Cognitive Screening for Dementia with Older Adults

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Welcome and Overview

1. With increased longevity comes the reality that age-related conditions will increase.

2. Dementia, often incorrectly thought of as a part of normal aging, is an age-related condition that can impact physical and mental health and well-being.

3. Understanding dementia(s) and educating people about healthy lifestyle choices for prevention are crucial tools for health professionals.

4. Cognitive assessments can be effective tools to identify brain health and functioning issues (Yates et al., 2021).

Cognitive Assessment as Tools

- Cognitive assessments (tests) are brief and efficient evaluation tools (Yates et al., 2021).
  - Unveil brain process
  - Understand performance of intellectual activities and problem solving
- Cognitive assessments do not reveal or diagnose:
  - Root causes of any impairment
  - Location of impairment
  - Severity or stage of the impairment
- Cognitive assessments provide a snapshot, through ratings and scores evaluating potential challenges impacting brain functionality.
  - They are not specifically used to diagnose a type of dementia.
  - They provide insight and can start the diagnosis process.

Alzheimer's Disease and Related Dementias (ADRD)

- Alzheimer's disease and related dementias (ADRD) are affecting a growing number of people throughout the world.
- Today there is no cure, but ongoing research, prevention awareness campaigns, and supportive living accommodations can potentially impact (Nandi et al., 2024):
  - Symptom exacerbation and delay
  - Identification of available therapies
  - Services to modify disease progression
  - Long-term costs for care
  - Affects on the caregiver
  - Incentives for ongoing public and private collaborative efforts needed to minimize the impact of ADRDs on individuals, families, communities, and businesses

Older Adult Population

- According to the National Institute of Health's (NIH) National Institute on Aging (NIA):
  - In the U.S. there are over 55 million people over 65.
    - 1 out of 7 people are 65+
    - 30.8 million women
    - 24.8 million men
    - By the year 2040, this cohort will comprise over 22% of the U.S. population.
  - ADRDs likely affect approximately 6 million annually.
  - 53 million people in the U.S. are unpaid caregivers.
  - 11,000 people turn 65 every day in the U.S.

Older Adult Population in the U.S. (U.S. Census 2020)

Age	2010 % of Older Adult Population	2020 % of Older Adult Population
65–74	21.7%	33.1%
75–84	13.1%	16.3%
85–94	5.1%	5.7%
95+	0.4%	0.6%

Older Adults and Chronic Conditions

- According to the Centers for Disease Control (CDC):
  - 60% of adults in the U.S. have one chronic condition.
  - 4 out of 10 adults in the U.S. have two or more chronic conditions.
  - 90% of the U.S. annual health care costs ($4.1 trillion) are for managing chronic conditions.
  - Most prevalent chronic conditions:
    1. Arthritis
    2. Heart disease
    3. Cancer
    4. Respiratory disease
    5. Alzheimer’s disease and related dementias
    6. Osteoporosis
    7. Diabetes
    8. Influenza and pneumonia
    9. Depression
    10. Chronic obstructive pulmonary disease (COPD)

Reflection Question 1

What are some ways to integrate preventative health tips to potentially drive down the rate of age-related chronic conditions?

Prevalent Chronic Conditions

- The Centers for Medicare and Medicaid (CMS) oversee the CMS CCW database to gain insight into correlations and indicators of chronic conditions and multiple chronic conditions to identify parameters that may exacerbate disease.

Prevalent Chronic Conditions

- CMS and the Department of Health and Human Services created and Initiative on Multiple Chronic Conditions (MCC) with the following correlated conditions:
  - Alcohol abuse/substance abuse
  - Alzheimer’s disease and related dementias
  - Heart failure
  - Arthritis
  - Hepatitis
  - Ashma
  - Asthma
  - HIV/AIDS
  - Atrial fibrillation
  - Hyperlipidemia
  - Hypertension
  - Cancer
  - COPD
  - Mental health disorders
  - Stroke
  - Diabetes

Prevalent Chronic Conditions

- Proper assessments and prevention are key to mitigate and minimize ADRDs .

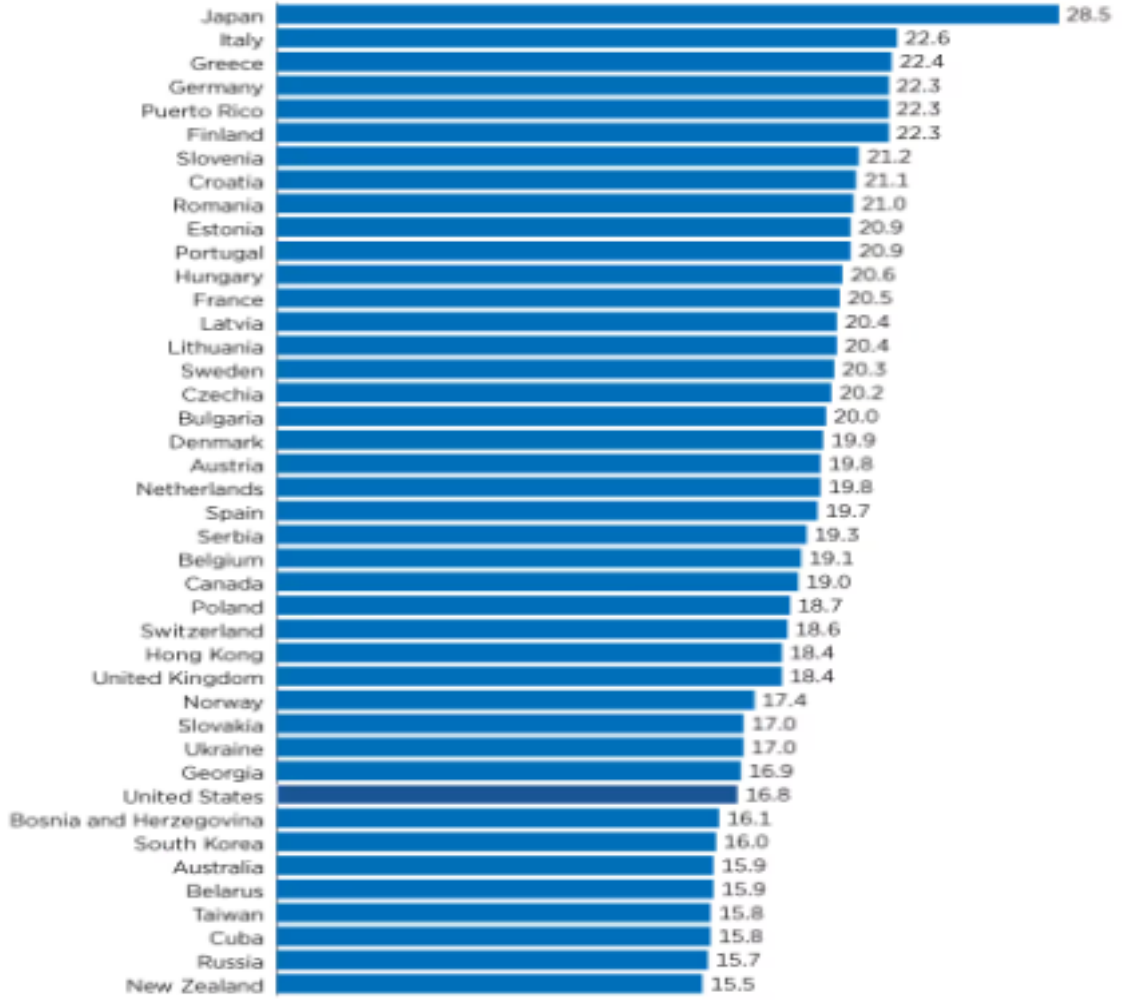
U.S. Census Insights: Older Adults

- In 2020, the 65-74 age group had the following characteristics:
  - Largest of the older age groups, representing over 50% of older adults with 33.1 million people
  - Older adult, ages 75-to-84, group grew at a slower rate (25.1%) than the younger cohorts, but is expected to rapidly increase as baby boomers age.
  - Older adults ages 85-to-94 grew at a slower rate (12.6%) than other older age groups.
  - Older adults 95 years and over experienced a large growth rate of 48.6%, growing from 425,000 in 2010 to 631,000 in 2020.

Global Older Population

- Globally, the older adult population is growing (World Health Organization, 2024) relative to their entire population:
  - Japan: 28%
  - Monaco: 36%
  - Italy: 23%
  - Finland: 22%
  - Portugal: 22%
  - Greece: 22%
  - Sweden: 20%
  - France: 20%

Countries or Areas with Largest Percentage Age 65 and Over: 2020



Note: Figure excludes countries and areas with less than 1,000,000 total population. For information on data collection, confidentiality protection, nonsampling error, and definitions, refer to <https://www2.census.gov/programs-surveys/decennial/2020/technical-documentation/complete-tech-docs/demographic-and-housing-characteristics-file-and-demographic-profile/2020census-demographic-and-housing-characteristics-file-and-demographic-profile-techdoc.pdf>.

Source: U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File (DHC) and International Database, accessed February 3, 2023.

Supporting the Aging Population

- The U.S. is at a crossroads to ensure accommodations are in place to support the needs of the aging population (CDC).
  - Growth of older adult populations is unprecedented.
  - Almost 20% of population in 2024
  - Approximately 25% of older adults are from diverse populations.
  - Increased longevity drives:
    - Development of chronic conditions
    - Disability
    - Mortality
    - Increased healthcare costs
    - Increased risk of ADRD

Supporting the Aging Population

- In 2021 healthcare and long-term care for ADRDs was $355 billion.
  - Development of programs and services for this population is a governmental and policy priority to support:
    - Independence
    - Activity
    - Social connection

Centers for Disease Control and ADRD

- Primary CDC initiatives to support older adults with ADRDs include:
  - Caregiver support and resources
  - Increased utilization of preventative services
    - Cancer screenings
    - Blood pressure checks
    - Evaluating blood sugar
  - Increased education about cognitive health involving primary care providers
  - Engaging in lifestyle change programs through Medicare health plans to reduce risk of diabetes
  - Promotion of healthy movement, balance, and exercise to reduce dementia risk, falls, and improve functional mobility
  - Increase early assessment and diagnosis for:
    - Risk reduction
    - Disease prevention
    - Disease management
    - Identification of risk for ADRDs

Reflection Question 2

Who are the key stakeholders to identify for a public health initiative to promote healthy behaviors to prevent dementia?

Risk of ADRDs

- Things to know about the risk of ADRDs (according to the Centers for Medicare and Medicaid, CMS):
  - Risks increase with age
  - Most prevalent in older adults over age 65
  - Increase rates as people age
  - Impact quality of life for patient and caregiver
  - Can lead to most expensive conditions in our society

ADRD Burden

- The burden of ADRDs is expanding and growing (Nandi et al., 2024) and by the year 2060 is projected to affect 13.8 million.
- ADRDs impact:
  - Brain function
  - Cognition
  - Learning
  - Memory
  - Reasoning
  - Ability to perform activities of daily living
  - Neuropsychological functioning
    - Anxiety
    - Psychosis
    - Delirium
    - Hallucinations
    - Death

Cost of ADRDs

2010 Cost of Direct Medical Care and Informal Caregiving for ADRDs	Projected 2040 Cost of Direct Medical Care and Informal Caregiving for ADRDs	Projected 2050 Costs of Direct Medical Care and Informal Caregiving for ADRDs
$157 billion - $215 billion	$379 billion - $511 billion*	$1.5 trillion*
*based on 2010 costs (Hurd as quoted by Nandi et al., 2024)		

Costs and Claims for ADRD

- In 2020, ADRDs cost (Nandi et al., 2024):
  - $196 in direct medical costs
  - $254 in direct caregiver costs
  - Total costs are higher than other costly diseases:
    - Chronic pulmonary obstructive disorder (COPD)
    - Diabetes
  - CMS claims data shows ADRD annual costs/per Medicare beneficiary:
    - $2,010 for Alzheimer’s disease
    - $1,870 for other dementias

ADRD Expenditures

- The high cost of ADRD progression expenditures include (Deb et al., 2017):
  - Different levels of support and care (based on disease stage)
  - Medical treatment
  - Pharmaceutical protocol
  - Home safety modifications
  - Safety services
  - Personal care and hygiene
  - Adult day care
  - Full-time residential services
  - Caregiving support

Needs of People with ADRD

- The current and projected costs of addressing the needs of people living with ADRD is overwhelming.
  - Government and societal costs
  - Individual costs
  - Family/lived ones
  - Community support
- Preventing disease, minimizing symptoms, and delaying onset through lifestyle modifications can decrease burdens (Nandi et al., 2024).

Needs of People with ADRD

Proper assessments to determine cognitive impairment in the early stages can provide insight into potential improvement for health span and improved quality of life.

- Support aging in place
- Reduced invasive and highly intensive services
- Continue clinical trials and other research to support finding a cure and identification of treatment
- Promote lifestyle changes that can improve overall well-being

About Dementia: Mayo Clinic

- Insights into Alzheimer's disease and related dementias (ADRDs) (Mayo Clinic):
  - Dementia is an aggregate of symptoms that impair cognition.
    - Impaired memory
    - Affect thinking
    - Interfere with social interactions and abilities
  - Dementia can have multiple causes; it is not a single disease.
  - Dementia typically manifests with memory loss; however, not all memory loss stems from dementia.
  - Some dementia symptoms can be reversible.
  - Alzheimer's disease is the most common cause of dementia in older adults.
    - There is no cure for Alzheimer's disease.

Aspects of Dementia

- **Cognitive Changes (Mayo Clinic)**
  - Other people notice a person’s memory loss
  - Challenges with finding the right words
  - Confusion and challenges with visual and spatial abilities and cues
  - Difficulties solving problems and reasoning, critical thinking becomes impaired
  - Difficulties performing tasks that are typically manageable
  - Challenges planning and organizing
  - Lack of coordination and affected movement
  - Becoming confused and disoriented with every day living

Aspects of Dementia

- **Psychological Changes (Mayo Clinic)**
  - Depression
  - Changes in personality
  - Increased anxiety
  - Agitation
  - Exhibiting inappropriate behavior
  - Sense of paranoia and suspicion
  - Hallucinations and delusions

Types of Dementia

Most Prevalent Types of Dementia	Brain Changes	Symptoms
Alzheimer's disease (National Institute on Aging)	• Throughout the brain, abnormal deposits of proteins form amyloid plaques and tau tangles form.	• Early stages: Memory loss, misplaced items, forgetting names, repeating themselves, becoming less willing to participate • Middle stages: Increased confusion and disorientation, repetitive and impulsive, paranoid and delusional, communication challenges, sleep issues, mood issues, inability to perform daily tasks • Later stages: Rigidity, weight loss, loss of speech, significant memory loss, ultimate loss of body control, death • Stage progression can vary based on wellness throughout life • Disease progression can begin 15 years prior to initial symptoms

Types of Dementia

Most Prevalent Types of Dementia	Brain Changes	Symptoms
Frontotemporal dementia (National Institute on Aging)	• Tau and TDP-43 proteins form in abnormal amounts in sight neurons in the frontal and temporal lobes in the brain.	• Inappropriate behaviors • Lack of empathy • Increased apathy • Exhibiting poor judgment • Compulsive behaviors • Lack of personal hygiene and self-care • Overeating • Communication problems: loss of speech and/or impaired speech • Movement disorders: rigidity/tremor/muscle spasms • Impaired coordination: fall risk, mobility issues • Swallowing challenges • Weakness

Types of Dementia

Most Prevalent Types of Dementia	Brain Changes	Symptoms
Lewy body dementia (Johns Hopkins University)	• Lewy bodies, alpha-synuclein protein, build up in abnormal deposits, impacting the brain's chemical messengers.	• Extreme confusion • Difficulty concentrating • Hallucinations • Parkinsonism (rigidity, slowness, tremors, and freezing) • Loss of coordination • Daytime sleeping • Radical personality change
Vascular dementia	• Blood clots, stroke, and other conditions disrupt the blood flow in the brain.	• Memory issues, long and short term • Misplacing items • Inability to follow directions or retain new information • Hallucinations • Poor judgment

Other Dementias

Other Dementias (National Institute on Aging)	
Atypical Alzheimer's disease	1 out of 20 AD patients Plaques and tangles impact other parts of the brain that in AD
Frontal variant Alzheimer's disease	Frontal variant of AD Impacts 1 in 50 AD patients
Posterior cortical atrophy	Caused by plaques and tangles in the back of the brain Symptoms present earlier, typically when a person is in their 50s
Parkinson's disease related dementias	Affects Parkinson's patients typically a year after motor skills are impacted Often misdiagnosed as Lewy body dementia
Huntington's disease related dementia	Genetic disease that is incurable Characterized by mood swings, lack of balance and coordination, changes in personality, impaired judgment, and dementia symptoms
Creutzfeldt-Jakob disease	Develops spontaneously causing memory issues, mood swings, and muscle spasms Impacts vision and balance

Case 1

- Biology, chemistry, anatomy, pharmacology, and pathology all are heavily covered in medical schools, as they should be. Advances in health care, scientific exploration, technology, and behavior are all constants, and they have supported the longevity surge experienced throughout the world. However, with longevity comes the reality of life with age-related chronic conditions, one of the most prevalent being dementia. It is time to integrate dementia diagnosis training into medical school education.

Case 1

- Medicare has created billing codes for dementia assessments and functional skills training overviews, yet research shows that primary care physicians are unprepared to make a dementia diagnosis and even more uncomfortable with presenting the diagnosis to family members. The American Medical Association has identified gaps in medical school curriculum relative to dementia education. Their recommendation is to interject case studies and share stories from community-based organizations providing social services to patients and families to build connectedness for supportive programming. Programming must align with the respective dementia to ensure that patients are receiving accurate diagnoses with appropriate treatment protocols. It is difficult to provide appropriate treatment when the physician isn’t aware of the diagnostics relevant to the respective dementia and the specialist is inaccessible for consultation. Ensuring that clinical providers are properly trained, able to integrate digital health technology, and deliver high-quality patient care with accurate diagnostics is key, even with diseases that may not always present the most hopeful outcomes.

Case 1

- Providing dementia training is imperative to ensure that disparities are avoided, and potential for misdiagnosis is reduced.

Disease Diagnosis

- Assessing cognitive impairment can enable a provider or allied health professional to identify treatment protocols that support a patient's disease progression based on understanding of the type of dementia and stage of the disease progress.
- Historically disease diagnosis, in particular for Alzheimer's disease (AD), was "purely biological" as quoted by Scheltens et al. (2022).
  - Disease was measured by progressive cognitive impairment and the effects displayed through behavior and cognition.
  - Evident functional decline impacted activities of daily living.
  - In years passed, life expectancy post dementia diagnosis in the U.S. was 3–4 years, in Europe 6 years.
  - Cognitive assessments can provide information providers share with patients to:
    - Improve nutrition
    - Engage in healthy activities
    - Prevent some dementias

Patient History ADRD

- According to Scheltens et al. (2022):
  - For patients with a family history of Alzheimer's disease and other disease indicators, this can extend years with quality of life:
    - A 70-year-old patient disease duration could be 10 years prior to symptom presentation and 6 years for dementia presentation.
    - An 85-year-old has three times increased prevalence of developing Alzheimer's disease.
  - Identifying early indicators can potentially minimize symptoms and extend symptom-free years.

Reflection Question 3

What language would you use to let a patient know that they have potential signs of cognitive impairment? How would you share that information with them?

Lancet Commission on Dementia Prevention

- The Lancet Commission on Dementia Prevention has recognized 12 modifiable risk factors that can also be integrated into assessments to provide patients with tools for lifestyle changes (Jai et al., 2020):
  - Smoking
  - Depression
  - Physical inactivity
  - Social isolation
  - Diabetes
  - Obesity
  - Hypertension
  - Hearing loss
  - Less education
  - Traumatic brain injury (TBI)
  - Air pollution
  - Excess alcohol consumption

Modifiable Lifestyle Risk Factors

- In addition to recognizing, assessing, and understanding modifiable lifestyle factors, in some patients exhibiting signs of dementia evaluating underlying amyloid pathology can be done by interpreting and studying biomarkers (Boeve et al., 2022).
- Other challenges with diagnosis can be with pharmaceutical protocols:
  - For some dementias, such as Lewy body, medication can exacerbate symptoms (Prasad et al., 2022).
  - Accurate diagnosis and assessment can limit potential adverse reactions.
  - Diagnosing can be challenging; standard of care assessment can help patients receive more custom protocols and treatment if needed.
- To clarify, some dementia symptoms can mimic various types of dementia so diagnosis should not be made based purely on symptoms; it is important to explore evidence found in biomarker studies partnered with cognitive assessments.

Dementia Diagnosis

- While difficult and psychologically challenging, receiving an accurate dementia diagnosis is important for a patient and their family.
  - Plan for their future
  - Make lifestyle changes to address symptoms
  - The earlier the diagnosis, the greater the opportunity to impact disease progression (Yates et al., 2021).
- Most diagnosis occur in primary office settings, but many occur in specialist settings with psychiatrists, clinical psychologists, and psych nurses.

Dementia Diagnosis

- Delay in diagnosis is not unusual.
- According to Yates et al. (2021), a “delay of 3 years is not uncommon” for a patient to receive a confirmed diagnosis.
- Healthcare providers and other professionals must be trained to deliver accurate information relative to diagnosis and plan of action.
- Approximately 39% of primary care providers state (Sideman et al., 2023) they are either “never” or “sometimes comfortable” diagnosing dementia.
    - Nearly 33% of primary care physicians report feeling uncomfortable addressing patient and caregiver questions about ADRDs.
    - 22% of all primary care physicians received no training on dementia care, assessment, and diagnosis during their residence.
    - While PCPs are providing care for patients with dementia, many report that they are not confident in their abilities in this area.

Reflection Question 4

How can healthcare professionals collaborate to promote awareness of dementia and potential prevention with lifestyle choices with all patients?

Primary Care Providers

- It is important for primary care providers to have consistent understanding of applied best practices when sharing outcomes of cognitive assessments.
- Lecouturier et al., as quoted by Yates et al. (2021), identified best practices for disclosure of scores from cognitive assessments:
  - Prepare for the disclosure of results
  - Integrate family members and/or caregivers
  - Understand the patient’s perspective
  - Disclose the diagnosis
  - Address patient’s reactions and feelings
  - Focus on quality of life and well-being
  - Provide information to plan for the future
  - Have effective communication approach

Primary Care Providers (PCPs)

- The role of a primary care physician and other allied health professionals is going to continue to increase in the lives of older adults (Sideman et al., 2023):
  - Improve population health
  - Focus on disease prevention
  - Promoting healthy behaviors
  - Develop relationships with patients and their support

Primary Care Providers (PCPs)

- 82% of primary care providers state that they are on the “frontlines of dementia care” according to the Alzheimer’s Association as quoted by Sideman et al. (2023).
  - 64% of older adults receive dementia diagnosis from their PCP.
  - While PCPs see themselves as frontline clinicians, they:
    - Are concerned with lack of training
    - Express difficulties accessing and communicating with appropriate specialists
    - Have limited information about needed services
    - Aren’t trained in delivering diagnoses

PCP: Addressing Patients with ADRD (Adapted from Sideman et al, 2024)

Primary Care Steps to Address Patient with ADRD	Proper Treatment and Dementia Care
Annual patient care visit	• Perform cognitive assessment to determine issues
Develop and management meaningful relationship	• Perform standard screenings • Develop treatment protocols and interventions • Refer for proper imaging • Pharmaceutical therapies • Social services • Refer to specialists
Able to provide comprehensive care	• Assess social determinants of health • Insight into challenges and limitations to accessing services
Care navigation and continuum	• Coordination of care • Collaborate with specialists • Refer for proper diagnosis

PCP: Addressing Patients with ADRD (Adapted from Sideman et al, 2024)

Primary Care Steps to Address Patient with ADRD	Proper Treatment and Dementia Care
Community resource and healthy living tips	• Provide education • Design opportunities for patient engagement • Maintain patient follow up • Engage and educate family and caregiver
Addressing modifiable lifestyle risks	• Disseminate information relative to diagnosis and safety • Share information pertaining to healthy choices for disease prevention and symptom reduction

PCP Insights when Addressing Patients with ADRD

Providers Perspectives on Dementia Diagnoses	Outcomes and Insights
Providers disclosing dementia diagnosis	• Diagnoses were delivered with patient and caregiver/family member • Focused on quality of life for patient • Confirmed understanding of information shared • Limited training for disease management
Providers' perspectives on communicating dementia diagnosis	• Train and involve allied health professionals in conducting assessments • Providers struggled with recognizing patient readiness for diagnosis • Providers felt they needed to align with additional services and supports • Healthcare professionals felt there was little training on addressing potential conflict • Referenced memory problems instead of the word "dementia" • Providers needed support to deliver a hopeful message

(Yates et al 2021)

PCP Insights when Addressing Patients with ADRD

Providers Perspectives on Dementia Diagnoses	Outcomes and Insights
Developing a tool to deliver dementia diagnosis	• Providers needed tools to address barriers to conversation with patient and family • Training is necessary to identify proper language and emotional presentation • Focus on patient-centered care; address consent and patient autonomy
Concern about potential issues disclosing amyloid status in adults who present normal cognition	• Concern for depression and anxiety; study did not unveil differences in amyloid elevated group and non-elevated group (Yates) • Using term “elevated” as opposed to positive for amyloid plaque appeared to help patients • Patients with increased amyloid experienced anxiety but it did not appear to last

(Yates et al 2021)

Healthcare Professional Feedback

- Feedback and insights from providers and allied health professionals (Sideman et al., 2024):
  - *“I think as the first point of contact for family members, we should certainly be aware of how to approach the evaluation of dementia and, I think initial screening labs. I generally think, we should be aware of when we need to refer out, so when we’re uncertain or when we think we need to have a specialist weigh in.”*
  - *“Our role is essential because we’re probably who have the most contact with patients . . . And I think noticing those changes over time is something that’s important for us to look out for and recognize. Also, I think having those more difficult discussions if we do have a good relationship with the patients makes sense instead of, you know. Maybe even a neurologist for the first time being like, you know, I’m worried you can’t drive anymore.”*
  - *“Definitely in my experience with my patients, we’re the ones that they trust . . . They trust me, and that therapeutic relationship goes a long way.”*
  - *“I think we try to prepare caregivers, family members, and also the patient for what may come . . . I generally like to make sure that the family members understand what they’re getting into if they’re going to be the caregiver and support them as well . . . I feel like the family member is my patient as well.”*

Cognitive Assessments

Cognitive Assessment Tools

- According to the Alzheimer's Association (2024), there is no cognitive assessment tool that is currently recognized as the leader or that should be used as a sole tool in the determination of a person's diagnosis.
- Cognitive assessments are a part of a tool kit to help:
  - People who are concerned about their memory or cognition
  - People who are concerned about changes in their functionality:
    - Depression
    - Lethargy
    - Diminished ability to engage in self-care
    - Managing disease
    - Increased sense of fall risk
    - Changes in balance
  - Family or loved ones who notice changes in a patient
  - All Medicare beneficiaries as standard care in their annual wellness visit with their primary care physician

Aspects of Dementia and Terminology (Boeve et al., 2022)

Mild Cognitive Impairment

Memory

Executive functioning

Language

Visuospatial functioning

Mild Behavioral Impairment

Apathy

Loss of empathy

Loss of inhibition

Compulsive behavior

Changes in eating habits

Hallucinations

Delusions

Mild Motor Impairment

Upper motor neuron signs

Lower motor neuron signs

Involuntary and/or uncontrollable movements

Detection of Dementia

- Lack of detection of early onset dementias that have limited to no symptoms has resulted in a failure to provide patients with care, that can include lifestyle changes, among 27% to 81% of impacted patients (Chun et al., 2021).
- Detection of dementia disease can be unpredictable due to presentation and various rates of symptom presentation and decline.
- Untended mild cognitive impairment can cause increased risk of exacerbated disease and dementia, as compared to those with normal cognition (Chun).
  - Early detection can be beneficial for clinicians to unveil potential treatable causes.
  - Early detection allows for time to implement lifestyle changes.
- Today, clinical diagnosis of mild cognitive impairment is often determined by the provider's best judgment.

Clinical Assessment Methods for Dementia

- According to Chun et al. (2021), clinical assessment methods utilized by providers include:
  - Clinical Dementia Rating (CDR) Scale
  - Petersen's Criteria
  - National Institute on Aging and Alzheimer's Association (NIA-AA) Criteria
- These tools are frequently combined with laboratory tests and patient history as front-line screening methods.
- For best long-term impact from a societal and patient care perspective, structured, easy-to-implement screening tools can be used by individuals and nonclinical healthcare professionals to provide older adults with the opportunity to engage in brain health behaviors and consult with their physicians.

Cognitive Screening Tools (Alzheimer's Association)

Cognitive Screening Tools	Scoring/Rating System	Evaluation	Clinical Application
Clinical Dementia Rating (CDR) (Schmidt, 2021)	• Numerical scale 0–3	• 0 Normal cognition • 0.5 very mild, questionable decline • 1 Mild dementia • 2 Moderate dementia • 3 Severe dementia	• Used in conjunction with clinical judgment and patient interview • Semi-structured interviews with patient • Separate interview with spouse/caregiver/family member • Helps to discern dementia level
Petersen's Criteria (Libon, 2011)	• Memory complaint • Objective memory impairment • No dementia • Preserved overall general function (can perform self-care functions and activities of daily living)	• Classifies results: • Amnestic: mostly memory-related issues and deficits • Nonamnestic: affected functional and executive skills	• Recognizes that MCI does not always lead to dementia • Targeted, specific therapeutics

Chung et al. (2021)

Cognitive Screening Tools (Alzheimer's Association)

Cognitive Screening Tools	Scoring/Rating System	Evaluation	Clinical Application
National Institute on Aging – Alzheimer's Association (NIA-AA) Criteria for Alzheimer's Disease	• Focus on three of the stages of AD • Dementia due to AD: notable cognitive decline • Mild cognitive impairment due to AD: transitional stage, not severe enough to be dementia • Preclinical/presymptomatic AD: (Research oriented)	• Biomarkers are the measurable indicators for risk and/or disease presentation • Brain imaging (MRI, PET), and cerebrospinal fluid proteins • Identification of preclinical AD to treat to slow or halt progression • Includes brain changes found post-mortem	• Enhance diagnosis • Improve autopsy reporting • Advance early detection

Chung et al. (2021)

Alzheimer's Association

- The Alzheimer's Association and other researchers mapping the disease trajectory appear to collectively agree that identifying patients are the earliest stages of Alzheimer's (preclinical symptom stage) can provide opportunity for therapeutic intervention (Chapman et al., 2022).
  - Identifying biomarkers is necessary to determine disease presence, although this does not guarantee that patient will develop the disease.
    - A minimum of 33% of cognitively normal older adults may present traditional tangles and plaques reflective of AD but do not develop the disease.
  - Another preclinical stage can be the patent sharing their concern about cognitive decline, also known as subjective cognitive decline (Chapman et al., 2022), despite normal results on cognitive assessments.
    - Further exploration can determine potential disease development and manifestation relative to AD and early interventions.

Treating Dementia Diagnosis

- According to Chung et al. (2021), there is a lack of effective pharmaceutical protocols and treatments that can treat a dementia diagnosis:
  - Limited clinical treatments to treat underlying causation
  - Limited clinical treatments that can slow down disease progression or rate of cognitive decline for the most prevalent dementias
  - Some medications that may only manage symptoms by temporarily relieving cognitive challenges and decline, as well as memory issues
- Cognitive assessment can precipitate patient education about lifestyle modifications that can potentially drive prevention and access to early treatment approaches.

Treating Dementia Diagnosis

- World Health Organization (WHO) recommends advocating for addressing modifiable lifestyle factors (Chung) to reduce risks and limit progression of any disease.
  - Improve diet and nutritional choices
  - Physical movement and exercise
  - Social connection
- Patient education and health promotion can be promising tools to actively engage is mitigating dementia impact and risk.

Comprehensive Cognitive Assessment

- Effective comprehensive cognitive assessment is conducted with (Quintoriano & Hamm, 2017):
  - Family history
  - Patient history
  - Physical examination
  - Cognitive examination
    - Cognitive abilities
    - Responsiveness
    - Hearing and vision examinations

Reflection Question 5

Is cognition screening and assessing a part of an annual physical exam for older adults age 65+ in your practice?

Screening Tools

- Determining applicable screening tool for cognitive assessment in a primary care provider's office should consider (Quintoriano & Hamm, 2017):
  - Practicality
    - Available time for implementation
    - Cost of the instrument
    - Accessibility of instrument
  - Feasibility
    - acceptability to both provider and patient
    - Ease of implementation and scoring
    - Timelines
  - Range of applicability
    - Sensitive to patient social determinants of health
    - Applicable to different dementias
  - Psychometric properties
    - Reliability of results

Limitations to Cognitive Assessments

- For the purpose of early diagnosis and dementia risk assessment, primary care physicians can provide initial diagnostics for dementia.
- Some limitations to performing cognitive assessment in primary care (Siddiqui et al., 2023):
  - May not have capacity to perform necessary tests for detection and diagnosis of dementia (Quintoriano & Hamm, 2017)
  - Some screenings required more time than one visit to primary care physician (PCP)
    - Example: MMSE (mini-mental state examination) is often used to evaluate and assess for dementia symptoms, but it has limitations due to lengthy administration, as well as education bias (Quintoriano & Hamm, 2017).
  - Concern for normalizing dementia as a part of aging, instead of focusing on preventative brain health
  - Lack of physician training on cognitive assessments

Mini-Mental State Examination (MMSE)

- The Folstein Mini-Mental State Examination (MMSE) is a type of cognitive assessment that evaluates (Arevalo-Rodriguez, 2021):
  - Attention and orientation
  - Memory
  - Registration
  - Recall
  - Calculation
  - Language
  - Ability to draw a complex polygon

Mini-Mental State Examination (MMSE)

- MMSE was not created and designed to recognize early stages of dementia, unveil the type of dementia, or predict future stages and progression of the disease.
- Benefits to the MMSE include (Arevalo-Rodriguez et al., 2021):
  - Rapid administration
  - Available in many languages
  - Accepted as a diagnostic instrument
- MMSE is a 30-question assessment that delivers a score upon completion.
  - Scores can be influenced by some social determinants of health and testing setting.
  - Local standards must be integrated into assessment for reliability.

Sample MMSE Questions and Activities

1. What is the year? Season? Date? Day of the week? Month?
2. Where are we right now?
3. The healthcare professional names three unrelated items, clearly and slowly, then asks the patient to name all three of them.
4. Count backwards from 100 by 7s,
5. Spell the word “World” backward.
6. Earlier, I asked you to name three items; can you recall what they were?
7. Make up and write a sentence about anything, but it must contain a noun and a verb.
8. Copy a specific picture (can be a symbol with a line intersecting it).

Assessment Tool: General Practitioner Assessment of Cognition (GPOG)

- The GPCOG was designed and validated to provide primary care providers with a tool for detecting dementia.
  - According to Brodaty et al. (2004), it performs as well as the MMSE.
  - Takes only 4 minutes to administer to the patient, and 2 minutes to interview the caregiver.
  - GPCOG is considered invaluable with diverse populations.
  - This assessment can help identify patients that may need further evaluation to determine if dementia is present (Fage et al., 2021).
  - GPCOG: total score of 9 points
    - Asked for name and address
    - Date
    - Drawing a clock including accurate placement of numbers and hands
    - Recalling news/current events
  - High reliability, sensitivity, and specificity
  - Effective in recognizing impaired cognition
- English_GPcog_20160329(1).pdf (link to GPOG English version)

Assessment Tool: Mini-cog

- Mini-cog can be a helpful tool in a primary care practice for initial screening of dementia (Seitz et al., 2018).
  - Considered a screening tool that should be followed with an assessment based on findings
  - Mini-cog consists of:
    - Three-word registration: healthcare professional selects three words that the patient repeats; response determines next steps.
    - Clock drawing: patient is asked to draw a clock face and place numbers where they belong, followed by setting the clock for a specific time.
    - Three-word recall: patient is asked to repeat the three words from the three-word registration.
    - Points are scored, and a point score of less than 3 suggests further evaluation with more extensive testing.

Assessment Tool: Montreal Cognitive Assessment (MoCA)

- According to Chun et al. (2021), the Montreal Cognitive Assessment (MoCA) is the tool that is preferred by primary care clinicians:
  - One of the commonly used assessments screening for mild cognitive decline
  - Validated and found to be more sensitive than the MMSE (Joulayanout & Nasreddine, 2017)
  - Evaluate specific cognitive domains
    - Short-term memory
    - Visuospatial abilities
    - Executive functioning
    - Working memory, attention, and concentration
    - Language
    - Orientation to time and place
  - Can be valuable to evaluate normal cognition with geriatric psychiatric patients
  - Evaluating mild dementia
  - Evaluating mild cognitive impairment
  - Demographic information should be considered when delivering this assessment
  - MoCA is appropriate for all levels of education (Joulayanout & Nasreddine 2017)
- 8.1-English-Test-2018-03.pdf (uiowa.edu) (link to English version MoCA)

Assessment Tool: Montreal Cognitive Assessment (MoCA) (cont.)

- MoCA is considered an accurate tool to identify mild cognitive impairment.
- MoCA does not consider root causes.
- MoCA takes approximately 10 minutes to administer.
- Questions and tasks include:
  - Copy a drawing of a three-dimensional cube
  - Draw a dial clock showing 10 minutes past 11:00
  - Connect numbered dots (1, 2, 3) and lettered dots (A, B, C) sequentially, alternating numbers and letters
  - Identify and name the three animals that are pictured on the page
  - Repeat a list of digits forward
  - Count backwards from 100 by 7s
  - Explain the similarity between a train and a bike
  - Know the date, time, and place

Assessment Tool: Mini-MoCA

- The abbreviated version of the MoCA was designed to provide an opportunity for primary care providers to implement a faster screening tool that can be expedited over the telephone (Dujardin et al., 2021).
  - Mini MoCA:
    - Is valid and reliable tool to detect cognitive impairment in various populations
    - Can be done remotely and for large-scale screenings in communities
    - Is a 5-minute test to administer

Assessment Tool: The Visual Cognitive Assessment Test (VCAT)

- The Visual Cognitive Assessment Test (VCAT) scale:
  - A multicultural, language neutral test
  - Image-based with visual representations
    - Highly intuitive
    - Culturally unbiased
    - Neutral language
    - Works well with patients with low education level
  - Created to identify early stages of cognitive impairment by evaluating:
    - Memory
    - Visuospatial function
    - Executive function
    - Language
    - Attention
  - Can indicate cognitive impairment but should be followed up with comprehensive assessment

Assessment Tool: Vascular Dementia Assessment Scale-Cognitive Subscale

- While Alzheimer's disease is the most common form of dementia, vascular dementia is the second most common.
  - MMSE and MoCA are used to evaluate presentation of mild cognitive impairment and dementia.
  - Vascular dementia, defined by vascular lesions and impaired vascular pathology, is different in presentation than AD (Sanders et al., 2023).
    - Attention and information processing challenges
    - Disorganized thoughts and changes in behavior

Assessment Tool: Vascular Dementia Assessment Scale-Cognitive Subscale

- The Vascular Dementia Assessment Scale-Cognitive Subscale (VADAS-Cog) (Bir et al., 2021):
  - Can be conducted in the acute setting to address cognitive impairment
  - Cognitive impairment caused by vascular dementia may be stabilized and can potentially improve (unlike AD); test examines:
    - Executive function
    - Working memory
    - Speaking ability
  - Typically conducted with the Neuropsychiatric Inventory to evaluate:
    - Depression
    - Apathy
    - Potential hallucinations and delusions
  - Results should be evaluated as a tool in a broader context.

Technology Advances

- Technological advances including integration of cognitive assessments, digital platforms, and artificial intelligence will provide opportunity for testing that can improve lives of patients with cognition impairment, symptomatic and/or asymptomatic.
- Standardizing assessments and delivery systems will enable more patients to identify areas of concern for long-term well-being and functionality.
    - Able to deliver awareness to larger populations
    - Facilitate remote testing and interpretations
    - Educate more people about brain health

Loewenstein Acevedo Scales of Semantic Interference and Learning (LASSI-L)

- Another innovative, novel assessment tool for mild cognitive impairment and early identifier of preclinical Alzheimer's disease (AD) is the Loewenstein Acevedo Scales of Semantic Interference and Learning (LASSI-L) (Curiel-Cid, 2021):
  - LASSI-L has identified patients with amnestic mild cognitive impairment (aMCI) and high amyloid plaques in the brain.
    - Developed a web-based brief digital version to improve and standardize administration conducted in real time and increase validity.
    - Tool can monitor longitudinal cognitive changes in patients relative to preclinical stages of AD.
      - Sensitive to biomarkers of AD (presentation of tangles and plaques)
      - Identifies neurodegeneration
      - Can provide patients with information needed to make lifestyle changes for maintenance of cognition and capability

Cognitive Assessments: Next Gen

- Cognitive assessments are widely utilized in the following settings (Hall et al., 2023):
  - Educational institutions
  - Corporations (for hiring)
  - Healthcare providers
- Next generation cognitive assessments are involving data gathered from cognitive assessments in alignment with neuroimaging technology such as fMRI, which explores brain functionality through imaging.
- Hall et al. (2023) assert that brain imaging, combined with automation and artificial intelligence (AI), will positively impact the process of assessing and diagnosing brain health and functionality in a manner that increases accuracy and efficiency.
  - This innovation is emergency research that will benefit the healthcare professional due to accuracy and expediency and the patient due to deeper understanding of their disease progression.
  - Should be note that cognitive assessment industry is growing: It was worth $3.9 billion in 2023, with expected growth to $29.3 billion in 2030 (Hall et al., 2023).

Digital Technology

- Cognitive rehabilitation treatment plans can be developed based on assessment outcomes.
- Digital technology can be utilized with rehabilitative treatment for some dementias.
- Patients with vascular dementia are shown to have promise for improvement with rehabilitative treatment (Sanders et al., 2023):
  - Global cognitive functions are shown to have potential for improvements.
  - Attention and working memory may also improve from applied rehabilitative treatment intervention.
  - Protocols should be individualized to achieve realistic goals and provide the opportunity for best outcomes.

Multidimensional Brain Health Assessment Devices (MBDs)

- Hall et al. (2023) state that the next generation of cognitive assessments will include:
  - Multidimensional brain health assessment devices (MBDs):
    - Interfacing simultaneous cognitive assessments and functional brain imaging
    - Measure real-time bold responses (able to compare scores relative to other individuals with similar criteria)
    - Neuroelectric activity
    - Magnetic fields
    - Requires standardized cognitive assessments and environments (lighting, equipment, and staff training)
    - Costs would be consistent with other diagnosis-driven technologies (MRI, PET, CT)
    - Cost savings potential for early identification, symptom control, and expanded quality of life is notable
    - Neuro-imaging, combined with digital, standardized cognitive assessment, can challenges presented by the aging brain
    - Can address patients in rural and hard-to-reach areas

Other Cognitive Assessment Tools

- Memory and Executive Screening (MES) (Guo et al., 2012) was originally developed to deliver an efficient assessment to identify mild cognitive impairment in a manner that could be beneficial to patients with illiteracy and low education:
  - Evaluates memory and executive function
  - Is highly sensitive and specific
  - Focuses on three indicators not related to educational level
  - Has an auditory memory component with 10 key points (Ciu et al., 2024)
  - Is considered a valid, easy-to-implement cognitive assessment

Assessment Tool: Five-Minute Cognitive Test

- The Five-Minute Cognitive Test (FCT) is another tool for cognitive assessment (Ciu et al., 2024) designed to address the following in a timely, efficient manner:
  - Episodic memory
  - Language fluency
  - Time orientation
  - Visuospatial function
  - Executive function
- FCT is considered reliable in detecting cognitive impairment, relative to the MMSE.
  - Scores range from 0 to 20, with lower scores indicating greater impairment.
  - This test is reliable and valid.

Assessment Tool: Short Form of the Informant Questionnaire on Cognitive Decline in the Elderly

- The Short Form of the Informant Questionnaire on Cognitive Decline in the Elderly (SHORT IQCODE) is a brief questionnaire completed by a person who knows the patient well (Burton et al., 2021).
  - Assesses cognitive decline looking back 10 years
  - Has been helpful identifying a patient with dementia
  - Focuses on:
    - Memory
    - Intelligence
    - Executive functioning
    - Ability to perform activities of daily living
      - Recalling events
      - Managing finances
      - Critical thinking and reasoning skills

Dementia Diagnosis

Cognitive Assessments as Standard Care

- Cognitive assessments are standard care for older adult patients.
- Primary care providers, physician assistants, nurse practitioners, and registered nurses should receive training on assessments, diagnosis, and available treatment protocols (Dening et al., 2023).
  - Early diagnosis is key to identify modifiable risk factors.
  - Integrate healthy lifestyle choices
    - Social connection
    - Nutrition/diet
    - Functional mobility
    - Exercise
    - Safe environment

Holistic Approach

- Throughout the world, longevity is increasing, and with it comes the increased burden of the reality of various dementia diagnoses and cognitive impairments (Liu et al., 2024).
  - Mild cognitive impairment diagnosis should be addressed with a holistic approach.
    - Personal history
    - Neuropsychological assessment
    - Laboratory tests
    - Thorough evaluation
    - Imaging, if necessary
  - Addressing cognitive impairment in a timely manner provides the physician with the opportunity to engage in potential treatment that may slow down symptoms while providing the patient with timely decision-making opportunity

Correlation to Comorbidities

- A shift toward addressing dementia testing with technology can provide healthcare professionals and PCPs with the opportunity to identify preceding correlates that may be addressed to avoid dementia progression.
- According to Forns et al. (2022), patients with dementia had a “high burden of baseline comorbidities”:

Hypertension and hypertensive heart disease	93.6% - 98.1%
Hyperlipidemia	93.4% - 95.4%
Chronic cardiovascular disease	83.5% - 92.2%
Cerebrovascular disease	69.6% - 85.4%
Chronic obstructive pulmonary disease	52.6% - 62.8%
Mood disorders	54.3% - 66.9%
Anxiety disorders	54.0% - 60.7%
Urinary tract infections	41.0% - 50.3%
Falls and/or fractures	30.4% - 38.5%

Case 2

- Emily Taylor, 75, lives alone, goes to church regularly, and volunteers at the preschool reading to the children every Wednesday. Last week when volunteering, she appeared confused and unfocused and tried to read the book while holding it upside down. When the teacher asked if she was ok, Emily laughed it off and said she was fine. It became clear that she wasn’t fine and she needed to see a doctor. Emily became adamant about being just fine to spend time with the students, and she began raising her voice and making incoherent statements. Alarmed, the school called 911, and Emily was taken to the local hospital by paramedics, who called her daughter and told her to meet them at the hospital. When Emily arrived at the hospital, she was deeply distressed, and the hospital gave her medication to address her agitation and dementia-like presentation.

Case 2

- Emily’s daughter shared that her mother had never presented dementia-like behavior in the past. The attending physician performed a cognitive assessment and determined that she was exhibiting dementia, and he shared his assessment with her daughter. Her daughter immediately called Emily’s PCP, a man who had been her physician for over 7 years. Within an hour, the PCP’s office called the hospital physician and said that Emily had a history of recent urinary tract infections. An expedited urinalysis was ordered, and Emily was found to have a serious UTI for which they began high doses on antibiotics. Within 24 hours, Emily had returned to her normal cognition but was very anxious about her future. Her PCP determined she needed to be on prophylactic antibiotics to avoid future UTIs.

Other Insight

- Recognizing that there are no cures for the most common dementias may precipitate patient reluctance to get a cognitive assessment.
- It is incumbent on healthcare providers to educate and inform patients that while Alzheimer's disease may be the most common form of dementia, not all dementia diagnoses are Alzheimer's.
- Proper and accurate diagnosis, including the risk of false positives, is crucial (Davis et al., 2021).
  - Inaccurate and incorrect diagnosis relative to dementia can cause distress and harm.
  - Accurate diagnosis may have the benefit of reducing adverse events.
    - Identifying appropriate care
    - Managing lifestyle choices

Training Healthcare Providers

- Healthcare providers must be trained (Yates et al., 2021):
  - Identifying proper assessment
  - Developing patient and caregiver rapport
  - Delivering diagnosis
  - Recommending proper community support
  - Reducing stigma
  - Finding balance between honesty and hopeful messaging and prognosis (Yates)

Wrap-Up

- The following are the most common cognitive screenings for mild cognitive impairment and dementia (Liu et al., 2024):
  - Montreal Cognitive Assessment (MoCA)
  - Mini-Mental State Exam (MMSE)
- These tests have limitations relative to:
  - Adaptation to different populations
  - Language and translation
  - Validation with populations from different cultural backgrounds
- Understanding tool limitations and application is crucial for proper diagnosis process.
- It is crucial to recognize that the tools support a diagnosis; they are a part of the process that can help identify a patient's need to ensure best practice, proper treatment, and the opportunity to plan for future needs.

You have completed the course:

Cognitive Screening for Dementia with Older Adults

Thank you!