Do Not Drink, Do Not Drive: Alcohol Use Disorder in the Elderly

Ganesh Gopalakrishna, MD, and Nisha Patel, DO

HISTORY OF PRESENTING ILLNESS

Mr A is an 82-year-old Hispanic man who presented with his family to the memory clinic at Banner Alzheimer's Institute for evaluation of cognitive impairment. He was referred to the memory clinic by his primary care physician (PCP) after his memory symptoms persisted despite improvement of mood with a selective serotonin reuptake inhibitor. Although his mood was better controlled, Mr A had started drinking more between his PCP visits and the first memory clinic appointment. The PCP's long-term follow-up plans included a family meeting with the social worker at Banner Alzheimer's Institute to address additional resources available to the patient and family. The family was continuously involved in his care, and his wife was the primary caregiver.

Mr A was a poor historian due to limited insight. His family reported that, progressively over the last 2 years, he was forgetting details of recent events and conversations and had difficulty tracking dates and appointments. He had forgotten the names of his daughters and was unable to recognize the relationship between different family members. He was also repeating questions, had word-finding difficulty, and was having trouble understanding others and making judgements. He was misplacing items and thinking others were stealing from him.

Mr A reported a problem using the phone but has always had problems using technology. His wife took over the finances 6 months prior to his first memory clinic appointment because he was not paying bills and was unable to balance the checkbook. He reported taking medications independently and goes shopping for alcohol by himself. He is independent in bathing, brushing his teeth, dressing, toileting, and eating. He does need reminders to shave, shower, and comb his hair. Mr A continued to drive, but his daughter had concern over his speed, turning in front of others, straddling lanes, running over curbs, getting lost, and getting angry while driving. He did get lost once while driving.

Mr A's family reported that he had anxiety when separating from his wife but would still leave the home to obtain alcohol; he also had anhedonia and irritability, which had improved with citalopram. Mr A reported a good mood, but his sleep was disturbed, and he acted out in his dreams. He once even fell out of bed due to these sleep behaviors. He reported good energy levels, but his appetite was poor, and he often did not eat when drinking alcohol. He denied suicidal ideations, homicidal ideations, or auditory or visual hallucinations. He reported paranoia and delusions about people stealing from him, but no other delusions or paranoia. He often repeatedly checked locks and the mail, even on Sundays.

PAST MEDICAL HISTORY

Mr A denied any head trauma, stroke, or seizures. He had a history of hypertension, chronic kidney disease, vitamin B_{12}

CME Background

Articles are selected for credit designation based on an assessment of the educational needs of CME participants, with the purpose of providing readers with a curriculum of CME articles on a variety of topics throughout each volume. This special series of case reports about dementia was deemed valuable for educational purposes by the Publisher, Editor in Chief, and CME Institute staff. Activities are planned using a process that links identified needs with desired results.

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CME Objective

After studying this article, you should be able to:

- Screen elderly patients for alcohol use disorder

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**Corresponding author:* Ganesh Gopalakrishna, MD, Stead Memory Clinic, Banner Alzheimer's Institute, 901 E Willetta St, Phoenix AZ 85006 (Ganesh.Gopalakrishna@bannerhealth.com).

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Case Conference
The Banner Alzheimer's Institute Case Conference is a weekly event in which physicians and staff discuss challenging and/or teaching cases of patients seen at the Institute's Stead Family Memory Clinic. These conferences are attended by a multidisciplinary group that includes Banner Alzheimer's Institute dementia specialists, community physicians (internal medicine, family medicine, and radiology), physician assistants, social workers, nurses, medical students, residents, and fellows. The Banner Alzheimer's Institute, located in Phoenix, Arizona, has an unusually ambitious mission: to end Alzheimer's disease without losing a generation, set a new standard of care for patients and families, and forge a model of collaboration in biomedical research. The Institute provides high-level care and treatment for patients affected by Alzheimer's disease, dementia, and related disorders. In addition, the Institute offers extensive support services for families and many unique and rewarding research opportunities.

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deficiency, and macrocytic anemia likely secondary to chronic alcohol use.

ALLERGIES

Mr A had no known drug allergies.

MEDICATIONS

Citalopram 10 mg/d
Ferrous sulfate 235 mg/d
Folic acid 1 mg/d
Hydralazine 25 mg twice/d
Metoprolol succinate extended release 25 mg/d
Sodium bicarbonate 10 g 3 times/d
Vitamin B_{12} 1,000 mcg/d
Vitamin D_2 50,000 IU/week

SOCIAL HISTORY

Mr A lived with his wife and grandson. He did not exercise on a routine basis but worked in the yard. He had a high school education. He was retired since 2004. He worked at a warehouse operating forklifts for Walmart for 15–20 years.

Clinical Points

- When older adult patients present with cognitive decline, it is important to rule out any organic, substance-induced, or mood-related etiology.
- It is imperative to perform alcohol use screening in primary care settings for older adults who often are not screened properly, as this could provide insight into limitations of activities of daily living and cognitive issues.
- The Alcohol Use Disorders Identification Test and Michigan Alcoholism Screening Test–Geriatrics Version are good screening tools for older adults with heavy alcohol use.
- Speaking to older adults about excessive alcohol use is best addressed by nonconfrontational, supportive conversation and use of long-term treatment.
- Family support can lead to better outcomes for older adults with alcohol use disorder.

He liked hunting, fishing, camping, playing the lottery, and boxing. He and his wife have been married for over 57 years. He had 4 daughters and 2 sons who were supportive but did not live with him. He learned English in grade school at age 7.

PSYCHIATRIC HISTORY

Mr A denied any psychiatric hospitalizations or suicide attempts. He was started on citalopram in 2018 for depression.

FAMILY HISTORY

Mr A stated that his sister developed dementia in her 80s, and his brothers developed dementia in their 70s. He stated that all his siblings and half siblings have or had dementia.

MENTAL STATUS EXAMINATION

Mr A appeared alert, well nourished, and in no acute distress. His rate, volume, and articulation of speech were normal. His thought process was sequential, coherent, and logical. His associations were intact and appropriate. He did not display loose associations and had no abnormal or psychotic thought processing, including hallucinations, delusions, obsessions, phobia, or compulsions. Mr A denied suicidal and homicidal ideation. He had impaired insight and judgement. He self-described his mood as good, and his affect was mood congruent, reactive, and appropriate.

Based on the information so far, do you think a major neurocognitive disorder is present?

A. Yes
B. No
C. Not enough information provided [correct answer]

The *DSM-5* (American Psychiatric Association, 2013) defines a major neurocognitive disorder as follows:

A. Evidence of significant cognitive decline from a previous level of performance in 1 or more areas of cognitive domains (complex attention, executive function, learning and memory, language, perceptual-motor or social cognition) based on:
   1. Concern of the individual, a knowledgeable informant, or the clinician that there has been a significant decline in cognitive function and
   2. Substantial impairment in cognitive performance, preferably documented by standardized neuropsychological testing or, in its absence, another quantified clinical assessment.

B. The cognitive deficits interfere with independence in everyday activities.

C. The cognitive deficits do not occur exclusively in the context of a delirium.

D. The cognitive deficits are not better explained by another mental disorder.

It is important to rule out potentially reversible causes of cognitive decline, like substance-induced cognitive disorders, before considering neurodegenerative disorders. There is mention of alcohol use in Mr A's history. It is important to obtain a comprehensive history of substance abuse when evaluating a patient for cognitive decline. Health care professionals frequently ignore screening elderly patients for problematic alcohol use (DiBartolo and Jarosinski, 2017).

Mr A initially reported drinking 2 beers per night. He noted that he had cut down his use, due to family pressure and initial behavioral interventions with his PCP, from half a bottle of wine daily. However, his family noted him averaging 21 cans of beer a week with some wine. He does have a history of a few citations for driving while intoxicated. He denied periods of sobriety. He had been drinking an 8 pack of beer per day for decades. He received a daily allowance of $20 from his wife, $15 of which he spent on alcohol. He walks to the store multiple times a day and has threatened to go to the bank if his wife does not give him money. He frequently stumbles when walking. He has had multiple falls and recently was found in the trash can, likely by falling over it. He sleeps poorly when intoxicated and will sleep until 2 pm. The following day, he does not remember his behaviors while intoxicated and apologizes for them. He reported smoking marijuana in the past for decades but has not used the substance in the last 5 years. He has never smoked tobacco cigarettes or used other tobacco products.

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Based on the presentation, what would you expect to see on Mr A's physical and neurologic examination?

A. Normal [correct answer]
B. Objective nonfocal neurologic findings (including frontal release signs)
C. Focal neurologic findings
D. Insufficient information is provided

PHYSICAL AND NEUROLOGIC EXAMINATION

Mr A's physical examination showed mild abnormalities in vision and hearing, but no localizing or lateralizing neurologic findings were present. Cranial nerve testing was symmetric, and his pupils were equal, round, and reactive to light. Sensation was grossly intact. Coordination testing was accurate. Deep tendon reflexes were symmetric with no pathologic reflexes. Station and gait were normal.

It is important to screen for any physical sequelae of continued alcohol use, which could include jaundice, anemia, hepatomegaly, pedal edema, ataxia, and neuropathy. No stigmata were noted in this patient.

Based on the information presented so far, how would you expect Mr A to perform on the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA) cognitive screening measures?

A. Normal range
B. Mildly impaired
C. Moderately impaired [correct answer]
D. Severely impaired

Mr A scored 18 on the MMSE (Folstein et al, 1975), which is in the moderately impaired range. He missed points on orientation registration, attention, comprehension, copying the drawing, and recall.

Mr A scored 13 on the MoCA (Nasreddine et al, 2005), suggesting moderate impairment. He demonstrated impairment in visuospatial tasks, attention, orientation language, abstraction, and delayed recall.

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Which of the following evaluations would you schedule next?

A. Standardized neuropsychological evaluation
B. Imaging of the brain
C. Thiamine level
D. Genetic testing
E. No further testing is necessary; would start cholinesterase inhibitor medication for Alzheimer's disease and observe
F. B and C [correct answer]

For alcohol use disorder workup, especially when presenting with cognitive or memory concerns, it is imperative to check the patient's thiamine level. Thiamine deficiency is common with chronic alcohol use and is caused by malnutrition, nausea, and vomiting. Alcohol also reduces the gastrointestinal tract's ability to absorb thiamine appropriately. The liver, if diseased by alcohol, may also have difficulty storing thiamine. Although there is a possibility of reversing some effects of the deficiency, thiamine repletion will often just reduce the progress of brain changes associated with alcohol (Zahr and Pfefferbaum, 2017).

Imaging is important in the evaluation of memory decline, especially given its utility to rule out major organic etiologies such as tumors, cerebrovascular accident, or other pathologies. In this case, we can use imaging to look for brain change patterns and radiologic signatures associated with alcohol-related brain diseases. For example, in Wernicke-Korsakoff syndrome caused by chronic alcoholism and thiamine deficiency, brain imaging has shown volume deficits not only in mammillary bodies, but also in the hippocampus. Anterograde amnesia is one of the key findings related to Wernicke-Korsakoff syndrome (Zahr and Pfefferbaum, 2017).

Given that alcohol may be confounding the presentation of cognitive decline in Mr A, neuropsychological testing would be more appropriate following reduction or abstinence in alcohol use. In this case, the physician's workup included obtaining folate level, complete blood count (CBC), comprehensive metabolic panel (CMP), vitamin B_{12} level, and thyroid-stimulating hormone (TSH) level to rule out reversible causes of dementia. Magnetic resonance imaging was also ordered. The physician provided psychoeducation on the effects of alcohol use on memory.

LABORATORY AND RADIOLOGY RESULTS

Mr A had recently had a RPR (rapid plasma reagin) test, which was negative. CBC results revealed low hemoglobin, and CMP showed kidney dysfunction. Liver function tests were within normal limits. His vitamin B_{12} level was low, and his folate and TSH levels were within normal limits.

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Based on the information so far, what underlying etiologic subtype of major neurocognitive disorder is present?

A. Alzheimer's disease
B. Frontotemporal lobar dementia
C. Dementia with Lewy bodies
D. Vascular disease
E. A mix of 2 or more of the above degenerative subtypes (A–D)
F. Adverse effects of medications (polypharmacy)
G. Due to another medical condition
H. Due to multiple etiologies (multifactorial) [correct answer]

THE TREATING PHYSICIAN'S IMPRESSION

Based on the history provided, the clinical presentation, and the results of the cognitive and physical examination, the treating physician felt that Mr A had a mild to moderate neurocognitive disorder (per *DSM-5* criteria). The pattern of symptoms and signs was typical of Alzheimer's disease, but in this case, mixed dementia remained a consideration—specifically, Alzheimer's disease combined with cognitive impairment secondary to long-term alcohol use.

According to the *DSM-5*, does Mr A qualify for a diagnosis of alcohol use disorder?

A. Yes [correct answer]
B. No
C. Not enough information

The *DSM-5* (American Psychiatric Association, 2013) defines alcohol use disorder as follows:

Requires a problematic pattern of alcohol use leading to clinically significant impairment or distress as manifested by at least 2 of the following in a 12-month period:

a. Drinking more alcohol over a longer period than intended
b. Persistent desire or unsuccessful effort to reduce alcohol use
c. Great deal of time spent obtaining and drinking alcohol, recovering from use
d. Cravings
e. Failure to fulfill major role obligations
f. Continued use despite awareness of interpersonal or social problems
g. Giving up activities for alcohol
h. Use in hazardous situations
i. Continued use despite awareness of physical or psychological problems

j. Tolerance noted by markedly increased amount of use or diminished effects of use
k. Characteristic withdrawal syndrome or needing to take substance to prevent withdrawal.

There are some challenges when applying the *DSM-5* criteria to older adults. Socio-occupational dysfunction may be difficult to apply to elderly patients who are retired and living alone at home. Tolerance is also difficult to define, as impairment may happen at lower doses without need for escalation. In the case of Mr A, he clearly meets multiple criteria, validating a diagnosis of alcohol use disorder.

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How does the National Institute on Alcohol Abuse and Alcoholism define heavy drinking in the general adult population?

A. More than 2 drinks for men and more than 1 drink for women on any day
B. More than 4 drinks for men and more than 3 drinks for women on any day [correct answer]
C. More than 3 drinks for men and more than 4 drinks for women on any day
D. More than 7 drinks for men and more than 4 drinks for women on any day

There are multiple ways to define excessive alcohol use. Heavy drinking is defined as alcohol consumption that has resulted in 1 or more adverse problems (medical, legal, family, psychological, financial, or social). The National Institute on Alcohol Abuse and Alcoholism defines heavy drinking as more than 4 drinks in men and more than 3 drinks in women in a given day. At-risk drinking is defined as alcohol consumption that increases the chance of developing alcohol-related problems and complications. The cutoffs defined for at-risk drinking vary among different agencies (Table 1).

Table 1. Cutoffs for At-Risk Drinking Among Agencies

Agency	Limits/Day	Limits/Week
National Institute on Alcohol Abuse and Alcoholism	3 drinks	7 drinks
American Association for Geriatric Psychiatry	2 drinks	7 drinks
US Department of Agriculture	2 drinks for men and 1 drink for women	

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What is the best screening tool for alcohol use disorder in older adults?

A. CAGE (Cut down, Anger, Guilty, Eye opener)
B. AUDIT (Alcohol Use Disorders Identification Test)
C. MAST-G (Michigan Alcoholism Screening Test–Geriatrics Version)
D. SASSI (Substance Abuse Subtle Screening Inventory)
E. Both B or C [correct answer]

The likelihood of having an alcohol-related discussion with patients declines as the patient ages. There are reliable and easy-to-administer screening instruments for ambulatory settings. The MAST-G (Blow et al, 1992) is specifically designed for older adults. It is a 24-item questionnaire with yes/no responses. More than 5 affirmative responses on the scale indicate problematic use. Sensitivity of this tool is 91%–93%, and specificity is 65%–84%. The AUDIT (Saunders et al, 1993) is a validated 10-item screening tool developed by the World Health Organization that can be self-administered. Scores can range from 0 to 40, with higher scores indicating greater use. The recommended cutoff is 8, but in older adults, the cutoff is lowered to 5. The CAGE (Ewing, 1984) is not a great screening tool for older adults, and it does not detect binge drinking well. The SASSI (Miller, 1985) is a widely used tool that is effective in identifying those who are in denial or purposefully hiding their substance use.

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Which of the following factors indicates poor prognosis related to alcohol use in the elderly?

A. Old age
B. Assertive therapeutic approach [correct answer]
C. Long-term interventions
D. Older women compared to men

Older adults have demonstrated good or even better outcomes compared to younger adults with regard to alcohol use treatment. An age-specific, supportive, nonconfrontational approach is more successful than assertive styles. Outcomes are better in older women compared to men. Outcomes are also better with longer treatment duration. Some barriers to timely treatment do exist including lack of awareness, time constraints, hesitancy among providers, burden of comorbidities, access to transportation, coexisting depression and anxiety, solitude, and extent of family support.

Alcohol withdrawal in the elderly is similar to the presentation in younger adults.

A. True
B. False [correct answer]

Alcohol withdrawal should be considered as a differential cause for any older patient presenting with confusion. Elderly patients may have atypical withdrawal symptoms. Onset of withdrawal may not occur until several days after cessation of drinking. Confusion, rather than tremor and tachycardia, is often the predominant clinical sign in the elderly. The severity and duration of withdrawal tend to increase with age. Interview of family members can be crucial in establishing the diagnosis. Uncomplicated withdrawal can be managed at home, with family present at all times. Similar to the younger adult patient, benzodiazepines are used for symptomatic treatment during withdrawal.

Psychosocial interventions focus on overcoming isolation and establishing social support through increased family visits or having the patient visit a senior center. Psychosocial interventions can be challenging, especially given the ongoing cognitive decline.

What medication would be most appropriate for Mr A?

A. Gabapentin
B. Naltrexone [correct answer]
C. Disulfiram
D. Acamprosate
E. Topiramate

Pharmacologic treatment has not been studied adequately in older adults, but it must be considered. The final goal of treatment is abstinence, but reducing drinking can be a reasonable goal with risk mitigation. Pharmacologic treatment should always be combined with behavioral treatment. In this case, Mr A was started on naltrexone 25 mg. The next appropriate step is to increase the dose to 50 mg if the patient can tolerate the lower dose (Kranzler and Soyka, 2018).

Naltrexone is a nonselective opioid antagonist, and it limits heavy drinking by curbing the craving for alcohol, which can reduce the risk of heavy drinking. There is minimal evidence supporting its use in the elderly. Two small randomized controlled trials (RCTs) with subjects aged 50 to 70 years showed reduced rate of relapse with naltrexone treatment (Kranzler and Soyka, 2018). This medication is especially useful since it can be started once daily while the patient is still drinking; however, the patient should not be receiving opioid pain medications. Eventually, the patient can transition to a monthly injection.

Acamprosate modulates glutaminergic transmission. The US Food and Drug Administration approved acamprosate for sustaining abstinence; however, there is limited evidence for effectiveness in the elderly. Gastrointestinal symptoms, especially diarrhea, are the most common side effect. However, this medication has 3-times-daily dosing, which can lead to noncompliance (Kranzler and Soyka, 2018).

Disulfiram is an acetaldehyde dehydrogenase inhibitor. If a patient taking disulfiram consumes alcohol, they may experience a severe reaction including diaphoresis, flushing, and hypotension. Disulfiram should be discontinued if the patient continues to drink while receiving treatment. Disulfiram has better results in open-label studies than RCTs. It works better in supervised settings, and the most common side effect is drowsiness. However, drug interactions and coexisting medical conditions limit the use of disulfiram in the elderly.

Topiramate is an anticonvulsant that has shown some evidence to reduce binge drinking; however, it has significant central nervous system side effects, including impaired attention, paresthesia, weight loss, and headache. There is limited evidence for gabapentin use in treating alcohol disorder. Negative side effects include sedation, dizziness, or gait disturbances (Kranzler and Soyka, 2018).

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DISCUSSION

Alcohol is the most-used substance. As with the younger population, drinking is a part of social engagement for older adults, and people often adopt or share drinking habits of their peers and partners. Rates of substance use are generally lower among older adults than younger people. According to a 2015 study by the National Survey on Drug Use and Health (NSDUH), half of individuals aged ≥65 years and a quarter of those ≥85 years drink alcohol (Lehmann and Fingerhood, 2018). The young old, defined as those aged 65–74 years, have been found to use alcohol more frequently. Binge drinking for adults aged ≥65 years is defined as occasional periods of loss of control drinking characterized by 4 or more drinks on 1 occasion and enough to produce a blood alcohol level >0.08. Binge

drinking is more prevalent among elderly alcohol users. The prevalence rates for at-risk drinking are estimated to be 16% in men and 10.9% in women. Rates of older adult binge drinking are 19.6% for men and 6.3% for women, as seen in 2005–2008 NSDUH data (Lehmann and Fingerhood, 2018).

Physiologic changes affect pharmacokinetics, leading to increased susceptibility to harmful effects of heavy chronic alcohol use in the elderly. There is no evidence that alcohol metabolism is significantly changed with aging, but the ability of the liver to process alcohol can diminish. Blood-brain barrier permeability and neuronal receptor sensitivity to alcohol in the brain also increase with age. The elderly often have decreased lean body mass, total body water, and gastric enzymes (Lehmann and Fingerhood, 2018; Moore et al, 2003; National Institute on Alcohol Abuse and Alcoholism).

To further add to these challenges, older adults are more likely to have multiple chronic health conditions necessitating use of prescription medications that can interact with alcohol and other substances. They already have an increased risk of falls, confusion, cognitive impairment, and medical comorbidity, leading to frequent hospitalizations, increased health care costs, loss of independence, and social isolation. This risk increases further with alcohol use (American Association for Geriatric Psychiatry).

History of heavy alcohol use is a well-established risk factor for development of dementia. Interestingly, moderate alcohol consumption (not heavy chronic use) is associated with decreased morbidity and mortality among older adults. Light to moderate use also has been suggested to lower risk of dementia compared to abstainers and heavy users. A U-shaped or J-shaped relationship between alcohol use and risk of dementia is demonstrated in multiple epidemiologic studies (Rehm et al, 2019). Notably, a 23-year prospective cohort study with more than 9,000 participants aged 35–55 years showed that risk of dementia was increased in people who abstained from alcohol in midlife or consumed greater than 14 units per week (Sabia et al, 2018). This relationship is far from being settled, with other imaging studies showing negative consequences on brain volume and white matter changes. Identification and management of alcohol use among people with dementia is poorly studied.

Those caring for the elderly often assume or ignore substance use screening. However, it is imperative to target and address potential risk factors or contributors to cognitive changes. Further research with substance use in the elderly is warranted to enhance knowledge, approaches, and treatment for this population.

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AUTHORS

Ganesh Gopalakrishna, MD, is a geriatric psychiatrist and dementia specialist at Banner Alzheimer's Institute and a clinical associate professor of psychiatry at the University of Arizona College of Medicine, Phoenix, Arizona.

Nisha Patel, DO, is a postgraduate year 4 resident physician in the Department of Psychiatry at the University of Arizona College of Medicine, Phoenix, Arizona.

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POSTTEST

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1. **A 72-year-old woman, Mrs L, presents to primary care accompanied by her daughter, who is worried about her mother. The daughter thinks that Mrs L is depressed because she is isolating herself, appears withdrawn, and can seem very confused. Mrs L has bruises on her arms but does not remember falling. She denies depression and reports that she feels fine and enjoys having some wine with her meals, which she thinks may have caused an occasional stumble. All of the following are appropriate next steps *except*:**
   a. Obtain laboratory results including a metabolic panel and vitamin B_{12}, folate, thyroid-stimulating hormone, and thiamine levels
   b. Administer the Michigan Alcoholism Screening Test–Geriatrics Version
   c. Initiate medication treatments for depression and cognitive impairment
   d. Order structural imaging of the brain

2. **Compared to young adults, older adults have a lower chance of recovery from alcohol misuse.**
   a. True
   b. False

3. **A 69-year-old man and his 71-year-old wife present to primary care. Both Mrs A and Mr A have noticed that their drinking "is getting out of control." Mrs A states that their drinking has been affecting their relationship and daily life. They usually finish 2 bottles of wine per day, or 4 drinks each. According to the National Institute on Alcohol Abuse and Alcoholism, which of the following statements is *true*?**
   a. Neither patient has surpassed the daily cutoff for at-risk drinking.
   b. Neither patient has surpassed the daily cutoff for heavy drinking.
   c. Both patients have surpassed the daily cutoff for at-risk drinking.
   d. She has passed the daily cutoff for at-risk drinking, and he has passed the daily cutoff for heavy drinking.