Dementia Screening in the Elderly

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Conflicts of Interest

Within the past 12 months, I have had NO financial relationships with proprietary entities that produce health care goods and services.

Teaching Objectives

- Epidemiology of dementia
- Medical screening evaluation of dementia
- Cognitive Assessment Screening tools
- Risks and benefits of screening for dementia

Cognitive Impairment

Measurable impairment in one of the cognitive domains with preservation of independence and function

Dementia

Impairment in memory and decline in one of the following
- Ability to generate speech or understand written/spoken language
- Ability to recognize objects
- Ability to execute motor functions
- Ability to make judgments, plan and carry out tasks
Deficits cause significant impairment in social or occupational functioning
Epidemiology of Dementia

Dementia affects 3-11% of all ages > 65
Estimates of 18.5 million Americans to have dementia in 2050
Estimated annual cost $100,000,000,000
Up to 2/3 of all dementia remains undiagnosed

Epidemiology of Dementia

- Alzheimer's type dementia effects 5.3 million
- Alzheimer's type dementia = 60%
- Vascular Dementia = 17%
- LBD, alcoholic dementia and FTD = 13%

Clinical Queues for Dementia Screening

Patient complains of memory problems
Informant has concerns for patient memory
Decreased functional performance
Depressed or anxious patients

Clinical Evaluation of Dementia

Thorough patient history
Review of risk factors
- past medical history (eg. Hypothyroidism)
- alcohol use
- head injury
- heavy metal exposure
- medications/drugs/toxins
- sexual history
- level of education

Clinical Evaluation of Dementia

Complete physical exam w/ neurological exam and gait assessment
Cognitive Assessment Screening tool
Assessment of IADLs and ADLs
< 5% reversible causes of dementia

Partial Differential Diagnosis of Dementia
Dementia Screening

Tools

USPSTF and American Academy of Neurology do not recommend routine screening in asymptomatic patients.

USPSTF does recommend cognitive assessment if cognitive impairments are suspected by the provider the patient or the patient’s informant.

Cognitive test should assess multiple functional domains

Test must be quick, easy, and able to identify mild dementia

These are not diagnostic tests

Instrumental Activities of Daily Living

- These are the skills to maintain a household
  - Medication management
  - Financial management
  - Preparing meals
  - Housework
  - Shopping
  - Telephone

Functional Domains

1. Attention
2. Memory
3. Language
4. Visuospatial Skills
5. Executive Function

Attention

- Ability to focus on a task
- When impaired may be difficult to assess other domains
- Affected by Delirium

100-93-86-79-72-65

DLROW
Memory

- Episodic
  - Supper Last Night
- Semantic
  - State Capitol
- Procedural
  - Tying shoes
  - Working
  - Phone number

Language

- Word formation, rhythm and verbal fluency
- Tested through naming, syntactically complex sentences and fluency task

Visuospatial Skills

- Ability to interact with the environment
- Visual processing and imagery
- Important for navigating

Executive Function

- Planning, abstract thought, and judgment.
- Effects function and independence more than any other domain

Dog-Cat = Pet

Cognitive Assessment Tools

Used to screen for cognitive impairment
Aid to establish a differential diagnosis
Rating severity of dementia
Monitor progression of disease
Document response to treatment

Dementia Screening Instruments

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<tr>
<th>Test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Minutes to Perform</th>
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<td>Mini-Mental State Examination</td>
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### Recommended Screening Instruments

Validated for Primary Care
- Memory Impairment Screen
- General Practitioner Assessment of Cognition
- Mini-cognitive Assessment
- MMSE
MIS, GPCOG, and Mini-Cog administered in <5 minutes
Similar negative predictive compared to MMSE
American Journal of Geriatric Psychiatry and AAFP recommendations for primary care provider

### MMSE score interpretation

- Normal cognitive function 27-30
- Mild cognitive impairment 21-26
- Moderate cognitive impairment 11-20
- Severe cognitive impairment 0-10

### MMSE Positives

Traditional “Gold Standard” of Cognitive Assessment
Tests language, attention, memory, visuospatial skills.
10 minutes to administer
cutoff of 24/30 it has 87% specificity and 82% sensitivity
Normative data available for different ages, gender, and education level

### MMSE Negatives

Ceiling Effect - May miss cognitive impairment in highly educated
Floor effect - Inability to detect changes in severely demented
Insensitive for detecting very mild dementia
Does not test Executive Function
Lengthy to administer
Steps of the Mini-Cognitive Assessment

1. Instruct the patient to remember 3 unrelated words
2. Instruct the patient to draw the face of a clock and set the time to 10 past 11.
3. Ask the patient to repeat the 3 previously stated words.

Mini-Cog

Assess Visuospatial and Memory domains
Quick to administer
May be used in all healthcare settings
Reasonable sensitivity (76-99%) and specificity (88-93%)
Better at identifying dementia than MMSE

General Practitioner Assessment of Cognition

2 step screening instrument, part one for the patient and part two for the informant
Quicker to administer than MMSE
Equal sensitivity and specificity as MMSE
Provides a systematic way of obtaining informant data
General Practitioner Assessment of Cognition

Good Positive Predictive and Negative Predictive value
Ranked by providers as efficient, economical and acceptable by patients
Performance of patient independent of education, gender, age, GDS score.
Limited usefulness without informant

Receiver Operator Curve

Memory Impairment Screen

4 Minute 4 item delayed free and cued recall test
4 words from 4 different categories given to patient
The 4 items are then cued by examiner until the words are recognized by cue.
2-3 minutes of interference with counting such as 1-20 then 20-1
4 word recall with or without cues

Memory Impairment Screen

Less than 5 minutes to administer
NPV and misclassification equivalent to MMSE
Age, education and gender did not affect results
It does not measure executive or visuospatial domains
Tests memory, attention, and language
Montreal Cognitive Assessment (MoCA)

MoCA score interpretation

- Normal cognitive function > 26
- Mild cognitive impairment average 22
- Alzheimer’s type dementia average 16

Montreal Cognitive Assessment

Initially designed for mild cognitive impairment
Evaluates multiple domains of function
Excellent sensitivity = AD 100% and MCI 90%
Specificity of 87% compared to 82% by MMSE
Test-retest reliability and internal consistency
If concern for MCI then MOCA
If functional decline and cognitive complaints then MMSE
Has been validated by several studies across cultures

MOCA vs. MMSE ROC for Mild Cognitive Impairment

Other screening tools

Functional Assessment Questionnaire

Geriatric Depression Scale
Geriatric Depression Scale

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. Are you often bored?  YES / NO
5. Are you in good spirits most of the time?  YES / NO
6. Are you afraid that something bad is going to happen to you?  YES / NO
7. Do you feel happy most of the time?  YES / NO
8. Do you often feel helpless?  YES / NO
9. Do you prefer to stay at home, rather than going out and doing new things?  YES / NO
10. Do you feel that your situation is hopeless?  YES / NO
11. Do you think it is wonderful to be alive now?  YES / NO
12. Do you feel that your situation is hopeless?  YES / NO
13. Do you feel full of energy?  YES / NO
14. Do you feel that most people are better off than you are?  YES / NO
15. Do you feel basically satisfied with your life?  YES / NO

Diagnosis and Other Consideration

Diagnosing Dementia

History + mental status examination lead to diagnosis

History + screening tool = inconsistency

Futher evaluation may be necessary

Further Evaluation

Neuroimaging such as CT or MRI (low yield)
Lab evaluation
- TSH
- CMP
- CBC
- Folate
- B12
- Calcium

Harms for Screening

- Screening does not affect long term outcomes
- Increased risk for depression/anxiety
- Time and cost for screening
- Long wait for diagnostic neuropsychiatric testing may cause anxiety
- Neuropsychiatric testing takes several hours
- No effective treatment of MCI
Harms of Screening

- Dementia may preclude long-term care insurance or enrollment in continuous care retirement community
- Side effects of medical treatment
- Many times medical therapies do not alter course of the illness
- Economic burden of increased screening
- Community resources may not be sufficient to accommodate case load

Benefit of Screening

Allows the patient time to develop advanced directives
Assign Power of Attorney for financial and healthcare decisions
Time to establish last will and testament
Patient/family can consider issues such as driving and long term care

Benefit of Screening

Delay the necessity for institutional care
Improve quality of life for caregivers
Potential pharmacological interventions
Provides families with explanation for recent behavior changes
Per USPSTF - No high-quality study to verify these claims

Summary

Epidemiology of dementia
Medical screening evaluation of dementia
Cognitive Assessment Screening tools
Further Evaluation
Risks and benefits of screening for dementia

References


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Questions