Recent Advances in Screening for Mild Cognitive Impairment and Alzheimer Disease

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More than 6 million Americans[1] are living with Alzheimer disease (AD), and that number is expected to reach 13 million by 2050.[1] One in every 3 seniors dies with AD or another dementia, and AD kills more than breast cancer and prostate cancer combined.[1] AD accounts for 60%–80% of all dementias,[2,3] often overlapping with other pathologies including Lewy body dementia, vascular dementia, and hippocampal sclerosis. It is estimated that more than 11 million family caregivers[1] provide around 16 billion hours in unpaid care, valued at nearly $272 billion.[1] Total health care costs for people with Alzheimer and other dementias are expected to increase from $321 billion in 2022 to close to $1 trillion[1] in 2050.

Within the last decade, scientists have discovered that certain biomarkers can be detected decades before the onset of AD symptoms,[4] resulting in earlier diagnoses and interventions. Notable biomarkers include amyloid β (Aβ42), total tau (t-tau), and phosphorylated tau (p-tau).[5] Aβ42 in the brain signals the production of tau, which causes the neuronal damage and synaptic dysfunction underlying AD.[6]

Early detection of these biomarkers can lead to early intervention and better patient outcomes. Through education, patients and families can gain a better understanding of the symptoms and changes that occur with AD and what the impact of the disease might be for them. With the time gained from faster diagnoses, patients with AD should discuss their treatment plan goals with their clinicians and weigh the risks and benefits of different treatment strategies together. Lifestyle interventions, financial planning, and seeking support services are additional benefits to an early diagnosis.[7]

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This COMMENTARY section of *The Journal of Clinical Psychiatry* presents the highlights of the teleconference series "Screening, Diagnosing, and Treating Mild Cognitive Impairment and Mild Alzheimer Disease," which was held on February 25, 2022. This report was prepared and independently developed by the CME Institute of Physicians Postgraduate Press, Inc., and was supported by an educational grant from Biogen MA Inc.

The teleconference was chaired by **Dr Allan Anderson, MD, MMM, CMD, DLFAPA**, Banner Alzheimer's Institute, Tucson, Arizona. The faculty was **Dr Matthew Malone, DO**, **MBA**, Banner Alzheimer's Institute, Tucson, Arizona.

CME Objective

After completing this educational activity, you should be able to:

- Diagnose patients with mild cognitive impairment or mild Alzheimer dementia
- Facilitate prompt treatment initiation for patients with mild cognitive impairment or mild Alzheimer dementia

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This Neuroscience Commentary activity was published in December 2022 and is eligible for *AMA PRA Category 1 Credit* through December 31, 2023. The latest review of this material was September 2022.

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Marlene P. Freeman, MD, Editor in Chief, Boston, Massachusetts, has received research funding from JayMac and Sage; has been a member of the Independent Data Safety and Monitoring Committee for Janssen (Johnson & Johnson), Novartis, and Neurocrine; and has served on advisory boards for Eliem and Sage. As an employee of Massachusetts General Hospital (MGH), Dr Freeman works with the MGH National Pregnancy Registry, which receives funding from Alkermes, Aurobindo, AuroMedics, Johnson & Johnson/Janssen, Otsuka, Sage, Sunovion, Supernus, and Teva, and works with the MGH Clinical Trials Network and Institute, which receives research funding from multiple pharmaceutical companies and the National Institute of Mental Health. Dr Freeman has also received royalties through MGH for the Massachusetts General Hospital Female Reproductive Lifecycle and Hormones Questionnaire.

None of the other planners, reviewers, and CME Institute staff for this educational activity have relevant financial relationships with ineligible companies to disclose. All relevant financial relationships have been mitigated. **Dr Anderson's and Dr Malone's financial disclosure appears on the next page.**

J Clin Psychiatry 2023;84(1):BG21120COM3

To cite: Anderson A, Malone M. Recent advances in screening for mild cognitive impairment and Alzheimer disease. *J Clin Psychiatry.* 2023;84(1):BG21120COM3

To share: https://doi.org/10.4088/JCP.BG21120COM3

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Financial Disclosure

Dr Anderson has served on the speakers/advisory boards for Biogen. **Dr Malone** has no financial disclosures.

Review Process

The author agreed to provide a balanced and evidence-based presentation and discussed the topic and CME objective during the planning sessions. The author's submitted content was validated by CME Institute staff, and the activity was evaluated for accuracy, use of evidence, and fair balance by a peer reviewer who is without conflict of interest.

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Differentiating between stages and types of dementia is an important step in optimizing patient outcomes, including the understanding that mild cognitive impairment (MCI) is not dementia.[7] MCI is characterized by the patient or the patient's family or caregivers reporting changes in cognitive ability, without any major change in activities of daily living (although compensatory measures may be present), no explanation from psychiatric disorders, and objective evidence of cognitive impairment on a clinical examination.[8]

Several screening methods are available to differentiate among forms of dementia. The Mini Mental State Examination (MMSE) is the most common cognitive screening test. It is well-established and sensitive to memory disorders specifically. The MMSE consists of 11 questions, takes approximately 10 minutes to complete, and is easy to administer.[9]

The Montreal Cognitive Assessment (MoCA) is also becoming more widely adopted. Like the MMSE, MoCA takes around 10 minutes and consists of a 1-page document that uses a 30-point scale to assess memory, reasoning, and executive functioning.[10] The MoCA can include the Memory Index Subscale (MIS), which calculates points for word recall in free recall, category prompts, and multiple choice. If total MoCA score is less than 20 and patients score less than 7 out of 15 on the MIS, the risk for progressing from MCI to AD increases by 60% in the next year.[11] If the total MoCA score is > 20 and the MIS is > 7, then the risk for progressing from MCI to dementia is less than 35%. The MoCA is 90% sensitive and 87% specific for MCI.[10,11]

Other tests used to screen for dementia include the Saint Louis University Mental Status Exam (SLUMS), the General Practitioner Assessment of Cognition (GPCOG), and the Mini-Cog.[12–14]

It is important for clinicians to include patient history and physical and neurologic examinations in their assessments to rule out AD mimics, such as psychiatric illnesses, neurologic disorders, or metabolic changes. By capitalizing on the rapidly improving understanding of AD pathophysiology, clinicians should be better able to identify dementia, intervene appropriately, and ultimately improve patient outcomes.

Published online: December 26, 2022.

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CME INSTITUTE POSTTEST

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1. Which of the following biomarkers plays a key role in the pathogenesis of AD and serves as a biomarker for diagnosis?

a. Phosphorylated neurofilament heavy chain (pNFH)

b. Aquaporin-4 (AQP-4)

c. α-synuclein (αS)

d. Aβ42

2. On the Montreal Cognitive Assessment, a total score _____ is associated with a 60% increased risk in progressing from mild cognitive impairment to AD within 1 year.

a. Less than 18

b. Less than 20

c. Less than 22

d. Less than 24

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