Mild Cognitive Impairment

AMANDA OVERSTREET, DO
CLINICAL ASSISTANT PROFESSOR OF MEDICINE
GERIATRICS AND PALLIATIVE CARE
MEDICAL UNIVERSITY OF SOUTH CAROLINA

Disclosures

- None

Objectives

- Discuss background of cognitive impairment
- Compare and contrast MCI vs Dementia
- Compare the tools to assess cognitive function
- Review impact of comorbidities on cognitive decline
- Discuss prognosis and treatment of MCI

Background

- Incidence of neurocognitive disorder rises with age
- Estimated prevalence of MCI by age:

Age	Percent
60-64	6.7
65-69	8.4
70-74	10.1
75-79	14.8
80-84	25.2

Background

- Factors most consistently associated with increased prevalence of MCI:
  - Advancing age
  - Lower educational level
  - Vascular risk factors
  - History of stroke or heart disease
  - APOe4
  - Neuropsychiatric symptoms

Mr. A

- Mr. A is a 74 yo M with history of hypertension and benign prostatic hypertrophy. During a routine visit, he mentions that he has a memory problem.
- Upon further discussion, he forgets names often

- Is this MCI or dementia? Or neither?

Definition: Mild Cognitive Impairment

- Measurable deficit in cognition
- Absence of dementia
- Absence of impaired activities of daily living (ADLs)

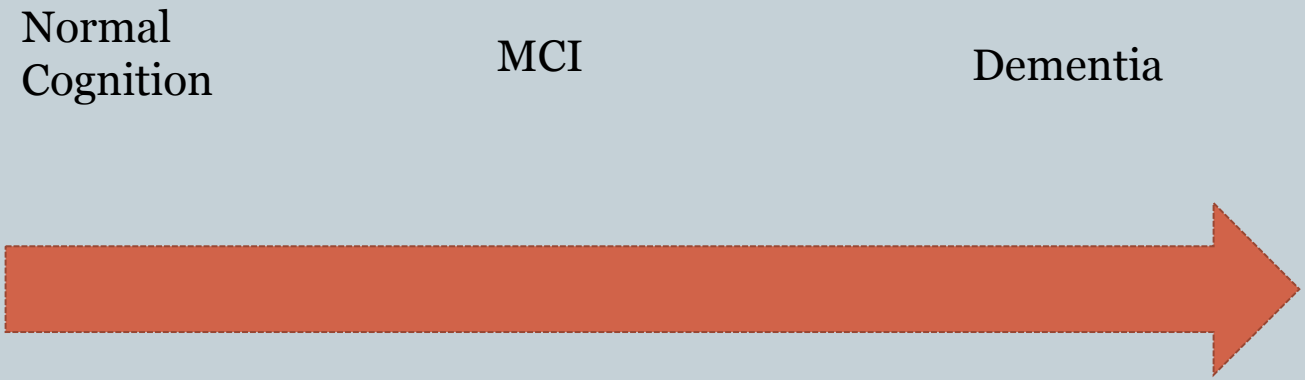
Definitions

- Amnestic MCI
  - Most common subtype
  - Observed memory impairment (compared for age/education)
  - Preserved domains of cognition other than memory
  - Intact ADLs
  - 1.5 standard deviations below norms (for age)
- Non-amnestic MCI
  - Impairment of another cognitive domain (ex function, language, etc) but not memory
  - Intact ADLs

Cognitive Domains

- Six neurocognitive domains to evaluate for neurocognitive disorder
  - Complex attention
  - Executive function
  - Learning and memory
  - Language
  - Perceptual/motor
  - Social cognition

MCI vs Dementia



Mr. B

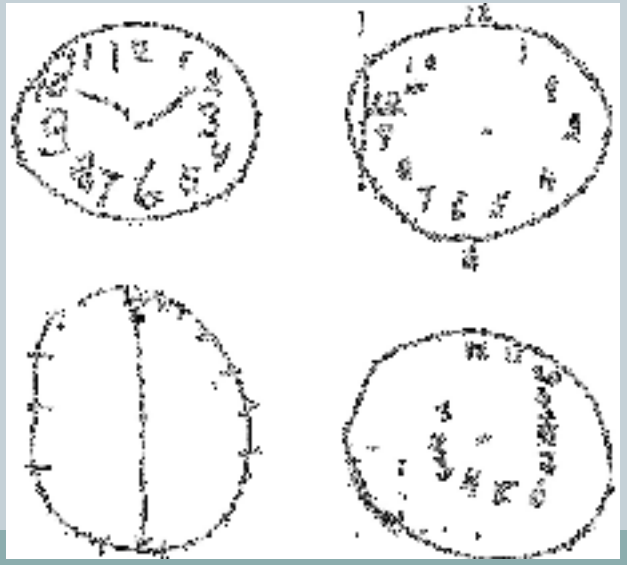
- Mr. B is a 74 yo M with history of hypertension, diabetes mellitus II, and coronary artery disease. He presents to the office with worsening memory in the last several months. He also has difficulty with word finding at times. Unfortunately, these issues are affecting his ability to remember recent conversations.

Types of neurocognitive assessment

- Neuropsychological testing
- MMSE
- MOCA
- Clock drawing
- Mini-Cog
- EMST

MiniCog

- Often used as first screening tool
- Clock draw + 3 item recall
- Able to distinguish normal cognition from dementia (specificity 89-93%)
- More sensitive than MMSE
- Not sensitive to MCI



MiniCog

Mini-Cog©

Instructions for Administration & Scoring

ID:_____ Date: _____

Step 1: Three Word Registration

Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).

The following and other word lists have been used in one or more clinical studies.[1-3] For repeated administrations, use of an alternative word list is recommended.

Version 1	Version 2	Version 3	Version 4	Version 5	Version 6
Banana	Leader	Village	River	Captain	Daughter
Sunrise	Season	Kitchen	Nation	Garden	Heaven
Chair	Table	Baby	Finger	Picture	Mountain

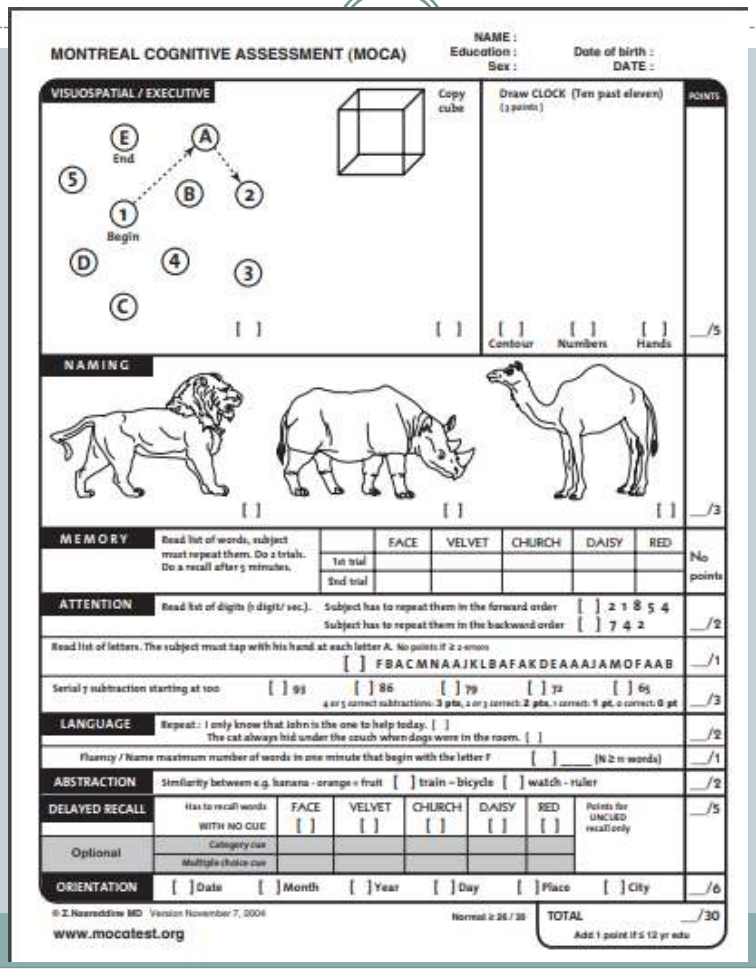
MMSE

- Most commonly used screening tool
- Lacks sensitivity to detect MCI
- Lacks sensitivity in patients with higher education
- Able to distinguish normal cognition from dementia
- Sensitivity 79%; Specificity 81% for dementia

MOCA

- More time consuming than other bedside screening tools
- More sensitive to MCI (sensitivity of 90% for MCI; 100% for mild dementia)
- Lacks empirical data to support as screening tool for MCI
- Reported specificity of 87% for MCI

MoCA



MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME :
Education :
Sex :
Date of birth :
DATE :

VISUOSPATIAL / EXECUTIVE — Copy cube — Draw CLOCK (Ten past eleven) (3 points) — POINTS

End, Begin — [ ] [ ] — [ ] Contour [ ] Numbers [ ] Hands — /5

NAMING — [ ] [ ] [ ] — /3

MEMORY — Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No points

ATTENTION — Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order [ ] 2 1 8 5 4. Subject has to repeat them in the backward order [ ] 7 4 2 — /2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors. [ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B — /1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65. 4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt — /3

LANGUAGE — Repeat : I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ] — /2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] ____ (N ≥ 11 words) — /1

ABSTRACTION — Similarity between e.g. banana - orange = fruit [ ] train – bicycle [ ] watch - ruler — /2

DELAYED RECALL

	Has to recall words WITH NO CUE	FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only
		[ ]	[ ]	[ ]	[ ]	[ ]	
Optional	Category cue						
	Multiple choice cue						

/5

ORIENTATION — [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City — /6

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www.mocatest.org

Normal ≥ 26 / 30

TOTAL /30

Add 1 point if ≤ 12 yr edu

Enhanced Mental Skills Test

- Telephone based or in-person screening test for cognitive impairment
- Used in financial planning or insurance underwriting
- Not widely used clinically by physicians
- Reportedly high sensitivity and specificity for MCI
- Address multiple domains of cognition, similar to neuropsychological testing

Mr. B (continued)

- Mr. B scores 26/30 on MOCA in the office.
- He denies depressive symptoms and has normal labs
- Even though his score is “borderline,” he feels as if something is wrong
- What next?

Neuropsychological Testing

- Gold standard for diagnosing neurocognitive disorder
- Scores are compared to people with normal cognition and same demographic background
- Domains include: memory, executive function, visuospatial, language, perception, sensorimotor function, attention, and mood

Mr. B

- He returns to the office 3 months later after neuropsych testing with a diagnosis of amnestic MCI. He wants to know what he can do to lower his risk of progression to dementia.

Impact of Other Comorbidities

- Depression
- Delirium
- Medication Use
- Obstructive Sleep Apnea
- Alcohol

Depression and MCI

Depressive symptoms increase the risk of progression to dementia in subjects with mild cognitive impairment: systematic review and meta-analysis

Raimundo J. Mourao[1], Guilherme Mansur[1], Leandro F. Malloy-Diniz[1,2], Erico Castro Costa[3] and Breno S. Diniz[1,2,4]

- 18 studies with over 10,000 patients
- Pooled relative risk of progressing to dementia was 1.28 in MCI group with depression vs MCI without depression

Delirium

- Acute change in cognition
- Confusion Assessment Method is validated tool to diagnose
- Literature support higher rates of long term cognitive impairment after episode of delirium
- Patients with any baseline cognitive impairment are more likely to have an episode of delirium (“fragile brain”)

Medication Use

- No definitive evidence of medications that worsen cognition or predispose patients to dementia

Obstructive Sleep Apnea

- Two groups:
  - MCI + OSA (adherent to CPAP)
  - MCI + OSA (non-adherent to CPAP)
- Results show that 1 year of CPAP adherence improves cognition in older adults with MCI

CPAP Adherence May Slow 1-Year Cognitive Decline in Older Adults with Mild Cognitive Impairment and Apnea

*Kathy C. Richards, PhD,[*] Nalaka Gooneratne, MD,[†] Barry Dicicco, MD,[‡] Alexandra Hanlon, PhD,[§] Stephen Moelter, PhD,[¶] Fannie Onen, MD,[†‖**] Yanyan Wang, PhD,[*††] Amy Sawyer, PhD,[§‡‡] Terri Weaver, PhD,[§§¶¶] Alicia Lozano, MS,[§] Patricia Carter, PhD,[*] and Jerry Johnson, MD[‖‖]*

Alcohol Use

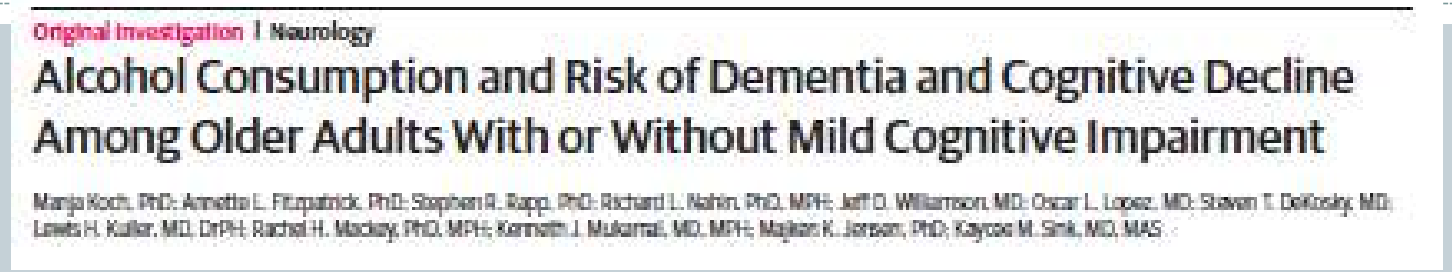
Alcohol consumption and transition of mild cognitive impairment to dementia

Gelin Xu, MD, PhD,* Xinfeng Liu, MD, PhD, Qin Yin, MD, Wusheng Zhu, MD, PhD, Renliang Zhang, MD, PhD and Xiaobing Fan, MD

Department of Neurology, Jinling Hospital, Nanjing University School of Medicine, Nanjing, Jiangsu Province, China

- 176 patients with MCI followed for 2 years
- Patients or caregivers answered questionnaires about alcohol use at baseline
- Patients classified as:
  - Abstainers
  - Light-moderate drinkers
  - Heavy drinkers

Alcohol Use



Original Investigation | Neurology

Alcohol Consumption and Risk of Dementia and Cognitive Decline Among Older Adults With or Without Mild Cognitive Impairment

Manja Koch, PhD; Annetta L. Fitzpatrick, PhD; Stephen R. Rapp, PhD; Richard L. Nahin, PhD, MPH; Jeff D. Williamson, MD; Oscar L. Lopez, MD; Steven T. DeKosky, MD; Lewis H. Kuller, MD, DrPH; Rachel H. Mackey, PhD, MPH; Kenneth J. Mukamal, MD, MPH; Majken K. Jensen, PhD; Kaycee M. Sink, MD, MAS

- 3021 participants; median age 78
- Patients with MCI at baseline and without
- Results:
  - Without MCI, nondrinkers and heavy drinkers have worse cognitive scores than people who drink 1 drink per week
  - With MCI, heavy drinkers have worse cognitive scores
  - No clear difference between nondrinkers and people who drink 7-14 drinks per week

Prognosis of MCI

- 5-15% of patients with MCI develop dementia within a year
- Amnestic MCI is more predictive of Alzheimer's disease

Prognosis of MCI

Prognosis of Mild Cognitive Impairment in General Practice: Results of the German AgeCoDe Study

CONCLUSIONS In primary care, about one-quarter of patients with MCI have progression to dementia within the next 3 years. Assessments of memory function and depressive symptoms are helpful in predicting a progressive vs a remittent course. When transferring the concept of MCI into clinical diagnostic algorithms (eg, *DSM-5*), however, we should not forget that three-quarters of patients with MCI stayed cognitively stable or even improved within 3 years. They should not be alarmed unnecessarily by receiving such a diagnosis.

Ann Fam Med 2014;158-165. doi:10.1370/afm.1596.

Treatment of MCI

- No FDA approved treatments
- AAN found evidence linking exercise with improved memory in patients with MCI
- Treat any modifiable risk factors for dementia
  - Minimize medications
  - Alcohol in moderation
  - Healthy diet
  - Treat vascular risk factors
  - Exercise
  - Maintain cognitive stimulation

Questions?

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