

Evidence-Based Cognitive Rehabilitation for Impairment of Executive Function

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Disclosures

- Received research grants to investigate the Cognitive Orientation to daily Occupational Performance Approach™
- CO-OP Certified Instructor
- Book contract with the AOTA press for a book on the CO-OP Approach™

PESG and ACRM staff have no interest to disclose.

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Learning Objectives

At the conclusion of this activity, the participant will be able to:

1. Describe examples of metacognitive strategy training for deficits in executive functioning (and other impairments).
2. Describe examples of problem-solving interventions for deficits in executive functioning.
3. Describe a general algorithm and conceptual framework for interventions for awareness, executive functioning, and behavioral/emotional self-regulation.

Executive Functioning

“*Integrative* cognitive processes that determine *goal-directed* and purposeful behavior and *superordinate* in the orderly execution of everyday life functions”

Executive Functions

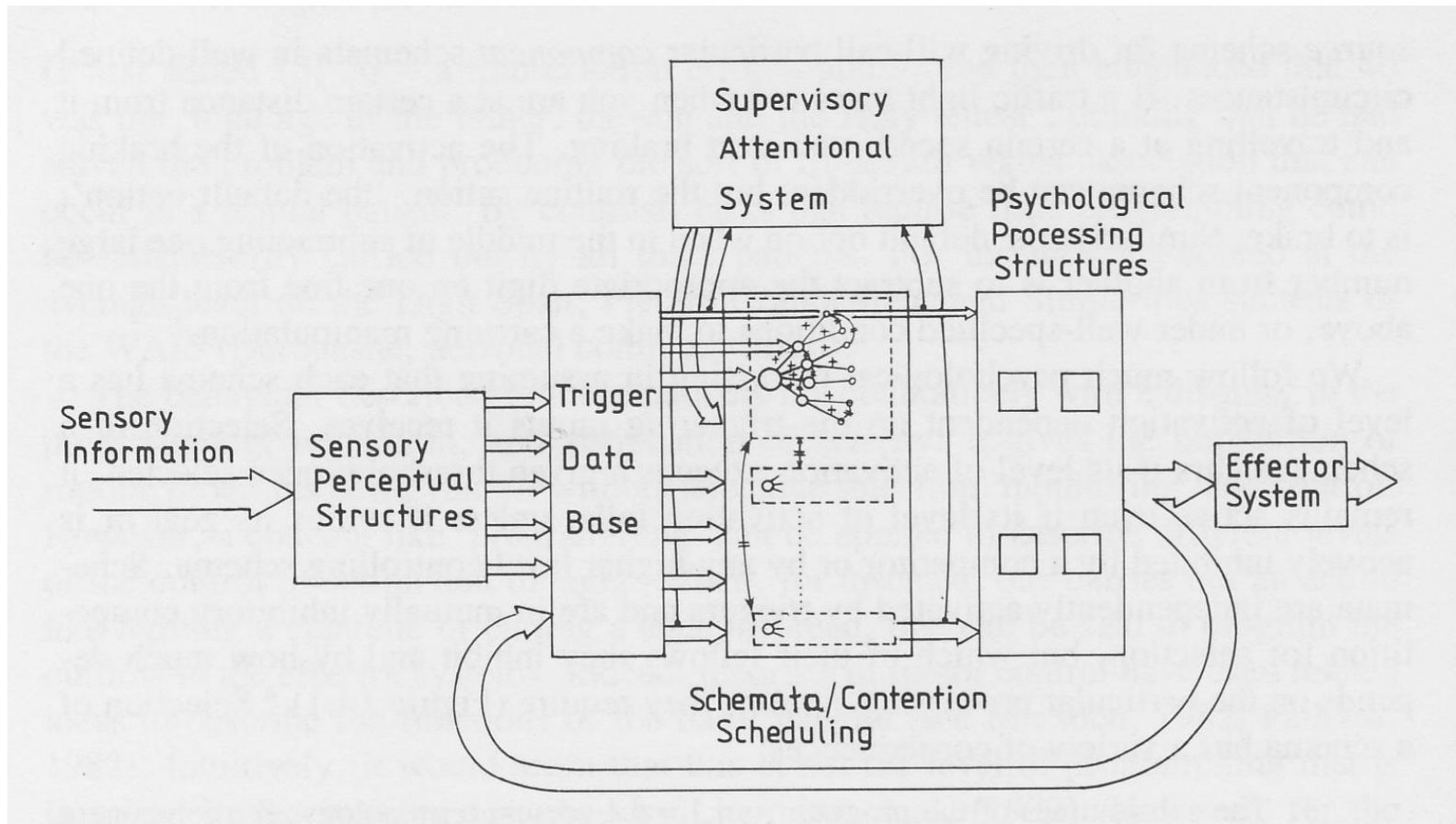


- Conductor of the orchestra; “supervisory attentional system” (strongly linked to attention)
- Lezak: those capacities that enable a person to engage successfully in independent, purposive, self-serving behavior
- Reduced ability
 - to initiate, stop and modify behaviour in response to changing stimuli
 - To handle sequential behaviour necessary for organization, planning and problem solving
 - To inhibit responses
- Often localized to dorsolateral frontal lobe, but it’s important to think in terms of frontal networks

Models of EF

Dual process theory: behavioral selection and regulation

Norman & Shallice, 1980/1986



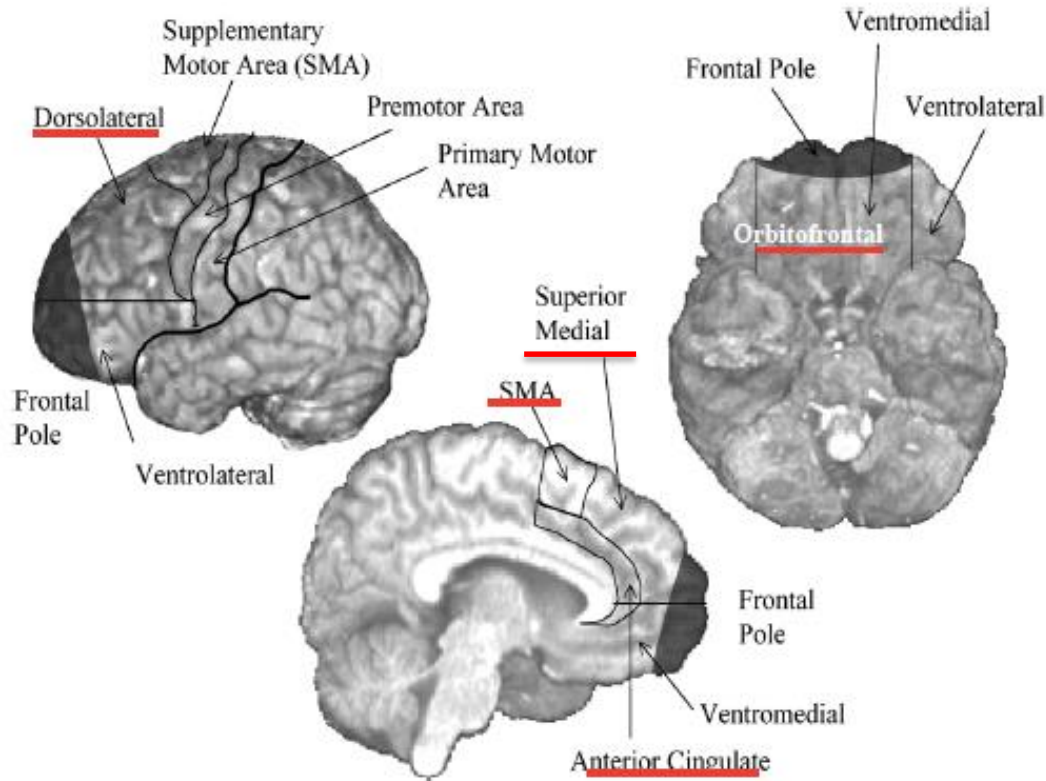


Frontal Functions

“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, *J Cog Neurosci*



Stuss et al., 2007

Energization (superior medial)

Self-regulation (orbito-frontal)

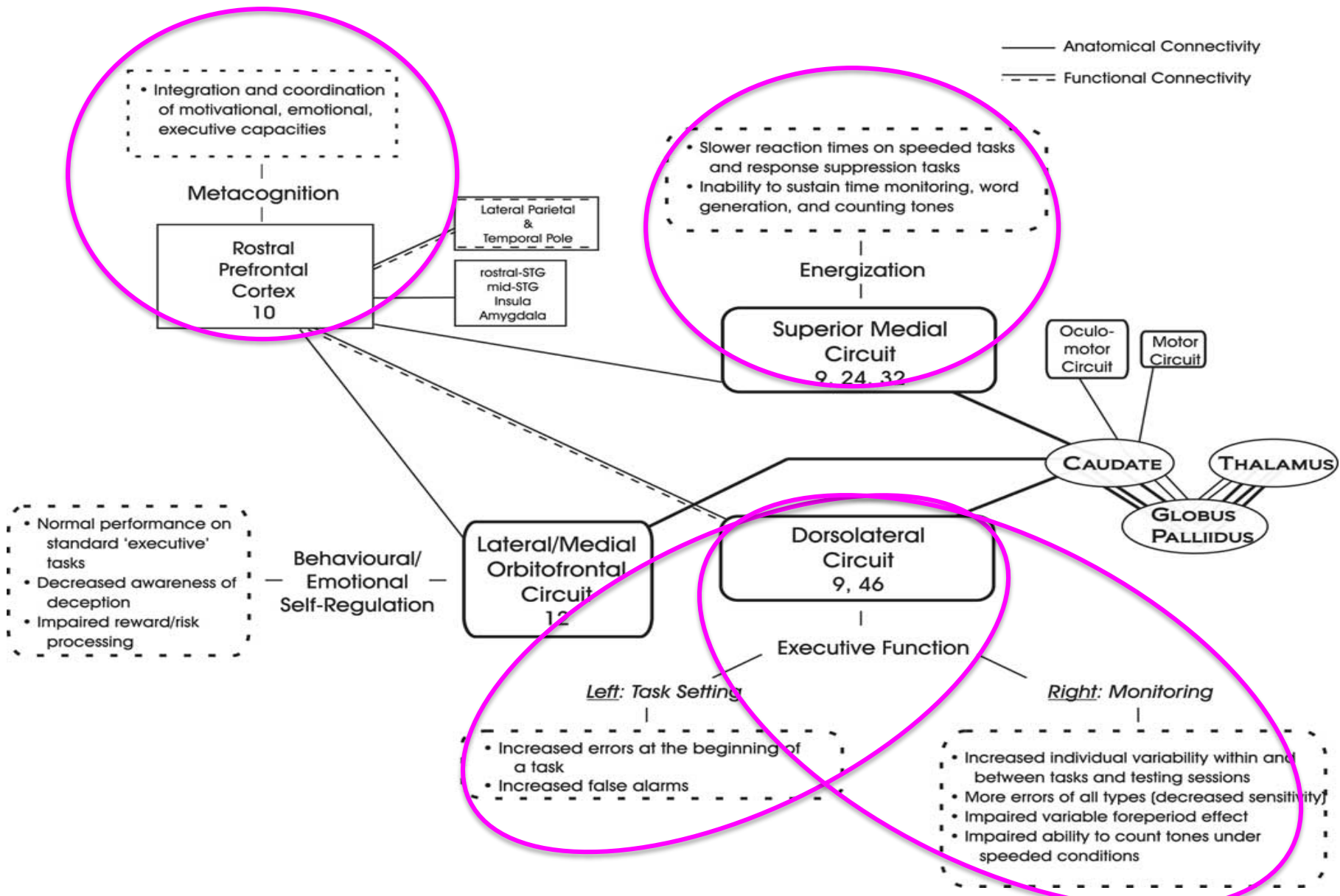
Executive Cognitive (dorso-lateral PFC) – task setting (L) & monitoring (R)

Meta-cognitive (frontal poles)

Models of EF

Functions of the Frontal Lobes: Relation to Executive Functioning

(Stuss, 2011)



Video clip of Executive dysfunction



Observations	Inference / Hypothesis



BI-ISIG and INCOG

Evidence-Based Recommendations

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INCOG Recommendations for Management of Cognition Following Traumatic Brain Injury, Part III: Executive Function and Self-Awareness

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Diana Velikonja, PhD; Mark Bayley, MD, FRCPC; Mary Stergiou-Kita, PhD*



BI-ISIG Recommendations for the Treatment of Executive Dysfunction (Updated)

PRACTICE STANDARD: Metacognitive strategy training (self-monitoring and self-regulation) is recommended for the treatment of mild-moderate deficits in executive functioning, including impairments of emotional self-regulation, during post-acute rehabilitation after TBI. Metacognitive strategy training may incorporate formal protocols for problem solving and goal management, and their application to everyday situations and functional activities, during postacute rehabilitation after TBI.

... optimised when the patient has awareness of the need to use a strategy and can identify contexts in which the strategy should be used.

BI-ISIG Recommendations for the Treatment of Executive Dysfunction (Updated) Cont.

PRACTICE (GUIDELINE) STANDARD:

Metacognitive strategy training should be incorporated into occupation-based treatment for practical goals and functional skills for patients with mild-moderate deficits in executive functioning after TBI and stroke.

Strategies to improve the capacity to analyze and synthesize information should be used with adults with TBI who have impaired reasoning skills (problem-solving training).

BI-ISIG Recommendations for the Treatment of Executive Dysfunction (Updated) Cont.

Group-based interventions may be considered for remediation of executive and problem-solving deficits...

Additional INCOG Recommendation (Evidence Level)

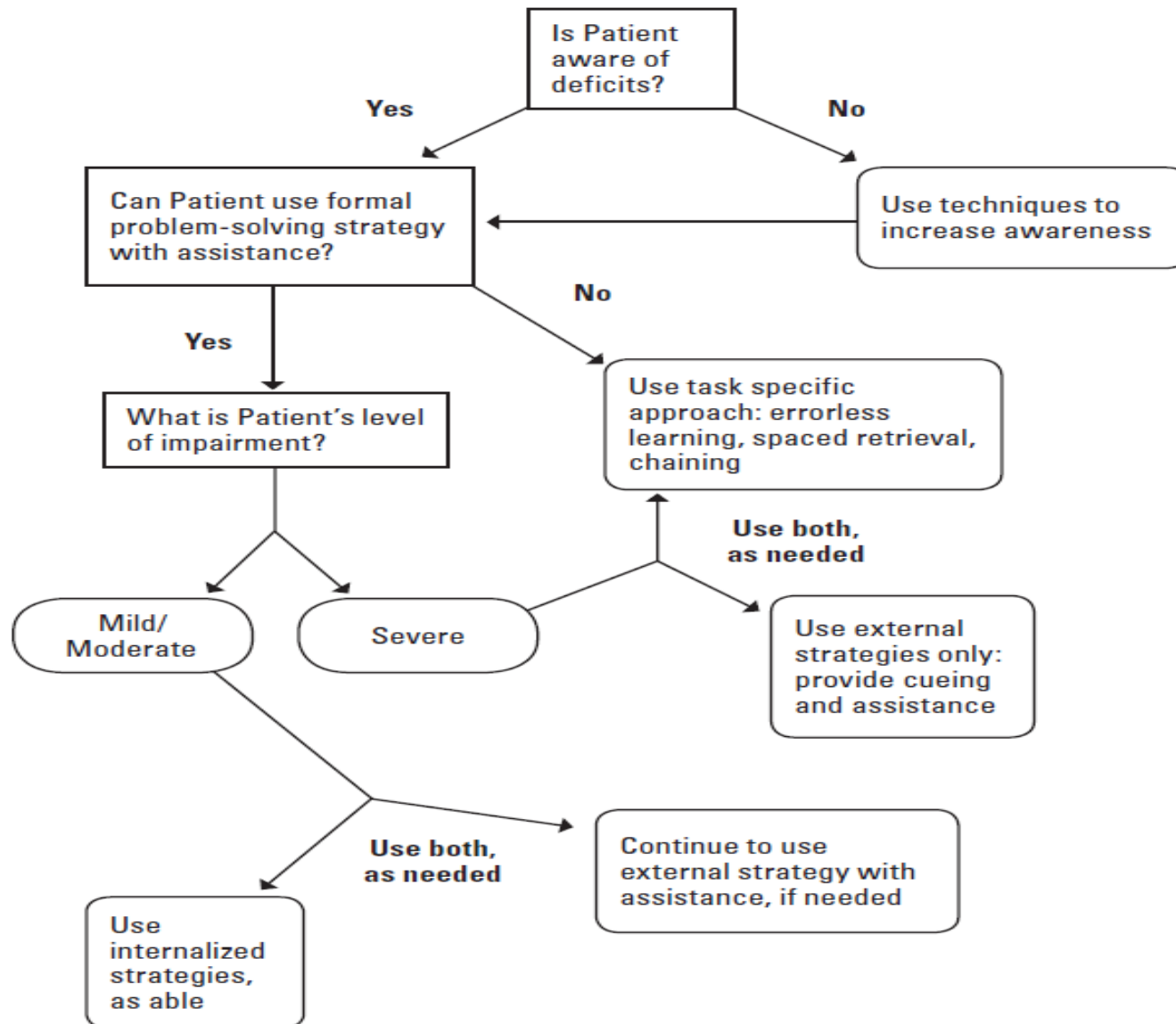


1. Direct corrective feedback should be used with adults with ...impaired self-awareness ... should be delivered in ... therapeutic, multicontext program. (A)



AWARENESS

Figure 2-1 A Decision Tree For Treatment Planning For Executive Dysfunction





Self-awareness

“...may ultimately be understood as the result of a complex combination of psychological and neuropsychological factors, which are affected by the (pathology) and by the individual’s personality and previous experiences” (Hart et al., *JHTR*, 2005)



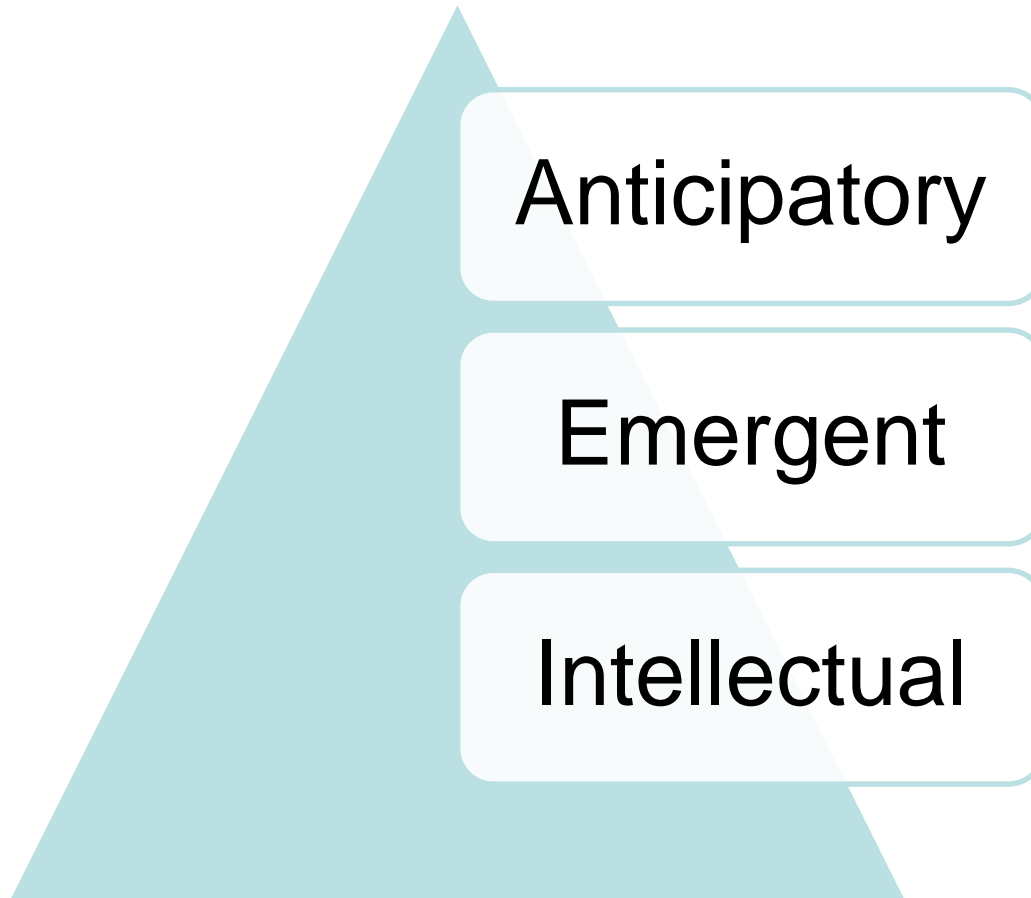
Intervene when....

Ownsworth & Clare, 2006

1. The likelihood of heightened emotional distress is relatively low* ...
2. AD represent a probable barrier to client's own goals...
3. AD pose a significant safety risk which cannot managed effectively in other ways ...
4. Resources are available closely monitoring the individual's emotional well-being and coping reactions.

*Rarely measured: Engel, Chui, Goverover & Dawson, 2017, *Neuropsych Rehabil*

Crosson's Model (1989)



Awareness and Compensation

(Crosson et al., 1989)

- Intellectual awareness deficit
- Emergent awareness deficits
- Anticipatory awareness deficit
- No significant awareness deficit
- External compensations
- Situational compensations
- Recognition compensations
- Anticipatory compensations

Addressing Deficits in Awareness

(Fleming & Ownsworth, 2006)

- Build a collaborative alliance
- Select personally relevant tasks
- Structure opportunities to identify errors and correct performance
- Compare performance to the person's own expectations
- Provide clear & tailored feedback
- Engage in goal setting



A General Algorithm for Training of Frontal (Executive) Functions (Table 2.1)

- Awareness
- Anticipation and planning
- Execution and monitoring
- Feedback, evaluation, and revision

Examples of Training of EF that Follow General Algorithm



- Awareness
- Anticipation and planning
- Execution and monitoring
- Feedback, evaluation, and revision

Examples that follow the algorithm:

- Time pressure management (Winkens et al., 2008)
- Awareness Intervention Protocol (Cheng & Man, 2006)
- Self-Awareness Training (Goverover et al. 2007)

Self-Instruction: Internalizing Strategies

(Based on Meichenbaum)

Cicerone & Wood, 1986

- Stage 1: Modeling by therapist of self-instructions
- Stage 2: Overt verbalization of steps before and during task performance
- Stage 3: Whispered (faded) verbalization before and during task performance
- Stage 4: Silent (self) verbalization before and during task performance



Self-Instruction training for planning disorder (Cicerone & Wood, 1986)

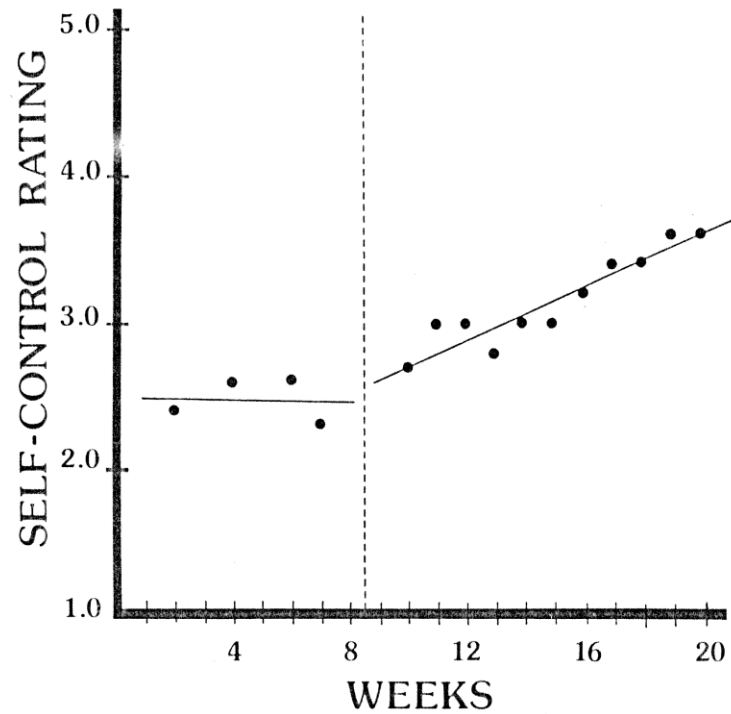
Positive Behaviors:

- Practicing a task procedure sequence
- Learning to use a strategy in a situation
- Practicing social skills

Negative Behaviors:

- Off-task verbalizations (e.g. talking about the weather) or self-stimulating verbalizations (whistling, singing) during task performance
- Off-task behaviors (e.g. playing with window shade) during task performance
- Unplanned moves (“acting before thinking”)

Effect of Self-Instruction on Social Behavior



Effect of Self-Instruction on Planning Disorder

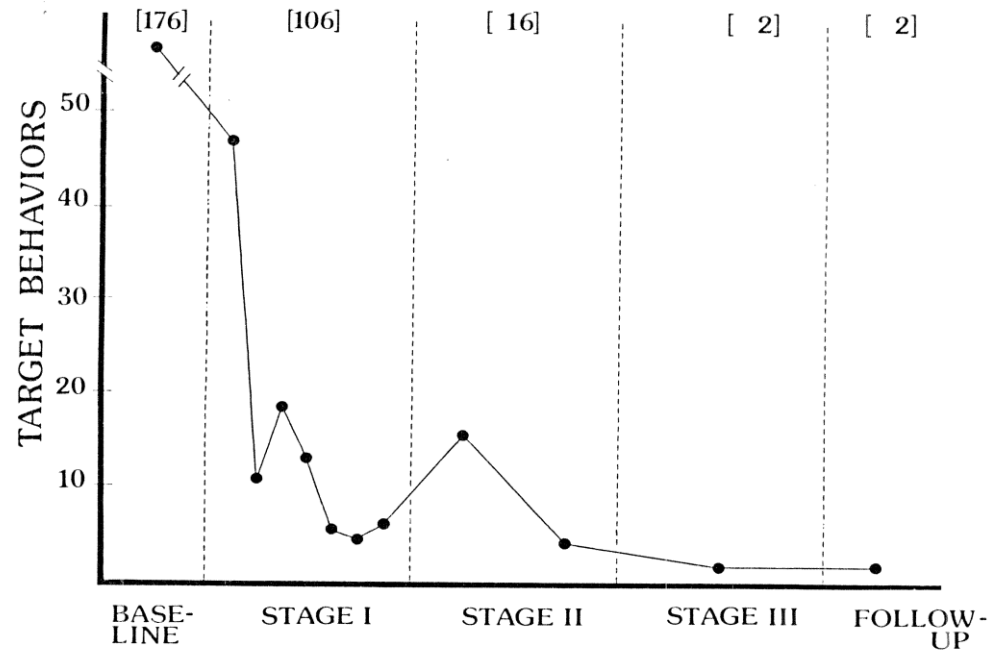


Table I. Problem-Solving Scripts for the

First Wheelchair Navigation Script

1. If I have a problem getting from point A to point B, I should stop after 2 attempts.
2. Then I should push myself away to figure out what the problem is.
3. Then I should figure out the possible solutions to the problem.
4. Next I should analyze the solutions.
5. Then I figure out the best solution.
6. Then I implement the solution.
7. Then ask myself if it worked. If it did not, then start the problem-solving process all over again.

Modified Wheelchair Navigation Script

Stop. What is the problem? Think how to do it.
Choose a new angle. Scan to the left. Did it work?

Yes

Pat yourself on the back.
I did a good job. I took my time. I figured out the solution.

No

Analyze the situation
Stop. Think how to do it differently. If I get frustrated, count to 11. Think how to do it differently. Go ahead.



Time Pressure Management

(from Table 2.1)

Awareness	Enhance the patient's awareness that mental slowness is a critical problem
Anticipate/ Plan	TPM Strategy ("Let me give myself enough time to do the task")
Execute / Self- Monitor	Monitor self while using TPM strategies; What to do in case of unexpected time pressure.
Self- Evaluate	Generalization - Vary tasks, level of difficulty, level of distraction

Time Pressure Management: An Awareness/Execution Training Model

(Fasotti et al, 2000)

1. Enhance the patient's awareness that mental slowness is a critical problem
 - Many activities affected by slowed speed
 - Associated problems
 - Fatigue
 - Forgetfulness
 - Emotional reactions

TPM: Awareness/Execution

(Fasotti et al, 2000)

1. Enhance the patient's awareness
 2. Acceptance & acquisition of TPM Strategy
- “Let me give myself enough time to do the task”
1. Are there 2 or more things to be done at the same time?
 2. Could I be overwhelmed or distracted?
 3. Which things can I do before the actual task begins?
 4. Make a plan (Do one thing at a time, Finish what I start)
 5. What can I do in case of overwhelming / unexpected time pressure?

TPM: Awareness/Execution

(Fasotti et al, 2000)

1. Enhance the patient's awareness
2. Acceptance and acquisition of TPM Strategy
3. Execute / Self-Monitor
4. Generalization
 - Application to varied tasks
 - Vary level of difficulty
 - Vary level of distractions
 - Homework and self-monitoring

Predict-Perform Paradigm (p. 34)

- Perceive
- Predict
- Perform
- (Ap)Prove



Predict-Perform (p. 34)

1. Therapist introduces task
2. Clients asked to
 - Define performance goals including task completion time
 - Predict performance
 - Anticipate and pre-plan for errors / obstacles
 - Choose a strategy to circumvent difficulties
 - Assess amount of assistance needed
3. Perform task
4. Self-estimate performance / self-evaluate
5. Discussion / feedback with therapist
6. Client records the experience including tips for success the next time



What kind of feedback?

- Schmidt, Fleming et al. (2013). *Neurorehabil & Neural Rep* – RCT
- Participants were videotaped doing a meal preparation task four times
- “Pause, prompt, praise” feedback throughout
- Primary outcome was error count during task
- Feedback session after every meal prep
 - Video & Verbal: **40 errors to 11 (>70% reduction)**
 - Verbal only: **38 errors to 30**
 - Experiential feedback: **48 errors to 30**

Awareness Intervention Protocol (Cheng & Man, 2006) (Table 2.1)

Awareness	Awareness of knowledge about deficits
Anticipate/ Plan	Predict performance on a functional task
Execute / Self-Monitor	Perform task & monitor performance
Self-Evaluate	Feedback given, self-evaluation, set short-term goals

Addressing Deficits in Awareness

(Cheng & Man, 2006)

1. Awareness of knowledge about deficits
 - Education
 - Discussion of strengths and limitations
 - Concrete & extensive feedback

Addressing Deficits in Awareness

(Cheng & Man, 2006)

1. Awareness of knowledge about deficits
2. Application of knowledge on real world
 - Experiential functional tasks *selected by therapist* based on patient's functional level
 - Patients predict level of performance
 - Patients perform task and self-monitor

Addressing Deficits in Awareness

(Cheng & Man, 2006)

1. Awareness of knowledge about deficits
2. Application of knowledge on real world
3. Practice of self-performed prediction and goal setting
 - Daily activities of varied difficulty
 - Standardized feedback
 - Self-monitoring and evaluation

Self Awareness Training (Goverover et al., 2007)(Table 2.1)

Awareness	General self-awareness of abilities; on-line awareness
Anticipate/ Plan	Define task performance goals
Execute / Self-Monitor	Choose a strategy to circumvent difficulties
Self-Evaluate	Self-assess performance

Self-Awareness Training

Toglia & Kirk,, 2000; Goverover et al., 2007

- Self Knowledge
 - General self-awareness and beliefs about one's abilities
- On-line Awareness
 - Task specific awareness activated during specific situation or performance of activity

Self-Awareness Training

Goverover et al., 2007

Anticipate/Plan

1. Define task performance goals
2. Predict task performance (rate difficulty)
3. Anticipate and plan for errors or obstacles

Execute/Self-Monitor

4. Choose a strategy to circumvent difficulties
5. Assess the amount of assistance needed to perform the task successfully
6. Perform IADL task according to defined task goals

Self-Evaluate

7. Self-assessment of performance
8. Therapist feedback and discussion
9. Journal experience

Metacognitive contextual intervention to enhance error awareness (Ownsworth et al., 2006)

PAUSE – to provide an opportunity for client to self-correct

PROMPT

- Non-specific: “What is happening?”
- Specific: “Check the recipe and find the first ingredient. Put it in the mixing bowl.”

PRAISE



What works best to optimize activity and participation outcomes?

NEUROPSYCHOLOGICAL REHABILITATION, 2017
<http://dx.doi.org/10.1080/09602011.2017.1292923>



Generalisation of performance to “untrained” environments was not measured specifically. For example, Ownsworth, Fleming, Desbois, et al. (2006) study included kitchen and volunteer/work environments, but both were intervention environments. Measures of the impact of cognitive impairment on everyday activities (e.g., Multiple Errands Test (MET)) or community participation (e.g., Community Integration Questionnaire), could be seen as measures indicative of generalisation and/or transfer; three studies included these types of measure. Two studies measuring community participation level outcomes reported non-statistically significant changes (Braden et al., 2010; Goverover et al., 2007). In case reports, Toglia et al. (2010, 2011) reported MET improvement.



Problem-solving Training for Treatment of Executive Dysfunction

A General Algorithm for Training of Executive Function



- Awareness
- Anticipation and planning
- Execution and self-monitoring
- Self-evaluation

Problem-solving Training

(Awareness, Anticipate/Plan, Execute/Self-monitor, Self-Evaluate) (See also Table 2.2)



Problem-Solving (Ben-Yishay & Diller, 1983)	GPDR (Ylvisaker & Feeney, 1998)	Levine 2000, 2011	CO-OP (Dawson, McEwen, Polatajko)	Executive Plus (Gordon et al.
ORIENT to problem FORMULATE problem ANALYZE conditions of problem Formulate STRATEGY & PLAN of Action Choose relevant TACTICS EXECUTE plan COMPARE solution to problem	Goal Plan Do Review	Stop Define List Learn Do Check	Goal Plan Do Check	Stop What is the problem? Alternative? Pick, Plan... Satisfied?

Stages in Formal Problem-Solving Training

(except CO-OP Approach™)

- Awareness: Is there a problem?
- Acquisition: Therapist trains patient in the rationale and procedures of the model being used.
- Application: Client begins to use the model on various tasks in the clinic.
- Adaptation: Client applies the skills learned in the first two stages to problems and tasks outside the clinic.

Goal, Plan, Do, Review

Ylvisaker & Feeney, 1998

- Goal: What do I want to accomplish?
- Plan: How am I going to accomplish the goal? List all the steps.
- Do: Execute the plan
- Review: How did I do? What worked? What didn't?

- **GOAL**: What do I want to accomplish?
- **PLAN**: How am I going to accomplish my goal?
 - MATERIALS/EQUIPMENT/STEPS/ASSIGNMENTS
- **PREDICTION**: How well will I do? How much will I get done?
- **DO**: Execute
- **REVIEW**: How did I do? What worked? What didn't?

Self-rating

1 2 3 4 5 6 7 8 9 10

Other rating

1 2 3 4 5 6 7 8 9 10

- **WHAT WORKED? WHAT DIDN'T WORK?**
- **WHAT WILL I TRY DIFFERENTLY NEXT TIME?**



Goal Management Training



- Manualized
- Theoretically based
- “primary objective is to train patients to stop ongoing behaviour in order to define goal hierarchies and monitor performance” (Levine et al., 2011)
- 9 modules, 2 hours each
- STOP, mindfulness, task splitting

Goal Management Training

Levine et al, 2000

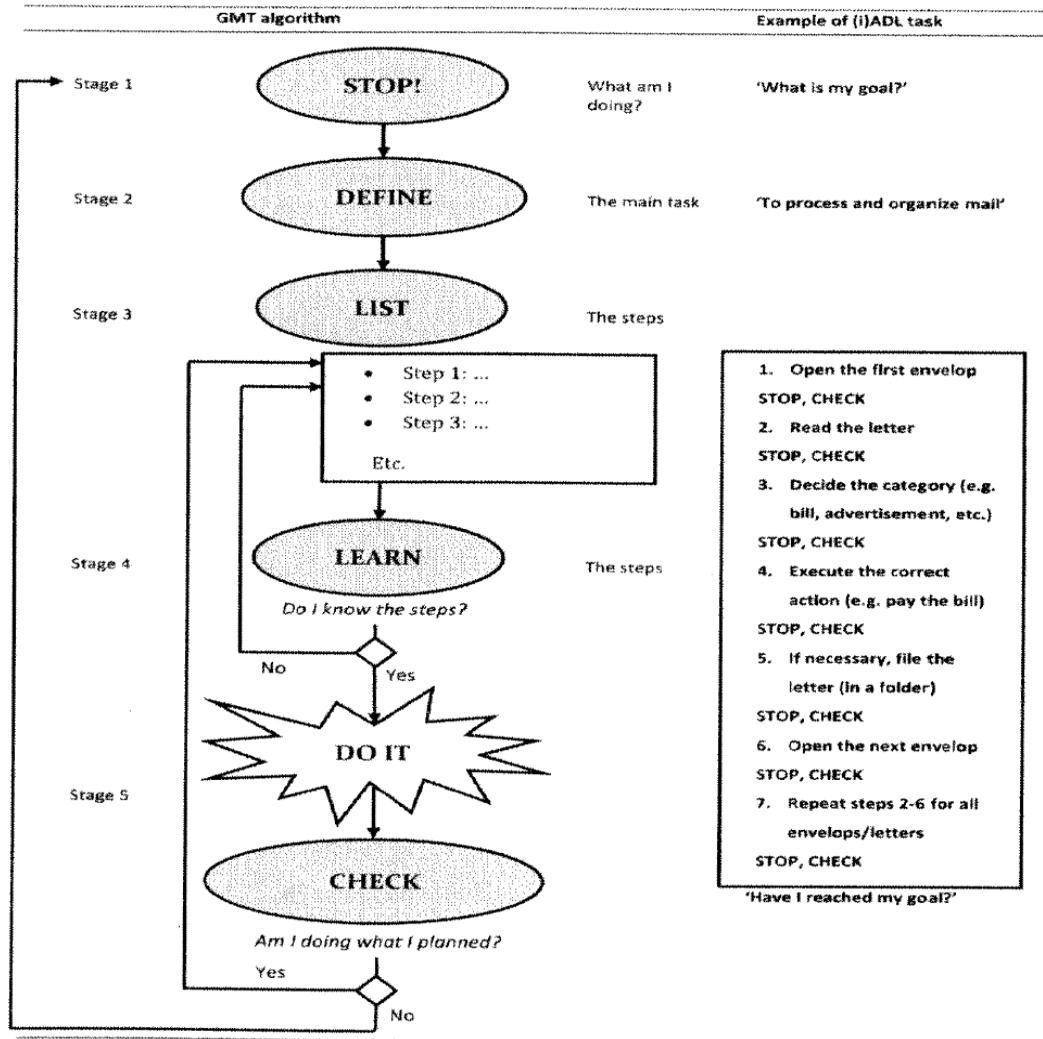


Figure 1 Flowchart of the GMT algorithm and an example of its application adapted from [20].

Goal Management Training (Levine et al., 2011)

GMT session	Objectives
1. Slip-ups	Overall introduction Defining goals, absentmindedness, action slips Raising awareness of consequences of action slips
2. Stop the Automatic Pilot	Defining automatic pilot (habit vs. control distinction) How automatic pilot can lead to errors Stopping the automatic pilot
3. The mental blackboard and present-mindedness	Defining the mental blackboard (working memory) Using "STOP!" to check the mental blackboard Mindfulness exercise to promote present-mindedness
4. Slate your goal	Being sidetracked from your goal Stating goals to activate working memory representation "STOP!" (present-mindedness) STATE cycle
5. Making decisions	Examples of competing goals Understanding emotional reaction to competing goals, including indecision To-Do Lists in the "STOP"-STATE cycle
6. Splitting tasks into subtasks	Defining overwhelming goals that require splitting Organizing goal hierarchies "STOP!"-STATE-SPLIT cycle
7. Checking (STOP!)	Recognizing errors in "STOP!"-STATE-SPLIT cycle Using "STOP!" to monitor output Review



Activity Analysis (Cicerone & Wood, 2008)

- Awareness: What is the task I want to accomplish?
- Anticipate/Plan (next slide)
- Executive/Self-Monitor
 - Identify strategies for use during task performance
 - Perform task
 - Self-monitor cognitive limitations, emotional response, strategy use
- Self-Evaluate, peer-evaluation, therapist-feedback → modify goals

Activity Analysis

Cicerone et al., 2008

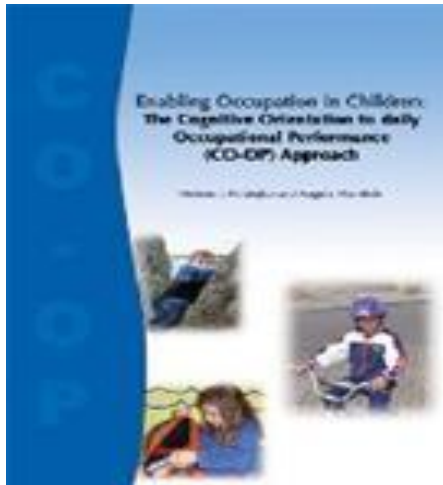
- What are the essential parts of the task / activity?
- What abilities and skills will influence completion of the activity?
 - (e.g. cognitive, emotional)
- What about the situation will influence completion of activity?
 - (e.g. deadlines, distractions, lack of information)
- What assistance is needed & available?
- What is the probability of success?

Executive Plus-Problem Solving

Gordon et al, 2006

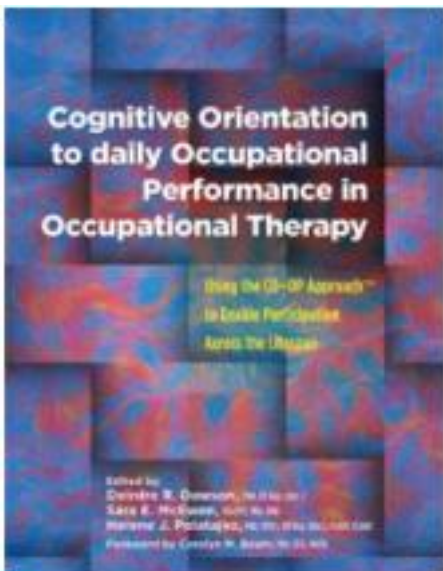
1. **S**top! Is there a problem? - recognize that the situation may be problematic and deploy the SWAPS strategy
2. **W**hat is the problem and should I try to solve it? – break down the problem into its component elements in order to understand it and generate an appropriate array of solutions
3. **A**lternatives and Options? – brainstorm and suspend judgments
4. **P**ick, Plan and Prioritize! – systematically assess each alternative, eliminate those you don't want to try and plan how to implement those that you choose to use
5. **S**atisfied? – assess satisfaction with your plan and (after implementing it) its outcome. Repeat steps 2 to 5 as necessary

Cognitive Orientation to daily Occupational Performance (CO-OP) ★



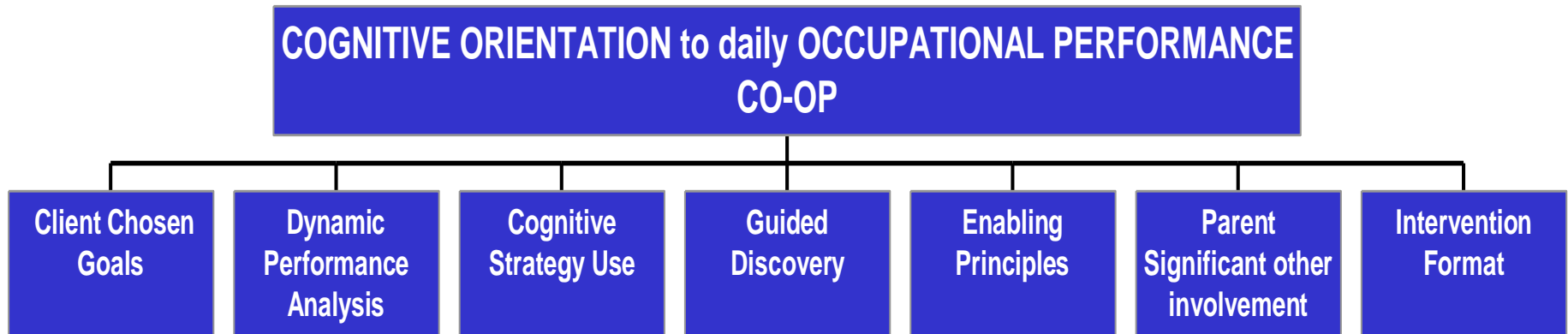
“a client-centred, performance-based, problem solving, approach that enables skill acquisition through a process of strategy use and guided discovery.”

(Polatajko & Mandich, 2004, p. 2).



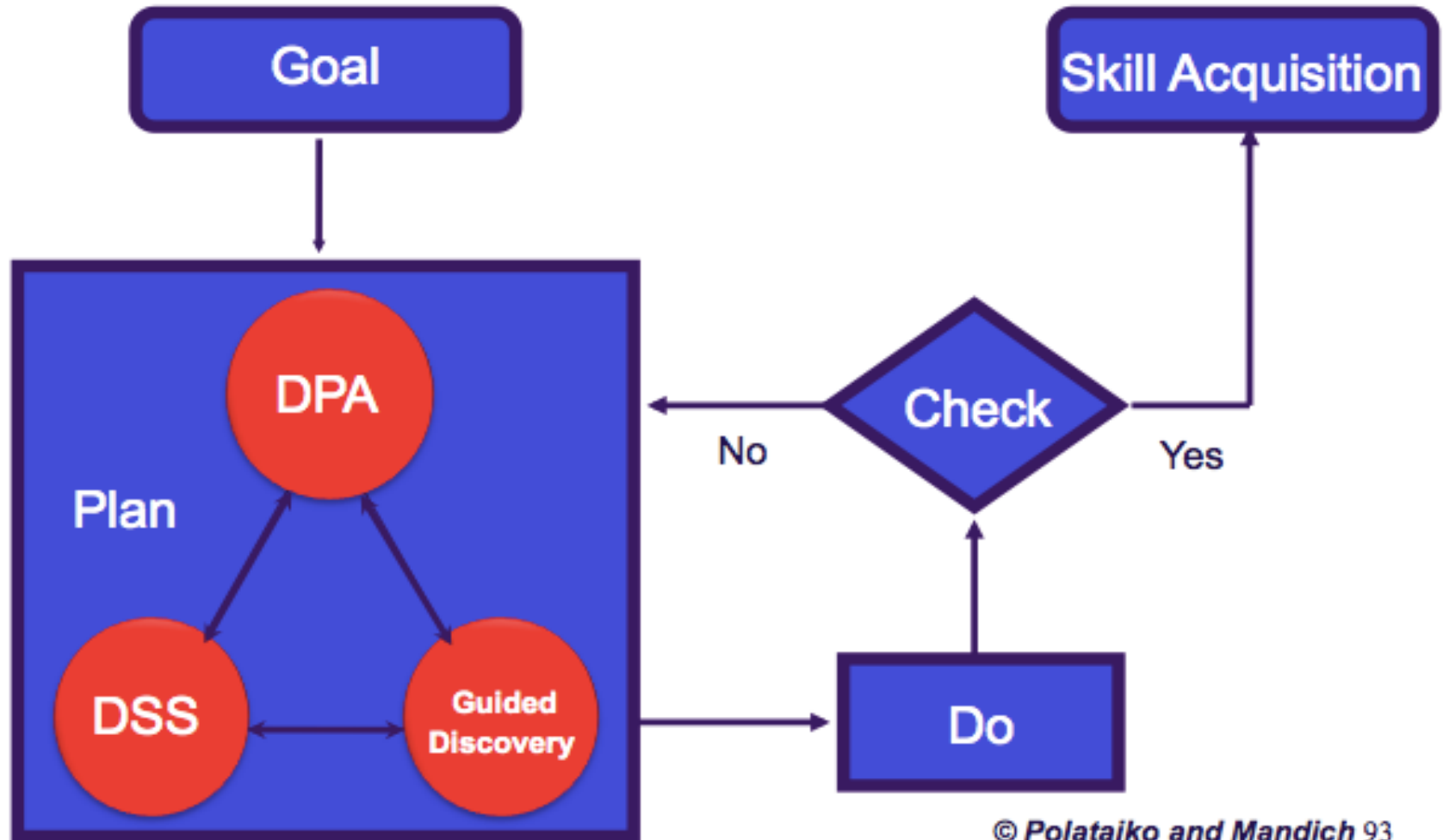


Key Features





The CO-OP Strategy Use Process



The Evidence (in adults with cognitive impairments)

Adults with ABI

1. Dawson et al. (2009). Using the cognitive orientation to occupational performance (CO-OP) with adults with traumatic brain injury. *Canadian Journal of Occupational Therapy*, 76, 115-127.
2. Dawson et al. (2013). Occupation-based strategy training for adults with traumatic brain injury: A pilot study. *Archives of Physical Medicine & Rehabilitation*, 94(10), 1959-1963..
3. Dawson et al. (2013). Managing executive dysfunction following acquired brain injury and stroke using an ecologically valid rehabilitation approach: A protocol for a randomized, controlled trial. *Trials*, 14.
4. Ng, E., ... Dawson, D. (2013). Telerehabilitation for addressing executive dysfunction after traumatic brain injury. *Brain Injury*, 27(5), 548-564.

Adults with Stroke

5. Skidmore... Dawson, D. et al. (2011). The feasibility of meta-cognitive strategy training in acute inpatient stroke rehabilitation: A case report. *Neuropsychological Rehabilitation*, 21, 208-223.
6. Skidmore, E. R., Dawson, D. R., et al. (2014). Developing complex interventions: Lessons learned from a pilot study examining strategy training in acute rehabilitation. *Clinical Rehabilitation*, 28(4), 378-387.
7. Skidmore, E., Dawson, D., et al. (Dec. 2015). Strategy training may reduce disability in the first six months post-stroke. *Neurorehabilitation and Neural Repair*.
8. Poulin, V., ... Dawson, D. (2016). Comparison of two cognitive interventions for adults experiencing executive dysfunction post-stroke: A pilot study. *Disability & Rehabilitation*.

Older Adults with Age-related Executive Changes

9. Dawson, et al. (2014). An occupation-based strategy training approach to managing age-related executive changes: A pilot randomized controlled trial. *Clinical Rehabilitation*, 28(2), 118-127.

Goal Measurement

Canadian Occupational Performance Measure*:

If **yes** to either a,b, or c

a. Do you need to _____?

b. Do you want to _____?

c. Are you expected to _____?

And **no** to either d,e, or f

d. Can you _____?

e. Do you _____?

f. Are you satisfied with the way
you _____?

*Law M, Baptiste S, Carswell A, et al. *Canadian occupational performance measure*.
Toronto: CAOT = ACE; 1994.



Examples of CO-OP toolkit items: Generalization Sheet (previously 'blue sheet')



Date:	
A.J.M.: Goal and Plan	P. M.L.: Check
What is your goal? _____	Did your plan work? <input type="checkbox"/> YES <input type="checkbox"/> NO
What is your plan for this goal? _____ _____ _____	If NO, what is your new plan? _____ _____ _____
How will you know if your plan worked? _____ _____ _____	_____ _____ _____

Date:	
A.J.M.: Goal and Plan	P. M.L.: Check
What is your goal? _____	Did your plan work? <input type="checkbox"/> YES <input type="checkbox"/> NO
What is your plan for this goal? _____ _____ _____	If NO, what is your new plan? _____ _____ _____
How will you know if your plan worked? _____ _____ _____	_____ _____ _____



STUDY PROTOCOL

Open Access

Comparison of error-based and errorless learning for people with severe traumatic brain injury: study protocol for a randomized control trial

Tamara Ownsworth^{1*}, Jennifer Fleming^{2,3}, Robyn Tate^{4,5}, David HK Shum¹, Janelle Griffin³, Julia Schmidt^{5,6}, Amanda Lane-Brown^{4,7}, Melissa Kendall⁸ and Mathilde Chevignard^{9,10}



Table 1 Comparison of the key principles and expected training outcomes of error-based learning and errorless learning

Key principles	Error-based learning	Errorless learning
Training approach and model	Top-down with an internal focus (person learns to monitor and correct their own errors)	Bottom-up with an external focus (therapist monitors and eliminates the person's errors)
Target of intervention	Increased awareness of deficits and the capacity to anticipate, self-monitor and self-regulate errors	Error-free performance on successive parts of the task through observing and practicing correct actions
Mechanisms (function of errors in learning)	A structured opportunity to make and self-identify errors with therapist's feedback to realize the functional significance of errors, and practice of self-initiated strategies (stop, check and correct) over sessions	The therapist prevents errors during the learning acquisition phase by modeling each step and the person practices only correct responses over sessions to support habit formation
Training outcomes (pre vs post)	Reduced errors on the training task, generalization of self-regulation skills to untrained tasks (reduced errors and improved broader behavioral competency) and greater awareness of deficits	Reduced errors on the training task, minimal change in awareness, lack of generalization of self-regulation skills to untrained tasks (minimal change in errors and broader behavioral competency)



Table 2 Overview of error-based and errorless learning training techniques

Session	Error-based learning (EBL)	Errorless learning (ELL)
Session 1: role reversal or modeling	<p>Role reversal: therapist makes a number of errors across all steps of the activity (for example, incorrect sequence, omitting a step).</p> <p>Participant checks the instructions to identify the therapist's errors, pauses the task and describes the corrective action (with prompts if needed).</p> <p>Post-task review of errors during each step and corrective strategies.</p> <p>Participant completes the activity according to the EBL procedures with post-task discussion of errors and their significance (for example, memory problems).</p>	<p>Modeling: therapist describes out loud and models correct performance of each action during all activity steps.</p> <p>Participant reads instructions and observes therapist's correct actions on each step.</p> <p>Post-task review of the correct performance on each step.</p> <p>Participant completes the activity steps according to the ELL procedures with post-task discussion reinforcing error-free performance.</p>
Sessions 2 to 3, 5 to 7: skill practice	<p>Participant previews the task and makes self-predictions of possible errors for each step and planned strategy use (for example, use timer for cooking).</p> <p>Participant follows activity instructions with the therapist observing, but not directing his/her actions.</p> <p>When an error is observed the therapist delays responding for up to 10 seconds to allow participants to self-correct the error.</p> <p>If an error is not self-corrected, therapists provide a non-specific prompt ('Can you stop and check what you need to do').</p> <p>Post-task self-evaluation of performance with goals set to improve in target areas.</p>	<p>Therapist reviews the activity with the participant and breaks each step into smaller sets of action.</p> <p>Therapist initially models each action (for example, measure the rice) and participants copy the action.</p> <p>Therapist anticipates errors and provides a high level of cuing to guide participant's actions to avoid opportunities for making errors.</p> <p>If an error occurs, the correct action is modeled and practiced until performance is error free.</p> <p>Post-task positive reinforcement for correct performance.</p>
Sessions 4 and 8: skill mastery	<p>Pre-task discussion and on-task prompting targets participant's awareness and correction of any errors on the activity.</p> <p>Therapist systematically fades prompts to support independent and self-directed checking and strategy use.</p>	<p>Pre-task review and repeated practice and reinforcement of correct actions within each step.</p> <p>Therapist maintains a high level of cuing to ensure error-free performance and habits.</p>

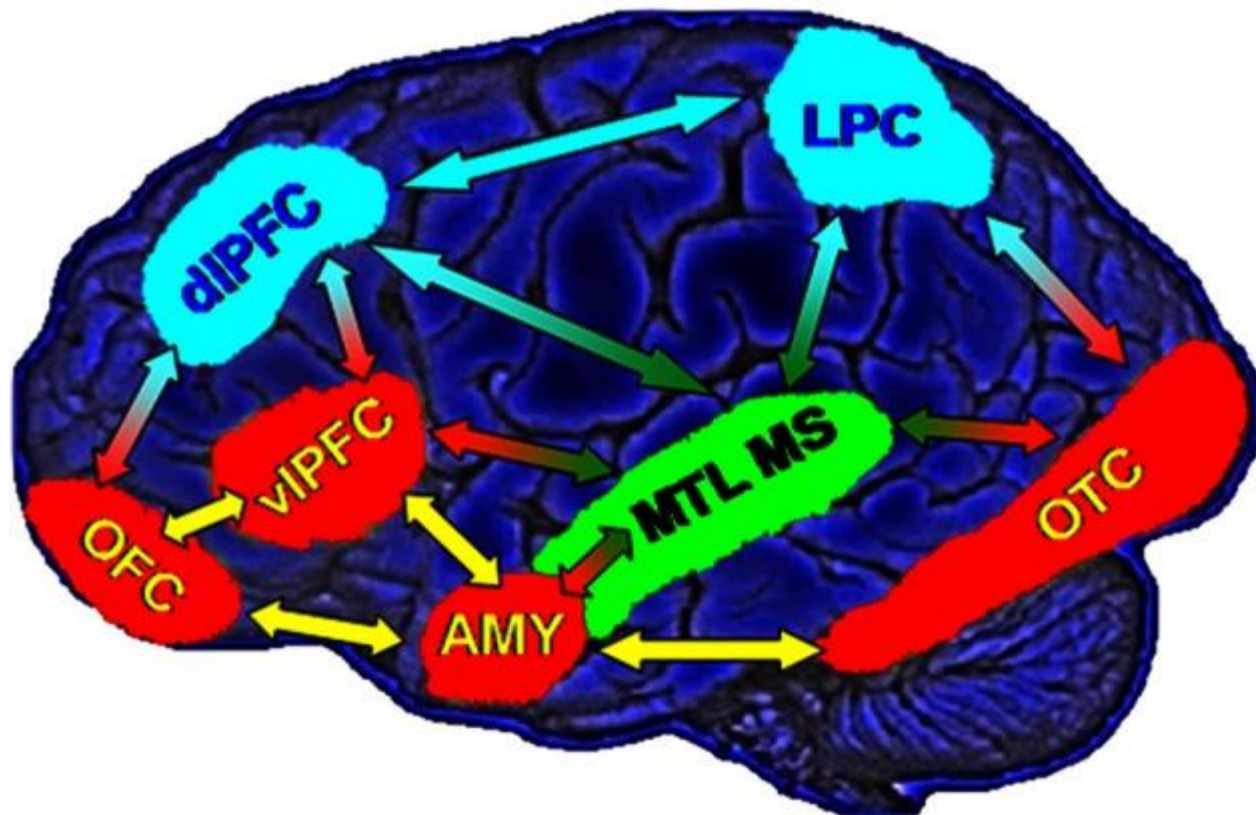


Metacognitive Strategies for the
Treatment of Executive
Dysfunction:
Emotional Self- Regulation

Targets of Metacognitive Strategy Training for Emotional & Behavioral Dysregulation

- Impulsivity
- Disinhibition
- Perseveration
- Affective dysregulation
- Anger Management

Dorsal Executive System



Ventral Affective System

Emotional Regulation

- Management of frustration during task performance
- Positive problem orientation
- Clarification of emotional states (CES)
- Goal maintenance and goal interference

Cognitive Energy Scale (CES)

1

Not paying attention

Mind is Blank

Inactive

2

3

Able to focus

Mind is sharp

Engaged

4

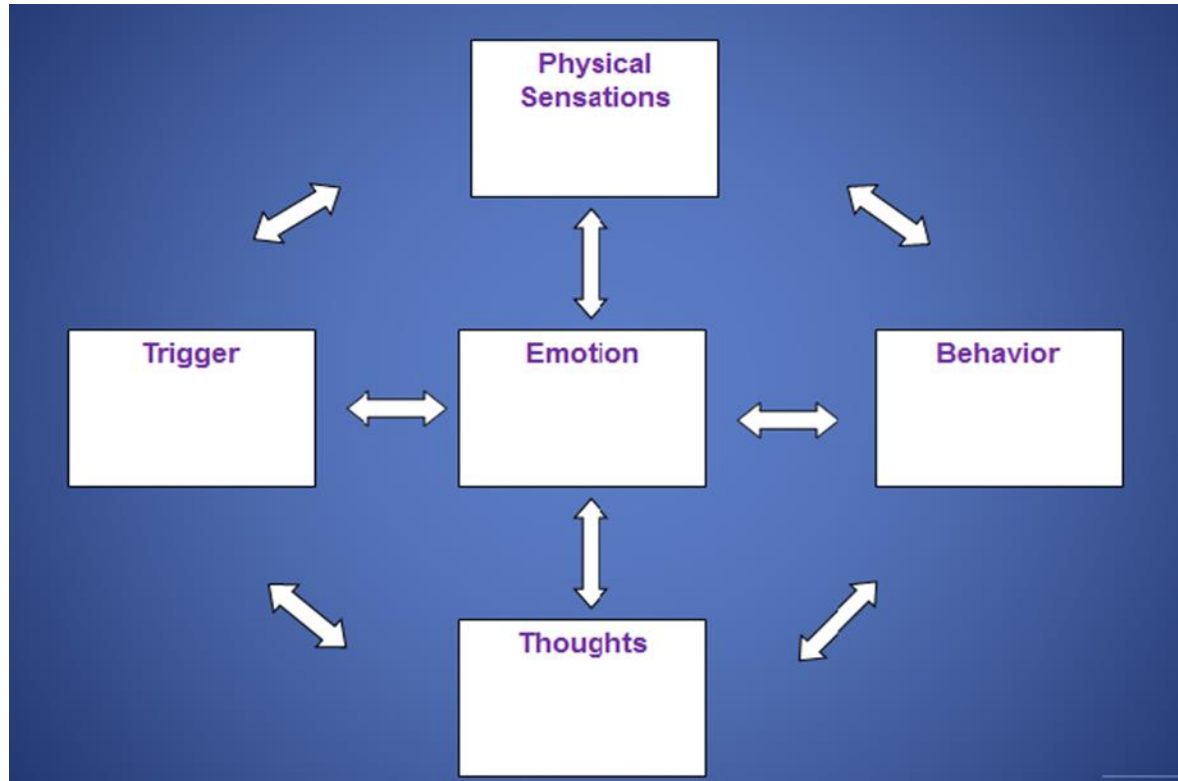
Distractible

Mind is Overwhelmed

Irritable to Aggressive

5

Executive Plus: Emotional Regulation



Executive Plus: Emotional Regulation

This manual is organized into sections:

1. Overview of Executive Plus and STEP
2. Problem Solving Clinical Manual
3. Problem Solving Workbook
4. Emotional Regulation Clinical Manual
5. Emotional Regulation Workbook

If you are interested in obtaining a PDF version of the manual, please contact Dr. Wayne Gordon, Director of the BIRC-MS (wayne.gordon@mountsinai.org).



Group Treatment Addressing Self-regulation & Clear Thinking

Group Remediation of Deficits in Problem Solving

Rath et al, 2003

- Group-based training on social problem solving using two component trainings:
 - Emotional self regulation strategies (problem orientation)
 - Clear thinking strategies (problem skills)
- Selective benefits on self-appraisal and interpersonal problem solving strategies shown on questionnaires and in role-played problem situations
- Problem solving benefits most apparent for patients with slower processing at baseline

Targets of Treatment in Emotional Self-Regulation

Rath et al, 2003



- Awareness of emotional states
- Strategic management of anxiety, depression, frustration
- Management of impulsivity and disinhibition
- Positive problem orientation
- Goal maintenance

Targets of Treatment in Clear Thinking

Rath et al, 2003



- Ability to set goals
- Ability to take another's perspective
- Ability to plan and sequence steps
- Ability to evaluate outcome of problem solving
- Ability to revise goals, plans, and strategies



Individual versus Group Remediation of Deficits in Problem Solving

Owensworth et al, 2008

- Individual vs. group-based training on awareness and problem-solving
- Individual treatment improved specific cognitive skills
- Group treatment improved behavioral and emotional symptoms

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