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Finding the Sweet Spot in Functional Cognitive Intervention: Grading Tasks to Maximize Outcomes

Angie Reimer OTD, MOT, OTR, CBIST
areimer@neurorecovery.net

Learning Outcomes

- Identify key components of functional cognition and their impact on IADL performance
- Develop appropriate occupation-based interventions to address cognitive dysfunction
- Demonstrate the ability to appropriately grade functional cognition interventions to the patient's appropriate skill level to maximize functional outcomes
Prevalence

- Annually in the United States
  - 2.4 million sustain a traumatic brain injury (TBI)
  - 795,000 individuals sustain an acquired brain injury (ABI) from non-traumatic causes
- More than 30% of all survivors experience cognitive impairment

What is functional cognition?

“how an individual utilizes and integrates his or her thinking and processing skills to accomplish everyday activities in clinical and community living environments. “
(AOTA, 2018)
Why does this matter?

- Associated with a 3-fold increase in risk for mortality
- Associated with decreased ADL and IADL function
- Patients may require longer-term, ongoing rehabilitation
- Associated with major depression, negative affect and anxiety

(EBRSR)

Functional Cognition domains

- Attention
- Memory
- Processing speed
- Executive functioning
- Social communication
- Emotional management

- Language
- Reading and writing
- Numeric/calculation
- Limb praxis
- Visuospatial function
- Social use of language
- Emotional function
- Attention
- Executive function
- Memory
### Subtypes of Attention

<table>
<thead>
<tr>
<th>Subtypes of Attention</th>
<th>Descriptions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused Attention</td>
<td>Selecting one source of information (i.e., stimulus) while withholding responses to irrelevant stimuli</td>
<td>Responding to pain; Turning to see a loud sound behind you</td>
</tr>
<tr>
<td>Sustained Attention</td>
<td>Maintaining attention to complete a task accurately and efficiently over a period of time</td>
<td>Reading a book; Watching a TV show; Listening to a presentation</td>
</tr>
<tr>
<td>Selective Attention</td>
<td>Maintaining attention in the presence of distractions</td>
<td>Focusing on the presenter at a conference while ignoring others talking outside; Studying while music is playing</td>
</tr>
<tr>
<td>Alternating Attention</td>
<td>Shifting between tasks that demand different behavioral or cognitive skills</td>
<td>Reading a recipe and stirring a pot; Filing and answering the phone</td>
</tr>
<tr>
<td>Divided Attention</td>
<td>Requires the ability to respond simultaneously to multiple task demands while maintaining speed and accuracy</td>
<td>Driving and talking on the phone; Cooking multiple courses at the same time</td>
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</tbody>
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### Memory Processes

- **Sensory Memory**
  - Holds sensory information for a few seconds after perception

- **Short Term Memory**
  - Enables recall of information lasting a few minutes to hours

- **Working Memory**
  - Temporary storage and active processing of information

- **Long Term Memory**
  - Permanent consolidation and storage of information
Executive function

- Goal setting
- Planning
- Sequencing complex actions
- Prioritizing
- Initiating
- Problem solving
- Divided attention
- Working memory
- Shifting (task switching)
- Self monitoring/correction
- Decision making
- Generating Strategies
- Modifying behavior in light of new information
- Inhibition

OT -vs- Speech in cognitive rehabilitation

Cognitive rehab needs to be approached as a team -- We approach the same deficits with different intention

- Speech
  - How do I improve the skill as a whole or give strategies?
- OT
  - How does this affect ADL/IADL tasks (return to home management, vocational activities and driving)?
Developing and grading functional cognition tasks

Important ingredients in cognitive rehab

- Patient actively involved in choosing goals, activities, and strategies
- Activities are meaningful and relevant
- Training in self regulation and self monitoring
- Opportunity for practice across a wide range of situations
- Therapeutic relationship
Life History and Occupational Profile

- Hobbies
- Career
- Family
- Values
- Habits
- Routines
- The more information you have the easier to plan treatments

Levels of Awareness

- Intellectual Awareness
  - may be aware a problem has occurred, but is unable to identify it

- Emergent Awareness
  - recognizes when an impairment affects abilities as it occurs

- Anticipatory Awareness
  - able to anticipate when an impairment will affect performance and implement strategies

cognitive rehabilitation

**Acquisition**
- Teach purpose and procedures of treatment
- Help pt. recognize and accept deficit and benefits of treatment (awareness)

**Application**
- Improve effectiveness and independence in compensating for deficits
- Promote internalization of strategies

**Adaptation**
- Promote transfer of training to tasks less structured, more novel, complex, distracting
- Generalization to home, community, work

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**Acquisition**
- General education about brain injury
- Education related to specific deficits
- Increase awareness as necessary
- Patient’s prediction of performance
- Intervention
- Review of results
Application

- Treatment plan, strategies to be learned based on patient goals
- Teaches, practices in sessions
- Increasing challenge (complexity, level of assistance, distractions, etc.)
- Careful monitoring of progress
- Predict-perform-evaluate

Adaptation

- Take strategy outside clinic
- Homework assignments
- Home, community, work
- Increasing generalization, facility with strategy
Finding the Just Right Challenge

The task should be graded to provide a significant challenge, yet allow the patient to be successful.

**The sweet spot is when the patient complains “this is hard!”**
Grading functional cognition

Simple  Task Complexity  Complex

Grading functional cognition

Concrete  Cognitive Distance  Abstract
### Grading Cues

<table>
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<tr>
<th>Cue Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Support/Affirmation</td>
<td>“You are doing great”</td>
</tr>
<tr>
<td>Verbal non-directive</td>
<td>“Is there anything missing?”</td>
</tr>
<tr>
<td>Verbal Directive</td>
<td>“Check that again”</td>
</tr>
<tr>
<td>Gesture</td>
<td>Pointing or tapping</td>
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<tr>
<td>Rearranging Task</td>
<td>Breaking into smaller tasks/ Arranging materials to assist with task completion</td>
</tr>
<tr>
<td>Demonstration</td>
<td>Showing them what to do</td>
</tr>
<tr>
<td>Physical Guidance</td>
<td>Positioning hand on items</td>
</tr>
<tr>
<td>Physical Support</td>
<td>Provision of slight support/ Tactile cues</td>
</tr>
<tr>
<td>Total Assistance</td>
<td>Full Verbal Cueing</td>
</tr>
</tbody>
</table>

### Strategy Training

- Focus on the “process” not the content
- Goal is not to develop specific skills or isolated strategy but to develop general strategies to be applied across situations.
- Repeated practice across a variety of situations is key
  - Generalization
  - Complexity/grading
  - Assuring safe discharge
Strategies

External strategies
- Checklists
- Voice recorders, alarms
- Smart phone
- **Other people
- Notebook
- Stimuli reduction methods (ear plugs etc.)

Internal strategies
- Self talk
- Cognitive check offs or mnemonics
- Mental rehearsal or mental imagery

Choosing appropriate strategies

What is the goal?

Start with strategies patient already uses

High tech or low tech?
How can I use this tomorrow?

Functional math

Banking
Budgeting
Figuring tips/discounts
Recipes
Bill Pay
Functional Math

- You are on a grocery shopping trip. You purchase 5 pounds of bananas at $0.59 per pound, rice at $2.35, 3 pounds of peaches at $2.05 per pound and two gallons of milk. You have a coupon for $0.35 off the rice and milk is on sale for $2.49 per gallon. You have $15.00 to spend on this trip, do you have enough money for these groceries?

Complex functional math

- You are in the hospital for 6 days for chest pain and high blood pressure. Prior to this stay you had met $175.62 of your yearly deductible. The cost per day for room and board is $874.63. While in the hospital you have $287.93 in medications. You are also charged $467.92 for an EKG, $318.92 for a chest x-ray and $763.29 for an echocardiogram. There is a $895.62 charge for lab work. Insurance pays for your hospitalization and medications at 80%, diagnostic imaging at 70% and labs at 80% after you meet a $500 deductible. How much of your bill does your insurance pay? What is your portion?
Online Banking and shopping tasks

http://www.otiadl.net/

Navigation and Wayfinding

- Navigation and safety in the parking lot
  - Easy – Sidewalks
  - Harder- Parking lots between cars
- Navigating the facility/medical campus
  - Starting with written directions progressing to needing to ask directions or use signs
- Mapquest or Google Maps tasks
Mapquest task

- Predict how much time you will need for this ______________________
- Find the address of an IKEA store in Columbus OH
- Using MapQuest, map out the address from your home to this store in Columbus
- Print the directions
  Tip: The reception desk has directions on how to use MapQuest if you need them, you must ask her for them

- If you are to report to the Columbus store by 12pm, what time should you leave to get there in time?

- You will be getting breakfast on your way through the drive through at a McDonalds. You need to find a McDonalds half way between your house and the Columbus store. Include the address of this McDonalds on this sheet of paper.

Recipe task

You need to make 52 chocolate chip cookies for a school bake sale. Use the attached recipe to make a grocery list containing the amount of each ingredient you will need to have on hand to complete this task.
Chocolate Chip Cookies (makes 2 dozen)

- 1/2 cup butter
- 1/2 cup shortening
- 3/4 cup packed brown sugar
- 1/2 cup white sugar
- 1 egg
- 1 teaspoon vanilla extract
- 1 teaspoon baking soda
- 1/4 teaspoon salt
- 1 1/2 cups semisweet chocolate chips
- 2 cups all-purpose flour

**Directions**

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**Pizza task**

You are having a party at your house and need to order pizza for the group. You will need to order the pizzas online at Pizza Hut. You have a $115.00 budget for the meal.

There will be 62 people at the party, 48 adults and 14 kids. You need to order 2 pieces for each adult and 1 for each child.

- 5 adults are vegetarian
- 2 adults are gluten free
- 1 adult and 2 kids don’t like mushrooms
- 4 adults don’t eat pork
- 2 adults and 4 kids will only eat pepperoni
- 1 adult and 2 kids will not eat onions
- 4 adults Supreme pizza
- 2 adults and 1 kid will not eat olives or pepperoni
Vocational tasks

- What did they do? Ask specifics to be able to simulate tasks.
- What does the environment look like? (busy, quiet, etc.)
- Do they have access to resources that can help with vocational readiness?

Construction/Building Tasks

Easy:
Reproduce on graph paper with marker

Medium:
Reproduce on wall with 1 square = 1 inch
Construction/Building Tasks

- Reproduce to scale with painter’s tape
  - Scale at 1:4 or 1:6
  - Require lowest point of design at a specific height

Multiple errands tasks

- Provide a list of tasks to be completed along with a list of rules to be followed
- Great measure of real life skills
- Can be completed over and over in infinite ways
Ways to grade multiple errands tasks

- Specific written instructions no rules
- Specific written instructions with written rules
- Written instructions with written rules and time constraint
- Written instructions with verbal rules
- Verbal instructions and verbal rules

Medication Management

- Filling pill boxes using medication bottles filled with “pills” (aka colored beads)
- Mark each pill bottle with the name of the drug (e.g. Xanax 2 mg)
- Write medication schedule on note card
  - Easy: AM only or PM only
  - Medium: Doses written in # of pills
  - Hardest: Fill both AM and PM with doses written in mg (e.g. AM Xanax 6mg – PM Xanax 4mg)
- Can also grade with number of meds used
Interventions available at

www.angiereimer.com

References:


Questions?

- areimer@neurorecovery.net