Does Mrs. Smith have dementia? How to find out in 5 minutes!

Big Sky Conference: North Dakota Academy of Family Physicians
Wednesday, January 18, 2017
Michael G. Mercury PhD (Michael.Mercury@nm.org)

Objectives
1. Review differential diagnosis of dementia
2. Learn a brief screening tool
3. Review next steps and workup for dementia

Disclosures Of Financial Relationship
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Employee
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Research Grants/Contracts

Differential Diagnosis of Dementia

Cognitive Disease: From Preclinical to MCI to Dementia

The Neurodegenerative Diseases Center
Memory Assessment Program
Northwestern Medicine Central DuPage Hospital Winfield IL

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Preclinical/Asymptomatic Dementia

- Neurodegenerative changes may precede dementia by as much as 20 years

- Biomarkers:
  - Aβ accumulation
  - Elevated CSF tau – indicates neuronal degeneration or injury
  - Decreased uptake on PET scans – temporoparietal region
  - Atrophy on MRI scans – temporoparietal region

- Symptoms:
  - Loss of sense of smell
  - Adult-onset neuropsychiatric symptoms (major depression, anxiety, apathy, disinhibition, irritability, and sleep disorders)

Mild Cognitive Impairment (MCI)

DSM 5: Mild Neuropsychological Disorder

1. Patient or family member notes a concern about memory or other cognitive function
2. Impairment in one or more cognitive domains on testing
3. Independent in instrumental activities of daily living (IADLs).
   - May have difficulties concerning complex day-to-day activities
4. Absence of dementia

Dementia Diagnostic Criteria

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| DSM-5 criteria for major neurocognitive disorder (previously dementia)
|---|
| A. Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains:
  - Learning and memory
  - Language
  - Executive function
  - Complex attention
  - Mental flexibility
  - Social cognition
| B. The cognitive deficits interfere with independence in everyday activities, at a minimum, assistance should be required with complex instrumental activities of daily living, such as paying bills or managing medications.
| C. The cognitive deficits do not occur exclusively in the context of a delirium.
| D. The cognitive deficits are not better explained by another mental disorder (e.g., major depressive disorder, schizophrenia)

Types of Dementia

- Alzheimer’s Disease (AD)
- AD & Vascular
- Lewy Body
- AD & Lewy Body
- Vascular
- Other

Why is Early Identification Important?

- Disease Modification:
  - No disease modifying medications available yet.
  - Many neuropsychiatric symptoms are treatable (e.g. depression, sleep)

- Advance Care Planning:
  - Helps families plan for the future, make living arrangements, take care of financial and legal matters, and develop support networks
  - Hopefully reducing caregiver burden

- Research:
  - Greater opportunity to participate in clinical trials
  - Example: aerobic exercise, Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet

- Hospital Readmission Rates
  - Alzheimer’s Disease 15%
  - Alzheimer’s Disease and related disorders 18.3%

Functional Activities Questionnaire

Alzheimer’s Disease -- Most Common Cause of Dementia

- In the United States, every 70 seconds someone develops Alzheimer’s disease.
- By 2050, someone will develop the disease every 33 seconds in the United States.
- Of the 78.2 million baby boomers, 10 million will develop Alzheimer’s disease in the United States (1 out of 8).
- Almost 30% of Americans have a family member with the disease.
- Two-thirds of those living with Alzheimer’s – 3.3 million – are women.
- 60% of Alzheimer’s caregivers – 6.7 million – are women.
- Four out of ten caregivers say they had no choice in becoming caregivers.

Number of Americans with Alzheimer’s Disease 2000 and 2050 Projected

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Americans</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>4.5</td>
</tr>
<tr>
<td>2050</td>
<td>13.2</td>
</tr>
</tbody>
</table>

Alzheimer’s Diagnosis

National Institute of Aging (NIA)

History and mental status exam indicates:
1. Impaired short-term memory
2. And presence of impairments in at least one of the following domains:
   1. Handling of complex tasks
   2. Reasoning ability (impaired abstract thinking)
   3. Spatial ability and orientation (constructional difficulty and agnosia)
   4. Language (aphasia)

These cognitive impairments---
1. Interfere with work, usual social activities, or relationships with others (FAQ)
2. Represent a notable decline from a previous level of functioning
3. Do not occur exclusively during the course of delirium
4. Are not better explained by a major psychiatric diagnosis

ICD-10 Considerations for Alzheimer’s Dementia

- Symptom Code: R41.3 Memory Loss

- Diagnostic Codes:
  - G31.84 Mild Cognitive Impairment
  - F03.90 Dementia (Major Neurocognitive Disorder)
    - with behavioral disturbance (next slide)
  - F03.90 Dementia (Major Neurocognitive Disorder)
    - without behavioral disturbance (next slide)
  - G30.9 Alzheimer’s Dementia
    - Add F02.81 if with behavior disturbance, F02.80 if without behavior disturbance

ICD-10 Considerations for Alzheimer’s Dementia

Behavioral disturbance (specify disturbance)
- i.e. psychiatric symptoms, mood disturbance, agitation, apathy, or other behavioral symptoms

Severity (per DSM-5)
- Mild – difficulties with IADLs (housework, managing money)
- Moderate – difficulties with basic activities of daily living (feeding, dressing)
- Severe – fully dependent

Alzheimer’s Prevalence Increases with Age

Alzheimer’s Disease

Increase or Decrease of Death Rate by Disease 2000-2007

<table>
<thead>
<tr>
<th>Disease</th>
<th>Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s</td>
<td>50.6%</td>
</tr>
<tr>
<td>HIV</td>
<td>-22.0%</td>
</tr>
<tr>
<td>Stroke</td>
<td>-18.9%</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>-13.5%</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>-6.4%</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>-3.1%</td>
</tr>
</tbody>
</table>

Sources: NIA, Rush Institute of Healthy Aging website
Brief Screening Tool for Dementia

What do we currently screen for in the office?

CAD!

Prevalence of Coronary Heart Disease by Age and Sex

What do we currently screen for in the office?

Diabetes!

Why Screen for Dementia in the Office?

- Progressive disease requiring monitoring over time
  - For driving, living situation, decision making
- Treatment consideration
  - To try to preserve function as long as possible
- Family education
  - Key to quality of life for the patient
  - Family can learn how to help patient (www.alz.org)
  - Safety issues

Memory Loss Can Be Dangerous

- Leaving the stove or other appliances on
- Forgetting to take medicines
- Forgetting to eat
- Forgetting to pay bills
- Forgetting you are taking care of minor children or impaired adults
- Missing appointments
- Getting lost including when driving
- Forgetting phone numbers including 911

Difficulties in screening for/diagnosing Alzheimer’s?

- Misattribution: Memory loss is misattributed to normal aging by physician and family. Until problems arise (e.g. unpaid bills, not taking medicines), family assumes patient is functional
- Loss of insight: “La belle indifference,” is typically early, so patients will not complain of memory problems
- Social skills: Can be preserved through moderate dementia, so interviewing the patient may not reveal problems
- Barriers in the office visit:
  - Time constraint of the 12-15 minute visit
  - Electronic medical record and “smart phrases” A&O X 3
  - Lack of confidence in own skills
  - Fear of offending patient by asking mental status questions
  - Limited sensitivity of screening tests
Issues with the MMSE

- 10-15 minutes to administer
- No alternate forms
- Language and cultural bias (e.g. no ifs, ands, or buts)
- Highly educated individuals can score 28/30 or higher and still have dementia
- Does not assess executive function and so can miss frontotemporal dementia
- Copyrighted; now enforced by PAR $1.36/administration

Benefits:
- Everyone is trained in it
- Helpful for tracking decline (>3 pt. decline clinically significant)

Interpretation of MMSE Score

<table>
<thead>
<tr>
<th>Score</th>
<th>Degree of Impairment</th>
<th>Formal Neuropsychological Testing</th>
<th>Day-to-Day Functioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-30</td>
<td>Questionable</td>
<td>Highly educated, “worried well,” family concerns</td>
<td>IADLs may be affected, may be compensating</td>
</tr>
<tr>
<td>20-25</td>
<td>Mild</td>
<td>Formal Assessment</td>
<td>Significant. At risk for financial exploitation, driving issues. May require supervision, support, assistance. Family education</td>
</tr>
<tr>
<td>10-20</td>
<td>Moderate</td>
<td>Formal Assessment</td>
<td>May need 24-hour supervision</td>
</tr>
<tr>
<td>0-10</td>
<td>Severe</td>
<td></td>
<td>Assistance with ADLs</td>
</tr>
</tbody>
</table>

MOCA
Montreal Cognitive Assessment

- Public domain
- ~15 minutes vs. 10 minutes
- Executive function (clock is too small)
- Valid confrontation naming
- Recall and recognition memory
- 3 alternate forms minimize practice
- ~60 languages
- Blind, but not deaf (English & Spanish)
- Physical disability

<table>
<thead>
<tr>
<th>Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>27+</td>
<td>Intact</td>
</tr>
<tr>
<td>18-26</td>
<td>MCI</td>
</tr>
<tr>
<td>10-17</td>
<td>Mild Cog Imp</td>
</tr>
<tr>
<td>&lt;10</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Screening Cognitive Function During the Annual Visit
“The Mini-Cog™ Plus”


- Time efficient (~4 minutes)
- Detects early dementias
- Can be used to differentiate dementias
- Less language/culture/education bias
- High yield/True Positives
- Establishes baseline for repeated screening
- Target Population: 65 years and older with new patients or annual visit
- Public Domain
Administration of Mini-Cog™: 3 Words and Clock

1. **3 Words:** Instruct the patient to listen carefully to and remember 3 unrelated words (e.g., apple table penny) and then to repeat the words.

2. **Clock Drawing Test:** Instruct the patient to draw the face of a clock, make it large, either on a blank sheet of paper or on a sheet with the clock circle already drawn on the page. Inside the circle, please draw the hours of a clock as they normally appear. After the patient puts the numbers on the clock face, ask him or her to draw the hands of the clock to read “ten after 11.” Place the hands of the clock to represent the time: “ten minutes after eleven o’clock.” These instructions can be repeated, but no additional instructions should be given. Give the patient as much time as needed to complete the task. The CDT serves as the recall distracter.

3. **Recall of 3 words:** Ask the patient to repeat the 3 previously presented words.

Scoring of the Mini-Cog™

- **3-Item Recall Score:**
  - **Numeric:** 1 point for each word recalled without cues, for a 3-item recall score of 1, 2, or 3.

- **Clock Drawing Score:**
  - **Numeric:** 2 points for a normal clock or 0 (zero) points for an abnormal clock drawing. A normal clock must include all numbers (1-12), each only once, in the correct order and direction (clockwise). There must also be two hands present, one pointing to the 11 and one pointing to 2. Hand length is not scored in the Mini-Cog™ algorithm.

Mini-Cog™ Plus: Animal Naming

Adapted from the WI Dementia Consortium Study

- **Animal Naming:** < 14 Animals in 60 seconds is impaired

- **Wisconsin Alzheimer’s Institute (WAI)** found a sensitivity of 85% and specificity of 88% for this cut score

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Abnormal &lt;14</th>
<th>Normal ≥14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Cognition</td>
<td>12%</td>
<td>88%</td>
</tr>
<tr>
<td>Alzheimer’s Disease</td>
<td>85%</td>
<td>15%</td>
</tr>
<tr>
<td>Other Dementia</td>
<td>85%</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Instructions:**
- **Animal Naming:** “I’d like to ask a question to check your memory.”
- **Clock Drawing:** “I’d like to see if you can draw an oval.”

**Scoring:**
- **Animal Naming:** 1 point for each animal recalled without cues, for a 6-item recall score of 1, 2, 3, 4, 5, or 6.
- **Clock Drawing:** 2 points for a normal clock; 1 point for an abnormal clock drawing. A normal clock must include all numbers (1-12), each only once, in the correct order and direction (clockwise). There must also be two hands present, one pointing to the 11 and one pointing to 2. Hand length is not scored in the Mini-Cog™ algorithm.

**Diagnostic Group**

- **Abnormal:** <14 Animals in 60 seconds
- **Normal:** ≥14 Animals in 60 seconds

**Administration:**

- **Animal Naming:** “I’d like to ask a question to check your memory.”
- **Clock Drawing:** “I’d like to see if you can draw an oval.”

**Procedure:**
- **Time for 60 seconds and record if responses:** 1 point for each animal, 0 points for an abnormal clock drawing. A normal clock must include all numbers (1-12), each only once, in the correct order and direction (clockwise). There must also be two hands present, one pointing to the 11 and one pointing to 2. Hand length is not scored in the Mini-Cog™ algorithm.

**Figure 1:** The Mini-Cog scoring algorithm. The Mini-Cog uses a three-item recall test for memory and a timed clock drawing test. The latter is scored as the “animal naming” helping to clarify scores when the memory recall score is intermediate.

**Figure 2:** The Mini-Cog™ Plus: Animal Naming.

**Figure 3:** Directions for Scoring Animal Naming Screen.
Scoring of the Mini-Cog™: Quantitative Clock Interpretation

Quantitative: (Scan Clock in EMR or include in paper chart). Write any errors.

Number Placement: Planning, neglect

Number Repetition: Perseverations (Vascular, Frontal Temporal Dementia)

Hand Placement:
- Equal Length: Planning
- At 10 and 11, slightly past 11, 11 and 1: Concrete
- Radial Lines: Vascular

Numbers written counter clockwise: right hemisphere stroke

Improved performance for Clock Copy (optional): Alzheimer’s improves, Vascular does not

Mini-Cog™ Plus: Scoring of Clock

2005
2007

Mini-Cog™ Plus: Animal Naming

Administration and Scoring

1. (State, “I would like you to name as many animals as you can think of in one minute. I will tell you when to start and stop. Do you understand the directions?”)

2. Tell the patient to start naming animals. Write down the animal names as they say them. Any kind of animal (e.g. mammals, insect, birds, fish, reptiles etc.) is acceptable. Write down repeated animals, but do not score repeats. After one minute, tell the patient to stop.

3. Scoring:
   - Count each unique animal listed.
   - Juvenile and adult, different sex counts as one animal (e.g. calf, cow, bull).
   - Different breeds are okay: Airedale, lab, schnauzer, etc. but if they also say the breed name (e.g. dog), do not count the word “dog,” only the breed types.
   - For screening purposes, a score of less than 14 is considered impaired.
   - Qualitatively:
     - Many repetitions represent perseverations and may indicate executive dysfunction.
     - Several mispronunciations of words may reflect education or hearing disability, aphasia.

Scoring of Mini-Cog™ Plus

History: Osteoarthritis

 Mini-Cog™: 0/3 words
 Animals: 10

History: mild left—sided weakness, left visual field extinction

 Mini-Cog™: 2/3 words
 Animals: 18

Mini-Cog™ Plus: Animal Naming

History: mild left—sided weakness, left visual field extinction

 Mini-Cog™: 2/3 words
 Animals: 18

History: 2 years of disease, Early hallucination, Parkinsonism

 Mini-Cog™: 2/3 words
 Animals: 12
Alzheimer’s Disease Diagnosis, Disease Course and Treatment Novelties: Case Example 1

History: Hypertension

What does this patient most likely have?

a. Dementia of the Alzheimer’s Type
b. Vascular Dementia
c. Lewy Body Dementia
d. Frontotemporal Dementia
e. None of the Above

Alzheimer’s Disease Diagnosis, Disease Course and Treatment Novelties: Case Example 2

History: Hypertension, Diabetes

What does this patient most likely have?

a. Dementia of the Alzheimer’s Type
b. Vascular Dementia
c. Lewy Body Dementia
d. Frontotemporal Dementia
e. None of the Above

Alzheimer’s Disease Diagnosis, Disease Course and Treatment Novelties: Case Example 3

History: Osteoarthritis

What does this patient most likely have?

a. Dementia of the Alzheimer’s Type
b. Vascular Dementia
c. Lewy Body Dementia
d. Frontotemporal Dementia
e. None of the Above
Treatable Causes

Thus recognition of a dementia syndrome is not a cause for nihilistic despair; rather it is a diagnostic challenge that demands thorough evaluation of the patient for potentially treatable processes that may be producing or exacerbating the intellectual impairment.

(Cummings & Benson, 1992, p. 2)

Next Steps and Workup for Dementia

“Round up the usual suspects”

https://www.youtube.com/watch?v=HXuBnz6vtuI

- Laboratory Tests: CBC, ESR, Chem Panel, TSH, B12 level, UA, Vitamin D
- Neuroimaging: structural neuroimaging to detect lesions (e.g. MRI w/wo contrast)
- Mental Health: depression or other psychological condition, or environment may be causing symptoms
- Specialty Consultation to Memory Center:
  - Neurology (Memory specialist): evaluate movement, senses, balance, reflexes and other areas, MRI w/ and without, coronal flair images of hippocampi, Amyvid™ PET scan
  - Neuropsychologist (PhD, PsyD): doctors evaluate attention, orientation, reasoning, language, memory and visuospatial for
- Differential Diagnosis of Dementia
- Driving Concerns
- Decision-Making Capacity "Competency"
- Independent Living

The History: Looking for Moderating Factors and Reversible Cause of Impaired Cognition (e.g. Memory Loss)

- Abnormal blood work (TSH, Vitamins B12, D etc.)
- Medications (The anticholinergics!)
- Physical Problems: Pain, Disease
- Impaired attention: Hearing & Vision Loss
- Sleep problems (e.g. sleep apnea)
- Habits (Alcohol consumption)
- Depression, Anxiety, Stress

Cognition and Late-Life Depression

- 15-27% of individuals >65 yrs old living in the community have depressive symptoms.
- Only 1-3% diagnosed Major Depression.
- Prevalence in women over 60 yrs old may be twice that of men of same age.
- White males over 65 yrs old account for 81% of all suicides annually
- Impact of depression on cognition:
  - Retrieval memory problems
  - Executive dysfunction
  - Slowed processing of information
Geriatric Depression Scale: Short Form

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? YES / NO
2. Have you dropped many of your activities and interests? YES / NO
3. Do you feel that your life is empty? YES / NO
4. Do you often get bored? YES / NO
5. Are you in good spirits most of the time? YES / NO
6. Do you feel happy most of the time? YES / NO
7. Do you feel helpless? YES / NO
8. Do you prefer to stay at home, rather than going out and doing new things? YES / NO
9. Do you feel that you have more problems with memory than most? YES / NO
10. Do you feel that your situation is hopeless? YES / NO
11. Do you think that most people are better off than you are? YES / NO

Answers in bold indicate depression. Score 1 point for each bolded answer.

A score > 5 points is suggestive of depression.
A score > 10 points is almost always indicative of depression.
A score > 5 points should warrant a follow-up comprehensive assessment.

Source: http://www.stanford.edu/~yesavage/GDS.html

The Neuropsychology Exam

A golden hammer can break an iron door.

The American Liner: New York struck a mine near Liverpool Monday evening. In spite of a blinding snowstorm and darkness, the sixty passengers, including 38 women, were all

Alzheimer’s Disease
Treatments and Support Services

- FDA Approved Treatments
  - Cholinesterase inhibitors
    - Aricept®, Exelon®, Razadyne®
  - NMDA antagonist
    - Namenda®
- Support Services
  - Alzheimer’s Association (Alz.org)
  - Support Groups
  - Adult Day Care
- Novel Treatments
  - Physical exercise
  - Coconut oil
  - Transcranial magnetic stimulation

Summary

1. Review differential diagnosis of dementia
2. Learn a brief screening tool
3. Review next steps and workup for dementia

Questions

William Utermohlen 1933 - 2007 (diagnosed 1995)
Thank you