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FREE WEBINAR
March 23, 2022
12:00 - 1:00 pm

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Making Sense of Brief Cognitive Testing with Older Adults

Laura Hemmy, University of Minnesota, Minneapolis MN and VA Geriatric Research Education and Clinical Center, Minneapolis MN

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Making Sense of Brief Cognitive Testing for Older Adults

Minnesota Gerontological Society
March 23, 2022



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Objectives

Describe the current state of knowledge for brief cognitive assessment in older adults perceived to be at risk for cognitive decline

- Understand how cognitive assessment benefits providers, patients, and family members
- Differentiate screening from other types of assessment
- Learn to evaluate cognitive tests to match use & patient
- This is NOT training to perform cognitive assessment

Cognitive Impairment in Older Adults



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Late Life Cognitive Impairment

- Cognitive impairment is common in older adults
- Globally, dementia affects approximately 7% over age 65
 - Prevalence is higher in high income countries
- Alzheimer's disease is the most common cause
- Combined healthcare, personal, and productivity costs of clinical Alzheimer's alone make it the third most expensive disease in the US, after heart disease and cancer

Prince et al. 2013; Meek et al. 1998



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Normal Aging & Cognition

- Aging is not synonymous with cognitive decline
 - Not everyone shows substantial cognitive decline with age
 - Not all cognitive domains are negatively affected by aging
- Variables affecting risk for cognitive decline
 - Age, Education, Health comorbidities
- Cognitive decline - areas of relative consensus
 - Processing speed, reaction time, attention, memory
- Challenges to detecting disease-related change
 - Insidious onset of deficits is most common



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Dementia

- Dementia is a *syndrome* with dozens of causes
 - AD is by far the most common cause in older adults (65+)
- Dementia risk increases with advancing age
 - Statistical norm in very old age (85+)
- Dementia does NOT represent healthy aging
 - Move from “*Is it normal?*” → “*Is it a problem?*”
 - Common, but due to disease pathology
- Common comorbid conditions (Depr, DM, CVD, OSA)
 - Often cause excess disability
 - Are rarely the primary cause of progressive impairment



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Common Causes of Dementia

- Alzheimer’s disease
- Cerebrovascular disease
- Lewy body disease
- Frontotemporal lobar degeneration
- Parkinson’s disease
- Hippocampal sclerosis
- Mixed pathologies (multiple contributions)

* Onset, course & associated features are key

Alzheimer’s Association, 2020



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Potentially Treatable Causes of Cognitive Impairment in Late Life

- Psychiatric disorders
 - Depression, anxiety
- Toxic/metabolic conditions
 - Drugs, medication interactions
 - Alcohol, B1/thiamine deficiency (Korsakoff’s)
 - B12/folic acid deficiency, thyroid
- Sleep disorders
 - Obstructive sleep apnea (OSA)
- Normal Pressure Hydrocephalus (NPH)

Alzheimer’s Association, 2020



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Forgetfulness: Normal or Not? How can you tell the difference?

Normal aging

- Making an occasional bad decision
- Missing a monthly payment
- Forgetting the day but remembering it later
- Sometimes forgetting a word
- Losing things from time to time

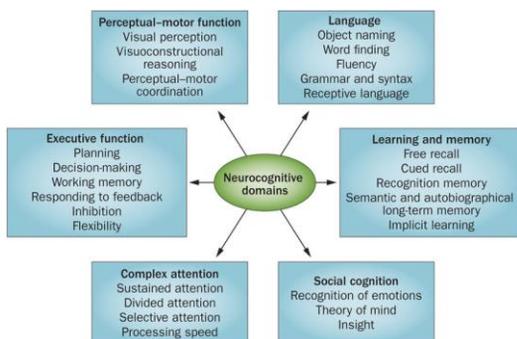
Alzheimer’s disease

- Making poor judgements or decisions a lot of the time
- Problems managing monthly bills
- Losing track of the date or time of year
- Trouble having a conversation
- Misplacing things often and being unable to find them

National Institute on Aging



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Sachdev et al. Nat Rev Neurol, 2014



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DSM-V Major Neurocognitive Disorder (dementia construct)

- Significant cognitive decline from previous function in 1+ cognitive domains based on:
 - Patient, informant, or clinician report
 - Impairment in test performance (2+ SD below norms)
- Cognitive deficits...
 - interfere with independence (ADLs / IADLs)
 - do not occur exclusively in the context of delirium
 - are not attributable to another Axis I disorder



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Dementia Morbidity

- Mismanagement
 - Work, finances, relationships, medications, health care
- Safety
 - Driving, wandering, power tools, falls, medications
- Social Isolation
 - Physical – deconditioning, poor diet & self-care
 - Psychological – boredom, apathy, agitation, paranoia
- Poor quality of life for patients & families
 - Caregiving stressors
- Often unrecognized by family & primary care
 - Safety crises in the home
 - Mismanaged co-morbid medical conditions (ER, hospital)



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Mild Cognitive Impairment

- Subjective cognitive complaint
 - Patient (corroborated by informant, provider)
- Objective cognitive impairment on testing
 - 1.5 SD below age-based norms
 - Amnesic or non-amnesic
 - Single vs. multiple cognitive domains
- Intact global cognitive functioning
- Intact functional ability (ADLs/IADLs)

Petersen, J *Internal Medicine*, 2004

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DSM-V Mild Neurocognitive Disorder (MCI construct)

- Mild cognitive decline from previous function in 1+ cognitive domains based on:
 - Patient, informant, or clinician report
 - Mild decline in performance (1-2 SD below norms)
- Cognitive deficits...
 - insufficient to interfere with independence
 - greater effort, compensatory strategies, or accommodation may be required to maintain function
 - do not occur exclusively in the context of delirium
 - are not attributable to another disorder



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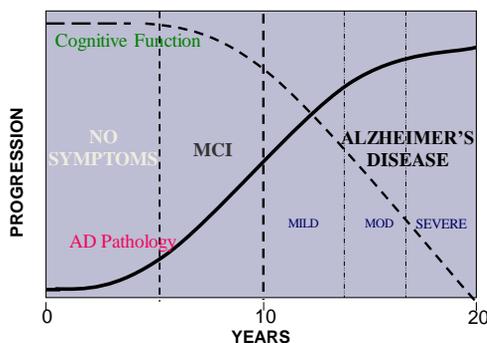
Pre-Clinical Disease Stages

- A stage in disease development, in which cognition has already begun to decline, but one does not yet meet criteria for dementia
 - Memory, executive, processing speed
- This prodromal phase can last 7-20 years*
- Pre-clinical cases are impaired compared with their own previous functioning, but not necessarily against age-based norms

*La Rue & Jarvik, 1987; Linn et al., 1995



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Diagnostic Terms: Alzheimer's Disease Example

DSM-IV

- Mild Cognitive Impt
- Dementia

DSM-V

- Minor Neurocogn Dis
- Major Neurocogn Dis

→ *Course, Level, Pattern*

NINDS/ADRDA

- Possible AD
- Probable AD
- Definite AD (pathology)

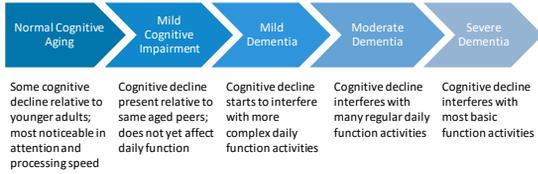
Alzheimer's Assoc/NIA

- Dementia due to AD
- MCI due to AD
- Preclinical AD (biomarker)



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Progression of Common Late Life Cognitive Impairment



This slide presents a progressive course. While the most common, it is not the case for all.



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Cognitive Assessment Practices



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Defining Impairment

When is cognitive performance labeled impaired?

Does the patient's cognitive performance look like themselves?

- Comparison against previous performance
- Estimation of premorbid ability (education, occupation, tests)
- Importance of taking a good history of onset & course of cognitive change

Does the patient's cognitive performance look like others?

- Comparison normative data
- Match test normative data to the individual in question (age, education, gender, race, native language, etc.)
- **Importance of a high quality, standardized test administration**



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Importance of Standardization

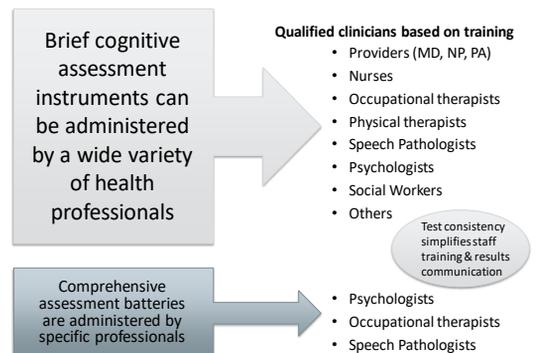
- Standardization sets administration and interpretation rules so that a test is always the same
- A test score is only useful by comparison (self, others)
 - Normed scores (e.g., Z scores, percentiles) vs. cut points
- Standardization assures scores can be compared across time and people
- Provider training in a standardized test administration is essential to obtaining a useable score
- Tests differ in how much guidance or credentialing is necessary to perform the test (e.g., recent MoCA change)



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Types of Cognitive Assessments

- Very brief (< 5 min, e.g. Mini-Cog)
- Brief global assessment (< 30 min, e.g. MoCA)
- Short batteries (< 60 min, e.g. RBANS)
- Comprehensive neuropsychological evaluation
- Discipline specific evaluations to address, speech, function, learning disability, etc.



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Cross-sectional vs. Longitudinal



Longitudinal assessment of cognition can tell you more

- Estimating progression rate can help with diagnosis & planning
- Reassess after a change (e.g., medication)
- Use a patient as their own reference

Test considerations

- Learning/practice effects
 - Alternate forms
 - Less cognitive impairment associated with more practice effect
- Range and sensitivity to detect change
- Consistent use of a test facilitates monitoring change over time



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Brief Cognitive Assessment Screening vs. Case Finding

Screening	Case-Finding
Cognitive status unknown	Cognitive status unknown
May be asymptomatic	Complaint or indication
All members of a cohort are tested	Only those with indication are tested

US Preventative Services Task Force found insufficient evidence to support screening in older adults, but does support case finding



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Test Performance Characteristics Are Not Static

Try not to think of cognitive assessment instruments as *good* tests or a *bad* tests

What is important is what is known about a test for your application with your population

- Reliability: consistent measurement
- Validity: measurement of the right thing
- Normative performance data to interpret score
- Sensitivity: identification of impairment
- Specificity: identification of lack of impairment



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Consider Equity & Accessibility in Test Selection

- Testing language fluency
- Sensory impairment
- Educational history
- Race/ethnicity
- Cultural background
- Administration method (on site, telephone, video)

NIA IMPACT Collaboratory Best Practice Recommendations (embedded trials)

- Assess validity for health-equity-relevant groups to ensure applicability in specific populations → *what is known about a test used with your population?*
- Explore how assessment may be interpreted with respect to norms and expectations of different health-equity-relevant groups
- Consider pilot work to evaluate acceptability and psychometrics of outcomes for health disparity populations

When good data are not available validating tests for your population:

- Consider a longitudinal testing approach using the patient as their own reference
- Consider relying more on assessment of functional disability



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Preclinical Cognitive Decline

- Pre-clinical cases may look impaired when compared with their own previous functioning, but not necessarily against age-based norms
 - Misattributions occur for **both** high and low functioning individuals
- Example: Rentz et al. (2004) compared prediction of cognitive decline in people with high premorbid IQ

Age matched norms	0%	Percent of sample impaired on testing
Age & education adjusted norms	31%	
Age & IQ-estimate adjusted norms	48%	



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Why Assess for Cognitive Impairment?



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Benefits of Cognitive Assessment

- Assess for reversible causes of cognitive impairment
- Reduced patient and family anxiety related to unexplained symptoms
- Help patients and families understand the nature of impairment
- Facilitates personal agency to define and plan one's future while still in a position to make informed decisions
- Enable lifestyle modification
- Enable financial and health care advance planning
- Promotes safety (driving, medication management)
- Better coordination of clinical care → organize around cognitive impmt
- Referrals for supportive resources
- Ability to try new interventions or treatments
- Potential to reduce economic costs of care and treatment

Alzheimer's Association; NIA; Borson et al. 2012



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Potential Harms of Cognitive Assessment

- Anxiety from a cognitive impairment diagnosis that may not progress
- Emotional distress from a diagnosis without disease modifying treatment
- Introduction of unnecessary symptomatic treatments
- Introduction of unnecessary limitations on independence
- Stigma associated cognitive impairment
- Risk of financial consequences (insurance denial, employment risk)
- Healthcare resource utilization in the assessment process

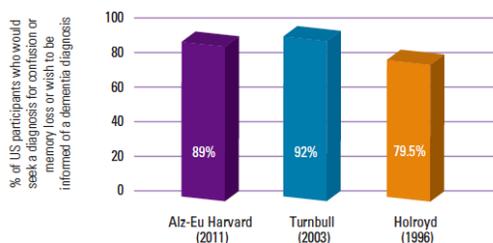
Most of these harms are potential and their actual affect on patient outcomes are not well studied

Alzheimer's Association; NIA; Borson et al. 2012; Fink et al. 2020



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Surveys of US adults: Majority want to know dementia diagnosis



Alzheimer's Association 2012

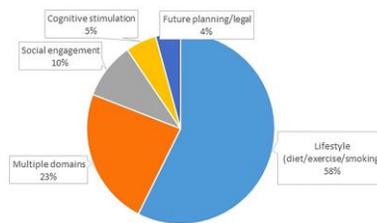


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What do people do with the results of cognitive screening?

Multicomponent screening with health & cognitive metrics (MoCA, Mini-Cog, SVF)

- 54% shared results with family
- 33% shared results with providers
- 52% made behavioral &/or lifestyle changes



Galvin et al. PLoS ONE, 2020



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IHI Age-Friendly Health Systems

The Institute for Healthcare Improvement (IHI) Age-Friendly Health Systems aims to meet the challenges of an older US demographic by...

1. Following evidence-based practice
2. Causing no harm
3. Aligning care with **what matters most** to older adults and their family members



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IHI Age-Friendly Health Systems



Outpatient Practice Setting Recommendations Include:

- Ask about **what matters most**, document, share across the care team
- Align care plan with **what matters most**
- Screen for cognitive impairment and document the results
- Evaluate and manage manifestations of dementia, educate older adults and caregivers, make referrals



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Practice Guideline for MCI

- Assess for MCI; do not assume patient concerns are normal aging
- Use validated assessment tools to assess for cognitive impairment
- Do not rely on report of subjective memory concerns alone
- Follow brief assessment with a formal clinical assessment for DX
- Assess for functional impairment related to cognition before giving a diagnosis of dementia
- Perform serial assessments over time to monitor cognitive change
- Discontinue medications that can contribute to cognitive impairment
- Evaluate for and treat modifiable risk factors
- Assess for and treat behavioral/neuropsychiatric symptoms
- Counsel patients and families to discuss long-term planning topics such as advance directives, driving safety, finances, and estate planning

Petersen et al. Neurology, 2018



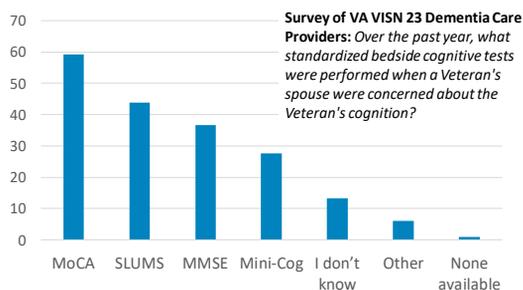
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Late Life Cognitive Impairment Recommendations for Testing and Follow-up



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Common Brief Cognitive Tests Performed



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USPSTF Review of Screening for Dementia

Brief cognitive tests examined in >1 study with sensitivity to detect dementia usually at 0.75 or higher and specificity usually at 0.80 or higher

- Clock Drawing Test
- Memory Impairment Screen
- Mental Status Questionnaire
- Mini-Cog
- Mini-Mental State Exam (32 studies: pooled sensitivity 0.89, specificity of 0.89)
- verbal fluency

Additional brief tests reported in >1 study, with sensitivity to detect dementia ranging from 0.74 to 1.0 and specificity from 0.65 to 0.96

- 7-Minute Screen
- Abbreviated Mental Test
- Montreal Cognitive Assessment
- St Louis University Mental Status Examination
- Telephone Interview for Cognitive Status

Patnode et al. JAMA 2020



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Patnode et al. JAMA 2020



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Review of Brief Tests for Specific DXs: Clinical Alzheimer's Dementia

- AAFP nominated systematic review of tests to identify CATD
- Many brief tests distinguished CATD from unimpaired
 - Montreal Cognitive Assessment (MoCA)
 - Brief Alzheimer Screen (BAS)
 - Mini-Mental State Examination (MMSE)
 - list learning delayed recall
 - Semantic verbal fluency (category fluency)
 - clock-drawing tests
- Accuracy was lower distinguishing CATD from MCI
 - MMSE, MoCA, list-learning delayed recall with performance data
- Some notable tests were not represented (e.g., Mini-Cog, SLUMS)
- No studies reported on testing harms

Hemmy et al. Annals Int Med, 2020



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Review of Brief Tests for Specific DXs: Post-Stroke Cognitive Impairment

- Systematic review of post stroke cognitive screening tools
- only the MoCA and MMSE could accurately screen impairments at all levels of severity and clinically feasible
 - For detecting vascular dementia, MMSE is best option
 - MMSE was not sensitivity or specific to mild impairments
 - MoCA can screen for all levels of impairment using alternate cut-off scores

Burton et al. J Rehab Med, 2015



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When to Assess Cognition if Not Screening

- Repeated forgetting of recently learned information
- Difficulty performing familiar tasks, ADLs, IADLs
- Forgetting simple words or substituting unusual words
- Failure to recognize known people
- Disorientation to time and place, becoming lost
- Cannot follow directions
- Problems with abstract thinking
- Poor or decreased judgment (e.g., financial scams)
- Misplacing things in unusual places
- Unexplained changes in mood, behavior, or personality
- Uncharacteristic passivity, loss of initiative, or interest in activities
- Poor historian
- Failure to keep appointments
- Struggling with adherence to medical plan of care

Warning
Signs

VA Dementia Warning Signs; Alzheimer's Assoc Early Warning Signs



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Other Possible Indications For Cognitive Assessment

- Requested by a patient, caregiver, other provider
- Unexplained weight loss, falls
- New central nervous system disease signs and symptoms
- Establish baseline cognition before interventions that might affect cognition
 - Complex surgical procedures
 - Prescribing CNS-acting medications
 - Consent for high-risk procedures
 - Complex patient education (e.g. hospital discharge prep, diabetes education)



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Recommendations for Evidence of Impairment on Brief Testing

- Caution some uncertainty what result means about diagnosis, prognosis
- Assess function (e.g. dressing, driving)
- Consider visioRefer for further assessments (diagnostic testing, neurocognitive testing, specialty clinics, PT/OT/SLP)
- n, hearing, mental health
- Refer for supportive services (for patient and caregivers)
- Address risk reduction in care plan and home
- Begin advance care planning efforts (e.g. POA, HC-POA)
- Assess caregiver challenges/burden/capacity



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Summary & Take-Home Messages

- Cognitive assessment benefits patients, family members and providers, and should be the standard of care for older adults
- Assessment choices should be tailored to the purpose, patient population, setting, professional staff, and resources available
- Cognitive deficits are defined by comparison against normative data for similar samples
 - Importance of test validation for population
 - Importance of standardized test administration
- Repeated testing to monitor change is best
- Providing feedback and documentation of findings are essential standards of care and constitute a meaningful intervention even without disease modifying treatment



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Education Resources

ACT on Alzheimer's Toolkits
<https://www.actonla.org/>

NIA Assessing Cognitive Impairment in Older Patients
<https://www.nia.nih.gov/health/assessing-cognitive-impairment-older-patients>

NIA ADEAR Center
www.nia.nih.gov/villabecomes

Test Resources

Mini-Cog
<https://mini-cog.com>

MoCA
<https://www.mocatest.org/>

SLUMS
<https://www.slu.edu/medicine/geriatric-medicine/geriatric-medicine/aging-successfully/assessment-tools/mental-status-exam.php>

RUDAS
<https://www.dementia.org.au/resources/rowland-universit-dementia-assessment-scale-rudas>



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with
Charissa Eaton, PhD, MSW, Professor of Social Work at Winona
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