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Treatment of MCI: What the SLP Needs to Know

Presenter: Kim McCullough, Ph.D., CCC-SLP

Moderated by:
Amy Natho, M.S., CCC-SLP, CEU Administrator, SpeechPathology.com

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Treatment of MCI: What the SLP Needs to Know

Kim McCullough, Ph.D., CCC-SLP
University of Central Arkansas
Conway, AR
kmccullo@uca.edu

Agenda

- Defining MCI
- Assessment of MCI
- Rationale for Treatment of MCI
- Examining the Evidence
- Questions/Comments

MCI Defined

Transitional zone between normal cognition and dementia.

However, not all individuals with MCI develop dementia.

60% will not

MCI affects approximately 20% of the population over the age of 70 years.

Petersen, 2003
Mayo Clinic, 2009

MCI Defined: 2011 Core Clinical Criteria

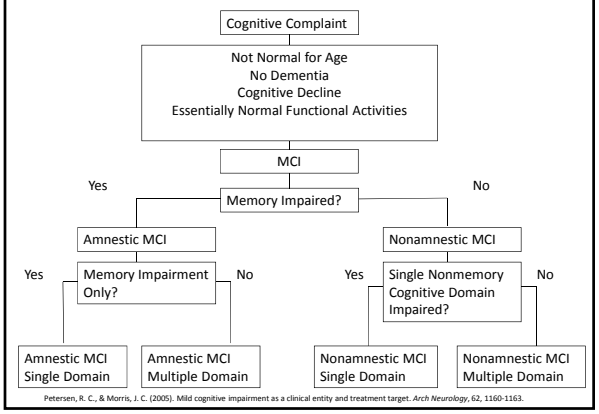
- Concern regarding change in cognition
- Impairment in one or more cognitive domains (1-1.5 SD)
  - Memory
  - Language
  - Executive function
  - Visuospatial skills
- Independent in functional abilities
- No dementia

Albert et al. (2011)

MCI Defined

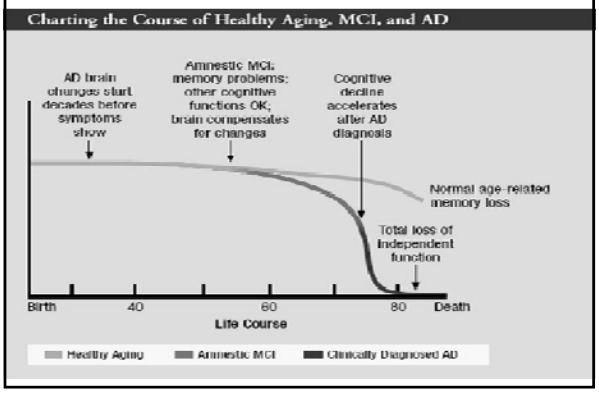
Clinical Presentations	⇒	**Possible Etiologies**
MCI Single domain		Degenerative
MCI Multiple domains		Vascular
MCI amnestic		Metabolic
Non-amnestic Domain		Traumatic
		Psychiatric

Flowchart for Diagnosis of MCI Subtypes



Petersen, R. C., & Morris, J. C. (2005). Mild cognitive impairment as a clinical entity and treatment target. *Arch Neurology*, 62, 1160-1163.

Relationship Between Healthy Aging, MCI, and AD



What Predicts Conversion?

- Depression
- Amnestic MCI with additional deficits in other cognitive domains
- Biomarkers

If an intervention could delay onset by 5 years …

There would be a 57% reduction in the number of AD patients.

And a reduction in Medicare costs by 230 billion!

(Sperling et al., 2011)

Where do we fit in?

1. • Identification/Screening
2. •Baseline objective/subjective measures
3. • Multidimensional Cognitive Intervention Program

What does ASHA Say?

- SLPs play a primary role in the screening, assessment, diagnosis, treatment, and research of cognitive-communication disorders, including those associated with dementia. (ASHA, 2005)
- Further, "screening is recommended for all persons, regardless of age, who have a condition that increases their risk for cognitive-communicative problems ". (ASHA, 2005)

Identification

SLPs are uniquely qualified to detect subtle early changes in language and cognitive functions.

Identification: Role of SLP

- Refer for medical diagnosis of MCI
- Encourage baseline measures of cognitive health
- Educate patients and caregivers

Identification: Opportunities

- Visits for hearing tests
- Residents of nursing and rehabilitation centers
- Spouses of individuals getting therapy
- Health Fairs
- When admitted to hospitals

Hospitalized elders
(Bicker et al., 2006)

N = 794 non-demented pts 65-85 years

Prevalence of MCI = 36%
61% 3.5 months later

MOCA

10 MINUTES

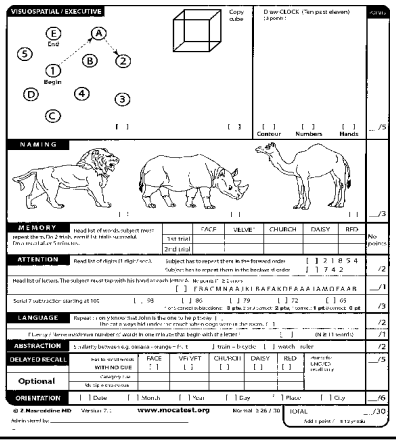
30 BEST SCORE

26 AND ABOVE IS NORMAL

www.mocatest.org

- Attention
- Concentration
- Executive function
- Memory
- Language
- Visuoconstructional skills
- Conceptual thinking
- Calculations
- Orientation

Nasreddine et al., 2005



RBANS

30 MINUTES

4 forms

- Story memory
- Line orientation
- Digit span
- Coding
- Figure copying
- Figure recall
- Picture naming
- Semantic fluency
- List recall & recognition

Randolph et al., 1998

ABCD

40 minutes

- Story Retelling
- Word learning
- Generative Naming
- Concept Definition
- Mental Status

- Bayles & Tomoeda, 1993

Subjective Measures

	Poor	Good	Excellent
How would you rate your overall memory?	1	2	3
How often do these present a problem for you?	Always	Sometimes	Never
Names	1	2	3
Faces	1	2	3
Appointments	1	2	3
Where I put things (keys, glasses, etc.)	1	2	3
Performing household chores	1	2	3
Directions to places	1	2	3
Phone numbers I have just checked	1	2	3
Phone numbers I use frequently	1	2	3
Things people tell me	1	2	3
Keeping up correspondence	1	2	3
Personal dates	1	2	3
Words	1	2	3
Forgetting what I buy at the store	1	2	3
Talking, a test	1	2	3
Beginning something and forgetting what I was doing	1	2	3
Losing my thread of thought in conversation	1	2	3
Losing my thread of thought in public speaking	1	2	3
Knowing whether I have already told someone something	1	2	3
As you're reading a novel, how often do you have trouble remembering what you've read...	Always	Sometimes	Never
In opening chapters, since I finished the book?	1	2	3
For 4-5 chapters before the one I am reading now?	1	2	3
In the chapter before the one I am reading now?	1	2	3
In the paragraph just before the one I am reading now?	1	2	3
In the sentence just before the one I am reading now?	1	2	3
How well do you remember things that occurred...	Poorly	Fair	Well
Last month?	1	2	3
Between six months and one year ago?	1	2	3
Between one and five years ago?	1	2	3
Between six and ten years ago?	1	2	3

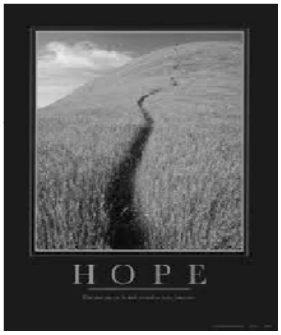
Subjective Memory Questionnaire

Small, G. (2004). *The memory prescription: Dr. Gary Small's 14-day plan to keep your brain and body young*. New York: Hyperion.

Could Intervention be the KEY to Prevention?

Hope…

Reports of the benefits of cognitive intervention for both Healthy Older Adults and individuals with MCI have given affected individuals hope.

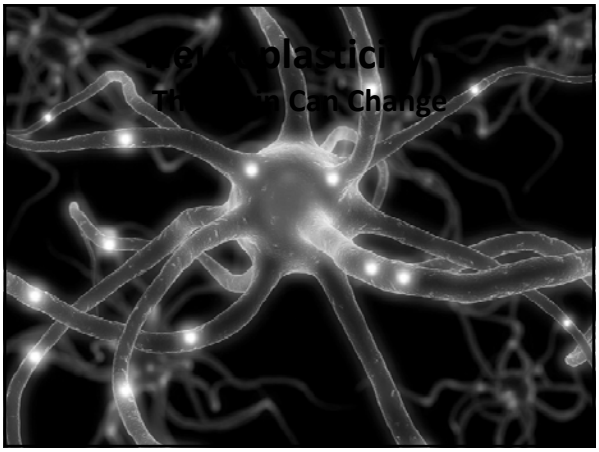


Treatment: What does ASHA SAY?

- SLPs have a therapeutic role with both patients and their caregivers through direct and indirect interventions. When a clinician is involved from early in dementia until the terminal stage, both types of intervention are likely to be used. (ASHA, 2005)

Rationale for Treatment

- Neuroplasticity
- Cognitive Reserve



Neuroplasticity

- The brain is continually changing.
- The brain has the capacity to learn and improve almost any function.

Cognitive Reserve

- The ability to engage alternate brain networks or cognitive strategies to cope with the effects of pathology.
- Built over a life-time.

What Contributes to Cognitive Reserve?

- Factors that consistently predict maintenance of cognitive abilities include:
  - Physical Exercise
  - Mental Activity
  - Control of Vascular Risk Factors

Cognitive Intervention Aim for MCI: Sustain and Build Cognitive Reserve
Repeated practice using tasks that target specified cognitive domains.

Key Elements of Cognitive Intervention Progams

Let's Examine the Evidence

Cognitive Intervention Defined

(Belleville. 2008)

Cognitive Training

- Teaching theoretically based strategies & skills to optimize cognition
- Standardized fashion
- Individual or Small group

Cognitive Stimulation

- Focus on increase of general cognitive and social skills in a non-specific format
- Discussions, leisure activities
- Small groups

Jean and colleagues (2010)

- Systematic literature review addressed the efficacy of 15 cognitive intervention programs on individuals with amnestic MCI.
- Significant improvements were reported:
  - On 44% of memory measures
  - 12% of other measures of cognition
  - On 49% QoL, mood and subjective reports of memory

Can obtain significant improvements on both objective & subjective measures

Meta-analysis : Li et al., 2011

- 17 MCI cognitive intervention studies included
- Key points:
  - Improvement in overall cognition & self-ratings
    - Small improvements in episodic and semantic memory, EF, attention, processing speed
    - Moderate improvements in Language (2 studies)
  - Computer –based intervention and structured teaching intervention both good for cognitive training

Healthy Older Adults: The ACTIVE Trial (2006)

- N=2832 volunteers
- MMSE 27.3 (23-30)
- Intervention: Cognitive Training
  - 10 one hour sessions
  - 4 session "Booster training" at 11mths & 35mths
  - 3 intervention groups: Memory, Reasoning or Speed of Processing

- Willis et al (2006). Long-term effects of cognitive training on everyday functional outcomes in older adults.

Healthy Older Adults: The ACTIVE Trial (2006)

- Memory Training:
  - Mnemonic strategies (organization, visualization, association) for remembering verbal material
- Reasoning Training:
  - Strategies for finding patterns in letter or word series
  - Identifying the next item in a series
- Speed of Processing Training:
  - Visual search and divided attention (computer based)

MCI Adults: Cognitive Intervention

(Belleville et al., 2006)

- N= 28 MCI, 17 HOA
- Treatment & Control groups
- MMSE 28.94 – MCI, 29.0 for HOA
- Intervention: Cognitive Training
  - 8 wkly 2 hour sessions plus homework
  - Small group of 4-5

MCI: Cognitive Intervention (Belleville et al., 2006)

- Components:
  - Session 1:
    - Education about aging, cognition, & program
  - Sessions 2-3:
    - Computer Assisted Attention training
  - Sessions 4-8:
    - Memory Strategies/Techniques
    - Face-name association, PQRST, method of loci, verbal organization

MCI: Cognitive Intervention(Belleville et al., 2006)

Results:

- Treatment groups (MCI &HOA) improved on objective measures; control groups (MCI & HOA) did not improve
- MCI improved memory performance (delayed word recall and face-name memory) and increased self-reported memory functioning in daily life

Evidence of Brain Plasticity in MCI

(Belleville et al., 2011)

- fMRI used to measure effect of training on brain activation in HOA & MCI
- N=15 MCI, 15 HOA
- 2 pre-training scans, 1 post-training scan
  - Verbal encoding and retrieval
- Intervention: Belleville et al., 2006
  - 6 weeks, 2 hour sessions, 12 hours total

Evidence of Brain Plasticity in MCI

(Belleville et al., 2011)

MCI Results:

- Training resulted in large network of increased brain activation
  - Encoding:
    - (R) inferior parietal lobe & frontal gyrus
  - Procedural Memory:
    - Right cerebellum and left BG
  - Retrieval:
    - Left parietal and prefrontal cortex & superior temporal gyrus bilaterally

Evidence of Brain Plasticity in MCI

(Belleville et al., 2011)

- Brain areas activated correlated with the "content" of the intervention.
- Memory training resulted in significant neural changes that are measurable with brain imaging.

Cognitive Intervention: Computer-Based Training (Barnes et al., 2009)

- N = 47 MCI
- 100 minutes/day, 5 days/week for 6 weeks
- Designed to improve processing speed and accuracy through several tasks that adaptively changed difficulty.
- Computer-based training is feasible. Verbal learning and memory favored the intervention.

Memory Strategy Training (Hampstead et al, 2012)

- Taught to use a three-step process for object location
- Measurable changes in the brain were observed within 2 weeks after 5 training sessions
- Increased activity within the left hippocampal body for trained & untrained stimuli

Intervention: Final Thoughts

- More research
  - Larger sample sizes, randomized controlled designs
- Intervention Format
- Outcome measures
- Generalization
- Functional impact
- Long-term efficacy