns
Anne Hunt
Carolina Bottari
Thecla Damianakis
Elsa Marziali
Helene Polatajko
Valerie Poulin
Carolyn Lemsky

CO-OP Academy:

Helene Polatajko
Sara McEwen
Deirdre Dawson
Et al.



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Outline

- ✦ Review executive cognitive functions
- ✦ Overview of meta-cognitive strategy training
 - Rationale for use with Executive Function difficulties
- ✦ Introduce the CO-OP Approach™
 - The Evidence
 - Key Features & Elements
 - Emerging delivery methods
 - Telehealth
 - Interprofessional Practice

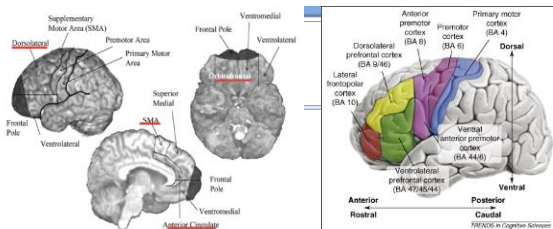


Frontal Lobe Functions

“Terms such as EF, the dysexecutive syndrome, the supervisory system, and frontal lobe functions are challenging to define and measure. The following schema divides what has been loosely termed ‘executive functions’ into four more clearly defined and circumscribed domains that follow anatomy and evolutionary development:

- (1) executive cognitive functions,
- (2) behavioral self-regulatory functions,
- (3) activation regulating functions,
- (4) metacognitive processes.”

Cicerone, Levin, Malec,
Stuss & Wyte, 2006



Executive Cognitive Tasks: Task Setting (dorsolateral PFC - L)

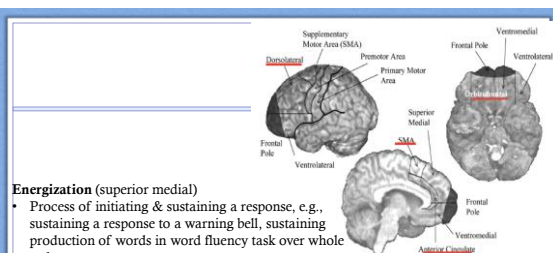
- Setting correct criterion for response, particularly in early stages of learning, e.g., false positives if impaired, planning ahead, checking watch at start of time sensitive event

Executive Cognitive Tasks: Self-monitoring (dorsolateral PFC – R)

- Monitoring ongoing performance, impairment results in increased variability, increased errors

Meta-cognitive processes (frontal poles – especially Brodman area 10)

- Self-awareness, personality, humour, social cognition,
- Integrate executive cognitive functions and emotional drive



Energization (superior medial)

- Process of initiating & sustaining a response, e.g., sustaining a response to a warning bell, sustaining production of words in word fluency task over whole task

Self-regulation (orbito-frontal)

- Stimulus - reward processing & associations
- Important when cognitive analysis, habit and/or environmental cues are not sufficient to determine the most adaptive response
- Related to regulating processes required for goal attainment

Executive functioning & rehabilitation

- ✦ Engagement in rehabilitation
- ✦ Skill acquisition if processes that support learning are impaired
- ✦ Goal setting
- ✦ Social functioning
- ✦ Generalisation of learning
- ✦ Coping
- ✦ Other?



Executive dysfunction manifests itself in unstructured activities of day-to-day life.

Assessment and intervention in rehabilitation almost always takes place in controlled, structured environments.



How do we manage EF difficulties and enhance performance in daily life?

"Metacognitive strategy training is recommended for deficits in executive functioning ... and as a component of interventions for deficits in attention, neglect and memory."

- Cicerone et al., 2011

Examples of interventions using metacognitive strategy training

Predict – perform (Goverover et al.)	GMT (Levine et al.)	CO-OP (Polatajko & Mandich)	WSTC (Lawson & Rice)	Problem-Solving (von Cramon)
Define goal Predict performance Anticipate problems Choose a strategy Do it Evaluate performance	Stop Be in the present State the goal Split the goal into steps Check	Goal Plan Do Check	What should I be doing? Select a strategy. Try the strategy. Check the strategy.	Orient to problem Define problem Generate alternatives Make a decision Do it. Verify the solution

Theory for use with Impairments in Frontal Processes

✦ We hypothesize that:

- ▶ Meta-cognitive or problem solving strategy compensates for impairments in the integrative functions in the frontal poles;
- ▶ Strategy provides a buffer between stimulus and response
- ▶ May enhance metacognitive skills (self-awareness, self-monitoring, self-regulation).

Theory for applying a meta-cognitive intervention

*“Occurrence of **transfer** is expected in strategy training as the training programme is not aimed at re-learning specific tasks, but at teaching patients new ways to handle problems resulting from an impairment”*

Guesgens et al., 2007

Cognitive Orientation to Daily Occupational Performance Approach



THE CO-OP APPROACH
Enabling Skilled Living

What is CO-OP?

An approach that:

- ✦ Is client-centred,
- ✦ Is performance based,
- ✦ Uses a problem solving approach
- ✦ Uses (domain-specific) strategies...
- ✦ identified through a process of guided discovery
...to enable skill acquisition.

Polatajko & Mandich (2004)

CO-OP Objectives

- ✦ Learning to use a meta-cognitive strategy
- ✦ Skill acquisition and goal attainment
- ✦ Generalization and transfer of learning through application of the meta-cognitive strategy



Does it work?

To be considered successful, rehabilitation must result in:

- ✦ clinically significant improvements in performance of and participation in everyday roles and activities;
- ✦ generalization of effects to untrained roles and activities;
- ✦ maintenance of gains over time.

(Sander, 2010; van den Broek, 2005)

The Evidence (in adults with stroke)

- ✦ McEwen, S. E., Polatajko, H. J., Huijbregts, M. P., & Ryan, J. D. (2009). Exploring a cognitive-based treatment approach to improve motor-based skill performance in chronic stroke: results of three single case experiments. *Brain Injury*, 23(13-14), 1041-1053.
- ✦ McEwen, S. E., Polatajko, H. J., Huijbregts, M. P., & Ryan, J. D. (2010). Inter-task transfer of meaningful, functional skills following a cognitive-based treatment: Results of three multiple baseline design experiments in adults with chronic stroke. *Neuropsychological rehabilitation*, 20(4), 541-561.
- ✦ McEwen, S., Polatajko, H., Baum, C., Rios, J., Cirone, D., Doherty, M., & Wolf, T. (2015). Combined cognitive-strategy and task-specific training improve transfer to untrained activities in subacute stroke: an exploratory randomized controlled trial. *Neurorehabilitation and neural repair*, 29(6), 526-536.
- ✦ Polatajko, H. J., McEwen, S. E., Ryan, J. D., & Baum, C. M. (2012). Pilot randomized controlled trial investigating cognitive strategy use to improve goal performance after stroke. *American Journal of Occupational Therapy*, 66(1), 104-109.
- ✦ Poulin, V., Korner-Bitensky, N., Bherer, L., Lussier, M., & Dawson, D. R. (2017). Comparison of two cognitive interventions for adults experiencing executive dysfunction post-stroke: a pilot study. *Disability and rehabilitation*, 39(1), 1-13.
- ✦ Skidmore, E. R., Holm, M. B., Whyte, E. M., Dew, M. A., Dawson, D., & Becker, J. T. (2011). The feasibility of meta-cognitive strategy training in acute inpatient stroke rehabilitation: case report. *Neuropsychological rehabilitation*, 21(2), 208-223.
- ✦ Skidmore, E. R., Dawson, D. R., Butters, M. A., Grattan, E. S., Juengst, S. B., Whyte, E. M., ... & Becker, J. T. (2015). Strategy training shows promise for addressing disability in the first 6 months after stroke. *Neurorehabilitation and neural repair*, 29(7), 668-676.

Key Features & Elements

COGNITIVE ORIENTATION to daily OCCUPATIONAL PERFORMANCE CO-OP



Polatajko & Mandich, 2004



Key Feature 1: Client Chosen Goals

- ✦ Goals must be personally meaningful
 - Increases motivation
 - Produce higher levels of performance
 - Help to focus behaviour
 - Encourage participation in tasks & task completion
 - Give client hope!

Facilitative Techniques for Goal Setting

- ✦ Be direct
 - "Tell me, is there anything you would like to do that you are not doing now?"
- ✦ Ask open ended questions about specific tasks.
 - "How are you managing your grocery shopping?"
- ✦ Allow sufficient time (10 sec)
 - Remember the person is processing the information.
- ✦ Acknowledge and affirm
 - "OK", "Mmm"
- ✦ "Summarize"
 - "So, from what you've told me, it sounds like"

Hunt, Dawson et al, 2015, *British Journal Of Therapy*.

Key Feature 2: Dynamic Performance Analysis

- Ongoing analysis with client of their performance.
- Use of activity analysis to identify performance problems or areas of breakdown
- Iterative
- Intervention guided accordingly.

Key Feature 3: Cognitive Strategy Use

Global Strategy: Goal-Plan-Do-Check

Domain Specific Strategies (DSS)

- ✦ Strategies that are specific to a particular task & situation (cognitive and/or other strategies).
- ✦ Introduced to solve specific performance issues as they arise.

(Polatajko & Mandich, 2004)

Key Feature 4: Guided Discovery

Guided discovery is a way of using language to “guide” the participant to “discover” strategies and make plans to solve their problems or to make plans to work toward their goals.

(Polatajko & Mandich, 2004)

Guided Discovery

Scenario:

Mr. Smith is getting ready to transfer and has not put the brakes on his wheelchair.

Direct Intervention:

“Don’t forget to put your brakes on!”

Guided Discovery – Make it obvious technique:

“Your chair seems to be moving”

What do you say?

Scenario 1: Jon has trouble getting to therapy appointments on time. At present therapists need to come and find him in his room, and bring him to therapy.

Scenario 2: Mary is getting out of bed at night to use the washroom, and the team is worried that without assistance she might fall.



Posited Active Ingredient 6: Enabling Principles

- ✦ Make it fun.
- ✦ Promote learning.
- ✦ Work towards independence.
- ✦ Promote generalization & transfer.

Intervention format & Emerging Delivery methods

- ✦ Interprofessional Collaboration

Implementation Sci. 2015, 10:157
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A multi-faceted knowledge translation approach to support persons with stroke and cognitive impairment: evaluation protocol

Sara E McEwen,^{1,2} Michelle Donald,³ Christine Dawson,⁴ Mary Y Egan,⁵ Anne Hunt,⁶ Sylvia Guent,⁷ Sharon Runions,⁸ and Elizabeth Linkewich⁹

Author information: Article notes: Copyright and license information: »

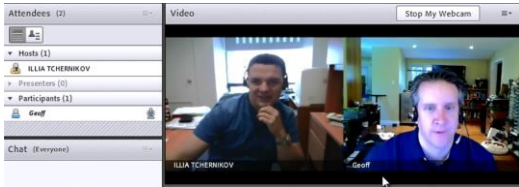
Abstract

Go to: »

Background

Patients with cognitive impairments following a stroke are often denied access to inpatient rehabilitation. The few patients with cognitive impairment admitted to rehabilitation generally receive services based on outdated impairment-reduction models, rather than recommended function-based approaches. Both reduced access to rehabilitation and the knowledge-to-practice gap stem from a reported lack of skills and knowledge regarding cognitive rehabilitation on the part of inpatient rehabilitation team members. To address these issues, a multi-faceted knowledge translation (KT) initiative will be implemented and evaluated. It will be targeted specifically at the inter-professional application of the cognitive orientation to

Telerehabilitation



Summary

- ✦ Executive functioning difficulties are common post-stroke & vital to participation in rehab and daily life;
- ✦ Rehabilitation must consider not only what we do but **how** we intervene to support skill acquisition / learning;
- ✦ Meta-cognitive interventions are recommended as a practice standard for adults with executive function difficulties;
- ✦ The CO-OP Approach is one intervention that uses meta-cognitive strategy training, improves performance in everyday life, & is currently being implemented as an interprofessional practice intervention;
- ✦ Exciting time to get involved- stay tuned for emerging evidence!

Thanks for your attention!

- ✦ NB: Often CO-OP training workshops run in Toronto
- ✦ For details visit CO-OP Academy Website:
<http://co-opacademy.ca/>

Emily Nalder: Emily.Nalder@utoronto.ca
