Evidence-Based Practice Interventions for Impairments of Executive Functions

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Learner Objectives

• List proven clinical intervention practices based on the evidence for disorders of executive functions.
• Identify the types of awareness deficits and the techniques for increasing awareness.
• Identify implementation procedures of interventions for executive dysfunction, including formal problem solving, and self-instructional and metacognitive strategies.

Development of the Manual

• Based on the systematic reviews (Cicerone et al., 2000, 2005, 2011)
• First Draft by Ed Haskins, Ph.D.
• Additions and revisions made by ACRM Sub-Committee of the Cognitive Rehabilitation Task Force
• Externally-reviewed by 15 novice to expert therapists and subsequent revisions
• Reviewed by the Clinical Practice Committee of ACRM and the final version will be available in April 2012

Evidence-Based Cognitive Rehabilitation: Recommendations

• 2000: 14 researchers pursued methodical review of 171 articles
• 2005: 13 researchers reviewed 87 studies
• 2011: 13 researchers reviewed 112 studies
• Generated 3 types of recommendations:
  – Practice Standards
  – Practice Guidelines
  – Practice Option
• Did also state “Not recommended”

Classification of Level of Evidence

Cicerone, 2000, 2005 and 2011

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Description – as to whether the treatment be specifically considered for persons with neurocognitive impairments and disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice Standard</td>
<td>Based on at least 1 well-designed Class 1 study, or overwhelming Class II evidence; providing good evidence to support a recommendation</td>
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<tr>
<td>Practice Guideline</td>
<td>Based on well-designed Class II studies with adequate samples; providing fair evidence to support a recommendation</td>
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<tr>
<td>Practice Option</td>
<td>Based on Class II or Class III studies with additional grounds to support a recommendation</td>
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Class I
(N = 29, 17, 19; Total = 65)
Studies w/ well designed, prospective, randomized controlled trials

Class II
(N = 35, 8, 11; Total = 54)
Prospective, nonrandomized cohort studies; or clinical series with well-designed controls that permitted between subject comparisons of treatment conditions

Class III
(N = 107,62, 82; Total = 251)
Clinical series w/o concurrent controls, or studies with results from 1 or more single cases w/ appropriate methods
Barriers to Translation of Research into Clinical Practice

- Clinical methods not often described in sufficient detail
- Practitioners do not have easy access to literature or time to read literature
- Training programs for practitioners do not include BI specific cognitive rehabilitation strategies
- Rehabilitation organizations have reduced training budgets
- Staff turnover results in experience drain

Purpose of the Manual

- Guide the practice of cognitive rehabilitation based on the evidence
- Assist the therapist in determine which type of strategy might be the most appropriate
- Provide structure for establishing and measuring long-term strategic and short-term tactical goals based on the evidence
- Provide therapists easy access to the rehabilitation procedures, tactics and strategies that were utilized in the research

Levels of Recommendation for Rehabilitation Strategies

- Practice Standard: “substantial evidence”
- Practice Guideline: “probable effectiveness”
- Practice Option: “possible effectiveness but requires further research”

BI-ISIG Recommendations for the Treatment of Executive Dysfunction

- Practice Standard: Metacognitive strategy training (self-monitoring and self-regulation) for deficits in executive functioning after TBI, including impairments in emotional self-regulation, and as a component of interventions for deficits in attention, neglect and memory

BI-ISIG Recommendations for the Treatment of Executive Dysfunction (cont’d)

- Practice Guideline: Training in formal problem-solving strategies and their application to everyday situations and functional activities during postacute rehabilitation after TBI
- Practice Option: Group-based interventions may be considered for remediation of executive and problem-solving deficits after TBI

DECISION TREE FOR TREATMENT PLANNING FOR COGNITIVE REHABILITATION
Strategies in the Treatment of Executive Dysfunction

- Formal problem solving
  - Cognitive
  - Behavioral
- Metacognitive strategies
  - Cognitive
  - Behavioral
- Complex programs

Examples of Formal Problem Solving Models

- Ylvisaker and Feeney, 1998: Goal/Plan/Do/Review
- Levine et al., 2000: Stop/Define/List/Learn/Check
- Lawson and Rice, 1989: What/Select/Try/Check

Major Factors in Formal Problem Solving Models

- Patient is trained in to use a structured sequence when addressing a problem.
  - Awareness
  - Anticipate/Plan
  - Execute/Monitor
  - Self Evaluate

Components of Awareness

- Recognize the existence of a problem.
- Indicate a personal goal that the problem is related to.
  - Why is this problem important and worth spending time on?
- Analyze and define the main problem.
  - Formulate questions about the problem
  - Analyze and record the main aspects of the problem
  - Distinguish relevant and irrelevant details

Components of Anticipate/Plan

- Identify information that needs to be gathered before choosing a solution.
- Generate a list of possible solutions.
  - Brainstorm, thinking of as many alternatives as possible
- List pros and cons of each solution
- Choose the best option
- List the various steps involved in the solution
- Learn the steps of the chosen solution

Components of Execute/Self Monitor

- Execute the solution without getting lost or stuck on one step
  - Avoid going off on tangents
  - Avoid perseveration and cognitive inflexibility
  - Keep in mind the goal: “Is this getting me closer to where I want to go?”
Components of Self-Evaluate

- Verify the effectiveness of the solution
  - Recognize faulty paths
  - Self-correct errors
  - Ask for feedback

Stages in Training with Formal Problem-Solving Procedures

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

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: What problems did I find? What solutions?

REVIEW: How did I do? What worked? What didn’t?

WHAT WORKED? WHAT DIDN’T WORK? WHAT WILL I TRY DIFFERENTLY NEXT TIME?

Hypothetical Outcomes with Formal Problem-Solving Strategies

- Pt learns to generalize skills to a range of situations and tasks
- Pt can internalize the strategy and independently apply to specific situations
- Pt learns to use the strategy but still needs some assistance
- Pt never learns to use the strategy with or without assistance. Needs procedural approach.

Worksheet: Goal, Plan Do, Review

(Short Form) 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 Writing in the Treatment of Executive Dysfunction

- Strategic/Monthly Goals
  - Initiate _____ (e.g., Acquisition, Application, Adaptation) stage of formal problem-solving protocol using the _____ (e.g., Goal-plan-do-review, WSTC, etc) method and implement as able.

- Tactical Goals
  - Patient will perform _____ (1) _____ task, at _____ (2) _____ level of difficulty, with _____ (3) _____ accuracy/speed or _____ (4) _____ assistance, using _____ (5) _____ equipment, strategies, modifications.
Goal Writing For Problem Solving in the Treatment of Executive Dysfunction

1. Types of Tasks
   - Impairment Level
     - Divided attention tasks
     - Problem-solving/reasoning tasks
     - Sequencing tasks
     - Organizational tasks
     - Planning tasks
     - Flexibility tasks
   - Functional Level
     - Functional clinic tasks requiring _____ ability
     - Functional household tasks requiring _____ ability
     - Functional community tasks requiring _____ ability
     - Functional work-related tasks requiring _____ ability

Examples of Goal Writing Using a Formal Problem Solving Strategy

- Patient will perform simple problem solving tasks with 80% accuracy.
- Patient will perform simple functional household tasks requiring planning ability with Min Assistance.
- Patient will perform complex in-clinic tasks requiring problem solving ability with Min Assistance using Goal-Plan-Do-Review strategy.
- Patient will perform complex functional household tasks requiring organizational ability with 100% accuracy using memory notebook and WSTC strategies.

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

Targets of Metacognitive Strategy Training for Behavioral Dysregulation

- Awareness
- Impulsivity
- Disinhibition
- Anger Management
- Perseveration

Major Features of Metacognitive Strategy Training for Executive Deficits

- Internally controlled: The timing and execution of the strategies are self-generated by the patient and under the control of internal cognitive processes.
- This is in contrast with strategies under external control, i.e., under the control of a therapist or caretaker.

Types of Interventions for Behavioral Self-Regulation

- Metacognitive Strategy Training
- Predict-Perform Strategy
- Self-Monitoring Training
Metacognitive Strategy Training: Therapist Interventions

- Awareness
  - Identify and clarify the nature of the executive deficits, and the tasks and behaviors with which they interfere with
- Anticipate/Plan
  - Choose a metacognitive strategy
  - Model doing each step of the task
  - Have patient practice while saying steps out loud

Pyramid Model of Awareness

- Intellectual Awareness
- Emergent Awareness
- Anticipatory Awareness

Techniques for Addressing Deficits in Awareness

- Videotape
- Group discussion
- Questionnaires
- Role reversals
- Self-monitoring
- Structured feedback forms

Behavior Record Form: Example with Sexually Inappropriate Conduct

- Targeted Behavior (NOT A LABEL):
  1. Lewd Comments
  2. Attempts to touch, hug, kiss, etc
  3. Attempts to remove clothing
  4. Repeated propositioning
  5. Sexually suggestive gestures.

Behavior Record Form, cont’d

<table>
<thead>
<tr>
<th>Behavior</th>
<th># of Times Observed</th>
<th>Comments</th>
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Predict-Perform, Steps 1 and 2  
Governor et al, 2007

- Therapist introduces task
- Asks patient to plan the task
  - Define goals for the task
  - Predict task performance
  - Anticipate and pre-plan for errors/obstacles
  - Choose a strategy to address anticipated problems
  - Assess the amount of assistance will need

Predict-Perform, Steps 3, 4, and 5  
Governor et al, 2007

- Patient then performs task
- Patient then evaluates own performance
- Therapist and patient discuss outcome, esp. any discrepancies between prediction and performance

Steps in Self-Monitoring Training  
Alderman et al, 1995

- Baseline recording
- Spontaneous self-monitoring
- Prompted self-monitoring
  - Independent self-monitoring and accuracy reward
  - Independent self-monitoring with reward for reduced rate of behavior

Clarifying the Nature of the Problem

- Daily Logs
- Worksheets
- Personalized lists of problems and strategies with labels
  - All organized in memory notebook, electronic device, etc.

Executive Impairments and Their Functional Consequences in Communication  
Sohlberg and Mateer, 2001

- Initiation and Drive: Difficulty starting a behavior
  - "I'm stuck again; I need to get moving and do this."
- Response Inhibition: Difficulty stopping behavior
  - "I'm going too far again; need to use my brakes and stop"
- Task Impersistence: Difficulty maintaining goal directed behavior
  - "I'm getting lost again. What is the goal here?"
- Organization: Difficulty sequencing and timing behavior
  - "I need to stay focused"

Planning a Solution

- Approach the issue with structured problem-solving strategy, using list of problems and labels
- Recognize the difference between emotions vs. neurobehavioral deficits
- Look for alternatives
- Teach strategies
Metacognitive Goal Writing in the Treatment of Executive Dysfunction

- **PATIENT SR: Goals for use of Predict-Perform**
- **Long Term Strategic Goal**
- Ms. SR will demonstrate ability to adequately predict objective performance on completion of actual academic tasks to increase independence with required return to school activities.

- **Monthly Strategic Treatment Goal for Training in Executive Functioning**
- Possible Strategic Goal #1: Initiate/Continue ________ stage (e.g., acquisition, application, adaptation) of formal problem solving strategy training in executive protocol.

Overall Treatment for High Level Cognitive Impairments

- Cycle of Goal Setting and Goal Review
- Patient and Family Education and Counseling
- Pharmacological management of symptoms by physician with therapist monitoring and input
- Remediation
- Strategy and compensation based intervention
  - Community Re-integration (home, school, work, social/recreation)
  - Environmental modifications

Therapeutic Alliance

- Awareness
- Goal-setting Process - ongoing
- Negotiating and agreement of the tasks and activities of therapy
- Strength of this alliance strongly predicts the ability of the client to engage in the therapeutic process, and the outcome of the services provided.

General Intervention Principles for TBI Intervention

Ylvisaker & Feeney, 1998 – Based on a contextualized, functional approach

- Assessment for planning intervention should occur in natural contexts, and should be ongoing and collaborative
- The most effective intervention occurs in meaningful contexts and is designed to influence routines.
- Intervention should be collaborative and integrative

General Intervention Principles for TBI Intervention

Ylvisaker & Feeney, 1998 – Based on a contextualized, functional approach

- Address simultaneously impairment, disability and handicap
- Intervention will fail without inclusion in meaningful chosen life activities – must work toward achievement of personally satisfying and meaningful goals
- Professionals must move beyond narrow medical and training models of intervention

Client-Clinician Collaboration Opportunities:
Adapted from Ylvisaker & Feeney, 1998

- Self Awareness; identification of strengths and limitations
- Goal Setting and Goal Review
  - Principles =
    - Based on Assessment
    - Client Participates on targets
    - Clearly defined and measurable
    - Easily communicated to all involved
    - Constantly monitored and modified
- Process is dynamic and evolving and reviewed routinely

Murdoch & Theodoros, 2001
Client-Clinician Collaboration Opportunities: Adapted from Ylvisaker & Feeney, 1998

- Planning therapeutic activities and choosing environments and partners
- Initiating activity toward stated goals
- Inhibiting less adaptive behaviors
- Self-Monitoring and Self-Evaluating – documentation
- Problem solving and Strategic thinking – development of next steps or alternative strategies

Patient and Family Education

- ABSOLUTELY CRITICAL!
- “If you don’t have information – you make it up”
- Research supports that the provision of an information booklet (written information and suggested coping strategies) reduces anxiety and reporting of ongoing problems; study with 202 mTBI adults (Ponsford, et al, 2002)

Patient and Family Education

- National and State Associations
  - Provide referral information
  - Offer family and survivor educational conferences
  - Printed brochures and guides
  - Web page downloads
- Biographies and Autobiographies
  - University “She was talking about me!” “That was my exact experience”
  - Where is the Mango Princess
  - Over My Head
  - In an Instant
  - I am the Central Park Jogger

Metacognitive Goal Writing: Examples

Possible Strategic Goal #2: Initiate/Continue (e.g., acquisition, application, adaptation) of metacognitive strategy training for problem solving in executive protocols.

Possible Strategic Goal #3: Initiate/Continue executive function protocol for behavioral dysregulation

Short-Term Tactical Treatment Goals:

STGa: Ms. SR will independently predict time and accuracy of performance on trials of academic tasks within 10% of actual performance in 90% of opportunities.

STGb: Ms. SR will independently generate strategies to improve ability to complete tasks with enhanced accuracy and time, based on review of objective previous performance on trials of academic tasks.

STGc: Ms. SR will independently predict adequate time to complete assignments by making entries in academic planner in 90% of opportunities across one month.

References

References
