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Cognitive Rehabilitation of Children and Adolescents: Practical Strategies for the Home, Community, and School Environments

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Learner Objectives

After this course, participants will be able to:

- Describe 3 components of cognitive rehabilitation treatment.
- List the steps to developing successful compensatory strategies.
- Describe 5 different compensatory strategies.

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Presentation Overview

- Basics about cognitive rehabilitation- efficacy, what is it?, who does it?, who can benefit?
- Factors to consider in the pediatric population
- Components of a cognitive rehab approach
- A step by step process for cognitive rehab/ strategy development (1-10)
- Case studies and practical strategies (discussed along the way)

Efficacy of Cognitive Rehabilitation

- There is substantial evidence to support interventions for attention, memory, social communication skills, executive function, and for comprehensive-holistic neuropsychological rehabilitation after TBI (Ciccerone, 2011)
- There is substantial evidence to support cognitive rehabilitation for people with TBI, including strategy training for mild memory impairment, strategy training for postacute attention deficits, and interventions for functional communication deficits. (Ciccerone, 2005)
- There is Level 2 evidence that behavioural and cognitive skills post ABI can be improved by participating in neurorehabilitation or neurobehavioural programs (Braunling-Mcmorrow et al., 2010).

Efficacy of Cognitive Rehabilitation

- There is substantial evidence to support the use of direct attention training and metacognitive training after TBI to promote the development of self-directed strategies during postacute rehabilitation and foster generalization to real-world tasks. (Ciccerone 2011)
- Self-directed strategy training is recommended for the remediation of mild memory deficits after TBI. (Ciccerone 2011)
- For impairments of higher cognitive functioning after TBI, interventions that promote self-monitoring and self-regulation for deficits in executive functioning (including impaired self-awareness) and social communication skills interventions for interpersonal and pragmatic conversational problems are recommended after TBI. (Ciccerone 2011)

Cognitive rehab provided by SLP's

(in addition to other professionals)

- ASHA has provided extensive recommendations and resources for SLP's who work with persons with cognitive-communication deficits
- SLP's in any setting who treat those with cognitive deficits, not just SLP's in medical settings
- For kids and adolescents, the school IS an appropriate setting to do cognitive rehabilitation and school SLP's should be doing it
- Cognitive deficits have a significant impact on academic success and the school setting is the optimal place to provide cognitive rehab
- School is their "real world"

Who can benefit from cog rehab?

1. Anyone who has experienced a change/reduction in their thinking/cognitive skills following a neurological illness or injury

OR

2. Anyone who has deficits in their thinking/cognitive skills

- The 2nd description is broader and can include those with learning disabilities or a degenerative disease process, in addition to those with an acquired brain injury
- My experience leads me to believe the 2nd

Children and adolescents who have sustained an acquired brain injury (ABI)

- Traumatic brain injury
- Hemorrhages (inter-cerebral, intra-cranial, subarachnoid) due to aneurysm or AVM
- CVA (stroke)
- Infection: meningitis, encephalitis, cerebritis
- Anoxia/hypoxia
- Toxic encephalopathy (drug overdose)
- Metabolic encephalopathy
- Brain tumor resection
- Abscess or sinusitis
- Seizure disorder
- Seizure focus resection
- Hemispherectomy for control of seizures
- Progressive neurological diseases

Factors which impact recovery in pediatric brain injury

- Predicting recovery and long-term outcome following a brain injury is a complicated process, dependent on a number of factors, including:
  - Length of time elapsed since injury (have a better idea after one year what the outcome will be)
  - Premorbid language/cognitive abilities
  - Family support
  - Neurological damage sustained
  - **The age of the child at time of injury: Damage to a still developing brain**
  - **Change in symptoms over time and ability to compensate**

Age of child at time of injury

- One of the most common misconceptions that exists is that an ABI sustained earlier in life leads to a more favorable outcome compared to an injury sustained later in life
- The conventional thinking regarding TBI in young people was that the child's brain was incredibly resilient to trauma because it was much more "plastic" than the adult brain, i.e., that other parts of the brain would take over for damaged parts
  - "The earlier the better"
  - "Young brains heal faster"
  - "They can outgrow it"

(Savage, 2009.)

Damage to a still developing brain….

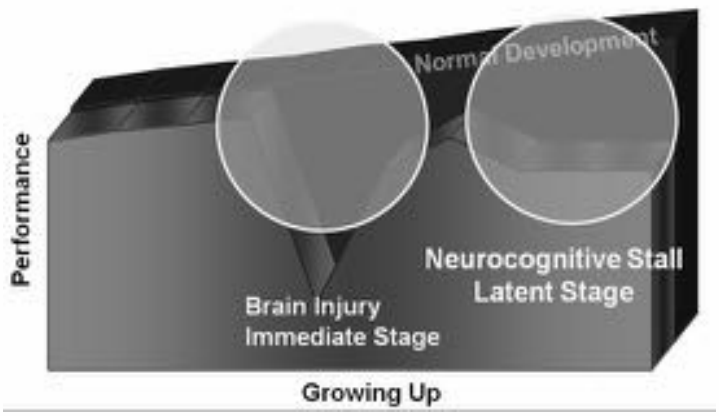
- The brains of children, adolescents and young adults are not static, but rather develop in leaps and spurts throughout childhood and well into the mid-twenties of young adulthood.
- ABI can have a negative impact on continued brain maturation and development in young people as they get older and grow into their adult years
- Current neuroscience research has identified that children, adolescents and young adults pass through five neuro-developmental stages between birth and 21+ years
- Neuroscience research has further identified that different regions of the brain (i.e., frontal-temporal region, temporal-central region, occipital-parietal region) have different periods of developmental maturation.

Neurocognitive Stall

(Chapman, 2007)

- Young people who have severe brain injuries may be at risk for manifesting a "neuro-cognitive stall" during a second phase of brain recovery
- Neuro-cognitive stall as defined by Chapman (2007) is a halting or slowing in later stages of cognition, social, and motor development beyond a year after brain injury
- Despite sometimes remarkable recovery during the first year after a TBI, young people appear to "hit a wall" or plateau and not meet later developmental milestones
- This neuro-cognitive stall may emerge despite the individual seeming to have recovered cognitive abilities commensurate to one's pre-injury level

Pediatric TBI: Two Stages of Recovery



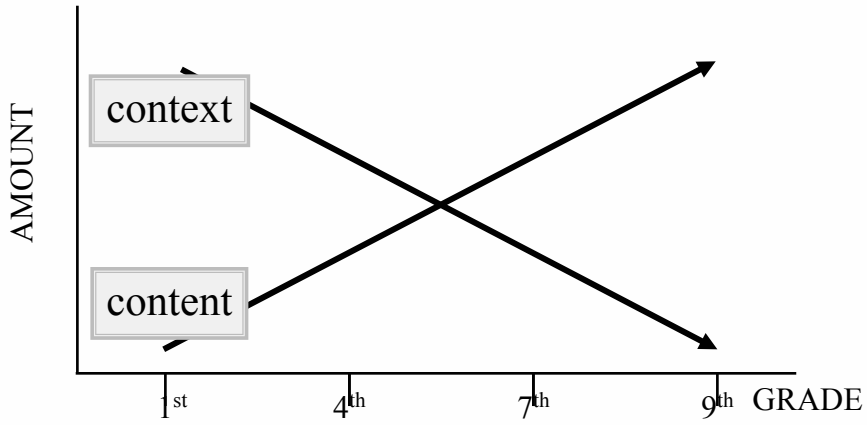
Chapman, 2007

The bar keeps getting raised….

- As children and adolescents grow up with an ABI, the impact of their deficits and their ability to compensate will change
- As young people's brains develop, the world around them also becomes more complex and sophisticated. Learning in school becomes more difficult, social and behavioral expectations increase, and the expectations of independence levels increase
- The impact of a neurocognitive stall, coupled with increasing demands and challenges in the world around them, can lead to a perception that these kids are "getting worse".
- They are not getting worse, but the functional impact of their deficits can become more obvious and detrimental, i.e. they are "growing into their symptoms"

Context Content Interaction

Bernstein & Waber, 1990



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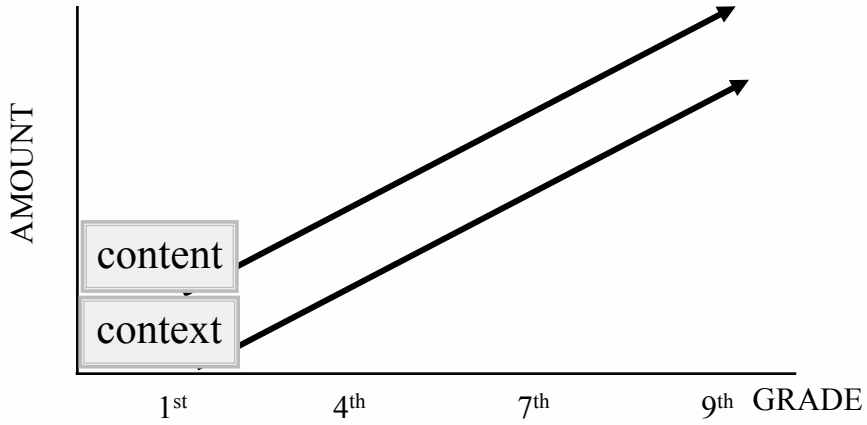
Optimal Context Content Interaction for ABI Patients



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Treatment for "life"…….

- Understanding ABI in this population as a *developing disability* over time can help better manage this disease-like process
- Clients' needs may change with time due to the changes in demands and the deficits they demonstrate at any given time
- Kids who have sustained an ABI and have a need for cognitive rehabilitation may not fit the traditional model of therapy services
- In our program, we use a variety of models such as a changing frequency, consultative, burst/intensive, group and individual, breaks from therapy and return as needed for current challenges

Cognitive skills impacted by an ABI

- Orientation
- Attention
- Memory
- Problem Solving
- Social Skills
- Reasoning
- Executive Functions
- Processing
- Insight/Awareness

What is "cognitive rehabilitation?"

In the literature, there are a variety of definitions or descriptions:

Summary:

- Targets improved measurable and satisfying functional outcomes following neurological injury
- Targets recovery of cognitive deficits- directly retraining those cognitive processes that have been impaired by injury based on the notion that damaged neural circuits can be retrained if they have been partially or substantially spared after injury
- Targets training in the use of compensatory strategies to enhance performance on everyday tasks

What is "cognitive rehabilitation?"

Summary:

- Involves metacognitive training
- Consists of a variety of intervention strategies and techniques (both group and individual)
- Highly individualized (patients and families are involved in setting goals and measuring outcomes)
- Can be provided by a variety of professionals

Key Points in Cognitive Rehab Treatment

The goal of cognitive rehabilitation therapy is to help an individual enhance his or her ability to move through daily life by **recovering** skills or **compensating** for damaged cognitive functions.

- Goal's must be functional and SMART*
- Highly individualized
- Family support and involvement is crucial
- Client is the most important member of the team

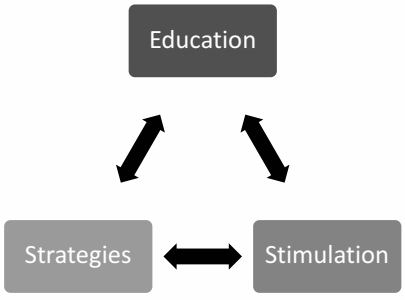
S- specific, M- measureable, A- attainable, R- realistic/resourced, T- timely & time bonded

Treatment Cognitive Rehab Targets Improved Functional Outcomes

Extensive client/family education

Stimulation for recovery of underlying skills

Development/training for compensatory strategies



Education- Therapist is a Teacher

GENERAL education

- The neuroanatomy of the brain, physiology, mechanics of injury to the brain
- Role of insight into problems and how insight is impacted after an ABI
- Patterns of recovery from ABI
- The process of Cognitive Rehabilitation
- Cognitive functions and how they are impacted in ABI
- Emotional consequences of an ABI
- Coping skills
- School advocacy

Education- Therapist is a Teacher

SPECIFIC, INDIVIDUALIZED education

- How do Susan's deficits impact her?
- What challenges does she currently have?
- What challenges will she face in the future?
- What are the priorities for treatment?
- What area(s) can be targeted in treatment
- "go over the menu" with them

Must Have Resource

Optimizing Cognitive Rehabilitation: Effective Instructional Techniques

by McKay Moore Sohlberg and Lyn S. Turkstra (2011)

- Instructional theory is critical to the delivery of effective rehabilitation
- Use a term called systematic instruction: persons with learning challenges (like ABI) benefit most from structured training that includes explicit models, errorless learning, strategies to promote learner engagement, and carefully guided practice to promote mastery, maintenance and generalization
- Developed a training framework: PIE
- Plan, Implement, Evaluate

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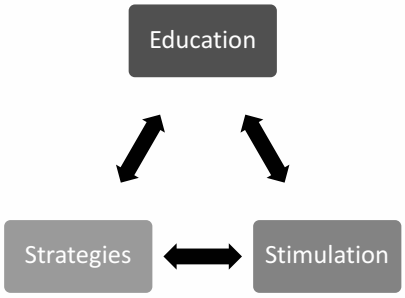

Stimulation/Process Training

- An analysis identifies the deficient underlying key cognitive processes
- Training exercises are designed to improve a particular deficit
- Can involve pen/paper, remedial games, computer tasks, OR functional real-life activities
- With correct kind of stimulation, new neurons can create optimal neural pathways and templates
- "Cells that fire together, wire together"
- A direct retraining of cognitive processes can result in reorganization of higher level thought processes

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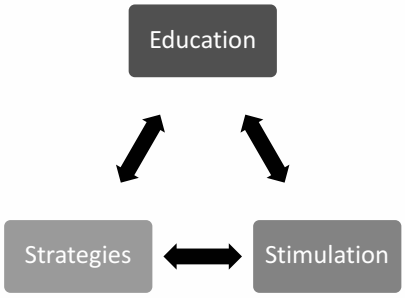

Strategy Training

- Strategies are taught to compensate for deficits
- Complementary to the process training since if a deficit does not improve, strategy training aims to teach the person how to bypass the problem
- The problem is still there, but the functional impact of it is minimized
- This is not an easy option, whole books have been written about this process
- Takes a long time
- Not everyone can benefit from, or use strategies
- Need metacognitive awareness

Process for Developing Strategies for Functional Independence

1. Determine a functional outcome goal
2. Determine the deficits contributing to poor outcome
3. Educate patient/family re: deficit and goal
4. Probe patient's insight/awareness of impact of deficit and target this in therapy as needed (metacognition)
5. Develop a strategy/accommodation to achieve functional goal
6. Target the strategy in therapy to train the client in use
7. Train the caregivers and support system
8. Develop reinforcement system to help generalize to functional tasks
9. Target generalization of strategy to functional tasks
10. Once a strategy/step is mastered move on to the next one

Determine a Functional Outcome Goal

- If the patient or family has many areas of need: choose one that will be the LEAST challenging to target first for fast success
- Examples:
  - Teacher would like child to complete in class work independently
  - Adolescent would like to be able to work the cash register at fast food restaurant
  - Adolescent wants to be able to remember words and motions to cheers
  - Parent wants child to be able to follow directions in the home/school

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Determine Which Deficits Contribute

You can do this by:

- Reviewing assessment results (standardized assessment)
- Observe patient in functional tasks or ask them to complete specific tasks designed to tease out deficits
- May need patient/family to keep data
- Ask specific questions designed to break down task into components and determine what the deficits are (interview skills)

Example for Determining Deficits

Teacher would like child to complete in class work independently.

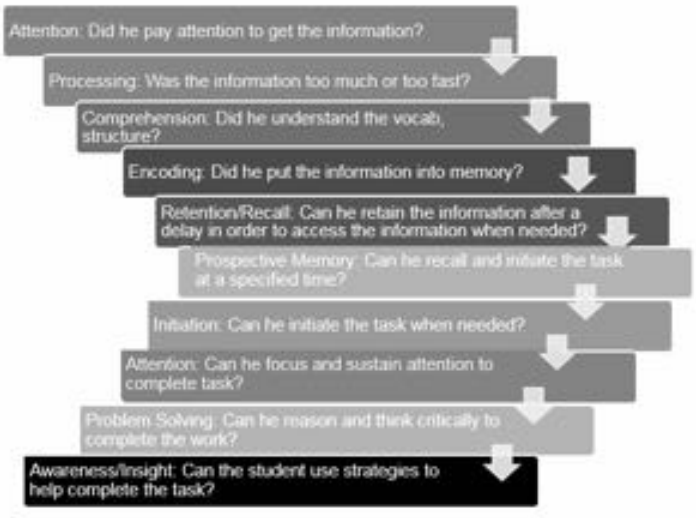
Child cannot complete work independently because….

- did not attend to the directions and/or could not process them
- loses focus and attention and gets off task (internal or external distractions?)
- unable to remember all the steps

Clinical Reasoning

- We need to be "detectives" and use the combination of knowledge of neuroanatomy and physiology, past experience, education of pt./family and good interview skills to gain information from patient/caregiver, team member report, observation in functional activities, data collected from well-designed tasks to control for variables, literature and best practices
- CLINICAL REASONING IS CRUCIAL

"He can't follow directions"



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Educate patient/family re: deficit and goal

- Once you have determined the skills which need to be targeted (for recovery or for development of compensatory strategies) EDUCATION is involved in every session, every task, every discussion
- Education is the key to improving metacognitive awareness and thereby developing and successfully applying strategies

Educate patient/family re: deficit and goal

Keys to successful education:

- Knowing how much information to give
- Taking into account the acceptance level and emotional status of the patient/family
- Be aware of the "buy in" of the patient/family
- What type of information to give, what method
- Use "teaching moments"
- Active learning (patient writing)
- Ask "what do you know?" (attention ex.)

Educate patient/family re: deficit and goal

Present at the correct rate and level (use analogies):

- Processing Speed: bridge is out, traffic jam, mud, teenage girls talking
- Memory: liquid on keyboard, filing cabinet
- Word Finding: Jukebox

Kinds of Attention

FOCUS

Able to pay attention and concentrate

KEEPING FOCUS

Able to keep paying attention and focus as it takes to do the work

BLINDER FOCUS

Keep focus even when there are distractions around. Put on the blinders and block it all out.

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Determine Patient's Insight/Awareness and Target as Needed

- Good insight/awareness/metacognition is the key to successful strategy use
- You may need to stay at this point for a while before moving on to developing strategies
- There are different levels of awareness/insight
- How can you improve metacognition?

Improve Metacognition

- Use pre-post self-assessments for tasks targeting skill
- Use self-evaluation forms and solicit feedback from other sources
- Have patient keep a journal
- Have others "gently" point out occurrences when deficit impacts in real life
- Complete tasks in therapy and discuss patient's performance: then link to real world outcomes of same level of performance

Can you improve metacognition in younger kids? YES!!

Process (Using interrupting as an example)

1. Describe the deficit in language they understand ("jump in", "rudey")
2. Observe them and take a baseline of how often it occurred in a task and provide them a visual representation (I use smiley/sad faces)
3. Get them to accurately identify that deficit/behavior in others (buzz game is fun!)
4. Once they can do that, establish a task and tell them you are going to "rate" them and set a goal, i.e. was 10, now 8
5. Then see if they can self-rate and disinhibit that behavior

Case Study: Brandy

- Brandy is a 16 year old girl who sustained a TBI
- Initial evaluation: Brandy endorsed mild attention deficits but no impairments in memory, problem solving, processing, exec fx
- IE: moderate decrease in attention, processing speed, memory, impulse control and a reduced frustration tolerance
- Initial sessions spent providing lots of education re: TBI, expected deficits associated with her injuries, probing functional impact of deficits with interview questions and activities designed to demonstrate her deficits
- She was accepting of the information, fun to work with, polite, but no real "buy in" to what I was "selling"

Case Study: Brandy

- In 3rd session, got on board with the attention deficits after I asked her to complete a simple worksheet and then brought in different distractions (phone, talking, noise, laughing). Asked her to tally how many times her attention wandered during that task in 10 minutes- she stopped at 30
- I also started to point out when she got the "spacey look" (her agreed upon term) when I was talking
- We began to develop strategies for attention/focus and target attention skills with APT II
- She began to report functional gains by 5th session- more able to block out noise in class, less bothered by distractions, more aware of when she was and was not paying attention
- Accomplished improved insight and metacognition for strategy use

Case Study: Brandy

- Next targeted improved insight to memory deficits
- Even after she was "buying" the attention problems, she still did not see her memory impairment (impact in school buffered by her previous accommodations)
- Started to play computer games to build insight to memory deficits
- Even though the games were somewhat juvenile, she had fun with them and when she could not "beat" them, she began to realize that it was due to memory impairment
- At first I just observed, then began to point out memory breakdown, then began to suggest strategies
- She began to actively use strategies, improvement in game = realization that they work
- Generalization to functional activities is focus now
- Goal- better memory for cheerleading

Insight Building with Rating Scale: Brandy

- By the 10th session, Brandy agreed to fill out a rating scale and provide it to friends and family
- She endorsed functional impact of memory problems with "sometimes" or "often" ratings on 8/10 questions (family/friends were commensurate)
- She reported that her self-ratings changed significantly since initiating therapy
- She reported "significant" benefit from therapy as did 4/5 of friends and family and all reported noticing functional improvement with use of strategies
- She was aware of her tendency to become irritated much more easily and to act impulsively
- She was not aware of her tendency to misunderstand conversations and make mistakes when re-telling stories
- This lead to development of strategies for improved comprehension and retention of conversations

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Strategy Training

3 categories of "strategies"

Accommodations (Environmental Supports)

- those which the individual does not have to take any responsibility
- Altering the environment around the individual

Strategies (internal, self-strategies)

- Person relies on him or herself
- Cannot be physically touched, they are inside the person's head
- Ex. visualization, association, mnemonics, retracing, focus man

External Aids (can be high tech or low tech)

- The person relies on others, physical objects, or devices.
- Ex. Computer, iPad, cell phone, lists, calendar, watches, alarms

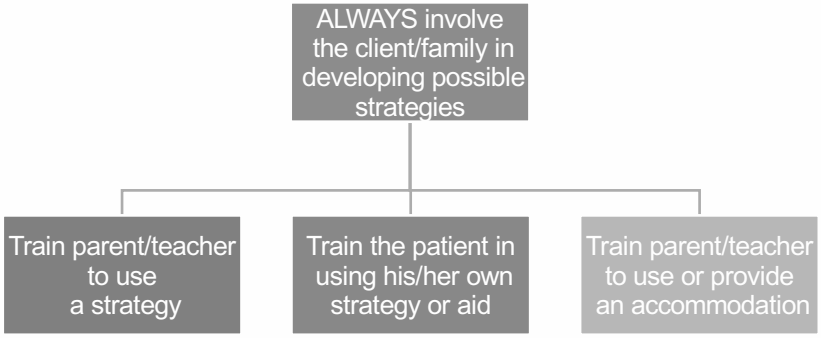
Teacher would like child to complete in class work independently

- Child did not attend to the directions and/or could not process them
- Child loses focus and attention and gets off task (internal or external distractions?)
- Child unable to remember all the steps
- Teacher slows the rate at which instructions are presented. Provides written copy of directions (Accom)
- Child allowed to do work in quiet environment. Teacher moves desk (Accom)
- Timer or watch alarm help redirect to task (ext. aid)
- Child taught to use "blinder focus" or "focus man"
- Child taught to use verbal rehearsal to encode directions prior to starting

Successful Strategy Training: Build Insight and Practice

- Good metacognition (insight/awareness), is the key to successful use of strategies
- Building metacognition is a crucial step in therapy, if you skipped it- go back
- If the client does not, or cannot, recognize the problems due to an insight or awareness problem, he/she will not see the need to use a strategy
- Even with awareness and insight, it takes a significant amount of time and practice to make the use of a strategy- routine or habitual
- Strategy training must be done with the client, family, friends, teachers, etc.

Develop a strategy/accommodation to achieve functional goal



Develop a strategy/accommodation to achieve functional goal

- As a clinician, you should have a “bag of tricks” to pull from
- Resources: books, continuing ed, “how to books”, other populations (ADD, tourette’s)
- Other patients, teachers, colleagues, parents
- Have suggestions ready but be open to ideas from patients and caregivers
- I have gotten great ideas from them!

Keys to successful strategy development and use

- The goal is to have the child/adolescent, with family input, come up with the idea
- To start, we create a chart describing the deficit, the functional impact, the "annoyance" factor, possible strategies
- Have them "name" the strategy to make it personal
- Have them create a written or picture description of the strategy
- I have all of my kids keep a "strategy" notebook which they manage, make, and keep

Amy: Making sure "I got it"

"Put the Breaks On!"

Ask others to slow down when they are talking too fast

"Say What?"

Ask others to repeat information

Check It!

Re-tell the information to verify I got it

DARAH'S GOOD LISTENING

JOB STOPPER

he takes away my attention so I can't do what I am supposed to do

JOB STOPPER: USES DISTRACTIONS TO STOP YOU FROM DOING A JOB WELL OR FINISHING A JOB. HE TAKES AWAY YOUR ATTENTION.
USE FOCUS MAN TO BLOCK THE JOB STOPPERS AND GET THE JOB DONE

V

S

My distractions

TOYS

TV

WHISKERS

PEOPLE

ME

Find the answer in my own brain

THINK

SOLVE THE PROBLEM

1. Say what the problem is.
2. Think of possible fixes.
3. Think of what could happen for each fix.
4. Choose the best fix.

Problems Natalie has solved in therapy

1. The cat jumps on me at night
2. Steven keeps asking me the same questions over and over
3. Getting a drink in therapy

Examples of Strategies and Accommodations: Brandy

Attention strategies/accommodations

- moved to front in all classes
- asked friends not to talk with her in class
- began to use Smart Pen- Live Scribe for note taking (www.livescribe.com)
- "force field focus" to block distractions
- "snap" back to focus
- honest with friends when she could not focus on a conversation/story

Examples of Strategies and Accommodations: Brandy

Memory strategies/accommodations

- "Active Encoding" purposefully put into memory
- Cell phone "home" in each room (decreased losing cell phone from 10x per day to 1x in a week, in only one week)
- repeat back to check accuracy of recall
- honest with friends when she is "full up"
- Self-rehearsal to hold information in memory for a short time
- Videotaping cheer practice

Collaboration with School

- Joshua is a 14 year old s/p meningitis who demonstrated mild-moderate deficits in processing speed, memory, and reading comprehension.
- These deficits greatly impacted him in the school environment and he felt very overwhelmed by teachers' expectations
- His mother reported difficulty getting Joshua to communicate his feelings to teachers and a feeling that the teachers "just don't get it"
- So, together, we developed a daily tracking sheet which described his understanding/memory/grasp of material

Collaboration with School

Daily Tracking Sheet

Class: _____ Date: _____

Activity/Topic: _____

Understanding Scale Rating: 5 4 3 2 1

Reason for Rating: _____

Assignment(s)/Due Date: _____

Student/Parent/Teacher Comment: _____

_____

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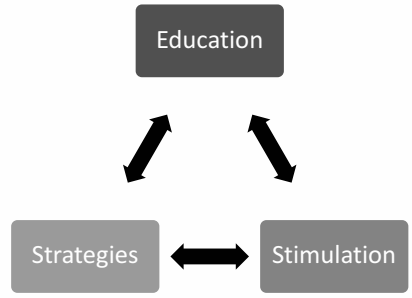
Extensive client/family education

Stimulation for recovery of underlying skills

Development/training for compensatory strategies



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Ally's tools for success

Area of Challenge	Possible Outcomes	What I can do/Strategies
Math	•Don't understand what the teachers talking about. •Won't be able to understand and then catch up with the other students	•I could ask my sister for help •I could ask my Dad for help •Ask the teacher for pointers before I start to have problems
Writing	•Getting stuck •Difficulty getting the words on paper •Grammatical error •Awkward wording •Misspelling words	•Use the How To Overcome Writers Block paper •Hamburger Strategy •Somebody/someone check the paper for me •Rereading it or hearing it read aloud •Look it up in dictionary/thesaurus
Word Finding	•Not being able to come up with the words that I'm thinking in my brain •I feel stupid/ •People find it difficult to talk to me	•Mentioning that I struggle with word finding out loud •Pause •Rewording/using alternate words
Reading Comprehension	•Not understanding what I'm reading •Have to read things sometimes two to three times to understand it	•Re-read material •Use Sparknotes to help •Outline •Read aloud •Books on tape

Wrap-Up/Questions

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