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CONTINUED

Technical issues with the Recording?

- Clear browser cache using these instructions
- Switch to another browser
- Use a hardwired Internet connection
- Restart your computer/device

Still having issues?

- Call 800-242-5183 (M-F, 8 AM-8 PM ET)
- Email customerservice@SpeechPathology.com

Treatment of Mild Cognitive Impairment

Kim McCullough PhD CCC/SLP

Moderated by:
Amy Hansen, MA, CCC-SLP, Managing Editor, SpeechPathology.com

Need assistance or technical support?

- Call 800-242-5183
- Email customerservice@SpeechPathology.com
- Use the Q&A pod

continued

How to earn CEUs

- Must be logged in for full time requirement
- Log in to your account and go to Pending Courses
- Must pass 10-question multiple-choice exam with a score of **80%** or higher
  - Within **7 days** for live webinar; within **30 days** of registration for recorded/text/podcast formats
- Two opportunities to pass the exam

continued

Treatment of Mild Cognitive Impairment

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CONTINUED

Learning Outcomes

After this course, participants will be able to:

- Explain the rationale for intervention with older adults.
- List the key components of successful intervention programs.
- Describe the strategies and activities that SLPs can use during intervention.

5

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Quick Facts: Alzheimer's Disease (AD)

- Every **65 SECONDS** someone in the US develops the disease.
- Between 2000 and 2015 deaths from heart disease have decreased 11% while deaths from AD have increased 123%.
- In 2018, AD and other dementias will cost the nation $277 billion by 2050, these costs could rise as high as $1.1 trillion.
- Early and accurate diagnosis could save up to $7.9 trillion in medical and care costs.

https://www.alz.org/facts/

6

CONTINUED

MCI Defined

Transitional zone between normal cognition and dementia.

More people with MCI than those without it develop Alzheimer's Disease.

About 8 of every 10 people who have amnestic MCI go on to develop Alzheimer's disease within 7 years.

(Petersen, 2016; NIA, 2017)

7

CONTINUED

NIH-ADRDA Criteria for MCI-AD

(McKhann et al 2011)

- Concern regarding change in cognition compared to prior level.
- Impairment in one or more cognitive domains.
- Preservation of independence in functional abilities.
- Not demented.
- Criteria involving biomarkers are still in the <u>research</u> phase.

8

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DSM-5 Criteria for Mild NCD (2013)

- Evidence of modest cognitive decline from a previous level of performance in one or more cognitive domains based on:
  - Concern regarding change in cognition compared to prior level.
  - A modest impairment in cognitive performance (documented by standardized neuropsychological testing).
- Cognitive deficits do not interfere with capacity for independence in everyday activities.

9

CONTINUED

World Health Organization (WHO):

- Dementia is a GLOBAL ISSUE
- The World Health Organization (WHO) released a comprehensive action plan that emphasizes prevention as a key component in the global response to dementia (WHO, 2017).

10

What do we know about Cognitive Intervention?

- Cognitive training can improve cognitive abilities.
- Dementia drugs cannot.
- Cognitive training programs that are in a group format and address multiple cognitive strategies seem to be the most promising.
- No scientific evidence exists that cognitive training can prevent Alzheimer's disease (AD) or other forms of dementia or MCI.
- Rigorous research is still needed before firm conclusions can be drawn.

Kueider, Bichay, and Rebok 2014

11

NIA-NASEM 2017 Recommendations: Moving Forward

- **Exercise** on a regular basis to benefit your heart and blood vessels, including those that nourish your brain.
- **Blood pressure management** for people with hypertension, especially in mid-life.
- **Cognitive Training,** aimed at enhancing reasoning, memory, and speed of processing, to delay or slow age-related cognitive decline is promising.

www.nationalacademies.org/dementia .

12

CONTINUED

An intervention that delays the onset of dementia by just 5 years would result in a 57% reduction in the number of people with dementia and an estimated reduction of $283 billion in Medicare costs
(Sperling et al., 2011).

13

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Fact: There is **not** a direct relationship between the degree of brain pathology and the clinical manifestation of that damage
(Stern, 2011).

14

CONTINUED

25% of individuals who have postmortem evidence of Alzheimer's do **not** exhibit symptoms of dementia during life (Ince, 2001).

15

CONTINUED

- People with higher levels of education and occupational attainment can sustain greater brain damage before exhibiting functional deficits. Why?

Because of differences in their "cognitive reserve"

16

continued

What is cognitive reserve?

The mind's resistance to brain damage.

17

continued

SLPs can help individuals build cognitive reserve.

18

CONTINUED

Cognitive Reserve

- Built over a life-time.
  - Education
  - Occupation
  - Leisure activities
- The ability to engage alternate brain networks or cognitive strategies to cope with the effects of pathology.
- Can build new knowledge and skills.
- Can "use not to lose" existing knowledge and skills! Stern, 2012

19

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Neuroplasticity underlies Cognitive Reserve

- The brain is continually changing.
- The brain has the capacity to learn and improve almost any function.
- Key Concepts:
  - Mood Matters
  - Neurons that fire together Wire Together
  - Memory guides and controls most learning
  - Use it or lose it

Merzenich, Michael. (2013). Soft-Wired: How the New Science of Brain Plasticity Can Change Your Life.

20

CONTINUED

Impact Study (Rebok, 2014)

- Training was conducted in small groups
- 10, 60-75 minute sessions over 5-6 weeks.
  - Two Booster Sessions 1 & 3 years
- Memory training focused on improving verbal episodic memory through instruction and practice in strategy use.
- Reasoning training focused on improving the ability to solve problems that contained a serial pattern.
- Speed-of-processing training focused on visual search and ability to process increasingly more complex information presented in successively shorter inspection times.

21

CONTINUED

Impact Study (Rebok, 2014) 5 and 10 years later……

- Benefits in reasoning were shown to last at least five years.
- Benefits in speed of processing persisted for up to ten years.
- Effects of cognitive training on daily function were modest
- Speculations……
  - Could reflect a cascade relationship between cognitive ability and daily function
  - Improved cognitive processing may alter patterns of neural activation over the long-term
  - Training-based improvements in cognitive abilities may promote “healthy lifestyle choices” and maintenance over many years

22

CONTINUED

FINGER (2015; 2017)

Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (Ngandu et al., 2015; Rosenberg et al., 2017).

- 2-year multicomponent intervention focused on cognitive training, exercise, diet, and vascular risk.
- Over 1200 participants at risk for cognitive impairment participated.
  - Control group (n=629) received regular health advice
  - Intervention group (n=631) received nutritional intervention, physical exercise training, monitoring and maintenance of metabolic and vascular factors, and cognitive training.
- Cognitive training took place in both individual and group sessions and included a computer-based weekly homework component.
- Improvement was 25% to 150% better in the intervention group
- All at risk elders can benefit from multi-domain interventions

23

CONTINUED

MEMO+ (Belleville et al., 2018)

- Participants with MCI (n=145) were assigned to one of three groups: cognitive training, psychosocial training, and a no-contact control group. Both the cognitive and psychosocial training were administered in *eight weekly sessions of 120 minutes*.
- The educational content of the cognitive training sessions was as follows:
  - Session 1: Memory and healthy aging
  - Session 2: Attention training
  - Session 3: Visual imagery skill building
  - Session 4: Method of loci
  - Session 5 Learning names of new acquaintances.
  - Session 6: The PQRST (Preview, Question, Read, State, Test) method was taught.
  - Sessions 7: Review of strategies from previous sessions; external memory aids
  - Sessions 8: Review of material from previous sessions.

24

CONTINUED

MEMO+ (Belleville et al., 2018)

- Outcomes:
  - Improved performance on outcome measures related to cognition, well-being and generalization of strategy training were still present at the 6 month follow-up.
- Participants in the psychosocial and no-contact groups did not demonstrate improved performance on the outcome measures.

25

CONTINUED

Meta-analysis of the Efficacy of Cognitive Intervention (Sherman et al., 2017)

- The duration of intervention (number of hours) had little influence outcomes
- Memory focused interventions appear to be more effective than multidomain approaches but both resulted in improvement on outcome measures

26

CONTINUED

Based on the literature here's what we did:

- 36 total participants
  - 27 females
  - 9 males
- Mean age of 80 years old
- Mean years of education was 15.4 years (3+ years of college)

27

CONTINUED

Program Structure: 1 hr/wk for 10 Weeks

- Pre-Assessment
- Week 1: Your Brain and Neuroplasticity
- Week 2: Attention
- Week 3: Memory Strategies Part 1
- Week 4: Memory Strategies Part 2
- Week 5: Language Comprehension
- Week 6: Language Production
- Week 7: Executive Functioning
- Week 8: Guest Speaker -Nutrition and Wrap Up
- Post-Assessment

28

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Pre & Post Assessment

- Questionnaire – Risk Factors, Subjective Complaints
- Self-Perception Questionnaires
- MMSE
- Portions of the ABCD
  - Speech Discrimination, Visual Perception, Literacy, Visual Field, Visual Agnosia
  - Story Retell – Immediate and Delayed Conditions
  - Following Commands
  - Repetition
  - Generative & Confrontation Naming
  - Concept Definition
  - Generative Drawing

29

CONTINUED

Education regarding Brain Healthy Habits:

Topic Examples:

- **The Aging Brain**
- **Physical activity**
- **Sufficient sleep**
- **Stress reduction**
- **Nutrition**
- **Hearing Impairment**

30

CONTINUED

Clinical Considerations:

- Appropriate task complexity
  - Manipulate based on performance
- Active engagement & Self-generation
  - Attention
  - Relevance
- *Distributed practice*
  - *Homework tasks*

- Methods:
  - Paper/pencil
  - Group Activities

Individual activities were in smaller groups (ratio varied from 1:2, 1:3, or 1:4;) Participants were strategically grouped.

31

CONTINUED

The Benefit of Group Setting: Improves Cognitive Reserve

- Increased loneliness associated with MCI and faster rate of cognitive decline over time. Wilson et al 2002.
- Decline in a participation time spent out of the home for those with MCI compared to HOA. Kaye et al 2011.
- Quality social relationships contribute to good health, lower levels of stress
  - Mendes de Leon et al (2003)
- Positive feelings have a positive influence on the body's immune system Lyyra & Heikkinen (2006)

32

CONTINUED

Memory Strategies

- *Method of loci*
- *Face-name associations*
- *Chunking*
- *Organizational Strategies*

33

CONTINUED

Evidence: Memory Strategy Training

- fMRI Imaging Evidence:
  - Significant changes in a large brain network that includes regions typically implicated in memory after an eight session intervention focusing on episodic memory strategies, metacognition and computer-based training of attention (Bellville et al., 2011).
  - Take aways:
    - the older brain is highly plastic
    - the older brain remains plastic even during early phases of disease
    - increased brain activation is found in areas related to the intervention

34

CONTINUED

Evidence: Memory Strategy Training: fMRI Imaging Evidence:

- N = 18 aMCI and 16 HOA
- **Intervention:** Taught to use a three-step process for object location based on a salient feature close to the object
- 5 sessions within 2 weeks
- MCI Mnemonic strategies group showed increased activity within the left hippocampal body for both trained and untrained stimuli (Hampstead et al., 2012).

35

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Example Activity: Language
Write a *story* using all of the words listed below:

- Exercise
- Stock market
- Mental
- Storm
- Gorilla
- Anxious
- Rheumatism
- Rational
- Indecisive
- Main library
- Crisis
- Exaggerate
- Cowboy
- Happiness
- Eat
- Delightful

36

CONTINUED

Example Activity: Memory Strategy, Language

- Each participant was given a list of questions and was charged with going around the room to find people to fit that description.
- Questions:
  - Someone with the same number of children as you.
  - Someone with the same shoe size.
  - Someone who graduated high school in the same year as you.
  - Someone with 3 grandchildren.
  - Someone who took a vacation last month.

37

CONTINUED

Example Activity: Attention

Education:

limiting distractions

exercise,

taking breaks

Taught reflection on thinking processes.

Discussed verbalizing thoughts.

Completed Attention paper/pencil tasks

cancellation tasks

38

continued

Preliminary Results: ABCD SUBTEST RESULTS

Arizona Battery for Communication Disorders of Dementia

39

continued

ABCD: Overview

- Has “comparison data”
- All memory and language tasks supported in the literature are included
- 14 subtests divided into 5 Main Constructs
  - Mental Status
  - Episodic Memory
  - Linguistic Expression
  - Linguistic Comprehension
  - Visuospatial Construction

40

CONTINUED

ABCD Domains

Linguistic Expression	Linguistic Comprehension	Verbal Episodic Memory and Learning	Mental Status	Visuospatial Construction
Object Description	Following Commands	Story Retelling: Immediate	Mental Status	Generative Drawing
Generative Naming	Comparative Questions	Story Retelling: Delayed		Figure Copying
Confrontation Naming	Repetition	Word Learning: Free Recall, Cued Recall, Recognition		
Concept Definitions	Word Reading Comprehension & Sentence Comprehension			

All cognitive domains specified by the DSM-5 except Social Cognition Included in the ABCD

41

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Lessons Learned

- The more fun the better – social engagement was critical.
- The Program "Flow" was easy for the participants to understand.
- Positive feedback was provided regarding all educational topics.
- Grouping of participants needs to be strategic. Group dynamic is critical to program success.
- Participants appreciated specific home activities that were assigned.

42

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Clinical Observations Worth Mentioning

- Ask the Client
  - "Which cognitive skills do you need to optimize?"
- Keep it REAL
  - Tasks should be RELEVANT to real-life outcomes
- It takes TIME to train the brain.
  - Continued practice is required for continued benefits.
- Intervention activities must:
  - Require effortful attention
  - Increase in difficulty based on individual performance

43

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Food for Thought……

- Detection of MCI in those Americans alive today, who are destined to develop AD, would reduce health care costs by $7- 7.9 trillion (Alzheimer's Association, 2018)

44

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More Questions than Answers…..

- How do we motivate folks to participate in these training programs?
- How do we make the programs meaningful and integrate them with daily life activities?
- What is the best way to make these programs accessible and affordable?
- Should folks receive health insurance benefits for undertaking cognitive training, and should Medicare pay for such training?

45