Brain TLC:
Supporting Brain Health with Cognitive Rehabilitation

Kristin Knight, MS, CCC-SLP
Haley Landau, MS, CCC-SLP

April 26, 2018
TODAY’S PLAN

• Provide an overview of:
  • The role of the speech-language pathologist (SLP)
  • Cognitive rehabilitation plan of care
  • Strategies with time for practice
  • Ideas to support brain health
• Q&A at the end
THE ROLE OF THE SLP

• Training
  • Master’s or Doctorate Degree
    • Course work and clinic rotations
  • Clinical fellowship year post graduation
  • Regular participation in continuing education trainings
THE ROLE OF THE SLP

• Settings
  • Early intervention (birth-3)
  • School-based
  • Hospital
  • Home health
  • Skilled nursing facility
• Outpatient clinic
THE ROLE OF THE SLP

• Areas targeted:
  • Speech clarity
  • Language: comprehension and expression
  • Voice
  • Swallowing: Recommend diet modifications and strategies to eat safely
  • Cognitive communication: Our focus today
OUTPATIENT REHAB CLINIC AT OHSU

• SLPs are specialized in cognitive communication and language therapy

• Frequent diagnoses seen in our clinic:
  • Mild Cognitive Impairment (MCI)
  • Dementia
  • Stroke
  • Brain injury
  • Parkinson’s Disease
  • Multiple Sclerosis
  • Cancer: Chemo fog
WHAT IS COG REHAB?

• An individualized program to restore baseline cognitive functioning with exercises and develop strategies to compensate for cognitive changes
COG REHAB PLAN OF CARE

• Evaluation process:
  • Interview: Concerns/changes in cognition, activities that are now challenging, current tools, background (medical history, social/interests, education level, prior/current work)
  • Formal assessments to detect changes in memory, attention, word retrieval, and speed of processing
  • Self-rating questionnaires
COG REHAB PLAN OF CARE

• Treatment:
  • Based on interview and assessments, set goals with client and family
  • Develop strategies and exercises to meet goals
  • Home program
  • Reassessment and updating goals
Cognitive (Thinking) Pyramid

- Executive Functions (Organization, Planning, and Problem Solving)
- New Learning
- Memory
- Attention
- Speed of Processing
- Energy

Pain  Sleep  Illness/Injury  Balance/Vision  Nutrition  Stress  Mood  Activity  Meds
Cognitive (Thinking) Pyramid

- Executive Functions (Organization, Planning, and Problem Solving)
- New Learning
- Memory
- Attention
- Speed of Processing

Energy

Pain  Sleep  Illness/Injury  Balance/Vision  Nutrition  Stress  Mood  Activity  meds
ENERGY

• Sleep hygiene
  • Pre-bedtime routine
  • Maintain same sleep/wake times
  • Limit prior to bedtime:
    • Caffeine and other stimulants
    • Foods that are heavy or cause indigestion
    • TV and phone screens
  • Regular exercise
  • Create an environment conducive to sleep
ENERGY

• Energy is limited and is ever-changing

• Many things impact energy and thereby cognition
  • Fatigue
  • Pain
  • Mood
  • Stress
SPEED OF PROCESSING

• The rate at which you take in auditory and/or visual information, make sense of it, and begin to respond

• Slowed speed of processing affects overall communication and many of the cognitive domains

• Can be one of the first cognitive abilities to decline with aging

• Linked to completion of daily activities, some of which are essential for maintaining independence (Ball et al., 2007)
  • Driving safety, mobility/fall risk, looking up a phone number, finding item at supermarket, or counting change

• Domain-specific strategies to be discussed throughout presentation
Cognitive (Thinking) Pyramid

Executive Functions (Organization, Planning, and Problem Solving)

New Learning

Memory

Attention

Speed of Processing

Energy

Pain  Sleep  Illness/Injury  Balance/Vision  Nutrition  Stress  Mood  Activity  Meds
ATTENTION

• Levels of attention
  • Sustained: focus on one specific task for a continuous amount of time
    • Reading, e-mailing, cleaning the bathroom
  • Selective: focus on stimuli while filtering out other distractions
    • TV on while completing above tasks
  • Alternating: ability to switch focus back and forth between multiple tasks
    • Cooking
  • Divided (?): process two or more stimuli simultaneously, “multi-tasking”
SUSTAINED ATTENTION STRATEGIES

• Set manageable, balanced goals
• Maintain a consistent routine
• Timers
• Set up environment for success
• Meta-cognitive strategies
  • Catch yourself - redirect
  • Self-talk
• Certain activities are more demanding on attention, so plan accordingly and make time for breaks
SELECTIVE ATTENTION STRATEGIES

• Limit distractions
  • Keep a neat work area
  • Phone ringer, tv, radio off
  • Computer pop-ups
  • Manage internal distractions
    • Wanders list

• Exercise selective attention by completing a relatively easy task and gradually adding in distractors (music/TV, complete task in a different environment)
ALTERNATING ATTENTION STRATEGIES

• To help with task shifting
  • Know your limits — try not to quickly jump between tasks when possible
  • Build in transition time to shift between tasks
  • Write a note about where you stopped to make it easier to transition back to the task later

• Exercise alternating attention by shifting attention in a controlled setting — complete puzzle or house chore while listening to the news or a TV show. Can you keep up with both?
MEMORY

• Components of memory
• Stages of memory processing
• Other types of memory
• Strategies
  • Internal and external
MEMORY

Components of memory:

• Attention – must first pay attention to remember
• Encoding – initial learning of incoming information
• Storage – maintaining info for a period of time
• Retrieval – recalling the stored information so it can be used
MEMORY

Stages of memory processing:

1) Registration – holds large amounts of data for seconds

2) Short-term memory – holds info for 30-45 seconds
   • Working memory – holding and mentally manipulating info over short periods of time
   • Intermediate – holds info 1-2 days, but not permanent

3) Long-term memory – lasting retention of info and skills
   • Procedural – knowing how to do things
   • Semantic – storing info about the world
   • Episodic – storing info about events we have experienced in our lives
MEMORY

Other types of memory:

• Prospective memory – “remembering to remember”

• Source memory – remembering how we learned something
# MEMORY

Strategies and Tools:

**External** —
- Use a calendar/planner
- Take notes or write reminders
- Write lists
- Take photos
- Use timers and alerts
- Memory Shrine

**Internal** —
- Association
- Imagery
- Repetition
- Chunking
- Mnemonics
- Method of Loci
- Acronyms
MEMORY

NAME strategy – acronym that stands for several ways to more deeply encode a person’s name to recall it later

• Notice the person – pay attention during the initial introduction

• Associate the person’s name with a visual image, something you know about them, or someone else you know with that name

• Mention their name several times in conversation

• Exaggerate a distinguishing feature
MEMORY

Let’s practice!

• Introduce yourself to someone you have never met and try using the NAME strategy to during a short conversation.
NEW LEARNING

Process of acquiring new or modifying existing knowledge, behaviors, skills, values, or preferences.

Metacognition is important for new learning

• “Thinking about our thinking”

• Guides our learning strategies

• Consists of:
  • Knowledge of cognition
  • Regulation of cognition — plan, monitor, evaluate
NEW LEARNING

Metacognitive strategies to support new learning include:

Think Aloud

• Narrate what you are doing as you do it. This can increase self-awareness during learning.

Self-explanation

• Use writing or speaking to explain the concept you are trying to learn to improve comprehension.

Self-reflect

• What learning strategy worked well and what did not? What will I do differently next time?
Cognitive (Thinking) Pyramid

Executive Functions (Organization, Planning, and Problem Solving)

New Learning

Memory

Attention

Speed of Processing

Energy

Pain  Sleep  Illness/Injury  Balance/Vision  Nutrition  Stress  Mood  Activity  Meds
EXECUTIVE FUNCTIONS (EF)

• The “CEO” of our brain – in charge of ensuring things get done

• Executive functions (EFs) consist of a family of three, interrelated core skills:
  • Inhibitory control
  • Working memory
  • Cognitive flexibility (Miyake et al., 2000; Diamond, 2013).

• From those three areas, one can build higher-order EFs, such as reasoning, problem-solving, and planning (Collins and Koechlin, 2012; Lunt et al., 2012).
EXECUTIVE FUNCTIONS (EF)

• EFs depend on the prefrontal cortex and other neural regions the prefrontal cortex is interconnected with (Aron et al., 2007; Eisenberg and Berman, 2010; Leh et al., 2010)

• Because the prefrontal cortex is the newest part of our brain, it and EFs suffer if one is stressed, sad, lonely, or not in good physical health.

• When relaxed, un-stressed, emotionally and socially nourished, and in good health, EF capabilities are more optimal.
EXECUTIVE FUNCTIONS (EF)

Strategies that support EFs include:

• Break down larger tasks into individual steps
  • Set a goal. Write all steps needed to reach goal.

• Organize work spaces and minimize clutter
  • Schedule time each week to organize and clean

• Use a visual schedule and review it frequently
  • Create check lists and to-do lists
COMMUNICATION

An exchange of information, ideas, needs, wants, feelings, and preferences

• Word retrieval – “it’s on the tip of my tongue”
  • Circumlocution – talk around the word
    • Describe what it looks like, what it is used for, where you find it, or the category it belongs to
  • Synonyms – use a similar word
  • Pause-think-speak – stress can make word-finding worse
    • Give yourself a second to think of the word or use a strategy
COMMUNICATION

• Thought organization
  • Who/what/when/where/why
  • Setting, characters, plot, outcome
  • Problem and solution
  • Chronological order of story
  • Compare and contrast

• Tracking a conversation
  • Control environment
  • Speaker control strategies
COMMUNICATION

- Speaker control practice
- What questions does Haley ask to control the rate of incoming info?
BRAIN HEALTH AREAS

- Physical activity
- Social engagement
- Cognitive exercise
- Balanced nutrition

(Williams and Kemper, 2010)
BRAIN HEALTH

• Physical Activity
  • Walking
  • Gym
  • Group classes
  • Yard work/house projects

• Social Engagement
  • Family and friends
  • Volunteering
  • Community organizations and groups

• Balanced nutrition
BRAIN HEALTH: IS COGNITIVE EXERCISE WORTH IT?

• Some rationale:
  • Neuroplasticity: the brain is continually changing, it has capacity to adapt
  • Cognitive reserve: ability to engage alternate brain networks or strategies to cope with the effects of pathology

• Computerized training (Finn and McDonald, 2011) improved attention, processing speed and memory.

• Research indicates older adults can improve cognitive abilities with training protocols targeting cognitive domains, such as memory and reasoning. Speed of processing training can positively impact everyday functioning among older adults. (Ball et al., 2007)
BRAIN HEALTH

• Cognitive Stimulation
  • Exercises
    • Word and number puzzles
    • Jigsaw puzzles, card and board games
    • Apps (Lumosity, BrainHQ, Peak)
  • New Learning Activities
    • Take a class
    • Attend a community lecture
    • Book club
    • Try a new hobby, house project, or recipe
Q & A

• Thank you for joining us!

• Questions?

• Contact us with additional questions:
  • knikris@ohsu.edu
  • landauh@ohsu.edu