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# Early Detection Of Mild Cognitive Impairment In Older Adults Through The Use Of Annual Screening In The Primary Care Setting

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# CHAPTER I

## Introduction to the Problem

Mild cognitive impairment (MCI) is a mild decline in a single domain or multiple cognitive domains. Although MCI usually causes cognitive changes that are noticeable by the individual and/or caregivers, the global cognition and activities of daily living (ADL) usually remain intact. However, the cognitive changes associated with MCI are generally not severe enough to interfere with the daily life and independent functions of the patient. While patients with MCI are more likely to develop Alzheimer's disease or other dementias than patients without MCI, a diagnosis of MCI does not always indicate that the patient will develop Alzheimer's disease or dementia. MCI may resolve, and the patient's cognitive exam may return to normal baseline or remain stable without progression. Symptoms of MCI are classified based on the thinking skills affected. MCI that affects memory is known as amnestic MCI. In the case of amnestic MCI, a patient may start to forget important information that he or she could previously recall easily, such as appointments or recent conversations. MCI that affects thinking skills other than memory is known as non-amnestic MCI. Thinking skills possibly affected with this type of MCI include the ability to make sound decisions, judgment of time, judgment of the sequence to complete complex tasks, or visual perception (Alzheimer's Association, 2013). The most recently developed diagnostic criteria for MCI is the pre-dementia phase of Alzheimer's disease.

Patients diagnosed with MCI usually have more difficulty and may take longer than their normal counterparts in performing cognitively demanding instrumental ADL. Activities that may be affected include shopping, driving, medication regimen, food

preparation, and handling finances. In older adults with MCI, even small subtle declines in cognitive abilities are associated with decreased independence and safety, increased caregiver burden, a decreased chance of reverting to normal cognitive status, and increased likelihood of developing dementia (Lin, Vance, Gleason, & Heidrich, 2012). Although the causes of MCI are not completely understood, experts believe that early screening and diagnosis slow disease progression.

**Background of the Problem**

More than 16 million people in the United States live with some form of cognitive impairment. The greatest risk factor for cognitive impairment is age. As the baby boomer's generation passes the age of 65 years, the number of people living with cognitive impairments is expected to increase dramatically. With an estimated 5.1 million Americans who are diagnosed with Alzheimer's disease and are 65 years of age or older, Alzheimer's disease is the most common type and the most well-known form of cognitive impairment. The projected increase of this disease incidence is 13.2 million by the year 2050 (CDC, 2011), resulting in a higher demand on the healthcare setting. The increasing economic burden and growing demand for care related to cognitive impairment will pose a serious challenge to the community, the state, and the nation. Apart from increased societal economic burdens, higher numbers of family members aiding in the care of the affected patients will experience greater demands—causing caregiver burnout. Currently, over 10 million family members provide care to a patient with a cognitive impairment.

Age is the primary risk factor for cognitive impairment. Other risk factors include family history, brain injury, education level, and other chronic

conditions. Other possible causes of MCI in older adults include medication side effects, metabolic and/or endocrine disorders, depression, dementia, and Alzheimer's disease. While some of these causes, such as medication side effects and depression, can be reversed with treatment; others, such as Alzheimer's disease, cannot be reversed. However, with early detection and diagnosis, symptoms can be treated, and families can be educated on the predictive cognition changes.

Patients who are developing cognitive impairment or who have dementia usually do not receive a formal diagnosis. In a review of literature, one study indicated that most primary care providers were unaware of cognitive impairments in more than 40% of their cognitive impaired patients. Another study revealed that > 50% of patients with dementia received no clinical cognitive screening by a primary care provider. The failure to evaluate for cognitive complaints is more likely to hinder the treatment of any underlying disease and comorbid conditions as well as to prevent safety issues for the patient and others. In most cases, cognitive impairment will worsen over time (National Institute for Learning [NIA], 2014). Providers who conduct early screening on patients' age 65 years or older are better able to identify emerging cognitive deficits, pinpoint possible causes, and develop an appropriate plan of care. Identifying patients who exhibit signs of cognitive impairment and taking appropriate steps to address their issues results in a positive impact on the patient, the community, and the state (NIA, 2014).

Recommendations for routine cognitive assessment screenings in older adults vary and continue to evolve. The U.S. Preventive Services Task Force (USPSTF) developed guidelines that recommend cognitive screening in asymptomatic patients,

since the overall benefits have been reflected to outweigh the overall cost and risk (USPSTF, 2015). The USPTF identified screening tools that successfully identify people with early stages of dementia. Currently, the amount of evidence-based research is inadequate to determine whether screening all older adults is beneficial (see Appendix B). However, minimal evidence was found to support any potential harm in screening for cognitive impairment.

The Centers for Medicare and Medicaid Services (CMMS) recommends including cognitive assessment screenings for early detection of MCI as part of the requirements of the annual wellness visit for older adults age 65 years or greater. Even though the CMMS recommends cognitive screenings annually, it does not specify what screening approach to use. The Alzheimer's Association recommends brief assessment tools of cognition that involve memory as well as formal interviews (see Appendix C). Patients who test positive for cognitive impairments are referred for a more comprehensive evaluation. The evaluation can be at a subsequent visit with a primary care provider or specialty clinician (Grober, Wakefield, Ehrlich, Mabie, & Lipton, 2017).

Routine cognitive assessment will eventually become the standard of care as a screening strategy to improve and better manage effective treatment regimens. Treatment and other preventive measures, as they emerge, will be integrated into primary care clinics where much of the older adult population receives their healthcare. Screening tools and case findings will be essential in implementing treatment regimens, thereby allowing adults to benefit from early detection and diagnosis (Grober et al., 2017). The overall evidence of routine cognitive screenings is insufficient. However,

several important reasons exist to screen and identify early mild cognitive impairments. Early detection has the potential to help patients make treatment decisions, including the treatment of reversible causes of dementia and the management of comorbid conditions. Early detection of mild cognitive impairments allows primary care providers to anticipate problems that the patient may have in understanding and adhering to recommended treatment regimens. Early detection also gives caregivers and family members the opportunity to begin planning for future problems that may result from the progression of cognitive impairment. Even though the overall evidence concerning routine screening is insufficient, providers should always remain aware of the early signs and symptoms of cognitive impairment and should evaluate for treatment.

The National Institute of Aging (NIA) has educational information available on the screening and detection of mild cognitive impairments for patients and primary care providers. This educational information includes a database of detection tools to screen and help detect mild cognitive impairments. This collection of statistical data, guidelines, recommendations, and objectives accentuates the fact that MCI is a progressive cognitive disease with the potential to adversely affect both the health of the patient and the overall healthcare system. Primary care providers, including nurse practitioners and advanced practice nurses, have the potential to take an aggressive approach to MCI detection and treatment by adhering to USPSTF recommendations.

**Statement of the Problem**

Dementia affects from 2.4 to 5.5 million Americans. Dementia's prevalence increases with age by 5% in persons aged 71-79 years, 24% in those aged 80-89 years,

and 37% in those older than 90 years of age. Mild cognitive impairment is different from dementia in that mild cognitive impairment is not severe enough to interfere with instrumental ADLs. Various forms of cognitive impairment differ in their impact on the daily functions of older adults. To ensure and maintain the patient's ability to perform independent ADLs, routine testing for declining mental functions must be completed and is mandated by the U.S. Government. The lack of consistent cognitive screenings increases the patient's chances of late diagnosis as well as possible detrimental effects and/or events.

**Purpose of the Study**

The purpose of this study was to determine primary care providers' adherence to USPSTF (2015), and the Alzheimer's Association's (2013) recommendations and guidelines advocating annual cognitive impairment screening on patients ages 65 years and older. The Alzheimer's Association issued an algorithm for detecting cognitive impairment in older adults; this cognitive assessment algorithm was accepted and mandated by U.S. Centers for Medicare and Medicaid Services during annual wellness visits of patients 65 years and older. In addition to the Alzheimer's Association, USPSTF acknowledges the increasing prevalence of cognitive impairment and the benefits of early detection. However, USPSTF argues a lack of research and information on the subject; to which, the current study attempted to aid the increasing data on cognitive screening in older adults (USPSTF, 2014). This study examined the amount of primary providers' compliance in completing cognitive impairment screenings of older adults, probable barriers decreasing provider adherence of implementing annual cognitive testing of older adults, and the preferred methods and

tools utilized for cognitive impairment screening of those adults ages 65 years and older.

**Significance of the Research Project**

With increasing advances in healthcare, people are living longer, but ironically their quality of life is diminishing. Over 5.1 million Americans over the age of 65 years are estimated to be living with some form of cognitive impairment—not including undiagnosed individuals. Along with other comorbidities commonly accompanying the geriatric population, cognitive impairment (i.e., Alzheimer's disease, mild cognitive impairment, and other forms of dementia) heavily burdens patients, patients' families, caregivers, the healthcare system, and the U.S. Government. In 2007, the U. S. Department of Health and Human Services, the CDC found approximately $647 million as the average cost for a government-funded (i.e., Medicaid) nursing facility to adequately care for an individual with Alzheimer's disease (Wiese & Williams, 2015). Wanting to prevent future federal bankruptcy and improve the quality of life for individuals diagnosed with age-related dementias, as well as their families and caregivers, the U.S. Government mandated cognitive screenings of older adults during annual wellness visits (CDC, 2011).

In 2011, the CDC, the Centers for Medicare and Medicaid Services, the Agency for Healthcare Research and Quality, and the Administration on Aging branch of the United States Department of Health and Human Services collaborated to combat the overwhelming burden of age-related dementias (Wiese, Williams, & Tappen, 2014). With efforts to increase early diagnosis and treatment of age-related dementias, the U.S. government initiated the National Alzheimer's Project Act, which required routine

cognitive screening of adults over the age of 65 years (Wiese, Williams, & Tappen, 2014). Over 5 years after the initiation of new guidelines warranting cognitive screening of older adults over 65 years, three questions justified investigation:

1. Do primary healthcare providers in Mississippi conduct mild cognitive impairment screenings on older adults, and, if so, how often?
2. What provider-generated barriers may decrease the likelihood of cognitive impairment screening in older adults during visits with primary care providers?
3. What screening methods do primary care providers use to detect mild cognitive impairments?

The current study attempted to answer these questions. Guided by Nola Pender's theoretical framework and concepts as proposed in her Health Promotion Model, this study surveyed numerous primary care providers to discern the prevalence of adequate screening for detection of cognitive impairment in older adults. The current study also raised awareness and promoted the necessity of annual cognitive screening of patients ages 65 years and older.

The CDC, the Alzheimer's Association, the Centers for Medicare and Medicaid Services, and the Administration on Aging Branch of the United States Department of Health and Human Services collaborated to produce the *Healthy People 2020* initiative, which specifically addresses the need for improvement in the detection and treatment of cognitive impairment in older adults (Wiese & Williams, 2015). With a lack of nursing research studies comparable to the current study, no recent evidence documented the

number of primary-care providers screening older adults to increase early detection of cognitive impairment in older adults.

Wiese and Williams (2015) composed a literature review to inform nurses of the current policies, tools, and benefits of annual cognitive assessments for older adults. From licensed practical nurses to advanced practice nurses, many nurses are unaware of the national screening guidelines and the benefits regarding cognitive assessments of the geriatric population. Many nurses are also unaware that such screening is within their scope of practice. The results of the current research study contributed to an increase in nursing knowledge of age-related dementia screening and nursing education in the importance of annual cognitive screening in older adults. These results promoted additional nursing research of early cognitive impairment detection in older adults and identified the most valid cognitive screening tools.

**Conceptual Framework**

Nola Pender's Health Promotion Model (HPM) served as the guideline for the theoretical framework for the research of the annual cognitive screenings in older adults. Presented in the 1980s, Pender integrated psychological, educational, and nursing concepts and theories to formulate her Health Promotion Model. The HPM is similar to Becker's Health Belief Model in the promotion of disease prevention. However, the HPM differs from Becker's model in that it does not include negative factors, such as fear or threat, as a source of motivation for health behavior. Pender's desired outcome from the HPM is that a person will have health-promoting behaviors, which will affect overall health, functional ability, and quality of life. The HPM theory notes patients have a unique set of experiences and characteristics that directly affect

their behaviors related to health. Pender takes a holistic view of not only the physical health of the patient, but also the surrounding factors that might influence the outcome of the patient's well-being. As a nursing-based theory, Pender's theoretical framework integrates key concepts of the nursing metaparadigm: person, health, environment, and nursing. Pender defined the concept of *person* as the focal point of the HPM (McCutcheon, Schaar, & Parker, 2016). Pender defined *environment* as the physical, social, and cultural surrounding, which can be manipulated to facilitate health-promoting behaviors. *Health* is described as a subjective, evolving experience throughout an individual's lifespan. The HPM considers *nursing* responsible for linking the person and environment to promote behavior changes leading to optimal health (Pender, 2011). Pender incorporated these fundamental nursing concepts to formulate the proposition and assumptions of the HPM.

The HPM suggests behaviors affecting positive or negative health promotion and outcomes are controlled by various internal and external factors (Sakraida, 2014). In Pender's article explaining the HPM and its application to healthcare, she discussed the major theoretical conceptions of the HPM. The following key terms are defined for the purposes of understanding the HPM in relation to the present study:

1. Health-promoting behavior - an action directed towards promoting and maintaining positive health outcomes.
2. Prior-related behavior - the frequency of a past behavior that directly or indirectly affects health-promoting behaviors.
3. Personal factors - sociocultural, psychological, and biological characteristics (i.e., age, race, socioeconomic status, etc.) influencing healthy behaviors.

4. Perceived benefits of action - an anticipated benefit of accomplishing a behavior.
5. Perceived barriers to action - perceptions or actual blocks inhibiting performing health-promoting behaviors.
6. Perceived self-efficacy - personal confidence in successfully performing a behavior.
7. Activity-related affect - subjective feelings of negativity or positivity proceeding, during, or following a health-promoting behavior; and directly affects perceived self-efficacy in that an individual is less likely to be confident in a behavior with subjective feelings of negativity.
8. Interpersonal influences –the views, expectations, support, etc. received from family, healthcare providers, peers, etc. which influence an individual's perception of a particular healthy behavior.
9. Situational influences – personal thoughts and perceptions of an impending behavior regarding aesthetics, additional options, and current environmental demands.
10. Commitment to a plan of action – personal dedication to initiation of a health-promoting behavior.
11. Immediate competing demands and preferences – various responsibilities or personal demands, which an individual may have greater or lesser amount of control over, that affects completing a health-promoting behavior (i.e. healthy diet, employment responsibilities). (Pender, 2011, p. 12).

In one of her first research studies on the correlation of behavior to enhancing health promotion, Pender found that many individuals would utilize preventative and health-promoting services when made available in their community. In her study, Pender surveyed hundreds of men and women between the ages of 20 and 90 concerning their thoughts on utilizing preventative and health-promoting services administered by a nurse practitioner. Although the research focus was on the behavioral influences affecting the utilization of nurse practitioners as opposed to physicians, the study found most of the sample population agreed to partake in health-promoting services when offered by any healthcare provider (Pender & Pender, 1980). This finding would later become the HPM's theoretical claim stating, "Families, peers, and healthcare providers are important sources of interpersonal influence that can increase or decrease commitment to and engagement in health-promoting behaviors" (Pender, 2011, p. 5). The current research study addressed the significance of healthcare provider commitment to and engagement in positive healthcare outcomes, especially regarding cognitive screening in older adults.

Many nursing researchers have based and tested their studies with Pender's HPM. McCutcheon et al. (2016) integrated the HPM into their study of college-aged males' behaviors in preventing human papillomavirus (HPV). McCutcheon et al. (2016) suggested most health preventive models were deficient and focused on fear as an incentive, whereas Pender's HPM emphasized positive methods to initiate and maintain health-promoting behaviors.

The HPM's theoretical claims and basis in advancing human potential closely align with the present study of early detection of cognitive impairment in older adults.

The HPM theoretical statements suggest individuals are more likely to increase desired behaviors when perceived beneficial or deemed efficient—allowing the individual to be perceived as competent (Pender, 2011). For primary healthcare providers, the perceived benefit to action would be earlier diagnosis and treatment of age-related dementias, to which the provider would enhance his or her competency in secondary preventative and health-promoting services. For primary providers not performing cognitive screenings, the perceived barriers to action may include various forms of activity-related effects, such as inexperience with using cognitive screening tools, length of examination, lack of time to perform cognitive screening in addition to other exams, or inadequate reimbursement for cognitive screenings. These activity-related effects, as stated in the HPM, are directly affected by the providers' perceived self-efficacy. By surveying the frequency of cognitive screening of older adults in the primary care setting and surveying the primary care provider's perspective on the lack of cognitive impairment screening, this study attempted to identify the perceived barriers and perceived self-efficacy to promote a positive behavioral change. As recommended in Pender's HPM, primary healthcare providers were allowed to observe the data identifying the lack of and importance of cognitive screening in older adults, to which implementation of routine cognitive screenings would begin to increase.

This current study utilized the HPM as a guide to identifying the perceived barriers to action and perceived self-efficacy of primary providers' non-adherence to the national guidelines requiring annual cognitive screening of older adults. Through surveying primary care providers, this study incorporated the theoretical assumptions

and propositions of the HPM to promote compliance with the national standard of routine cognitive screening in the geriatric population.

## Research Questions

In order to guide data collection regarding primary care providers' adherence to screening recommendations and guidelines, the following research questions were formulated:

1. Do primary care providers in Mississippi conduct mild cognitive impairment screenings on older adults; if so, how often?
2. What provider-generated barriers may decrease the likelihood of cognitive impairment screening in older adults during visits with primary care providers?
3. What screening methods do primary care providers use to detect cognitive impairments?

## Definition of Terms

### Primary care providers

*Theoretical:* Primary care providers are healthcare professionals who serve as the first contact a patient makes with the healthcare delivery system and act as the principal point of continuing care for established patients by coordinating specialty care and other services a patient may need (American Academy of Family Physicians [AAFP], 2014).

*Operational:* For the purpose of this study, primary care providers are physicians, nurse practitioners, physician assistants, or other medical practitioners who

render primary care to older adults over the age of 65 years and respond to the web-based survey.

**Mild cognitive impairment**

*Theoretical:* Mild cognitive impairment is an intermediate stage between the expected cognitive decline of normal aging and the more serious decline of dementia ("Mayo Clinic," 2016).

*Operational:* For the purpose of this study, mild cognitive impairment is defined as a mild decline in a single domain or multiple cognitive domains, and it indicates a significant risk of progression to dementia or Alzheimer's disease in patients older than 65 years.

**Older adult**

*Theoretical:* Any patient that is > 65 years of age who receives medical treatment ("Patient," 2016).

*Operational:* For the purpose of this study, the older adult is defined as a self-identified person over the age of 65 years who receives care from a primary care provider choosing to participate in this study by responding to the web-based survey.

**Screening method**

*Theoretical: Screening* is defined as a preliminary procedure, such as a test or examination, to detect the most characteristic sign or signs of a disorder that may require further investigation ("Screening," n.d). A *method* is defined as means or manner of procedure, especially a regular and systematic way of accomplishing something ("Method," n.d.).

*Operational:* For the purpose of this study, screening methods included any documented evidence of mild impairments including, but not limited to, written questionnaires, oral questions, health history, screenings, or electronic medical records (EMR).

**Provider-Generated Barriers**

*Theoretical: Provider* is defined as any individual, institution, or agency that provides health services to healthcare consumers ("Mayo Clinic," 2016). *Generated* is defined as brought into existence, produced, or originated ("Generated," 2018). *Barriers* is defined as a factor that tends to restrict the free movement, mingling, or interbreeding of individuals or populations ("Barriers," 2018).

*Operational:* For the purpose of this study, provider-generated barriers are any factors originating with the provider that restrict the likelihood that the provider will screen for mild cognitive impairments in older adults.

**Assumptions**

For the purpose of this study, the following assumptions were made:

1. Due to the anonymity of the survey, the researchers assumed participants were honest about their current practices and thoughts regarding cognitive impairment screening of older adults.
2. In utilizing healthcare providers (i.e., physicians, nurse practitioners, and physician assistants) within the primary care setting, the researchers assumed all participants had adequate and equivalent professional and educational competencies regarding healthcare within the geriatric population.

3. Participants who agreed to participate in the current study were not coerced or awarded incentives to encourage participating in this research study.
4. The researchers assumed the sample population of primary care providers assessed a uniform number of older adults in each of their facilities.

# CHAPTER II

## Review of Literature

The purpose of this study was to determine primary care providers' adherence to the recommendations established by the United States Preventive Services Task Force (USPSTF) (2014) and the guidelines published by the Alzheimer's Association (2013). The USPSTF is an independent group of national experts in evidence-based practice and prevention measures that work to improve health by making evidence-based recommendations about clinical preventive services, such as screenings for the early detection of mild cognitive impairment. According to the USPSTF, "This recommendation applies to universal screening with formal screening instruments in community-dwelling adults in the general primary care population who are older than age 65 years and have no signs or symptoms of cognitive impairment" (USPSTF, 2014, p. 1). The Centers for Medicare and Medicaid Services (CMS) amended its recommendations for annual wellness visit (AWV) effective January 1, 2011. The amendment included guidelines for what is included in the AWV. According to the CMS website, "the following services to an eligible beneficiary by a health professional . . . detection of any cognitive impairment that the individual may have" (CMS, 2011, p. 2). With cognitive screening covered in the AWV, the Alzheimer's Association published the *Cognitive Assessment Toolkit* (see Appendix E) as a guideline to help providers assess mild cognitive impairment quickly and efficiently (*Cognitive Assessment Toolkit*, n.d.). This chapter introduces the theoretical framework, presents a review of literature in reference to the present study, and further includes summarizations of work by Nola Pender and other research based on the HPM.

**Theoretical Framework**

According to Nola Pender, her Health Promotion Model is driven by the desire to increase well-being to foster human potential (Pender, 1996). Using the HPM as a guideline for the present study was advantageous, as it aligned the researchers to focus on the overall well-being and potentiality of patients with mild cognitive impairment. At the start of the study, there was no cure of MCI, but there was opportunity to prevent further losses through medication, lifestyle, and behavioral modification. In recognizing MCI earlier, rather than later, providers were better able to prepare the patient and family for the advancement of the disease and for the modifications to the patient's environment and treatment. In so doing, the provider helped create the best possible outcome for all affected. For example, early in diagnosis, the provider might have connected the family to resources to help enhance the patient's nutrition through education of meal planning and preparation, daily caloric goals, and ease of availability of food and services. If the patient and family would have had a nutritional plan in place as the disease progresses, the patient would experience overall better health and wellness due to his or her optimal nutritional status. By using the HPM as a guideline to the study, the researchers were able to use a holistic view of the patient and health-promoting strategies to formulate appropriate assumptions and create effective methods of study to promote early recognition of MCI and anticipate difficulties that could hinder understanding and adherence to a treatment program.

Kelley, Sherrod, and Smyth (2009) conducted a research study in fall 2009. This study utilized a retrospective chart review of 250 charts. The population included males and females within the clinic who had a history of smoking and coronary artery

disease (CAD) (Kelley et al., 2009). Of the 250 charts reviewed, only 150 patient charts met the parameters of the study. Data were obtained utilizing a "smoking cessation chart review form" (Kelley et al., 2009, p. 87). The following rescarch questions were addressed in the study:

1. Is smoking cessation therapy being implemented with known coronary artery disease patients who smoke with clinical diagnosis of acute coronary syndrome?
2. What timeframe (including prior diagnosis up to one year after diagnosis) is smoking cessation addressed with known coronary artery disease patients who smoke with a clinical diagnosis of acute coronary syndrome? (Kelley et al., 2009, p. 85)

The conceptual framework of the study was based on Pender's theory of the HPM. The results of the study revealed that 68.7% of the patient sample did receive smoking cessation teaching prior to or up to one year of the diagnosis of coronary artery disease (Kelley et al., 2009, p. 89). According to Kelley et al.,

> Pender's HPM addresses many of these factors from the patient perspective by accounting for various characteristics that determine why one person may quit smoking while another will not, even with identical smoking cessation intervention. However, the most relevant HPM construct for this study was interpersonal influences. (Kelley et al., 2009, p. 90)

The major limitation of the study was the small scale with which it was carried out. Another limitation seen was only 150 of the charts accessed met criteria for the

study. Finally, the last limitation listed was that the data collection tool had no validity or reliability for its usefulness established (Kelley et al., 2009).

Mehrabbeik, Mahmoodabad, Khosravi, and Fallahzadeh (2017) conducted a study entitled *Breakfast Consumption Determinants Among Female High School Students of Yazd Province Based on Pender's Health Promotion Model.* Their work consisted of a cross-sectional study examining 200 high school female students utilizing a researcher-made questionnaire based on Nola Pender's Health Promotion Model. Cluster sampling method was utilized in selecting the students. According to the study, the "children and adolescence" growth and development stage requires more nutrients to sustain normal growth patterns. However, the stage is also the most crucial period for correction of dietary pattern. With this correction, breakfast is described to have the most positive effects on nutrition and cognitive function. Thus, the purpose of the study was to promote the importance of breakfast and its effects on physical and cognitive development. Mehrabbeik et al. found 23% of students ate breakfast every day, and 3% never ate breakfast. Few students (11.3%) stated eating a variety of cakes or cookies as breakfast. One limitation of this study included using a specific demographic rather than a variety of ages and gender. Contrary to this, a strength found in this study was the utilization of Pender's HPM as the theoretical guideline. Mehrabbeik et al. provided in-depth insight to the following five components of the HPM: (a) positive activity-related effect, (b) interpersonal influences, (c) prior related behavior, (d) perceived barriers of action, and (e) self-efficacy. Because Mehrabbeik et al. designed and implemented the study based on Pender's HPM, they concluded, "that Pender's Health Promotion Model is a good predictive model for breakfast consumption among student.

Given that its components predicted 33% of breakfast consumption, in planning educational interventions, special attention to these components would be very helpful" (Mehrabbeik et al., 2017, p. 5065).

Pender's Health Promotion Model was used in two very important facets of the current research. First, Pender's model was used as a focus for the questions in the survey. The current research was considered whether or not primary care providers were routinely screening for mild cognitive delays in patients over the age of 65 years. The survey questions intended to include several questions aimed at why providers may not be screening adequately or at all. These questions used Pender's model as a base to examine what barriers exist to adequate screening. Secondly, Pender's model was used to help shape follow-up teaching that was indicated with providers. Pender believed that personal, self-initiated changes are essential to true and lasting change. The key to making a difference, as it was found that the screening was not being done on an adequate level, was based on the learner seeing a positive benefit in the suggested changes. In the current research, the change increased the knowledge for a need of routine and early screening with a future benefit of better healthcare outcomes for patients and their families.

**Review of Related Research**

Malmstrom et al. (2015) implemented the following two studies: (a) to examine the use of The Rapid Cognitive Screen (RCS) to test for mild cognitive impairment and dementia by primary care physicians and (b) to examine the ability of the RCS to detect MCI and dementia in an outpatient clinic setting/primary care setting. According to Malmstrom et al., one in nine persons aged 65 years or older and 32% of persons over

85 years of age are estimated to have Alzheimer's disease, and the CDC's expectation is that this number will triple by 2050. Primary care physicians frequently do not properly identify persons with cognitive dysfunction, and no gold standard screening tool currently exists to detect cognitive dysfunction. Because dementia and cognitive impairment interfere with patients' ADLs, the lack of consistent cognitive screening decreases the chance of early diagnosis and possibly increases the likelihood of detrimental effects and/or events. The Diagnostic and Statistical Manual of Mental Disorders (4th edition; DSM-IV) criteria were used to make the diagnosis of mild cognitive impairment or dementia in this study, and there was no theoretical framework for the study identified.

Malmstrom et al. (2015) identified the following three objectives for Study 1: Examine the RCS sensitivity and specificity for MCI and dementia, evaluate the RCS predictive validity for nursing home placement and mortality, and compare the RCS to the Clock Drawing Test (CDT) plus recall. Study 1 utilized the RCS, which included three items from the Veterans Affairs' Saint Louis University Mental Status (SLUMS) exam. Malmstrom et al. were testing the ability of the RCS to differentiate between variables of normal cognition, MCI, and dementia as noted in the DSM-IV. The patient was to recall five words, perform a clock-drawing test, remember a story, and recall the fact that Chicago was located in the state of Illinois (insight). The RCS was scored on a scale from 0-10 with zero being the worst and 10 being the best. The patient could score a total of 5 points for memory, 4 points for clock drawing, and 1 point for the story recall. In 2003, the Malmstrom et al. began recruiting from the Saint Louis Veterans Affairs Medical Center hospitals. The sample population included 702 male

participants ranging from 65-92 years of age. Dementia was present in 12% ($n$ = 82) of the participants, and MCI was present in 26% ($n$ = 180). Scores from the study were evaluated against the DSM-IV criteria for diagnosis of mild neurocognitive disorder or dementia. Malmstrom et al. also performed a follow-up evaluation 7.5 years later to evaluate the association of RCS scores with nursing home placement and mortality. Of the 702 participants studied, Malmstrom et al. were able to follow up with 533 participants with no changes in demographic data. Due to changes in primary care providers, incorrect contact information, or inactive electronic medical records, some participants were unable to be located.

The only objective for Study 2 was to examine the ability of the RCS to detect dementia and MCI in an outpatient setting. The sample population included 168 participants ranging from 60-90 years of age. In 2013, the researchers began recruiting participants from the Saint Louis University Geriatric Medicine and Geriatric Psychiatry outpatient clinics. The study participants included 104 females and 64 males, out of which 71 were of African American decent and 92 of Caucasian decent. In this study, 36% ($n$ = 61) of participants were diagnosed with MCI and 44% ($n$ = 74) of participants with dementia.

Malmstrom et al. (2015) analyzed data using IBM SPSS Statistics, version 22 (Somers, NY) and SAS, version 9.2 (SAS Institute, Inc., Cary, NC) for Receiver Operating Characteristic (ROC) contrasts. Statistics were reported as means, standard deviations (SD), or percentages. Scores from RCS (0-10) and CDT plus recall (0-5) were used for ROC curves for MCI and dementia. Sensitivity and specificity were calculated using a standard approach. Results from ROC contrasts were computed to

"compare the total areal under the curve (UAC) of the screening tests (RCS vs. CDT plus recall) for MCI and for dementia on the DSM-IV" (Malmstrom et al., 2015, p. 742). Malmstrom et al. also reported odd ratios (ORs) and 95% confidence intervals (CIs) adjusted for the age of the participant reported for the logistic regression analysis.

According to the results of Study 1, the RCS was superior to the CDT plus recall in predicting both dementia and MCI. Study 2 also found that RCS was successful in predicting dementia and/or MCI with the use of the SLUMS exam in the outpatient settings. Both tests were found to have good sensitivity for the detection of dementia on the DSM-IV, with optimal scoring for dementia to be $\leq 5$ for RCS and $\leq 2$ for CDT plus recall. When testing for MCI, the RCS exhibited a higher specificity with an optimal score of $\leq 7$, while the CDT plus recall only had optimal scores of $\leq 3$. Although there was little difference in the two screening methods in reference to dementia, the RCS is a better detector for MCI which led Malmstrom et al. to find it as an overall better screening method for predicting both dementia and MCI. In $< 3$ minutes, the RCS can be administered in a primary care setting with preliminary results showing it superior to CDT plus recall in detecting MCI. Further study of the CDT plus recall as a tool alone for detecting MCI would assist in solidifying these preliminary results. Because participants whose scores detected dementia or MCI were less likely to expire or be in a long-term care facility 7.5 years after screening, it would be advantageous to conduct long-term research to study the effects of predicting dementia and MCI through not only the RCS but through the CDT plus recall as well.

One strength found in this study is the author's' use of RCS as a screening tool. Regardless of patient load and busy schedules, RCS can be administered and scored

quickly in the primary care setting; and it could be widely available to providers as it is not a copyrighted material. With a variety of demographic data, this study offered a fairly thorough assessment of the use of the RCS as an appropriate screening method for MCI and dementia. However, a larger sampling from more than one region or setting would give a more complete estimate of sensitivity and specificity of the screening tools. Another issue that could be improved upon is for a complete follow-up for patients as there was nearly a 25% loss of patient follow-up in Study 1.

Muller, Perische, Heymann, Elbing, and Laske (2017) executed a study comparing the diagnostic accuracy of the digital CDT against the conventional CDT for discrimination of patients in the early course of Alzheimer's disease from cognitively healthy individuals. According to Muller et al., 50% of cognitively impaired cases go undiagnosed, with the number of cognitively impaired individuals increasing dramatically as the elderly population increases. Moreover, there is a considerable delay in the diagnosis of dementia, which reduces the efficacy of available treatments. Current diagnostic standards of dementia are time-consuming (including psychometric testing), invasive (including spinal fluid testing), and expensive (including neuro-diagnostic imaging). There is a need to develop fast, easy noninvasive and inexpensive diagnostic tools to accurately detect people with cognitive impairment and dementia. Early diagnosis through fast and accurate screening is the key to starting medications and treatments needed and allowing for careful planning of financial and support systems.

Muller et al. (2017) sought to study several areas identified in the study including the following: (a) clinical and demographic characteristics of the participants,

performance on the CDT in patients with amnestic mild cognitive impairment (aMCI), early dementia of Alzheimer's type (eDAT), and healthy individuals/healthy control (HC); (b) screening value of the CDT in patients with aMCI, eDAT, and healthy individuals; performance on the CDT in patients with aMCI showing normal conventional Clock Drawing Test (cCDT) scores and healthy controls; and (c) screening value of the CDT in patients with aMCI showing normal cCDT score and healthy controls.

Out of 70 participants included in this study, 34 were females and 36 were males with the mean age 66.9 $\pm$ 10.3 years. All participants included were right-handed and had normal or corrected-to-normal visual acuity and sufficient hearing ability. No participants were included with a physical handicap that affected his or her ability to perform the tasks indicated. Muller et al. (2017) also conducted a depression exam utilizing the Geriatric Depression Scale (GDS) to exclude symptoms of depression that could interfere with test results. Patients with aMCI or EDAT were recruited from the Memory Clinic of the Department of Psychiatry and Psychotherapy at the University Hospital of Tubingen. All participants underwent physical, neurological, and neuropsychological and psychiatric examinations. Neuropsychological assessment included the use of the Mini Mental Status Exam (MMSE) and the Trial Making Test (TMT-a). The results from these tests were compared to the diagnostic criteria for eDAT defined by the National Institute of Neurological and Communicative Disorders and Stroke Alzheimer's Disease and Related Disorders Association. To qualify for eDAT criteria, participants had to score 4 points on the Global Deterioration Scale. Furthermore, the diagnosis of aMCI was defined according to the Mayo criteria,

including presence of a memory complaint, objectively impaired memory function, intact ADLs, and the absence of dementia.

The CDT was performed using a Windows Surface Pro 4 digitizer and a handheld stylus pen. The tablet assessed different patient movements including time-in-air and time-on surface calculated in milliseconds according to their binary coding. Total-time corresponded to the time-in-air plus time-on-surface. All participants completed the cCDT on the tablet with a handheld stylus pen following the instruction to draw a circle (clock face) with the numbers in the appropriate positions and to place the hands on the clock representing "10 past 11 o'clock." Scoring ranged from 1 point (perfect) to 6 points (not representative of a clock at all). A score > 3 was considered impaired.

Muller et al. (2017) analyzed data using statistical software package (SPSS--version 23). For all tests, the level of statistical significance was set to $p < 0.05$. Data were also analyzed using the Pearson chi-square test to detect group differences in gender distribution. Kruskal-Wallis test was used to detect group differences in cCDt and GDS scores. One-way analysis of variance (ANOVA) was used to assess group differences in age, education and global cognition (MMSE), Trial Making Test Part A (TMT-a) and Part B, time-in-air, time-on-surface, and total-time. According to the Muller et al., receiver operating characteristics (ROC) curves were established to illustrate the specificity of dCDT variables (i.e., time-in-air, time-on-surface, and total time) as well as cCDT scores in relation to sensitivity in classifying Healthy Control (HC) individuals and patients with aMCI.

Muller et al. (2017) examined the influence of aMCI and early dementia development on alterations in movement execution. Muller et al. studied these movements in comparison to the traditional CDT scoring. The traditional scoring system reveals poor sensitivity but excellent specificity in discriminating aMCI patients from healthy individuals. Even in aMCI patients with normal cCDT scores, usage of in-air trajectories yielded excellent sensitivity and a very good specificity in discriminating from healthy individuals. The proportion of aMCI patients with normal cCDT scores was 80% of all aMCI patients. It is inferred that these findings indicate that even if the clock drawing falls into the range of "normal" performance, it is not necessarily implicative that the subject is cognitively normal. It is also found that digitalized assessment of one's non-visible time-in-air movements can be used as supplementary information in identifying participants in the pre-dementia stage of Alzheimer's disease.

Hessler et al. (2013) sought to determine the effectiveness of the Six Item Cognitive Impairment Test (6CIT) when used to screen patients for cognitive impairment or dementia in the primary care setting. Hessler et al. predicted that the number of people affected by dementia will double every 20 years. This statistic alone is enough to warrant providers to diligently screen elderly patients and patients with risk factors for cognitive impairment or dementia. Hessler et al. found that practitioners were more likely to screen patients if they had access to tests that were easy to administer and tests that provided effective and consistent results. The Six Item Cognitive Impairment Test (6CIT) has an administration time of 2 to 4 minutes, which fits well with the busy schedule of a general practitioner. The 6CIT is also thought to be as reliable and consistent as the mini-mental state examination. The purpose of this

study was to determine if the 6CIT is a suitable screening tool for the primary care setting as it has been used in previous studies but not specifically in the primary care setting.

The previous studies conducted with the 6CIT were in controlled settings, such as dementia and geriatric centers; therefore, Hessler et al. (2013) wanted to test the validity and reliability in a non-controlled environment. This particular study was part of the large population-based intervention program referred to as INVADE (Intervention Project on Cerebrovascular Disease and Dementia in the District of Edersberg) that investigated the effects of primary medical care interventions on the incidence of dementia. The INVADE trial studied prevention at the primary care level in Barvaria, Germany. In order to participate in the study, the following criteria were outlined: (a) the patient must belong to a specific health insurance company referred to as AOK, (b) live in Edersburg, and (c) be 55 years or older. There were no outlined exclusion criteria. The screening process took place from 2001 to 2003. From an original selection of 11,317 people, 3,908 patients signed informed consent and agreed to participate in the study. To determine a baseline, the patients were given a 6CIT at the initial examination. Patients were then examined at three follow-up exams: Exam I at 2 years, Exam II at 4 years, and Exam III at 6 years. The test has a maximum score of 28 with a cutoff of 10 to 11 for a diagnosis of dementia and a score of 7 to 8 for milder cases.

Of the 3,908 participants examined, 1,600 were male, 2,308 were female, and the mean age was 67.7 years. Hessler et al. (2013) used 72 different general practitioners to conduct the screenings. The mean 6CIT score was 2.7 ($SD = 3.9$).

Patients remained in the study an average of 72.1 months. Over the course of the study, 528 (or 14%) of the patients interviewed at baseline were diagnosed with dementia. Considering all factors (i.e., user error, age, gender, etc.), patients with a 6CIT score above the 7-8 cutoffs had a threefold to fourfold increased risk for dementia. The 6CIT proved to be a stable test over a long period of time and was able to identify most patients without dementia. However, it failed to identify a large population of patients with dementia. Based on the findings stated above, Hessler et al. (2013) determined that the 6CIT was not suitable for use as routine screening instrument in the primary care setting as it simply has the potential to overlook too many cases of dementia.

Some of the strengths of the 6CIT study were the focus on the test's functionality, specifically in the primary care setting. Hessler et al. (2013) acknowledged prior 6CIT studies and their effectiveness in diagnosing dementia; but, to their knowledge, this was the first 6CIT study designated to the primary care setting only. This study was also able to test real-world suitability and validity over three distinct time periods. The major weakness of the study was the inability of the 6CIT to conduct a thorough dementia assessment on nearly 4,000 total patients. The group members instead were forced to use dementia diagnosis from insurance claims to compare the reliability of the 6CIT findings.

Fowler et al. (2015) conducted a 24-month cluster-randomized trial with two parallel groups. The purpose of this study was to determine if access to cognitive reports altered physician screening practices and treatment methods. As the aging population increases, the number of patients with cognitive impairment will also increase. Today, more patients are seeking medical treatment in the primary care

setting instead of going to a specialist; therefore, it is suggested that cognitive screening should take place in the primary care setting even though cognitive screening can be time-consuming and challenging. In January 2011, Medicare and Medicaid services began covering the cost of an annual wellness visit; and, when performed thoroughly, these assessments can be very beneficial in early diagnosis of cognitive impairment. Fowler et al. (2015) sought to determine if identifying patients with mild cognitive impairment could result in a change in the physicians' approach to treatment or if an early diagnosis could impact the progression of cognitive decline.

Fowler et al. (2015) identified two hypotheses. The first hypothesis stated that primary care physicians in the cognitive report group (CR) who received cognitive reports based on neuropsychological testing would perform dementia screening test, refer patients to specialists for diagnostic assessment, and prescribe anticholinesterase inhibitors more frequently than providers in the treatment as usual group (TAU) (Fowler et al., 2015). The second hypothesis was that the patients of physicians in the CR group would have a slower rate of progression of cognitive deficits over 2 years than cognitively impaired patients in the TAU group (Fowler et al., 2015). This hypothesis was based on the belief that cases of reversible cognitive impairment would see improvement due to spontaneous resolution or treatment of the underlying cause. In more serious cases, if the cause of impairment was believed to be Alzheimer's disease, the prognosis would be improved by prescribing cognitive enhancing medication.

According to Fowler et al. (2015), the randomization of the study was accomplished by focusing on primary care practices rather than individual primary care physicians (PCP) and patients. Randomization at the PCP level was thought to

influence the results of the study due to several factors. Those factors included physicians calling upon a colleague to cover each other's patients thereby possibly sullying results between groups or patients sharing providers possibly causing flawed results. The chosen practices were broken into two groups: control report (CR) and treatment as usual (TAU). Twelve primary care practices from southwestern Pennsylvania were chosen according to specific geographic locations, such as urban, suburban, and rural. Two of the 12 were defined as urban, and 2 as rural. Eight of the 12 were suburban and were further classified based on the number of physicians participating in the study. Each site was randomly assigned to the CR and TAU groups with 6 sites in each group. Practices were recruited from October 2005 to January 2006, and patients were recruited from January 2006 to January 2008. Physicians were given freedom to select the patients themselves. Patients with a diagnosis of dementia on their medical record or with a mini-mental state exam (MMSE) score of 18 or below were excluded. Patients with complaints of memory loss who did not have a diagnosis of dementia, however, were not excluded. A total of 731 patients were referred for the study, 183 declined participation, and a total of 581 patients completed the baseline assessment. Fifteen of the patients were deemed ineligible related to not meeting the mentioned criteria. The final sample included 533 patients; of these, 423 returned for the final 2-year assessment. The TAU group represented 169 of these patients, and the CR group accounted for 254 patients. A total of 110 patients were lost to follow-up due to factors, such as primary care changes, lack of interest, or expiration (Fowler et al., 2015).

Data were collected by means of a structured chart abstraction tool and included demographics, neuropsychological tests, self-related questionnaires, and electronic medical records. Information was collected over four periods: 12 months before baseline, baseline to 12 months after baseline, 13-24 months, and 25-30 months. Participants were ultimately given the diagnosis of normal, mild cognitive impairment, or dementia, which was determined by guidelines set by the University of Pittsburgh Alzheimer's Disease Research Center.

The mean age of participants at entry to the study was 73.6 years. Of the participants, 58.9% were male and 63.8% were married. There were no significant baseline differences between the two study groups. The results of the study by Fowler et al. (2015) revealed no major difference in the way physicians treated the patients on either side at the end of the 24 months. Physicians who received cognitive reports, however, were more likely to order further testing and prescribe medication than the physicians in the treatment as usual group; but there was no significant improvement in those patients with MCI or dementia in either control group. One theory is that most physicians prefer a wait-and-see approach over aggressive therapy, especially if the patient does not have complaints concerning their cognitive impairment symptoms. In the future, researchers would like the physicians involved in this type study to be more specific with their documentation and more focused with their cognitive screening assessment.

Fowler et al. (2015) claimed that at the time of their study there was no other study that had been previously conducted in this manner. Many studies had been published on screening for cognitive impairment, but no previous study had tested

specifically the different behaviors of primary care physicians in relation to the presence or absence of previous cognitive reports. Another one of the strengths to this study was the comprehensive cognitive function assessment that was utilized. Previous studies have only implemented a brief neurological exam. Although the study had several strengths, there were also some weaknesses. The major problem with Fowler et al.'s study was the demographic breakdown—with a majority of patients identifying their race as white. Because physicians were able to choose the patient population, concern arose that physicians may have targeted patients who were already known to have cognitive impairment.

Fowler et al. (2015) constructed a very relevant and well-planned study. The research group went to great lengths to keep the study neutral and eliminate as many biases as possible. The population and sample were clearly identified as well as the data collection methods and instruments used during the course of this randomized trial. Fowler et al. could have improved this study by requiring physicians to perform specific cognitive screenings on every patient in both control groups. This change would have provided more consistent and thorough results. The charting was also very minimal in some cases since several physicians only mentioned "memory problems" in their respective documentation.

Wiese, Williams, and Tappen (2014) completed a systematic literature review of peer-reviewed publications identifying modifiable barriers to cognitive screening in rural areas in the U.S. In the U.S., cognitive impairment with regard to mild cognitive impairment, Alzheimer's disease, and dementia is rapidly increasing in correlation with the rise in the older adult population. Wiese et al. (2014) suggested every 67 seconds

one person develops Alzheimer's disease in America, and 75% of those individuals diagnosed with Alzheimer's disease live in long-term healthcare facilities by the age of 80 years. An estimated 5.2 million Americans have yet to be diagnosed with Alzheimer's disease, and over 50% of those undiagnosed live in rural regions of the United States. Wiese et al. (2014) proved the significance of their study in alluding to the U. S. government's acknowledgment of the need for increasing the detection of MCI, as proposed in the *Healthy People 2020* initiative. In addition to *Healthy People 2020* goals, Wiese et al. cited reputable organizations, such as the Alzheimer's Association, the Alzheimer's Foundation of America, and the 111th Congress Special Committee on Aging, along with six peer-reviewed publications (2014). This review by Wiese et al. (2014) focused on the barriers resulting in the lack of cognitive screening in rural regions of the U.S. and offered resolutions to these barriers with the utilization of Carrillo and Carrillo's Healthcare Access Barriers (HCAB) model. Carrillo and Carrillo's framework suggested three modifiable barriers: financial, structural, and cognitive. Wiese et al. stated their research question as the following: What are the barriers to cognitive screening in rural U.S. populations? Seeking to answer this research question, Wiese et al. (2014) reviewed several recent studies that addressed and correlated with modifiable barriers of the HCAB model (2014).

The methodology of this study was clearly defined. Wiese et al. (2014) utilized current peer-reviewed publications to complete a literature review addressing the barriers of the HCAB model (i.e. financial, structural, and cognitive). Due to the qualitative structure of the study, there was no setting, sample, or independent and dependent variables. Wiese et al., however, identified the population under study as

rural residents in the U.S. and the variables of interest as the three barriers identified in the HCAB model.

Wiese et al.'s (2014) interpretations were depicted in a chart. The chart included each peer-review publication, the original purpose and design of each publication, and the barriers that each publication identified. In addition, the chart categorized each barrier listed into principal barriers of the HCAB model. Wiese et al. (2014) found that all six peer-reviewed publications recognized cognitive/emotional barriers, specifically the lack of knowledge. Wiese et al. specified that many of the publications addressed the barrier of lack of provider knowledge. Several of the publications described instances in which healthcare providers believe cognitive impairment is a part of the normal aging process and thought an early diagnosis of Alzheimer's disease was futile (Wiese et al., 2014). Wiese et al.'s implications for improving provider knowledge of the need and the importance of cognitive impairment screening included the following:

1. Correct inappropriate responses of primary healthcare providers due to misconceptions and lack of expertise in screening for cognitive impairment.
2. Educate healthcare providers on the benefits of cognitive impairment screenings.
3. Educate primary healthcare providers regarding the mandatory screening of Medicare recipients during annual wellness exams (Wiese et al., 2014).

Markwick, Zamboni, and de Jager (2012) conducted a comparative study on the ability of the Montreal Cognitive Assessment (MoCA) and the Mini-Mental State Examination (MMSE) in the early detection of mild cognitive impairment. The

performance of the MoCA subtest was compared at the same cutoff score as the MMSE. The cutoff score for the MoCA was < 26, and the cutoff score of the MMSE was ≥ 27. The MoCA detected cognitive impairments not detected by the MMSE in the majority of the participants screened. The MoCA appeared to be a sensitive screening test for the detection of early cognitive impairments (Markwick et al., 2012). Cognitive impairments are considered a transitional state between normal aging and Alzheimer's disease and are typically indicated by the presence of cognitive impairment in those greater than the expected age in the absence of dementia. The ability to be able to detect cognitive impairments by using screening methods will help with the diagnosis of early dementia and management of the disease.

The early identification of cognitive impairments may be a precursor to Alzheimer's disease or other dementias and will possibly lead to improved patient care of those diagnosed with dementia or other cognitive disorders. Treatment is most beneficial when the symptoms are mild and people are able to cope. It is recommended that screening should be used on those who have an increased risk of developing cognitive impairments.

A review of the screening methods in primary care revealed that the most commonly used cognitive screening instrument for dementia is the MMSE. The MMSE assesses cognition in five subtest areas. The subtest areas include orientation, registration, recall, attention/concentration/calculation, and language. Despite its popularity, the MMSE has several limitations. These limitations could possibly limit the effectiveness of this screening in different populations. Race, education, and language ability affect the performance on the MMSE. The MMSE's ability to

differentiate between those with mild cognitive impairment and healthy subjects is limited. The meta-analysis showed that across several studies, the results showed sensitivity to detect MCI in 62.7%, a specificity of 63.3%, and a positive predictive value of only 37%. The cutoff scores for the MMSE are as follows: < 26 is abnormal interpretation, < 21 has increased odds of dementia, and > 25 has decreased odds of dementia (Markwick et al., 2012). The MMSE was designed to screen for dementia in a time when there was little research on mild cognitive impairments. Now there are screens available that would be more sensitive in the detection of mild cognitive deficits and should be more widely used.

Another screening tool is the Montreal Cognitive Assessment (MoCA). This tool assesses multiple aspects of cognition, short-term memory, functioning, attention, concentration, and orientation to place and time. The MoCA was designed specifically for screening patients who present with mild cognitive difficulties and sensitive to deficits in cognition. With a possible score of 30 points, 73% of those studied obtained scores below the cutoff of 26 points. Even though their scores on the MMSE fell within the normal range, MoCA had a sensitivity of 90% for detecting mild cognitive impairment in the subgroups. It also revealed that the MoCA had a very high consistency and retest reliability (Markwick et al., 2012).

Sensitivity results of this population used a cutoff score of 26. The MoCA had a sensitivity of 83% to detect MCI. The MMSE included the memory task which is limited and does not include a cued recall component. Additionally, there is not any test of executive function or working memory. Several attributes contributed to the MoCA for their findings of improved detection of MCI when compared to the MMSE.

The main purpose of this study was to evaluate research in a group of older adults to utilize the benefits of the MoCA, as opposed to the MMSE for the use of detection of MCI in clinic settings (Markwick et al., 2012).

Participants were selected from a longitudinal memory and aging study (Oxford Project to Investigate Memory and Aging=OPTIMA) and were older adults with no medical history of a stroke or vascular events. They had attended regular OPTIMA appointments for over a year. These participants were assessed with a counter-balanced method of using MMSE and MoCA, followed by a full battery of neuropsychological tests covering cognitive domains. The OPTIMA assessment included medical history, examination, brain imaging, and dementia screening blood test. Diagnosis was based on the results and from the full assessment (Markwick et al., 2012).

The statistical analysis was carried out by using PASW statistics 18. The univariate analysis of variance (ANOVA) was used to test for age, gender, and education on MMSE and MoCA scores. The sensitivity of the MoCA was to detect cognitive impairments with a cutoff score < 26 and then investigated and compared to the MMSE score with a cutoff > 27. The cutoff score can distinguish between those with MCI and cognitively normal subjects. If the scores were < 24 or 30, then it is generally considered to be indicative of dementia (Markwick et al., 2012).

There were 107 consecutive participants, male and female, with a mean age of 76 years. There were no significant associations of gender, age, or education with the MMSE and MoCA. MMSE scores ranged from 24-30, and the MoCA scores ranged from 13-30. The correlation between these two-screening tests was significant. This study group had MoCA scores < 26, which indicated cognitive impairment. The

MMSE used the cutoff > 27, and 33.7% still fell below the MoCA cutoff. The general agreement of the diagnosis included 79 controls, 20 MCI, 6 probable Alzheimer's disease, and two other dementia-related diagnoses. The MoCA scores that were below 26 included 18.6% with dementia, 37.2 with MCI, and 44.2% controls. This showed 80% sensitivity to MCI and 100% sensitivity to dementia. In this wide population, the MoCA detected more participants with cognitive impairments than the MMSE.

In the elderly population, the MoCA detected more participants with cognitive impairments than the MMSE. Results suggested that screening for cognitive functioning, such as orientation to place and time, remains important. However, screening with a broader range of cognitive tasks, including those not represented in the MMSE, would be important in identifying mild cognitive difficulties that might go undetected. The findings did have implication for the choice of screening instruments used in clinic settings, especially for those with early cognitive impairments, where the MMSE was not sensitive enough to detect the deficits. The MoCA is more suitable than the MMSE in screening for mild cognitive impairments. In conclusion, the study demonstrated that in an elderly population, the MoCA detected more subjects with cognitive impairment than the MMSE. Also, the cognitive impairment was evident across a variety of cognitive tasks.

Fowler et al. (2012) performed a cross-sectional study to determine primary care patients' perceptions of dementia screening and evaluate the possibility of an association between their perceptions and their willingness to undergo screening. The study utilized the PRISM-PC, a questionnaire created by the researchers, to assess the study participants' perceptions of dementia (Fowler et al., 2012). The Mini-Mental

State Examination (MMSE) was used for dementia screening in the patients who agreed to be screened for dementia after the PRISM-PC.

According to Fowler et al. (2012), dementia is a debilitating and degenerative neurological condition that, at the time of the study, affected about 4.5 million people in the U.S. Fowler et al. theorized that an understanding of patients' perceptions of the benefits and harms of dementia screening may help to show any possible barriers and facilitators to implementing sufficient dementia screening programs in primary care. Fowler et al. stated that this study and others like it are necessary because, according to the USPSTF, the evidence to systematically screen for dementia in primary care is insufficient due to a lack of studies evaluating the efficiency, benefits, and harms of dementia screening in primary care (Fowler et al., 2012). There were no hypotheses in the study.

The study was conducted from January 2008 to June 2009 at a community-based primary care clinic. A face-to-face interview was utilized. Participants included men and women ages 65 years and above. A total of 554 people participated in the study which included 388 females, 166 males, 313 African Americans, and 363 people ages 70 years or older. All interviews were conducted in the clinic, and privacy was ensured before the interview. The questionnaire and subsequent screening—if the patient agreed—were all conducted at the same time.

For this study, the PRISM-PC was used to determine the patient's perceptions of dementia screening during a face-to-face interview. The PRISM-PC was developed by the researchers to examine the perceived harms and benefits of dementia. In this questionnaire, Alzheimer's Disease, served as a proxy for "dementia" because early

research revealed that people more readily understood this term (Fowler et al., 2012). The PRISM-PC has a total of 50 questions. Basic demographic data was established in the first 12 questions, including age, sex, race, education, annual income, and living situation. These initial questions also delved into the patient's experience with Alzheimer's disease. Additionally, there are 38 questions that measured the patient's knowledge of and attitudes toward the acceptability, benefits, and harms of dementia screening. The questionnaire was scored on a 1-5 point Likert scale. A selection of 1 designated *strongly agree*, and a selection of 5 designated *strongly disagree*. After the questionnaire, the participants who agreed to dementia screening were screened using the MMSE. Fowler et al. (2012) stated that participants whose results were positive on the MMSE were referred to the local memory clinic for a diagnostic assessment.

According to the Fowler et al. (2012), the majority of participants (89.7%) agreed to be screened for dementia upon completion of the questionnaire. Study participants' beliefs about screening and the benefits and harms associated with it were associated with their likelihood of accepting dementia screening. Participants who were more strongly in agreement with the questions on the PRISM-PC geared toward the benefits of knowing about dementia earlier were much more likely to agree to screening. The odds of refusing the screening were significantly higher in patients aged 70-74 years ($OR = 5.65, p < 00$) and mildly higher in patients aged 75-79 years ($OR = 3.63, p = .01$) than in the reference group of patients aged 65-69 years. Further analysis of the data showed that the only significant sociodemographic difference between the participants who accepted screening and those who refused was age. Race, sex, education, annual income, and living situation did not have a measurable effect on the

participant's likelihood to accept screening. In summary, the younger patients, ages 65-69 years, were most likely to accept screening; and the middle age range in the study, ages 70-75 years, were least likely to accept screening.

Fowler et al. (2012) identified several weaknesses in their study. First, there was an inherent selection bias as a result of the recruitment process. Since the study only recruited from the patients in the community-based clinic, there were many groups not reached by the study. Another limitation was the sample size. Fowler et al. acknowledged that inferences about perceptions and behavior are more difficult with a small sample. Small sample sizes can skew statistics and lead to a limited generalizability of the study to the larger population. Also, since it seems the participants only used one clinic for the study, this could limit the ability to generalize the study to the larger population, especially to other socioeconomic groups. Finally, the researchers also addressed the fact that there was not any follow-up data collected about the reasons any of patients had for refusing dementia screening. The researchers recommended future studies include further testing of instruments, such as the PRISM-PC, to attempt to determine whether patients who are already experiencing some cognitive impairment perceive screening differently from those without any cognitive impairment (Fowler et al., 2012).

Berres, Krumm, Mistridis, Monsch, and Taylor (2015) performed a longitudinal study with the intention of modeling the longitudinal course of different neurophysiological functions preceding the diagnosis of mild cognitive impairment due to Alzheimer's disease. Berres et al. specifically wanted to determine the average time before a mild cognitive impairment diagnosis that each neurophysiological and clinical

variable diverged from the course of a neurologically healthy individual. The ability to identify the type and sequence of cognitive decline before a mild cognitive impairment diagnosis is crucial to understanding the pathogenesis of Alzheimer's disease (Berres et al., 2015). It is also very important in initiating much needed therapeutic interventions. The study focused on patients during the period where cognitive impairments were not yet manifested in daily life. If Alzheimer's disease could be predicted in this period, it would greatly improve the ability to implement disease-modifying interventions. While patients' (who will eventually be diagnosed with Alzheimer's disease) cognitive performance in preclinical mild cognitive impairment stage is still normal, according to diagnostic criteria, their neurophysiological function will inevitably begin to decline when compared to individuals who remain cognitively healthy (Berres et al., 2015). According to Berres et al. (2015), there have been very few studies to examine the cognitive functioning of individuals preceding a diagnosis of mild cognitive impairment.

Berres et al. (2015) did not appear to have any hypothesis on the study. However, the researchers did list information from preceding studies that was applicable to this study. Previous studies seemed to be in agreement that verbal and visual episodic memory appeared to be the first and most affected cognitive functions in preclinical mild cognitive impairment. According to those studies, verbal and visual episodic memory could decline as early as 7 to 10 years prior to a diagnosis of mild cognitive impairment. According to Berres et al. (2015), all of these studies reinforced the importance of the subsequent dementia diagnosis when researching the pattern of cognitive decline in preclinical mild cognitive impairment.

Baseline testing was conducted on patients from 1997 to 2001. This testing included a clinical physical exam, medical history questionnaire, neurophysiological evaluation, and assessment of depression to ensure that all participants were completely physically and mentally healthy. The study followed 87 participants from 1997 to 2013. The participants were reevaluated every 2 years after the initial baseline testing. These reevaluations consisted of a comprehensive neurophysiological examination. An informant, a person close to the participant who could give valuable insight into any changes since the previous assessment, was also consulted every 2 years. This informant step helped uncover slight changes in the participant that only someone present in day-to-day life would notice (Berres et al., 2015).

This study utilized the longitudinal BASEL project (Basal Study on the Elderly). After the initial examination visit, at each visit the participants were evaluated using an identical version of the Consortium to Establish a Registry for Alzheimer's Disease-Neuropsychological Assessment Battery (CERAD-NAB). The CERAD-NAB is a comprehensive neuropsychological assessment. The informants were given the IQCODE to fill out about the participants at every evaluation. This 16-item questionnaire asks the informant to compare the participant's present cognitive function to their function 2 years prior. The IQCODE is scored on a scale of 1 to 5 with 1 being *much improved* and 5 being *much worse*. The study analyzed changes in both the participants' and the informants' scores of the 27 participants who were later diagnosed with mild cognitive impairment compared to the 60 participants who remained cognitively intact even after the study's completion (Berres et al., 2015).

The statistical analysis of the study was done with cubic splines, an alternative cubic function for analysis. Cubic splines were used because simple linear, quadratic, and cubic functions were not sufficient due to the portions of function being nearly linear or even consistent at some intervals since many of the participants had little or no change throughout the study (Berres et al., 2015). All areas assessed in patients who remained neurologically intact (NC-NC) increased or stayed the same throughout the study. According to Berres et al., the following results were given for NC-MCI participants. Verbal delayed recall initially decreased slightly—around 8 years prior to MCI diagnosis—but drastically decreased around 2 years before diagnosis. Verbal savings followed an almost identical pattern. Verbal encoding, visual episodic delayed recall, and visual savings performance declined approximately 4 years before an MCI diagnosis. Verbal discriminability and executive functions declined approximately 2 years prior to diagnosis. In NC-MCI participants, a decline in semantic fluency was statically noted approximately 4 years before the MCI diagnosis. A very gradual decline was noted in constructional praxis functioning around 6 years prior to the MCI diagnosis. A decline was noted in psychomotor speed around 2 years prior to MCI diagnosis. In language assessment with the Boston naming test and with the IQCODE questionnaire, a very mild variation was seen in both 2 years before the mild cognitive impairment diagnosis. Finally, a statistically significant difference was not noted between NC-NC and NC-MCI participants in phonemic fluency prior to the MCI diagnosis (Berres et al., 2015).

Berres et al. (2015) concluded that this study definitely indicated that using a complete neurophysiological evaluation can bring neurological decline to light before

mild cognitive diagnosis criteria is met. However, they also point out some areas of needed improvement to the study. First, Berres, et al. indicated that the study should be recreated with a larger sample. A small sample size always carries the risk of an inability to generalize the results to the larger population. Another limitation listed was the sample used was one of convenience, so the results might be less likely to be generalizable to the population as a whole. Berres et al. suggested that future research be conducted to determine whether changes in scores on neuropsychological testing provide more sensitive markers of future MCI diagnosis than cross-sectional scores as well as the optimal combination of neuropsychological test scores, CSF, PET, and MRI measures to predict progression to Alzheimer's disease.

In conclusion, the purpose of this study was to determine primary care providers' adherence to the recommendations established by the USPSTF and the guidelines published by the Alzheimer's Association. With nearly 5 million Americans currently diagnosed with Alzheimer's disease and dramatic increases expected over the next 30 years, the need for a more rapid and efficient screening tool is becoming more imperative. This chapter detailed review of literature specific to research on screenings for the early detection of mild cognitive impairment. After review of the above literature, it is concluded that annual cognitive screenings would be beneficial in enhancing overall patient health and quality-of-life outcomes, lessening caregiver strain, and decreasing annual healthcare costs.

# CHAPTER III

## Methodology

The purpose of this study was to determine if and how often primary care providers adhere to the guidelines recommended by the USPSTF and the Alzheimer's Association pertaining to screening for mild cognitive impairments. Mild cognitive impairment is a mild decline in single or multiple cognitive domains and indicates a significant risk of progression to dementia or Alzheimer's disease. The Alzheimer's Association guidelines dictate that all patients should be screened on an annual basis—regardless of whether they are exhibiting signs of cognitive impairment (Alzheimer's Association, 2013). The USPSTF recommends screening all adults in the primary care setting aged 65 years or older who have no signs or symptoms of mild cognitive impairment. (USPSTF, 2014). Aiming to identify self-reported compliance with the guidelines, the current researchers conducted a web-based study using a questionnaire created specifically to gather and analyze information from the providers. The current study helped to determine whether responding providers are screening for MCI and, if so, what screening methods are being utilized. This chapter will discuss the design and implementation of the study, the population and sample studied, the method of data collection, and analysis of the findings.

### Design of the Study

A quantitative descriptive study design was utilized for this research. Beck and Polit (2017) stated that the purpose of descriptive research is "to observe, describe, and document aspects of a situation as if naturally occurs and sometimes to serve as a starting point for a hypothesis generation or theory development" (p. 206). Descriptive

research is popular in healthcare settings due to its focus on observation and description and not on manipulation or experimentation. Since the purpose of the study was to deduce whether or not providers are screening without interfering with their process or test a hypothesis, the current study design was the most appropriate. This study utilized a web-based survey on SurveyMonkey, Inc. to gather and analyze data. The data gathered included the following: demographic data, likelihood to screen, current screening practices, factors that increase likelihood to screen, barriers to screening, and screening criteria. The current researchers assessed the providers' compliance with guidelines for screening through a web-based survey, since this method increased the pool of providers available to the study. The web-based survey was not limited geographically as a compliance audit or chart review.

**Protection of Human Subjects**

Permission to conduct the study was obtained from the Institutional Review Board of Mississippi University for Women (see Appendix A). Human subjects were used when providers were asked to complete a survey questionnaire indicating current cognitive screening practices utilized in the clinical primary care setting. The guidelines used for proper screening were those set by the USPSTF in screening for cognitive impairments in patients age 65 years or older in the primary care setting (see Appendix B). During data collection, intense caution was taken to protect participants' anonymity. To ensure this anonymity remained intact, a non-traceable survey was utilized via SurveyMonkey, Inc. The information obtained was used only for this research project. This information remained closely guarded, stored only in a secure location, and deleted after data collection was completed. The SurveyMonkey, Inc.

account was deleted upon completion of the research project. As stated by SurveyMonkey Inc.'s website policy, at the time that the account was deleted the collected data were automatically removed from the website's server.

**Instrumentation**

The online survey utilized SurveyMonkey, Inc. to host the survey during the study and maintain the data collection throughout the duration of the research. The survey utilized a series of researcher-developed questions (see Appendix F) specifically tailored to this research. The researchers used this survey to collect data from primary care providers in Mississippi and other surrounding U.S. states and territories regarding their self-reported compliance with the recommendations for screening for MCI. Data collected on the survey included demographic data, current screening practices, likelihood to screen, factors that increase likelihood to screen, barriers to screening, screening tools used, and whether the provider's current place of employment has specific screening guidelines.

This survey was comprised of multiple-choice questions, with two questions having the option for multiple answers. Questions 1-4 elicited responses concerning demographic data including state of residence, area of practice, title of provider, and age of provider. Questions 5 and 6 pertained to the first research question and elicited responses concerning current screening practices and likelihood to screen. Questions 7 and 8 pertained to the second research question and attempted to discover factors that increase likelihood to screen and barriers to screening. Questions 7 and 8 had the option for the participant to select multiple answers if more than one option was relevant to them. Questions 9 and10 pertained to the third research question and

elicited responses concerning screening tools used and whether the participant's current place of employment has specific screening guidelines in place. The options listed in the factors that increased likelihood to screen, barriers to screening, and screening tools used were chosen based on current literature and prior research on MCI screening. This survey did not undergo any psychomotor testing but had face validity determined by a panel of expert researchers.

**Setting of the Study**

The setting for this study was primary care providers in Mississippi and other surrounding U.S. states and territories. The research was conducted via a web-based survey available to any primary care providers reached by the survey. The survey was distributed through SurveyMonkey, Inc. protocols and through posting by the researchers to social media outlets such as Facebook, Inc. and provider-specific groups. To reduce the likelihood of unqualified subjects completing the survey, the provider groups chosen on social media outlets were closed-groups open only to licensed providers. The members of the groups were introduced to the study, invited to complete the survey at their discretion, and asked to share the survey with their qualified colleagues if possible.

**Population and Sample**

The population for this study included primary care providers from Mississippi and other surrounding U.S. states and territories. The survey generated a convenience sample of providers who agreed to participate by answering the web-based survey. This sample was reached via postings on social media outlets and word of mouth. The researchers studied approximately 100 surveys from providers at primary care clinics in

the state of Mississippi and other surrounding U.S. states and territories. The survey was available on SurveyMonkey, Inc. from March 26, 2018, to May 25, 2018.

**Methods of Data Collection**

After reviewing available options, the research team settled upon creating a questionnaire through SurveyMonkey, Inc. Several local primary care providers were presented with an opportunity to participate in the study. The research team also made the survey available on social media outlets to local providers. Providers who agreed to participate were given a thorough explanation of the study, and any and all questions were answered regarding the nature and reason for the research project and data collection. Providers who agreed to participate were instructed to complete a brief questionnaire through the SurveyMonkey, Inc. website. The information collected from the survey remained anonymous, and no identifying data related to the provider or the provider's practice was available in any fashion.

**Methods of Data Analysis**

Data were compiled upon completion of the surveys. The website utilized for the survey, SurveyMonkey, Inc., compiled the analysis. Upon completion of the analysis, data were transferred to another source of data collection, such as Microsoft Excel. Findings were broken down using percentages, descriptive statistics, and central tendency.

**Other**

At the end of the survey, an option was provided to leave contact information, including an email address for participants who would like to be updated with the findings of the study. Once all data were collected and measured, providers who

participated in the study and elected to leave their contact information were sent a thank you letter and the findings yielded from the research. A copy of the outline of the research project and the guidelines, which were followed during the project, were also provided.

# CHAPTER IV

## Results

With an increasing number of Americans over the age of 65 years diagnosed with various forms of cognitive impairment, patients and patients' families take on substantial financial and emotional burdens of managing a diagnosis of cognitive impairment. Over 10 years ago, the CDC estimated an average of approximately $600 million was needed to manage a patient with Alzheimer's disease living within an assisted-living and/or nursing facility. With cost of treatment steadily rising and quality of life diminishing for adults with cognitive impairment, the U.S. Government mandated cognitive screenings of patients the age of 65 years during annual wellness visits in order to increase early diagnosis and treatment of age-related dementias (CDC, 2011).

Over 100 primary healthcare providers were anonymously surveyed via a web-based program to compute the following information: the amount of primary providers' compliance in completing cognitive impairment screenings of older adults, any probable barriers decreasing provider adherence of implementing annual cognitive testing of older adults, and the preferred methods and tools utilized for cognitive impairment screening of those ages 65 years and older. The following chapter will discuss the results of this study and display primary care providers' adherence to the USPSTF and the Alzheimer's Association's recommendations and guidelines advocating for annual cognitive impairment screening on patients aged 65 years or greater.

**Profile of Study Participants**

The target sample population for this study included primary care providers practicing in the southeast region of the United States. To reduce unqualified subjects who were healthcare providers not practicing in primary care, this study's anonymous, web-based survey was advertised on voluntary, closed-groups on social media outlets for licensed primary care providers. After participants in this study voluntarily completed a brief anonymous survey, members of the closed-groups were asked to share the survey with their qualified colleagues at their discretion.

Over 100 participants completed the survey. Qualified subjects consisted of primary care providers, including physician assistants, certified nurse practitioners, and physicians practicing in family medicine and/or internal medicine in primarily the southeast region. While maintaining anonymity, the initial three questions of the survey provided disqualifying demographics in requesting participants' state of primary practice, professional title, and primary area of practice. With these screening questions in place, the majority of the study participants were identified as certified nurse practitioners in family practice working in Mississippi.

**Statistical Results**

Primary care providers' adherence to the USPSTF guidelines were examined by an anonymous survey of 101 providers from all over the country, but primarily in Mississippi and the surrounding states. The results are addressed below.

The providers who took the survey reported their professional title. In regard to the type of provider in the sample ($N = 101$), 13 were medical doctors (MD), 84 were

nurse practitioners (NP), and 4 were physician assistants (PA). The results for the number of responses from each of the three categories are shown in Figure 1.

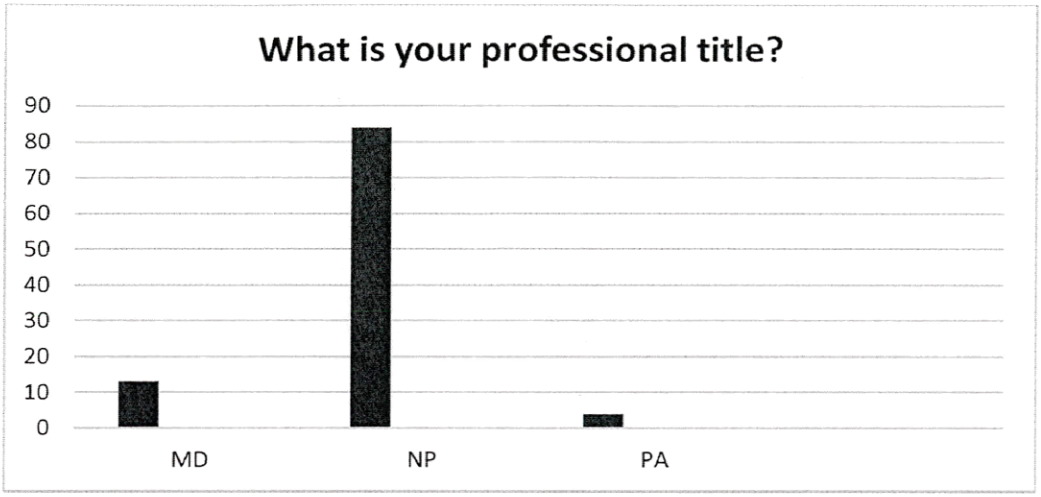


*Figure 1.* Professional title of survey responders.

Figure 2 demonstrates the area of practice of each provider who responded to the survey. When the answers on the following questions were compiled and the data analyzed, only answers from family practice, internal medicine, and geriatrics/long-term care were used in the data analysis. This distinction was made because the providers are practicing in the emergency room or urgent care for mainly acute issues and are not held to the same screening standards. The answers associated with the urgent care and emergency room providers will not be included in any of the following data. The results revealed 66 family practice, 15 internal medicine, 12 geriatrics/long-term care, 7 urgent care, and 1 emergency room response. Figure 2 displays a compilation of the responses to the question regarding primary area of practice.

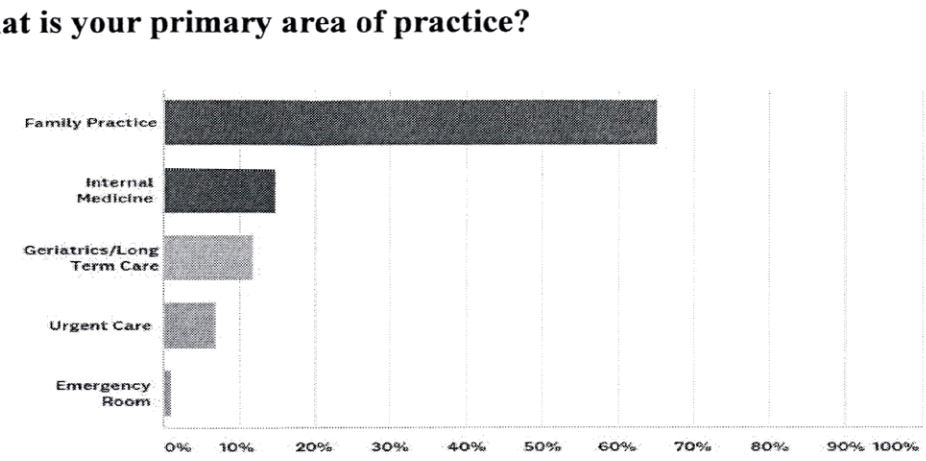


*Figure 2.* Area of practice.

The third question elicited the age of the provider responding to the survey. There were four categories given for age. Group 1 was ages 21-35 years, Group 2 was ages 36-50 years, Group 3 was ages 51-65 years, and Group 4 was ages 65 years and older. The age distribution of the providers who responded to the survey is shown in Figure 3.

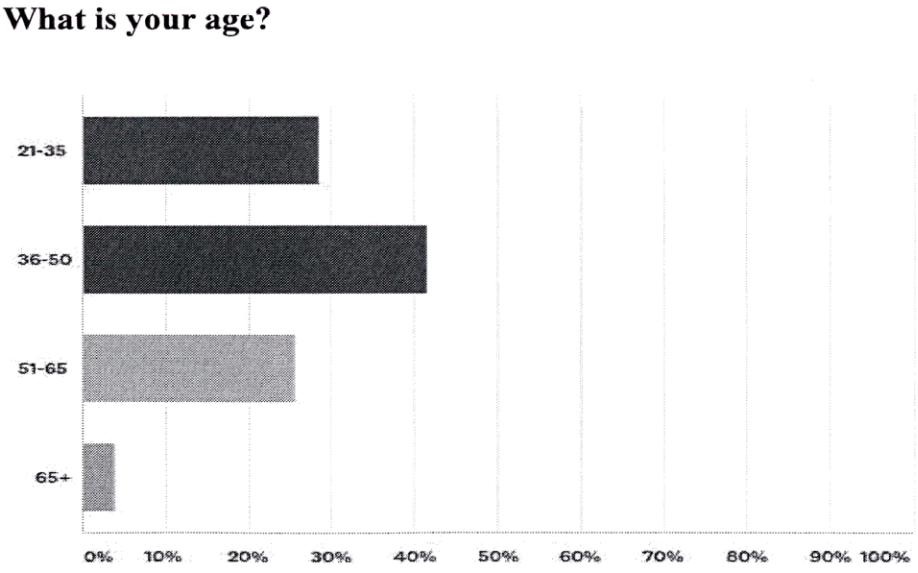


*Figure 3.* Age of participants.

The remaining questions in the survey examined the screening practices of the providers who responded. When asked which response best described screening practices for mild cognitive impairment in patients age 65 years and older, 55 providers responded that, *I screen patients if they or their family mention a concern over memory problems or a decline in ability to perform ADLs.* A total of 29 providers responded that, *I screen every patient aged 65 years and older every year at their wellness visit*, and 10 providers responded that *I do not screen patients for mild cognitive impairment.* See Figure 4 for these findings.

**Which response best describes your screening practices for mild cognitive impairment in patients age 65 and older?**

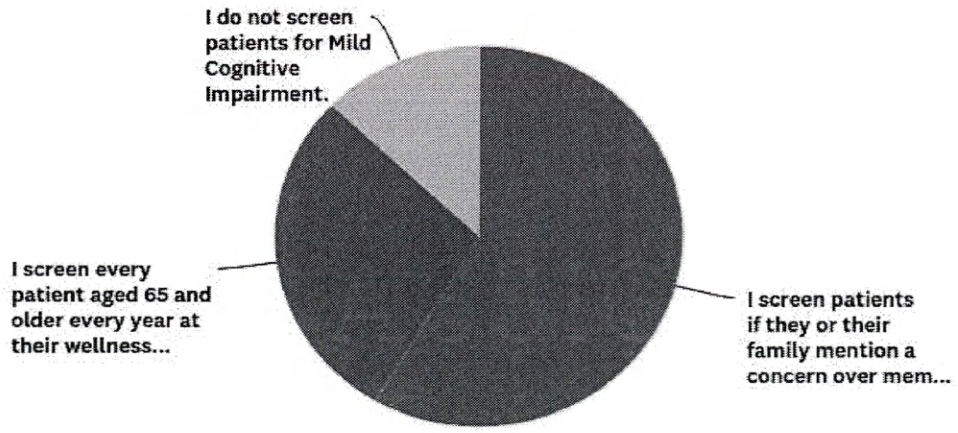


*Figure 4.* Screening practices.

The providers were also asked, "If a patient over 65 years of age comes into your clinic without any obvious signs of cognitive impairment, how likely are you to screen this patient for mild cognitive impairment?" Their responses were divided into four categories: (1) *I will not screen*, (2) *I am not likely to screen*, (3) *I am somewhat likely to screen*, and (4) *I will very likely screen.* The responses were as follows: 15

providers chose *I will not screen*, 43 providers chose *I am not likely to screen*, 25 providers chose *I am somewhat likely to screen*, and 11 providers chose *I will very likely screen*. These results are demonstrated in Figure 5.

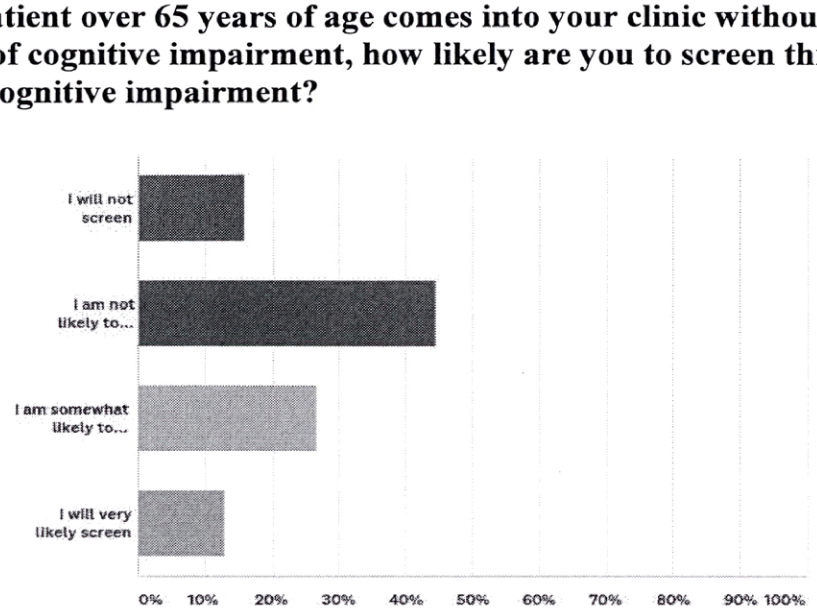


*Figure 5*. Likelihood to screen.

Providers were asked which factor/factors make them more likely to screen patients over 65 years of age for mild cognitive impairment. They were instructed to choose all relevant answers with an option to choose *Other* and describe a specific answer not listed above. The option, *Patient has not been screened in at least 12 months*, was chosen 23 times; the option, *Patient's family mentions deterioration or change in patient's behavior*, was chosen 72 times; the option, *Patient appears somewhat lost in the conversation*, was chosen 69 times; the option, *Patient admits to forgetfulness or memory loss issues*, was chosen 69 times; the option, *Guidelines that dictate how often a patient should be screened*, was chosen 33 times; and *Other* was

chosen two times with the responses as *Personality changes* and *All of the above*. These results are displayed in Figure 6.

**Which factor/factors make you more likely to screen patients over 65 years of age for mild cognitive impairment?**

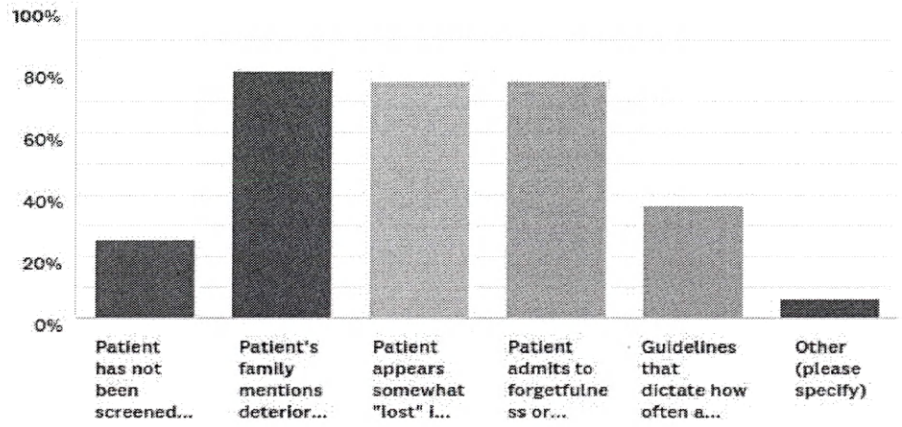


*Figure 6.* Factors increasing likelihood of screening.

Providers were asked which factor/factors make you less likely to screen patients over 65 years of age for mild cognitive impairment. They were instructed to choose all relevant answers and given the option to choose *Other* and describe a specific answer. The choice *Concerns over unnecessary testing* was chosen 24 times; the choice *Lack of clear guidelines on when and how to screen* was chosen 31 times, the choice *Lack of clear guidelines as to which screening tool to use* was chosen 31 times, and the choice *Lack of adequate time with each patient* was chosen 65 times. The choice *Other* was chosen 10 times with some responses being: *I started from the beginning testing this age group*, *No concerns*, *able to tell detailed medical (history) and recent events well*, *Concerns that patients may be offended or upset by screening*, *Patient refusal*, *(Patient) worries over consequences of a dementia score*. And *No real treatment or*

*cure* and *Insurance reimbursement is so poor and we have so many we have to see to make any money*. These results are displayed in Figure 7.

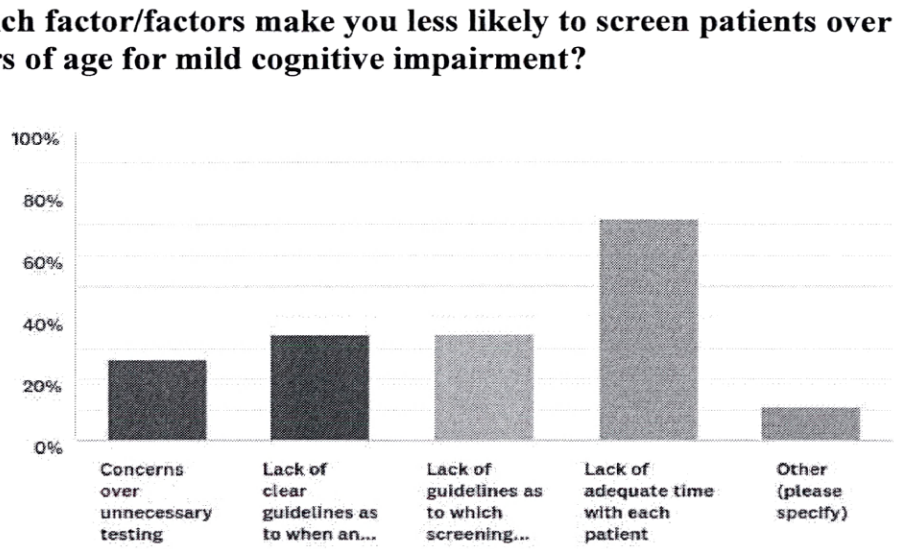


*Figure 7.* Factors decreasing likelihood of screening.

In order to determine the preferred screening tool for MCI, the providers were asked the following question: When/if you screen for mild cognitive impairment, and what screening tool do you use most often? The responses were as follows: Mini Mental State Examination was chosen 57 times, Short Portable Mental Status Questionnaire was chosen 2 times, Mini-Cog was chosen 16 times, clock test was chosen 6 times, and 3-word recall test was chosen 9 times. The remaining 3 providers chose *Another screening tool* and inserted the following 3 answers: *MoCA*, *Animal fluency*, and *We actually use a combination of these-in yearly wellness exams, use 3-word recall and clock test. If there is an acute issue, use mini mental exam*. The Health Risk Assessment tool was not chosen by any provider, and 4 providers chose *I do not use any screening tools*. These results are displayed in Figure 8.

**When/if you screen for mild cognitive impairment, what screening tool do you use most often?**

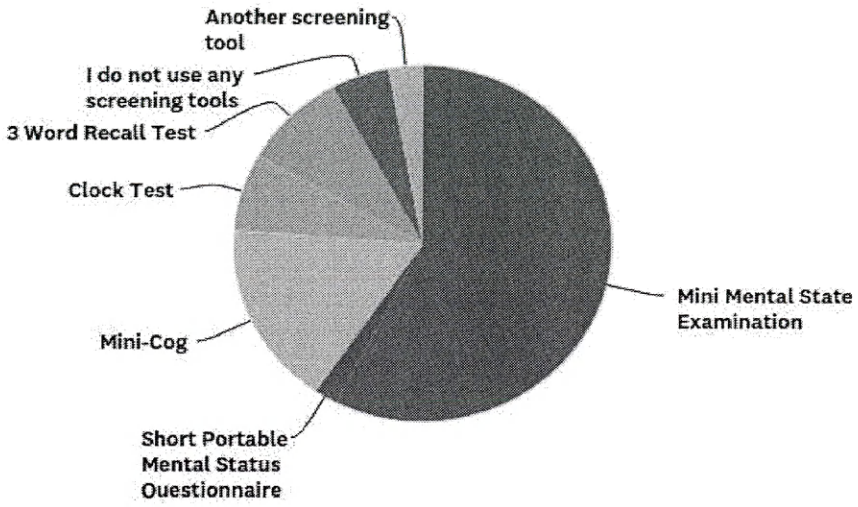


*Figure 8.* Screening tool preference.

The providers were asked if their current clinic or current place of employment had set guidelines in place for screening for mild cognitive impairment. Of the 94 responses used to analyze the data, 27 responded *yes* and 67 responded *no*. Those results are displayed in Figure 9.

**Does your current clinic/place of employment has set guidelines in place for screening for mild cognitive impairment?**

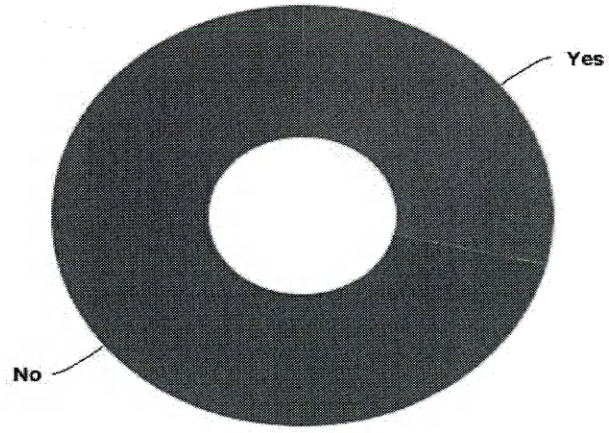


*Figure 9.* Guidelines at current place of employment.

The final question was added as an option at the end of the survey. The question consisted of the option for participants to leave their email address if they wished to receive the results of the survey. This question was optional, and participants could choose to end the survey without entering a response. If provided, email addresses were not associated with any previous answers, which protected the anonymity of the survey. Of the 101 providers surveyed, 18 chose to leave their email address and were sent the results at the conclusion of data analysis.

# CHAPTER V

## Summary, Conclusions, and Recommendations

Mild cognitive impairment (MCI) is a mild decline in a single domain or multiple cognitive domains. A diagnosis of MCI drastically increases a person's risk of eventually developing Alzheimer's disease. More than 16 million people in the U.S. live with some form of cognitive impairment. Age is the biggest risk factor for developing cognitive impairment, and advances in technology and medicine are allowing people to live longer than ever. The projected increase of this disease incidence is 13.2 million by the year 2050 (CDC, 2011), thereby increasing the healthcare strain and economic burden. In 2007, the CDC reported approximately $647 million as the average cost for a government-funded (i.e. Medicaid) nursing facility to adequately care for an individual with Alzheimer's disease (Wiese & Williams, 2015).

Alzheimer's disease is not reversible; therefore, early detection, diagnosis, and treatment of MCI are imperative. Unfortunately, patients who are developing cognitive impairment or who have dementia usually do not receive a formal diagnosis. Studies indicated that most primary care providers were unaware of cognitive impairments in > 40% of their cognitively impaired patients. Another study revealed that > 50% of patients with dementia received no clinical cognitive screening by a primary care provider. With efforts to increase early diagnosis and treatment of age-related dementias, the U.S. Government initiated the National Alzheimer's Project Act, which required routine cognitive screening of adults over the age of 65 years (Wiese et al., 2014). According to the USPSTF, screening was recommended on a yearly basis and applies to community-dwelling adults in the general primary care population who are

older than the of 65 years and have no signs or symptoms of cognitive impairment. The CMS amended their recommendations for the Annual Wellness Visit (AWV) effective January 1, 2011, to include guidelines for screening for cognitive impairment during the AWV (CDC, 2011). Over 5 years after the initiation of new guidelines warranting cognitive screening of older adults over 65 years of age, three questions justified investigation:

1. Do primary care providers conduct mild cognitive impairment screenings in older adults?
2. What provider-generated barriers may decrease the likelihood of cognitive screening in older adults during visits with primary care providers?
3. What screening methods do primary care providers use to detect mild cognitive impairment?

The purpose of this research study was to answer these questions. A quantitative descriptive study design was utilized for this research. The research team utilized a researcher-created, web-based survey on SurveyMonkey Inc. to gather information from primary care providers in Mississippi and other southern U.S. states and territories. The information gathered included providers' screening practices, likelihood to screen, factors that increased or decreased likelihood of screening, and clinic screening guidelines. The results gathered will be used to increase provider knowledge and improve patient outcomes.

This chapter contains the details of a research study that was created with the hope of helping primary care providers understand the importance of routinely and consistently screening for and diagnosing cognitive impairment as early as possible.

The summary and discussion of the findings, the limitations of the study, conclusions of the study, and the implication of the findings are analyzed within the chapter. Recommendations for future research and compliance with suggested screening guidelines in primary care practice based on the conclusions of this study are also listed.

**Summary of Findings**

Over 100 primary healthcare providers, including physicians, physician assistants, and nurse practitioners, were anonymously surveyed via a web-based program to compute the following: (a) primary providers' compliance in completing cognitive impairment screenings of older adults, (b) probable barriers decreasing provider adherence of implementing annual cognitive testing of older adults, and (c) the preferred methods and tools utilized for cognitive impairment screening of those ages 65 years and older. Of the 101 surveys completed, 83.17% were submitted by nurse practitioners, 12.87% were physicians, and 3.96% were physician assistants. Of the survey takers, 65.35% practiced in primary care settings and 14.85% were in an internal medicine setting. The remaining 19.8% of survey takers practiced in urgent care, geriatrics, long-term acute care, or emergency room settings. Survey results indicated that only 28.71% of providers routinely screened patients aged 65 years and older every year at their wellness visit, and 58.42% only screened if the patient or a family member voiced concern over memory problems or a decline in the ability to perform ADLs.

Surprisingly, even with the current guidelines in place to screen every patient 65 years or older for MCI at their AWV, 44.55% of providers answered that they were not likely to screen for MCI if the patient presented with no obvious signs of MCI, and only

12.87% answered that they were very likely to screen the patient. Eighty percent of providers answered that the patient's family member mentioning deterioration or changes in the patient's behavior was the biggest factor in choosing to screen a patient for MCI, and 72.22% answered that the biggest factor deterring them from routinely and consistently screening patients was lack of adequate time with the patient. The Mini Mental State Examination was the most popular screening tool used by 57.43% of providers.

**Discussion of Findings**

In one of her first research studies on the correlation of behavior to enhancing health promotion, Nola Pender found that many individuals would utilize prevention and health-promoting services when made available to their community. Although the research focus was on the behavioral influences affecting the utilization of nurse practitioners as opposed to physicians, the study revealed most of the sample population agreed to partake in health-promoting services when offered by any healthcare provider (Pender & Pender, 1980). This finding would later become the HPM's theoretical claim stating, "Families, peers, and healthcare providers are important sources of interpersonal influence that can increase or decrease commitment to and engagement in health-promoting behaviors" (Pender, 2011, p. 5). The current study addressed the significance of healthcare provider commitment to and engagement in positive healthcare outcomes, especially regarding cognitive screening in older adults.

The findings of the current researchers were similar to those of Fowler et al. (2015) in that the current study also revealed primary care providers are lacking in their assessment of MCI. Fowler et al. (2015) aimed to determine if identifying patients with

mild cognitive impairment could result in a change in providers' approach to treatment or if an early diagnosis could impact the progression of cognitive decline. Therefore, the findings of each study were congruent, and each study demonstrated a need for primary care providers to screen for MCI regardless of available time or standardized tool.

Muller et al. (2017) concluded there is a need to develop fast, easy, non-invasive, and inexpensive diagnostic tools to accurately detect people with cognitive impairment and dementia. The current researchers found that 72.22% of the providers surveyed stated that time was the determining factor in not screening for cognitive impairment. Although there are significant data found related to the importance of early screening and diagnosis of mild cognitive impairment, providers continue to find less and less time for screenings related to the number of patients to be seen to meet reimbursement goals. For that reason, Muller et al. (2017) and the current study echo similar findings in the need for a standardized, rapid, and inexpensive diagnostic tool to be used in the primary care setting.

Malmstrom et al. (2015) found that primary care providers frequently do not properly identify persons with cognitive dysfunction because no gold standard screening tool currently exists to detect cognitive dysfunction. Because dementia and cognitive impairment interfere with patients' ADLs, the lack of consistent cognitive screening decreases the change of early diagnosis and possibly increases the likelihood of detrimental effects and/or events. Similarly, the current researchers found that 34.44% of providers stated they did not screen because there is a lack of standardized tools. The current study and the reviewed literature agreed in that, if given a

standardized tool, primary care providers will be able to enhance the patient's continuity in the healthcare setting, as well as provide patients and their families with the confidence and support needed to accept early screening.

Although not addressed in the study's questionnaire and research, Fowler et al. (2012) recognized another aspect in barriers to completing routine cognitive assessment. Fowler et al. (2012) performed a cross-sectional study to determine primary care patients' perceptions of dementia screening and to evaluate the possibility of an association between their perceptions and their willingness to undergo screening. In the current study, when asked about factors making it less likely for providers to screen patients 65 years of age and older, one participant specified that *(Patient) worries over consequences of a dementia score. And No real treatment or cure*. While patient perception was not originally considered in the design of the present study, Fowler et al. (2012) discussed significant reasoning for further investigation into this component.

Regardless of identified barriers, the current study and literature reviewed demonstrated significant need for early cognitive screening in adults age 65 years and older. According to Pender's work with the Health Promotion Model, the nursing discipline is responsible for linking the person and environment to promote behavioral changes leading to optimal health (Pender, 2011). Therefore, it is important to consider the outcome of the patient's well-being. Whether lack of education, lack of time, non-standardized screening tools, or negative patient perceptions, it is imperative for the primary care provider to treat the patient physically and psychosocially in order to produce the best possible outcome.

**Limitations**

Although well-constructed to obtain primary care providers' adherence to the current guidelines regarding cognitive screening in older adults, the current study presented with several limitations, which may have decreased the generalizability of its findings. The federal government issued guidelines requiring annual cognitive screening of older adults, however no gold standard screening tool existed for detecting cognitive impairment; therefore, this study's results of the primary care providers' utilization and competency of a single screening tool could not be accurately measured. In lacking a single cognitive screening tool, the researchers were unable to uniformly measure and critique study participants. In addition to the absence of an exemplar cognitive screening tool, there was no benchmark screening instruments with a high specificity and/or sensitivity for diagnosing MCI. Most cognitive screening tools detected generalized cognitive impairment and not specifically MCI, which required further assessment and possible referral to a specialist for a more accurate diagnosis.

The validity of the research was affected by the small sample size and geographical location. The research project was only implemented as a survey and was posted on several social platforms for primary care providers. The sample size was made up of only 101 primary care providers' responses. Additionally, posting on social media platforms allows for providers from many states to have access to the survey. The majority of respondents were from Mississippi; however, several other states were represented. Thus, the small sample size and geographical location limited the amount and number of samples that could be reviewed, narrowing our field of research and generalizability.

Another key limitation within the study was that not all of the providers surveyed were primary care providers. Of the respondents, 7.62% did not work in a primary care setting. Of the 7.62%, 0.99% worked in an emergency room setting and 6.93% worked in an urgent care setting. Working in settings outside the primary care setting could potentially affect the intended results, as emergency/urgent care settings are not required to test for cognitive impairment on a routine basis. Another limitation was the possibility of inadequate reporting by the healthcare providers. Without a uniform cognitive screening tool and a substantial number of primary providers excluded in the convenience sample, this research study proposed several limitations, which may have affected the generalizability of the study's findings. Furthermore, collecting data in a period of 30 days may have limited the amount of surveys that could have been obtained.

**Conclusions of the Findings**

The goal of the current study was to determine primary care providers' adherence to the guidelines established by the USPSTF for mild cognitive impairment screenings. According to the results, the researchers determined adherence to the guidelines established by the USPSTF were inadequate. The results revealed that only 12.87% of primary care providers surveyed screen according to the recommendations of the USPSTF. Consequently, 28.71% of the primary care providers surveyed stated they do not screen at all for MCI. Based on these results, the researchers concluded that compliance to recommended screenings established by USPSTF among primary care providers is insufficient and there was a great need for further education on this topic.

**Implications**

The purpose of this study was to determine primary care providers' adherence to USPSTF and the Alzheimer's Association's recommendation and guidelines advocating annual cognitive impairment screening on patients ages 65 years or greater. Primary care providers, including nurse practitioners and advanced practice nurses, have the potential to take an aggressive approach to MCI detection and treatment by adhering to USPSTF recommendations. This current study utilized Nola Pender's Health Promotion Model (HPM) as a guide to identifying the perceived barriers to action and perceived self-efficacy of primary providers' nonadherence to the national guidelines requiring annual cognitive screening of older adults. Through surveying primary care providers, this study incorporated the theoretical assumptions and propositions of the HPM to promote compliance with the national standard of routine cognitive screening in the geriatric population.

Based on the findings of this study, there is a great need for further education of the USPSTF guidelines and the Alzheimer's Association recommendations for routine screenings for MCI in the primary care setting. As nurse practitioners are often the first access to health care in rural areas, this education of early screenings is of great importance. In 2007, the Centers for Disease Control and Prevention (CDC) found approximately $647 million as the average cost for a government-funded (i.e. Medicare) nursing facility to adequately care for an individual with Alzheimer's disease (Wiese & Williams, 2015). With adequate routine screenings and early diagnosis, providers can decrease the risk of complications related to MCI and decrease the costs of caring for individuals with cognitive impairments later in diagnosis. Advance practice nurses, as

well as other providers, not only have the ability to change outcomes for patients; but they have the responsibility also to educate their patients, families, and colleagues about the significance of early screening for MCI.

The CMS recommends indulging cognitive assessment screening for early detection of MCI as a part of the requirements of the annual wellness visit for adults ages 65 years and older (see Appendix D). Even though CMS recommends cognitive screenings annually, they do not specify what screening approach to use. The federal government issued guidelines requiring annual cognitive screening of older adults; however, no gold standard screening tool existed for detecting cognitive impairment. In addition to the absence of an exemplar cognitive screening tool, there were no benchmark screening instruments with a high specificity and/or sensitivity for diagnosing MCI. Most cognitive screening tools detected generalized cognitive impairment and not specifically MCI, which required further assessment and possible referral to a specialist for a more accurate diagnosis. Due to the stated findings, further implications for standardized cognitive impairment screening and scoring across different disciplines in the medical field would provide better continuity in care for patients and decrease prevalence of delayed diagnosis of MCI.

**Recommendations**

Based on the significant findings of this study, recommendations for future study should be discussed. It is important to consider whether or not providers are influenced in screening for MCI. Payer source should be identified in those patients screened to identify a trend. It would be interesting to identify whether or not providers are considering the reimbursement versus the long-term benefit prior to screening

patients for MCI. Another argument could lie in the outcomes of those identified as having an MCI. Once identified, research could include plan of care after diagnosis. Researchers could evaluate the aggressiveness of treatment once the provider makes the diagnosis. Lastly, one aspect to consider when performing future research is the provider's awareness of the recommended guidelines. Research aimed at identifying whether or not providers are aware of current recommendations for screening for MCI could foster fruitful research data for long-term planning. As previously discussed regarding implications, a standardized assessment tool is vital to continuity of care between providers and prevention/treatment of MCI. With proper education and an appropriate assessment tool, patients would experience less decline in cognitive abilities, increased independence and safety, a decrease in caregiver burden, a decrease in the progression of dementia, and an increased chance of maintaining baseline cognitive status.

As discussed, implications for future research were a vital outcome of this study. While the study findings are significant, without further data, the motivation to increase awareness is minimal. The outcomes of this study indicate that further research for MCI screening in the primary care setting by nurse practitioners and physicians is warranted. The study raised the following aforementioned topics for future research. Further investigation into providers' awareness of current guidelines, deterring payor sources, the impact of time to screen, and the availability of screening tools would yield more gainful data for future implications.

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# APPENDIX A

## Approval of Mississippi University for Women's

## Institutional Review Board

The Mississippi University for Women
*A Tradition of Excellence for Women and Men*

Provost and Vice President for Academic Affairs
1100 College Street MUW-1603
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March 8, 2018

Carey McCarter, Ph.D.
Mississippi University for Women
College of Nursing and Health Sciences
1100 College Street, MUW- 910
Columbus, Mississippi 39701

Dear Dr. McCarter:

I am pleased to inform you that the members of the Institutional Review Board (IRB) have reviewed the following proposed research and have approved it as submitted:

| | |
|---|---|
| **Name of Study:** | Early Detection of Mild Cognitive Impairment in Older Adults Through the Use of Annual Screening in the Primary Care Setting |
| **Research Faculty/Advisor:** | Carey McCarter, Ph.D. |
| **Investigators:** | Jordan Lundy, Donald Tisdale, Charles Knapp, Jessica Mann, and Kayla McMorise |

I wish you much success in your research.

Sincerely,

Thomas C. Richardson, Ph.D.
Provost and Vice President for Academic Affairs

TCR/tc

pc: Tammie McCoy, Institutional Review Board Chairman

# APPENDIX B

# USPSTF Cognitive Screening Recommendations



## Final Recommendation Statement

*Cognitive Impairment in Older Adults: Screening*

*Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.*

### Recommendation Summary

***Summary of Recommendation***

| Population | Recommendation | Grade (What's This?) |
|---|---|---|
| Older Adults | The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for cognitive impairment. | |

See the Clinical Considerations section for suggestions for practice regarding the I statement.

### Table of Contents



### Preface

*The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care services for patients without related signs or symptoms.*

*It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.*

*The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.*

### Rationale

***Importance***

Dementia affects approximately 2.4 to 5.5 million Americans. Its prevalence increases with age, to 5% in persons aged 71 to 79 years, 24% in those aged 80 to 89 years, and 37% in those older than 90 years. Mild cognitive impairment (MCI) is different from dementia in that the cognitive impairment is not severe enough to interfere with instrumental activities of daily life. It is difficult to estimate the prevalence of MCI, and estimates range widely, from 3% to 42% in adults aged 65 years and older.

***Detection***

The USPSTF found adequate evidence that some screening tools have sufficiently high sensitivity and specificity to be clinically useful in identifying dementia.

***Benefits of Detection and Early Intervention***

The USPSTF found inadequate direct evidence on the benefits of screening for cognitive impairment. Evidence shows that several drug therapies and nonpharmacologic interventions have a small effect on cognitive function measures in the short term for patients with mild to moderate dementia, but the magnitude of the clinically relevant benefit is uncertain. The USPSTF found adequate evidence that interventions targeted to caregivers have a small effect on measures of caregiver burden and depression, but the magnitude of the clinically relevant benefit is uncertain. The USPSTF found no published evidence on the effect of screening on decision making or planning by patients, clinicians, or caregivers.

***Harms of Detection and Early Intervention or Treatment***

The USPSTF found inadequate evidence on the harms of screening for cognitive impairment and of nonpharmacologic interventions. It found adequate evidence that acetylcholinesterase inhibitors (AChEIs) are associated with adverse effects, some of which are serious, including central nervous system disturbances and arrhythmia. Gastrointestinal symptoms are also common.

***USPSTF Assessment***

The USPSTF concludes that the evidence on screening for cognitive impairment is lacking and that the balance of benefits and harms cannot be determined.

## Clinical Considerations

### *Patient Population Under Consideration*

This recommendation applies to universal screening with formal screening instruments in community-dwelling adults in the general primary care population who are older than age 65 years and have no signs or symptoms of cognitive impairment. Early detection and diagnosis of dementia through the assessment of patient-, family-, or physician-recognized signs and symptoms, some of which may be subtle, are not considered screening and are not the focus of this recommendation.

### *Suggestions for Practice Regarding the I Statement*

*Potential Preventable Burden*

The prevalence of dementia in the United States is 5% in persons aged 71 to 79 years, increasing to 24% in those aged 80 to 89 years and 37% in those older than 90 years[1, 2]. The prevalence of older adults with MCI is difficult to estimate because of differences in the definition of MCI and methods used in studies; estimates range widely, from 3% to 42% in adults age 65 years and older. Approximately 40% to 50% of older adults report subjective memory symptoms. The rate of progression of MCI to dementia is uncertain [1, 2].

Although the evidence on routine screening is insufficient, there may be important reasons to identify early cognitive impairment. In addition to its potential to help patients make diagnostic and treatment decisions, including treatment of reversible causes of dementia and management of comorbid conditions, early recognition of cognitive impairment allows clinicians to anticipate problems patients may have in understanding and adhering to recommended therapy. This information may also be useful to patients and their caregivers and family members in anticipating and planning for future problems that may develop as a result of progression of cognitive impairment. Although the overall evidence on routine screening is insufficient, clinicians should remain alert to early signs or symptoms of cognitive impairment (for example, problems with memory or language) and evaluate as appropriate. The National Institute on Aging has information on the detection and management of cognitive impairment for patients and clinicians, including a database of tools to detect cognitive impairment (available at www.nia.nih.govThis link goes offsite. Click to read the external link disclaimer).

*Potential Harms*

Information about the harms of screening, including labeling and the effect of false-positive results, is limited. Acetylcholinesterase inhibitors are associated with adverse effects, some of which are serious, including central nervous system disturbances and bradycardia. Gastrointestinal symptoms are also common. Information about the harms of nonpharmacologic interventions is limited, but these harms are assumed to be small. Exercise interventions are not associated with serious adverse effects.

*Costs*

The cost of screening varies depending on the screening instrument. Some instruments take little time and are free to the public. The most widely studied instrument, the Mini-Mental State Examination (MMSE), takes approximately 10 minutes to administer and is not free. Total health, long-term, and hospice care costs for dementia in the United States were an estimated $183 billion in 2011. Medicare and Medicaid pay approximately 40% to 70% of these costs, representing $130 billion. These costs do not include the estimated $202 billion in uncompensated care that informal caregivers provide annually[3].

*Current Practice*

At present, diagnosis of dementia primarily occurs as a result of a clinician's suspicion of patient symptoms or caregiver concerns and not as a result of routine formal screening. As much as 29% to 76% of patients with dementia or probable dementia in the primary care setting are undiagnosed[4–6]. In 2011, Medicare added detection of cognitive impairment to the new annual wellness visit benefit, and the Alzheimer's Association has published guidance on how to implement this benefit.

### *Assessment of Risk*

Increasing age is the strongest known risk factor for cognitive impairment. The ε4 allele of the apolipoprotein E gene is a reported risk factor for Alzheimer disease. Other reported risk factors for cognitive impairment include cardiovascular risk factors (such as diabetes, tobacco use, hypercholesterolemia, hypertension, and the metabolic syndrome), head trauma, learning disabilities (such as Down syndrome), depression, alcohol abuse, physical frailty, low education level, low social support, and having never been married.

Several dietary and lifestyle factors have been associated with decreased risk for dementia; these factors have weaker supporting evidence than those previously mentioned. Adequate folic acid intake, low saturated fat intake, longer-chain ω-3 fatty acids, high fruit and vegetable intake, Mediterranean diet, moderate alcohol intake, educational attainment, cognitive engagement, and participation in physical activity are all associated with decreased risk for dementia.

### *Screening Tests*

Screening tests for cognitive impairment in the clinical setting generally include asking patients to perform a series of tasks that assess at least 1 cognitive domain (memory, attention, language, and visuospatial or executive functioning). Blood tests and radiology examinations are not currently used as screening tests but are often used after a positive screening result to confirm the diagnosis of dementia and determine its subtype. Although optimum sensitivity and specificity of the MMSE probably vary depending on the patient's age and education level, a large body of literature suggests that a general cut point of 23/24 or 24/25 (score considered "positive"/"negative") is appropriate for most primary care populations.

Other instruments with more limited evidence include the Clock Drawing Test, Mini-Cog Test, Memory Impairment Screen, Abbreviated Mental Test, Short Portable Mental Status Questionnaire, Free and Cued Selective Reminding Test, 7-Minute Screen, Telephone Interview for Cognitive Status, and Informant Questionnaire on Cognitive Decline in the Elderly. Each of these tests has reasonable performance in some studies, but estimates of sensitivity and specificity vary, and the optimum diagnostic threshold or cut point for many of these instruments is unclear. For information on all instruments reviewed by the USPSTF, including the Montreal Cognitive Screening Assessment, the St. Louis University Mental Status examination, and other instruments with 2 or fewer studies, see the full evidence report (available at wwww.uspreventiveservicestaskforce.org)[1].

### *Treatment and Interventions*

Treatment of cognitive impairment focuses on several signs and symptoms, including quality-of-life, cognition, mood, and behavioral impairments.

Several pharmacologic and nonpharmacologic interventions aim to prevent, slow, or reverse cognitive impairment in older adults or improve caregiver burden and depression. Pharmacologic treatments approved by the U.S. Food and Drug Administration include AChEIs and memantine. Nonpharmacologic interventions include cognitive training, lifestyle behavioral interventions, exercise, educational interventions, and multidisciplinary care interventions. Several interventions focus on the caregiver and aim to improve caregiver morbidity and delay institutionalization of persons with dementia.

### *Other Approaches to Prevention*

The USPSTF has published recommendations related to several of the risk factors for cognitive impairment, including counseling on tobacco cessation, alcohol use, healthful diet, physical activity, and falls prevention and screening for high cholesterol, hypertension, and depression (available at wwww.uspreventiveservicestaskforce.org).

## Other Considerations

### *Research Needs and Gaps*

More research on screening for and treatment of MCI is needed. Evidence on the effect of screening and early detection of mild to moderate dementia on decision making, planning, or other important patient outcomes is a critical gap in the evidence. Given the lack of evidence that treatment affects long-term cognitive outcomes for mild to moderate dementia, its effect on decision making and planning could be the most compelling reason for screening. However, no studies provided information on this effect. More research on the harms of screening is needed. Research on new interventions that address the changing needs of patients and families and interventions that clearly have an effect on the long-term clinical course of mild to moderate dementia are also critically needed.

## Discussion

Discussion

### *Burden of Disease*

Dementia is an acquired condition characterized by a decline in at least 2 cognitive domains (loss of memory, attention, language, and visuospatial or executive functioning) that is severe enough to affect social or occupational functioning[7]. Patients with dementia may also exhibit behavioral and psychological symptoms. The major dementia syndromes in older adults include Alzheimer disease, vascular dementia, frontotemporal dementia, dementia with Lewy bodies, Parkinson disease with dementia, and dementia of mixed cause (8). Mild cognitive impairment is different from dementia in that the cognitive impairment is not severe enough to interfere with instrumental activities of daily life.

Dementia affects approximately 2.4 to 5.5 million Americans, but its prevalence is difficult to determine because of differences in definitions and populations used in studies (8–10). Age is the most important risk factor. Data from large population-based surveys indicate that the prevalence of dementia in the United States is 5% in persons aged 71 to 79 years, 24% in those aged 80 to 89 years, and 37% in those older than 90 years[8]. Prevalence varies by race; prevalence in adults aged 71 years and older in 1 large study was 21.3% for blacks and 11.2% for whites[11]. The prevalence of Alzheimer disease in Hispanics is approximately 1.5 times that seen in the white population[11–13]. Dementia also affects more women than men. In persons aged 71 years and older, approximately 16% of women have dementia compared with 11% of men; these differences are primarily explained by women's longer life expectancy rather than any sex-based risk factors [14]. Alzheimer disease accounts for 60% to 80% of all dementia, frontotemporal dementia accounts for 12% to 25%, 10% to 20% is considered vascular dementia, 5% to 10% is considered dementia with Lewy bodies, and 10% to 30% is considered dementia with mixed cause[8, 10, 15] It is difficult to estimate the prevalence of MCI, and estimates range widely, from 3% to 42% in adults aged 65 years and older, depending on the population and diagnostic criteria used[16, 17].

### *Scope of Review*

In 2003, the USPSTF concluded that the evidence was insufficient to recommend for or against routine screening for dementia in older adults. To update its recommendation, the USPSTF commissioned a systematic review of the evidence on screening for cognitive impairment, including dementia and MCI. The evidence review gathered evidence on the benefits, harms, and test performance of screening instruments to detect cognitive impairment in older adults and the benefits and harms of commonly used treatment and management options for older adults with MCI or early dementia and their caregivers. Important potential benefits included decision making, cognitive function, physical function, quality of life, safety, and caregiver burden. The USPSTF reviewed a significant amount of evidence, including available studies on caregiver burden and future planning (the full evidence report is available at www.uspreventiveservicestaskforce.org)[1]. The review focused on screening adults in the general primary care population and management of screen-detected patients with cognitive impairment, excluding delirium. The review on treatment and management focused on studies of adults with mild to moderate dementia because these are the patients most likely to be identified by screening.

### *Accuracy of Screening Tests*

The review identified 55 studies on instruments that screen for cognitive impairment. Forty-six of the studies provided evidence on the sensitivity and specificity of screening for dementia, and 27 provided evidence on MCI. Included studies had to use a diagnostic reference standard (such as the *Diagnostic and Statistical Manual of Mental Disorders, Third or Fourth Edition*) or criteria from the National Institute of Neurological Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association (now known as the Alzheimer's Association). These studies were conducted in primary care–relevant populations, and most instruments were brief (≤10 minutes) and administered in a clinical setting. Studies on self-administered instruments were also reviewed.

Screening instruments evaluated in more than 2 studies include the MMSE, Clock Drawing Test, verbal fluency tests, Informant Questionnaire on Cognitive Decline in the Elderly, Memory Impairment Screen, Mini-Cog Test, Abbreviated Mental Test, and Short Portable Mental Status Questionnaire. The MMSE was the most evaluated instrument, with 25 published studies. The MMSE is a 30-point instrument with 11 items. It has been studied in various populations; the mean age of participants ranged from 69 to 95 years, the mean prevalence of dementia ranged from 1.2% to 38.0%, and education level also varied widely but was not always reported. For the most commonly reported cut points (23/24 or 24/25 [score considered "positive"/"negative"]), the pooled sensitivity from 14 studies (involving 10,185 participants) was 88.3% (95% CI, 81.3% to 92.9%) and specificity was 86.2% (95% CI, 81.8% to 89.7%)[1, 2]. The other instruments were studied in far fewer studies (4 to 7 studies each), had limited reproducibility in primary care–relevant populations, and had unknown optimum cut points. Sensitivity and specificity ranged widely in these studies.

### *Effectiveness of Early Detection and Treatment*

No trials evaluated the direct effect of screening for cognitive impairment by comparing screened and unscreened older adults and reporting important patient outcomes, including decision-making outcomes. The review identified more than 130 studies on several interventions for managing or treating mild to moderate dementia, including pharmacologic and nonpharmacological interventions. Pharmacologic interventions included U.S. Food and Drug Administration–approved medications for the treatment of Alzheimer disease with the purpose of preventing or delaying cognitive impairment (AChEIs and memantine), medications for cardiovascular risk reduction for vascular dementia, nonsteroidal anti-inflammatory drugs, gonadal steroids, and dietary supplements. The review also considered evidence on nonpharmacologic interventions, including interventions aimed primarily at the caregiver or patient–caregiver dyad and at the patient (such as cognitive training, rehabilitation, or stimulation, with or without motor skills training interventions; exercise interventions; multidisciplinary care interventions involving assessment and care coordination; and education-only interventions).

Fifty-four trials provided evidence on AChEIs for the treatment of mild to moderate Alzheimer disease (donepezil, galantamine, rivastigmine, and tacrine), including 4 trials of persons with MCI. Ten additional trials reported on memantine in persons with moderate dementia. Many studies reported differences in scores on the Alzheimer's Disease Assessment Scale–Cognitive Subscale (ADAS-cog). The ADAS-cog is a validated instrument that assesses memory, attention, orientation, language, and praxis. Scores range from 0 to 70, with higher scores signifying greater cognitive impairment; a change of 4 points or more is commonly accepted to be clinically significant for patients with mild to moderate dementia. Acetylcholinesterase inhibitors and memantine improved global cognitive function by approximately 1- to 3-point differences on the ADAS-cog. A meta-analysis of 7 rivastigmine trials reported a 3-point difference on the ADAS-cog (−3.06 [95% CI, −4.48 to −1.65]; $I^2$ = 92.6%). Only 4 trials were conducted in persons with MCI and reported global cognitive function[18–21]. These trials of donepezil and galantamine generally showed a small but unclear clinical effect on global cognitive function. Only one half of the trials reported global physical function; findings were inconsistent and sparsely reported. Few studies reported outcomes beyond 6 months. Longer-term studies were generally consistent with studies of shorter duration and demonstrated statistically significant small improvements of unknown clinical importance.

The review considered 26 studies that evaluated other medications or supplements, including low-dose aspirin, 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors (or "statins"), nonsteroidal anti-inflammatory drugs, gonadal steroids, and dietary supplements, and did not find any evidence that these medications or supplements provided a benefit in global cognitive or physical function in persons with mild to moderate dementia or MCI[1].

The review identified 59 studies that evaluated the effect of nonpharmacological interventions aimed at the caregiver or both the patient and caregiver. Most of these trials evaluated interventions that included an educational component designed to increase caregiver skills. Although the approaches to education in the interventions varied, there was a generally consistent finding of a small benefit on caregiver burden and depression outcomes in persons caring for patients with moderate dementia. The clinical meaning of the changes in caregiver burden and depression is unknown but on average is probably small at best. Ten studies on exercise interventions were reviewed; the clinical effect of these results on important outcomes is uncertain because of the limited number of trials and variability in studied populations, exercise interventions, and reported outcomes.

Fifteen cognitive intervention trials provided somewhat inconsistent evidence that cognitive stimulation with or without cognitive training seems to improve global cognitive function measures in the short term for persons with MCI or dementia. However, the magnitude and certainty of the clinical benefit is difficult to determine because of the limited number of trials, clinical and statistical heterogeneity combined, and imprecision of results.

### *Potential Harms of Screening and Treatment*

No studies reported on direct or indirect harms from false-positive or false-negative results, psychological harms, unnecessary diagnostic testing, or labeling. One study provided some information on the potential harms of screening for cognitive impairment in primary care. In this study of 3573 older adults, approximately one half of patients who had a positive screening result for cognitive impairment (207 out of 434 patients) declined a formal diagnostic work-up for dementia. Only 233 out of 3573 participants initially declined to be screened[22, 23].

Adverse effects from AChEIs are common. Withdrawal or discontinuation rates in studies of AChEIs were 14% for donepezil and rivastigmine and 17% for galantamine. Serious adverse effects from these medications seem to occur with similar frequency across the different AChEIs. Bradycardia and adverse effects related to bradycardia (such as falls and syncope) may result from taking AChEIs. Tacrine, which had very high discontinuation rates in trials, has an uncommon but serious adverse effect of liver toxicity. Tacrine is no longer used in the United States for this reason. In trials, memantine did not differ from placebo in the percentage of withdrawals from medication due to adverse or serious adverse effects. Evidence on the harms of nonpharmacologic interventions in patients with dementia or their caregivers is limited.

### *Estimate of Magnitude of Net Benefit*

The USPSTF found no evidence on the direct benefits and harms of screening for cognitive impairment and therefore considered the indirect evidence on screening accuracy, early treatment, and harms. Evidence is adequate that some screening tools can accurately identify dementia. Treatment of mild to moderate dementia with several drug therapies and nonpharmacologic interventions results in small improvements in measures of cognitive function and caregiver outcomes, but the clinical significance of these improvements is uncertain. The USPSTF found no published evidence on the effect of screening on decision making or planning by patients, clinicians, or caregivers. Evidence on the harms of screening and nonpharmacologic interventions is inadequate. The USPSTF found adequate evidence that AChEIs are associated with adverse effects, some of which are serious. Overall, the USPSTF was unable to estimate the balance of benefits and harms of screening for cognitive impairment.

### *How Does Evidence Fit With Biological Understanding?*

Dementia is the manifestation of various pathophysiologic changes in the brain; therefore, the development of early interventions that result in an important clinical effect on all types of dementia is difficult. The exact causal mechanism for many types of dementia is unknown. Most dementia in the United States is a result of Alzheimer disease, which is the target of most U.S. Food and Drug Administration–approved drugs for dementia. Given that current therapies for dementia do not seem to affect the long-term progression of mild to moderate cognitive impairment, the hope is for effective interventions that can help patients and caregivers prepare for dealing with dementia symptoms.

### *Response to Public Comment*

A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 5 November to 2 December 2013. Several comments agreed with the insufficiency of the evidence. A few comments disagreed with the recommendation, and some comments expressed confusion about the meaning of an I statement and how it may affect early detection. The recommendation contains suggestions for practice regarding the I statement and notes that, although evidence on routine screening is insufficient, there may be important reasons to identify early cognitive impairment in specific circumstances. Other comments requested clarification on the meaning of screening and for whom the recommendation is intended; in response, information was added to the recommendation. A few comments provided evidence on additional risk factors for cognitive impairment and suggested additional research gaps; these were added to the Clinical Considerations section. The importance of vascular causes of dementia was mentioned in a few comments, and information on USPSTF recommendations related to vascular risk factors was added.

## Update of Previous USPSTF Recommendation

This recommendation updates the 2003 USPSTF recommendation on screening for dementia. This updated recommendation differs from the 2003 recommendation in that it considers the evidence on screening for and treatment of MCI in addition to dementia and how screening affects decision making and planning. The current evidence review found much more information on the test performance of screening instruments than in 2003, and the USPSTF concluded that there is now adequate information on the test performance of some screening tools. Similar to the findings of the 2003 evidence review and recommendation, the USPSTF found that pharmacologic treatments result in small benefits of unknown clinical significance and concluded again that the overall evidence is insufficient to make a recommendation on screening.

## Recommendations of Others

In 2011, Medicare began covering the detection of cognitive impairment as a part of the new annual wellness visit benefit. In 2013, the Alzheimer's Association published guidance on the detection of cognitive impairment during the annual wellness visit and recommended an algorithm involving a health risk assessment, patient observation, and unstructured questioning. The Alzheimer's Association recommends the use of a brief structured assessment (such as the General Practitioner Assessment of Cognition, Mini-Cog Test, Memory Impairment Screen, Alzheimer Disease 8-Item Informant Interview, or the short version of the Informant Questionnaire on Cognitive Decline in the Elderly) if signs or symptoms of cognitive impairment are present or if an informant is not available to confirm the absence of signs or symptoms[24].

## Members of the U.S. Preventive Services Task Force

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**APPENDIX C**

**Alzheimer's Association Guidelines for Cognitive Impairment Screening**

Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL
GUIDELINE
CLEARINGHOUSE

# General

## Guideline Title

Alzheimer's Association recommendations for operationalizing the detection of cognitive impairment during the Medicare Annual Wellness Visit in a primary care setting.

## Bibliographic Source(s)

Cordell CB, Borson S, Boustani M, Chodosh J, Reuben D, Verghese J, Thies W, Fried LB, Medicare Detection of Cognitive Impairment Workgroup. Alzheimer's Association recommendations for operationalizing the detection of cognitive impairment during the Medicare Annual Wellness Visit in a primary care setting. Alzheimers Dement. 2013 Mar;9(2):141-50. [61 references] PubMed

## Guideline Status

This is the current release of the guideline.

# Recommendations

## Major Recommendations

Recommended Algorithm for Detection of Cognitive Impairment During the Annual Wellness Visit (AWV)

Incorporating Assessment of Cognition During the AWV

The Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition for consistency (see Figure 1 in the original guideline document) illustrates a stepwise process. The process is intended to detect patients with a high likelihood of having dementia. The AWV algorithm includes both structured assessments discussed previously (in the original guideline document) and other less structured patient- and informant-based evaluations. By assessing and documenting cognitive status on an annual basis during the AWV, clinicians can more easily determine gradual cognitive decline over time in an individual patient—a key criterion for diagnosing dementia due to Alzheimer's disease and other progressive conditions affecting cognition.

For patients with a previous diagnosis of mild cognitive impairment (MCI) or dementia, this should be documented and included in their AWV list of health risk factors. Annual unstructured and structured cognitive assessments could be used to monitor significant changes in cognition and potentially lead to a new diagnosis of dementia for those with MCI or new care recommendations for those with dementia.

Detection of Cognitive Impairment During the AWV—Initial Health Risk Assessment (HRA) Review, Conversations, and Observations

The first step in detection of cognitive impairment during the AWV (see Figure 1, Step A in the original guideline document), involves a conversation between a clinician and the patient and, if present, any family member or other person who can provide collateral information. This introduces the purpose and content of the AWV, which includes: a review of the HRA; observations by clinicians (medical and associated staff); acknowledgment of any self-reported or informant-reported concerns; and conversational queries about cognition directed toward the patient and others present. If any concerns are noted, or if an informant is not present to provide confirmatory information, further evaluation of cognition with a structured tool should be performed.

Patient completion of an HRA is a required element of the AWV and can be accomplished with the help of a family member or other knowledgeable informants, including a professional caregiver.

Published Centers for Medicare and Medicaid Services (CMS) guidance offers healthcare professionals flexibility as to the specific format, questions, and delivery methods that can be used for an AWV HRA. The following questions may be suitable for the AWV HRA and have been tested and evaluated in the general population through the Behavioral Risk Factor Surveillance System or presented as HRA example questions:

1. During the past 12 months, have you experienced confusion or memory loss that is happening more often or is getting worse?
2. During the past 7 days, did you need help from others to perform everyday activities such as eating, getting dressed, grooming, bathing, walking, or using the toilet?
3. During the past 7 days, did you need help from others to take care of things such as laundry and housekeeping, banking, shopping, using the telephone, food preparation, transportation, or taking your own medications?

A noted deficit in activities of daily living (ADLs) (e.g., eating and dressing) or instrumental activities of daily living (IADLs) (e.g., shopping and cooking) that cannot be attributed to physical limitations should prompt concern, as there is a strong correlation between decline in function and decline in cognitive status across the full spectrum of dementia. In addition to clinically observed concerns, any patient- or informant-reported concerns should trigger further evaluation. Positive responses to conversational queries, such as "Have you noticed any change in your memory or ability to complete routine tasks, such as paying bills or preparing a meal?" should be followed up with a structured assessment of cognition.

Upon realizing the time constraints of a typical primary care visit, if no cognitive concerns surface during the initial evaluation and this information is corroborated by an informant, the clinician may elect not to perform a structured cognitive assessment and assume that the patient is not currently demented. This approach is supported by studies in populations with low rates of dementia that suggest the absence of memory difficulties reported by informants and patients reduces the likelihood that dementia is present.

Structured Cognitive Assessment Tools for Use with Patients and Informants During the AWV

The second step in detection of cognitive impairment during the AWV (see Figure 1, Step B in the original guideline document) requires cognitive assessment using a structured tool. Based on synthesis of data from the six review articles previously discussed (in the original guideline document), patient tools suitable for the initial structured assessment are the General Practitioner Assessment of Cognition (GPCOG), Mini-Cog, and Memory Impairment Screen (MIS).

Recognizing that there is no single optimal tool to detect cognitive impairment for all patient populations and settings, clinicians may select other brief tools to use in their clinical practice, such as those listed in Table 3 in the original guideline document. The 15 brief tools listed were evaluated in multiple review articles (passed through at least two review search criteria for tools possibly suited for primary care) or are used in the Veterans Administration (VA). Tools listed in Table 3 in the original guideline document are subject to the inclusion/exclusion criteria of each review and do not represent the entire listing of the >100 brief cognitive assessment tools that may be suitable for primary care practices.

If an informant is present, defined as someone who can attest to a patient's change in memory, language, or function over time, it is suitable to use the Eight-item Informant Interview to Differentiate Aging and Dementia (AD8), the informant component of the GPCOG, or the Short Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), during the AWV.

Primary Care Workflow Considerations

According to the algorithm, any patient who does not have an informant present should be assessed with a structured tool. For such patients (and for practices that implement structured assessments during all AWVs), completion of this structured assessment can be administered by trained medical staff as the first step for cognitive impairment detection. This could improve office efficiency. To increase acceptance of a structured assessment, the reason provided to the patient can be normalized with a statement such as, "This is something I do for all of my older patients as part of their annual

visit." When the initial assessment prompts further evaluation, explanation of results should be deferred until a more comprehensive evaluation has been completed. "There are many reasons for not getting every answer correct. More evaluation will help us determine that," is an example statement that may encourage patients to pursue further testing.

Full Dementia Evaluation

Patients with assessments that indicate cognitive impairment during the AWV should be further evaluated to determine appropriate diagnosis (e.g., MCI, Alzheimer's disease) or to identify other causes. As reflected in the algorithm (see Figure 1, Step C in the original guideline document), initiation of a full dementia evaluation is outside the scope of the AWV, but can occur in a separate visit either on the same day, during a newly scheduled visit, or through referral to a specialist. Specialists who have expertise in diagnosing dementia include geriatricians, geriatric psychiatrists, neurologists, and neuropsychologists. The two-visit approach has been cited as a time-effective process to evaluate suspected dementia in primary care and is consistent with the two-step approach widely used in epidemiologic research on dementia. Regardless of the timing and setting, clinicians are encouraged to counsel patients to include an informant in the diagnostic process.

Components of a full dementia evaluation can vary depending on the presentation and include tests to rule in or out the various causes of cognitive impairment and establish its severity. Diagnostic evaluations include a complete medical history; assessment of multiple cognitive domains, including episodic memory, executive function, attention, language, and visuospatial skills; neurologic exam (gait, motor function, reflexes); ADL and IADL functioning; assessment for depression; and review for medications that may adversely affect cognition. Standard laboratory tests include thyroid-stimulating hormone (TSH), complete blood count (CBC), serum $B_{12}$, folate, complete metabolic panel, and, if the patient is at risk, testing for sexually transmitted diseases (human immunodeficiency virus, syphilis). Structural brain imaging, including magnetic resonance imaging (MRI) or computed tomography (CT), is a supplemental aid

in the differential diagnosis of dementia, especially if neurologic physical exam findings are noted. An MRI or CT can be especially informative in the following cases: dementia that is of recent onset and is rapidly progressing; younger onset dementia (<65 years of age); history of head trauma; or neurologic symptoms suggesting focal disease.

## Clinical Algorithm(s)

An algorithm titled "Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition" is provided in the original guideline document.

# Scope

## Disease/Condition(s)

Cognitive impairment

## Guideline Category

Diagnosis
Evaluation
Risk Assessment
Screening

## Clinical Specialty

Family Practice
Geriatrics
Internal Medicine
Neurology
Nursing
Psychiatry
Psychology

## Intended Users

Advanced Practice Nurses
Nurses
Physician Assistants
Physicians
Psychologists/Non-physician Behavioral Health Clinicians
Social Workers

## Guideline Objective(s)

To provide primary care physicians with guidance on cognitive assessment during the Annual Wellness Visit (AWV) and when referral or further testing is needed

## Target Population

Medicare beneficiaries during their Medicare Annual Wellness Visit (AWV)

## Interventions and Practices Considered

1. Conversation between clinician and patient/informant
2. Patient completion and clinician review of a Health Risk Assessment (HRA)
3. Use of a structured assessment tool, including:
    - General Practitioner Assessment of Cognition (GPCOG)
    - Mini-Cog
    - Memory Impairment Screen (MIS)
    - Eight-item Informant Interview to Differentiate Aging and Dementia (AD8)
    - Short Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE)
4. Full dementia evaluation (outside the scope of the Medicare Annual Wellness Visit [AWV])

## Major Outcomes Considered

- Cognitive level
- Functional level

# Methodology

## Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

## Description of Methods Used to Collect/Select the Evidence

A MEDLINE (PubMed) search conducted in October 2011, using the key words "screening or detection of dementia or cognitive impairment," yielded over 500 publications. To narrow the search to tools more applicable to the Annual Wellness Visit (AWV), the

workgroup sought to determine whether the literature offered a consensus regarding brief cognitive assessment during time-limited primary care visits.

The workgroup focused on systematic evidence review (SER) studies published since 2000, resulting in four studies by Lorentz et al., Brodaty et al., Holsinger et al., and Milne et al. Although each SER had a similar objective—to determine which tools were best for administration during primary care visits—different comparison criteria to select the tools were applied (see Table 1 in the original guideline document). Two other studies were also considered relevant to the development of the workgroup recommendations: Ismail et al. conducted a literature review designed to identify widely used and most promising newer brief cognitive tools being used in primary care and geriatrics, and an SER by Kansagara and Freeman of six brief cognitive assessment tools that could serve as possible alternatives to the Mini-Mental State Examination (MMSE) for use by the U.S. Department of Veterans Affairs (VA). Neither study was designed to determine which brief tool is the "best," but both provided evidence related to primary care use and performance characteristics of brief assessments of cognition (see Table 1 in the original guideline document).

## Number of Source Documents

The workgroup focused on systematic evidence review (SER) studies published since 2000, resulting in four studies. Two other studies were also considered relevant to the development of the workgroup recommendations.

## Methods Used to Assess the Quality and Strength of the Evidence

Not stated

## Rating Scheme for the Strength of the Evidence

Not applicable

## Methods Used to Analyze the Evidence

Systematic Review

## Description of the Methods Used to Analyze the Evidence

Systematic Review

The workgroup's research included comparing five systematic evidence reviews (SERs) of brief dementia screening tools published since 2000 and a 2010 literature review of newer brief assessments of cognition. The workgroup's research focused on determining if there was a consensus among the published SERs as to which tool is most suited for primary care and if there were any common results across the publications.

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

Not stated

## Rating Scheme for the Strength of the Recommendations

Not applicable

## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Not stated

## Description of Method of Guideline Validation

Not applicable

# Evidence Supporting the Recommendations

## Type of Evidence Supporting the Recommendations

The recommendations are supported by systematic evidence reviews and a literature review.

# Benefits/Harms of Implementing the Guideline Recommendations

## Potential Benefits

- Detection of cognitive impairment during the Medicare Annual Wellness Visit
- Establishment of a baseline for longitudinal assessments for those with normal assessments

## Potential Harms

Not stated

# Qualifying Statements

## Qualifying Statements

- There are limitations to these recommendations. They are based on assessment of recommendations from review articles and on expert opinion, not on a new, comprehensive review of original research to define the optimal approach to detection of cognitive impairment or review of emerging technologies that could assist in testing (e.g., use of online or electronic tablet applications). Further complicating systematic evidence reviews (SERs) of brief cognitive assessment tools is that sensitivity and specificity will vary depending on the dementia prevalence of the study population, the tool(s) used, and the cut score selected for each tool. Brodaty et al. recognized that published research concerning cognitive impairment screening tools is uneven in quantity and quality. The literature also is lacking in comparative validity of brief cognitive assessment tools in low-education or illiterate populations.

- The Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition is based on current validated tools and commonly used rule-out assessments. The use of biomarkers (e.g., cerebrospinal fluid [CSF] tau and beta amyloid proteins, amyloid tracer positron emission tomography scans) was not considered as these measures are not currently approved or widely available for clinical use.

# Implementation of the Guideline

## Description of Implementation Strategy

An implementation strategy was not provided.

## Implementation Tools

Chart Documentation/Checklists/Forms

Clinical Algorithm

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

# Institute of Medicine (IOM) National Healthcare Quality Report Categories

## IOM Care Need

Living with Illness

## IOM Domain

Effectiveness

Patient-centeredness

# Identifying Information and Availability

## Bibliographic Source(s)

Cordell CB, Borson S, Boustani M, Chodosh J, Reuben D, Verghese J, Thies W, Fried LB, Medicare Detection of Cognitive Impairment

Workgroup. Alzheimer's Association recommendations for operationalizing the detection of cognitive impairment during the Medicare Annual Wellness Visit in a primary care setting. Alzheimers Dement. 2013 Mar;9(2):141-50. [61 references] PubMed

# Adaptation

Not applicable: The guideline was not adapted from another source.

# Date Released

2013 Mar

# Guideline Developer(s)

Alzheimer's Association - Disease Specific Society

# Source(s) of Funding

Alzheimer's Association

# Guideline Committee

Medicare Detection of Cognitive Impairment Workgroup

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## Financial Disclosures/Conflicts of Interest

Soo Borson is the developer of the Mini-Cog and is the owner of its copyrights.

Over the past 5 years, Malaz Boustani has received research support for investigator-initiated projects from Forest Pharmaceutical and Novartis; honoraria from Novartis and Pfizer, Inc.; and research support for investigator-initiated projects from the National Institutes of Health (NIH) and the Agency for Healthcare Research and Quality (AHRQ). Dr Boustani was a member of the US Preventive Services Task Force that published the systematic evidence review *Dementia Screening* for the AHRQ in 2003.

## Guideline Status

This is the current release of the guideline.

## Guideline Availability

Electronic copies: Available from the Alzheimer's & Dementia, the Journal of the Alzheimer's Association Web site  .

Print copies: Available from the Alzheimer's Association, National Office, 225 N. Michigan Ave., Fl. 17, Chicago, IL 60601-7633, Phone: 1-800-272-3900.

## Availability of Companion Documents

A variety of resources, including the Medicare Annual Wellness Visit fact sheet, recommended cognitive assessment tools, and instructional videos, are available from the Alzheimer's Association Web site  .

## Patient Resources

A variety of resources for patients concerned with cognitive decline and their families and caregivers are available from the Alzheimer's Association Web site  .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health

professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## NGC Status

This NGC summary was completed by ECRI Institute on September 27, 2013. The information was verified by the guideline developer on October 22, 2013.

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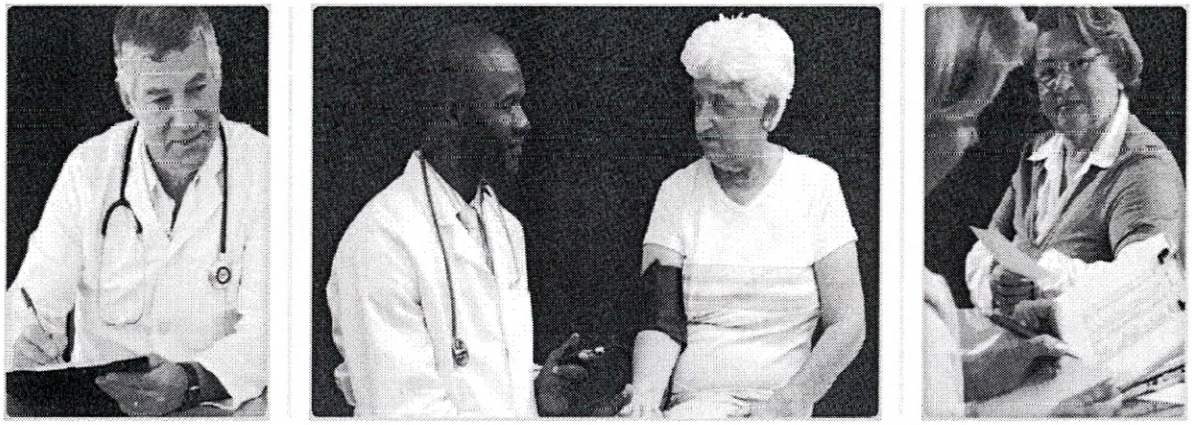
# APPENDIX D

## The ABC's of the Medicare Annual Wellness Visit


## THE ABCs OF THE ANNUAL WELLNESS VISIT (AWV)



**Target Audience:** Medicare Fee-For-Service Program (also known as Original Medicare)

The Hyperlink Table, at the end of this document, provides the complete URL for each hyperlink.





CMS Medicare Learning Network

- Have not received an Initial Preventive Physical Examination (IPPE) or AWV within the past 12 months

elements of all subsequent AWVs. You must provide all elements of the AWV prior to submitting a claim for the AWV.

NOTE:

## HEALTH RISK ASSESSMENT (HRA)

The AWV includes a Health Risk Assessment (HRA). The following tables include a brief summary of the minimum elements in the Framework for Patient-Centered Health Risk Assessments publication

- The history of HRAs
- A sample HRA

## INITIAL AWV COMPONENTS: APPLIES THE FIRST TIME A BENEFICIARY RECEIVES AN AWV

**Acquire Beneficary Inf o rma t ion**

| Action | Elements |
|---|---|
| ❑ Administer HRA | ❑ [illegible]<br>○ [illegible] should take no more than 20 minutes<br>❑ Account for and tailor to the communication needs of underserved populations, persons [illegible]<br>❑ [illegible]<br>○ Demographic data<br>○ Self-assessment of health status<br>○ Psychosocial risks<br>○ [illegible]<br>○ [illegible] and walking<br>○ [illegible] |
| ❑ Establish a list of current providers and suppliers | [illegible] |

Acquire Beneficiary Information (cont.)

| Action | Elements |
|---|---|
| ❑ medical/family history | ▯ Past medical and surgical history, including experiences with illnesses, hospital stays, operations, allergies, injuries, and treatments<br>▯ Use of, or exposure to, medications and supplements, including calcium and vitamins |
| ❑ factors for depression, including current or past experiences with depression or other mood disorders | of depression, which you may select from various available standardized screening tests designed for this purpose and recognized by national professional medical organizations |
| ❑ ability and level of safety | a screening questionnaire from various available screening questions or standardized questionnaires recognized by national professional medical organizations to assess, at a<br>▯ Ability to successfully perform ADLs<br>▯ Fall risk<br>▯ Hearing impairment<br>▯ Home safety |

**Begin Assessment**

| Action | Elements |
|---|---|
| ❑ Assess | [illegible]<br>▯ Height, weight, body mass index (or waist circumference, if appropriate), and blood pressure<br>▯ Other routine measurements as deemed appropriate based on medical and family history |
| ❑ Detect any cognitive impairment the [illegible] | [illegible] friends, caretakers, or others |

**Counsel Beneficiary**

| Action | Elements |
|---|---|
| ❑ Establish a written screening [illegible] a checklist for the next 5 to 10 years, as appropriate | [illegible]<br>▯ Age-appropriate preventive services Medicare covers<br>▯ Recommendations from the United States Preventive Services Task Force (USPSTF) and the Advisory Committee on Immunization Practices (ACIP)<br>▯ [illegible] preventive services covered by Medicare |
| ❑ Establish a list of risk factors and conditions for which the primary, secondary, or tertiary interventions are recommended or underway for [illegible] | [illegible]<br>▯ Mental health conditions<br>▯ [illegible]<br>▯ [illegible] |

**Counsel Beneficiary (cont.)**

| Action | Elements |
|---|---|
| ❑ Furnish personalized health advice and referrals to health education or preventive counseling services or programs | ▯ Community-based lifestyle interventions to reduce health risks and promote self-<br>○ Fall prevention<br>○ Nutrition<br>○ Physical activity<br>○ Tobacco-use cessation<br>○ Weight loss |
| ❑ Furnish, **at the discretion of the beneficiary**, advance care planning services | ▯ Future care decisions that may need to be made<br>▯<br>▯ Explanation of advance directives, which may involve the completion of standard forms |

## SUBSEQUENT AWV COMPONENTS: APPLIES FOR ALL SUBSEQUENT AWVs AFTER A BENEFICIARY'S FIRST AWV

**Acquire Updated Beneficiary Information**

| Action | Elements |
|---|---|
| ❑ Update HRA | ▯ [illegible]<br>○ [illegible] should take no more than 20 minutes<br>▯ [illegible]<br>○ Demographic data<br>○ Self-assessment of health status<br>○ Psychosocial risks<br>○ [illegible]<br>○ [illegible]<br>○ [illegible] |
| ❑ Update the list of current providers and suppliers | Include current providers and suppliers regularly involved in providing medical care to [illegible] |
| ❑ [illegible] medical/family history | [illegible]<br>▯ [illegible]<br>▯ Past medical and surgical history, including experiences with illnesses, hospital stays, operations, allergies, injuries, and treatments<br>▯ Use of, or exposure to, medications and supplements, including calcium and vitamins |

**Begin Assessment**

| Action | Elements |
|---|---|
| ❑ Assess | ▯ Weight (or waist circumference, if appropriate) and blood pressure<br>▯ Other routine measurements as deemed appropriate based on medical and family history |
| ❑ Detect any cognitive impairment | friends, caretakers, or others |

**Counsel Beneficiary**

| Action | Elements |
|---|---|
| ❑ Update the written screening | ▯ Age-appropriate preventive services Medicare covers<br>▯ Recommendations from the USPSTF and the ACIP<br>▯ preventive services covered by Medicare |
| ❑ Update the list of risk factors and conditions for which primary, secondary, or tertiary interventions are recommended or underway for | ▯ Mental health conditions |

**Counsel Beneficiary (cont.)**

| Action | Elements |
|---|---|
| ❑ Furnish personalized health advice and referral, as appropriate, to health education or preventive counseling services or programs | Community-based lifestyle interventions to reduce health risks and promote self-management, such as:<br>○ Fall prevention<br>○ Nutrition<br>○ Physical activity<br>○ Tobacco-use cessation<br>○ Weight loss |
| ❑ Furnish, **at the discretion of the beneficiary**, advance care planning services | Future care decisions that may need to be made<br>[illegible]<br>Explanation of advance directives, which may involve the completion of standard forms |

## AWV CODING, DIAGNOSIS, AND BILLING

### Coding

**AWV HCPCS Codes and Descriptors**

| AWV HCPCS Codes | Billing Code Descriptors |
|---|---|
| G0438 | |
| G0439 | Annual wellness visit, includes a personalized prevention plan of service (PPS), subsequent visit |

### Diagnosis

You must report a diagnosis code when submitting a claim for the AWV. Since you are not required to document a **specific** diagnosis

### Billing

- Physician (a doctor of medicine or osteopathy)
-
- Medical professional (including a health educator, registered dietitian, nutrition professional, or other licensed practitioner), or a team of medical professionals who are directly supervised by a physician (doctor of medicine or osteopathy)

## ADVANCE CARE PLANNING (ACP) AS AN OPTIONAL ELEMENT OF AN AWV

ACP is the face-to-face conversation between a physician (or other qualified health care professional) and a beneficiary to discuss the beneficiary's wishes and preferences for medical treatment if he or she were unable to speak or make decisions in the future. You can provide the ACP at the time of the AWV, at the beneficiary's discretion.

### Coding

Use the following CPT codes to file claims for ACP as an optional element of an AWV.

**ACP CPT Codes and Descriptors**

| ACP CPT Codes | Billing Code Descriptors |
|---|---|
| 99497 | Advance care planning including the explanation and discussion of advance directives such as standard forms (with completion of such forms, when performed), by the physician or other qualified health care professional; first 30 minutes, face-to-face with the patient, family member(s), and/or surrogate |
| 99498 | Advance care planning including the explanation and discussion of advance directives such as standard forms (with completion of such forms, when performed), by the physician or other qualified health care professional; each additional 30 minutes (List separately in addition to code for primary procedure) |

### Diagnosis

You must report a diagnosis code when submitting a claim for ACP as an optional element of an AWV. Since you are not required to document a **specific** diagnosis code for ACP as an optional element of an AWV, you may choose any diagnosis code consistent with a beneficiary's exam.

## Billing

[illegible]

- Provided on the same day as the covered AWV
- Furnished by the same provider as the covered AWV
- [illegible]
- [illegible]

The deductible and coinsurance for ACP are waived only once per year, when it is billed with the AWV. If the AWV billed with ACP is denied for exceeding the once per year limit, the deductible and coinsurance will be applied to the ACP.

**NOTE:** The deductible and coinsurance apply when ACP is provided outside the covered AWV.

## FREQUENTLY ASKED QUESTIONS (FAQs)

### What are the other Medicare Part B preventive services?

- Alcohol Misuse Screening and Counseling
- [illegible]
- Cardiovascular Disease Screening Test
- Colorectal Cancer Screening
- Counseling to Prevent Tobacco Use
- Depression Screening
- Diabetes Screening
- Diabetes Self-Management Training (DSMT)

- Glaucoma Screening
- Hepatitis C Virus (HCV) Screening
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- IPPE (also called the "Welcome to Medicare Preventive Visit")
- Medical Nutrition Therapy (MNT)
- Prostate Cancer Screening
- Screening for Cervical Cancer with Human Papillomavirus (HPV) Tests
- Screening for Lung Cancer with Low Dose Computed Tomography (LDCT)
- [illegible]
- [illegible]
- Screening Mammography
- Screening Pap Tests
- Screening Pelvic Examination (includes a clinical breast examination)
- Ultrasound Screening for Abdominal Aortic Aneurysm (AAA)

[illegible] Preventive Services Educational Tool for additional resources on Medicare preventive services.

## Who is eligible for the AWV?

[illegible] coverage period, and who have not had either an IPPE or an AWV within the past 12 months. **Medicare pays for only one first AWV per beneficiary per lifetime and one subsequent AWV per year thereafter.**

## Is the AWV the same as a beneficary' s yearly physical?

No. The AWV is not a routine physical checkup that some seniors may [illegible] practitioner. Medicare does not cover routine physical examinations.

## Are clinical laboratory tests part of the AWV?

No. The AWV does not include any clinical laboratory tests, but you may make referrals for such tests as part of the AWV, if appropriate.

## Do deductible or coinsurance/copayment apply for the AWV?

No. Medicare waives both the coinsurance or copayment and the [illegible]

### PREPARING ELIGIBLE MEDICARE BENEFICIARIES FOR THE AWV

[illegible] for their AWV by encouraging them to come prepared with the [illegible]

- Medical records, including immunization records
- Family health history, in as much detail as possible
- A full list of medications and supplements, including calcium and vitamins – how often and how much of each is taken
- A full list of current providers and suppliers involved in providing care

## Can I bill an electrocardiogram (EKG) and the AWV on the same date of service?

Generally, you may provide other medically necessary services on the same date of service as an AWV. The deductible and coinsurance/copayment apply for these other medically necessary services.

## How do I know if a beneficary already got his/her first AWV from another provider and know whether to bill for a subsequent AWV even though this is the first AWV I provided i to this beneficary?

You have different options for accessing AWV eligibility information depending on where you practice. You may access the information through the Health Insurance Portability and Accountability Act (HIPAA) Eligibility Transaction System (HETS) or through the provider call center Interactive Voice Responses (IVRs). CMS suggests providers check with their Medicare Administrative Contractor (MAC) [illegible] your MAC for more information.

## RESOURCES

The Medicare Preventive Services webpage lists educational products for Medicare Fee-For-Service providers and their staff about preventive services, coverage, coding, billing, payment, and claim filing procedures.

**AWV Resources**

| Resource | Website |
|---|---|
| 42 Code of Federal Regulations 410.15 (policy governing AWV service) | GPO.gov/fdsys/pkg/CFR-2016-title42-vol2/pdf/CFR-2016-title42-vol2-part410-subpartB.pdf |
| CMS Provider Minute: Preventive Services (pointers to help you submit correct documentation and avoid claim denials) | Youtube.com/watch?v=-tuMWM4KeZg&feature=youtu.be&list=PLaV7m2-zFKpigb1UvmCh1Q2cBKi1SGk-V |
| Medicare Benefit Policy Manual | Chapter 15<br>CMS.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/bp102c15.pdf |
| Medicare Claims Processing Manual | Chapter 12, Section 30.6.1.1<br>CMS.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/clm104c12.pdf<br>Chapter 18, Section 140<br>CMS.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/clm104c18.pdf |
| MLN Guided Pathways: Provider Specific Medicare Resources | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNEdWebGuide/Downloads/Guided_Pathways_Provider_SpecificBooklet.pdf |
| MLN Matters® Article MM7079, Annual Wellness Visit (AWV), Including Personalized Prevention Plan Services (PPPS) | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/MM7079.pdf |

**AWV Resources (cont.)**

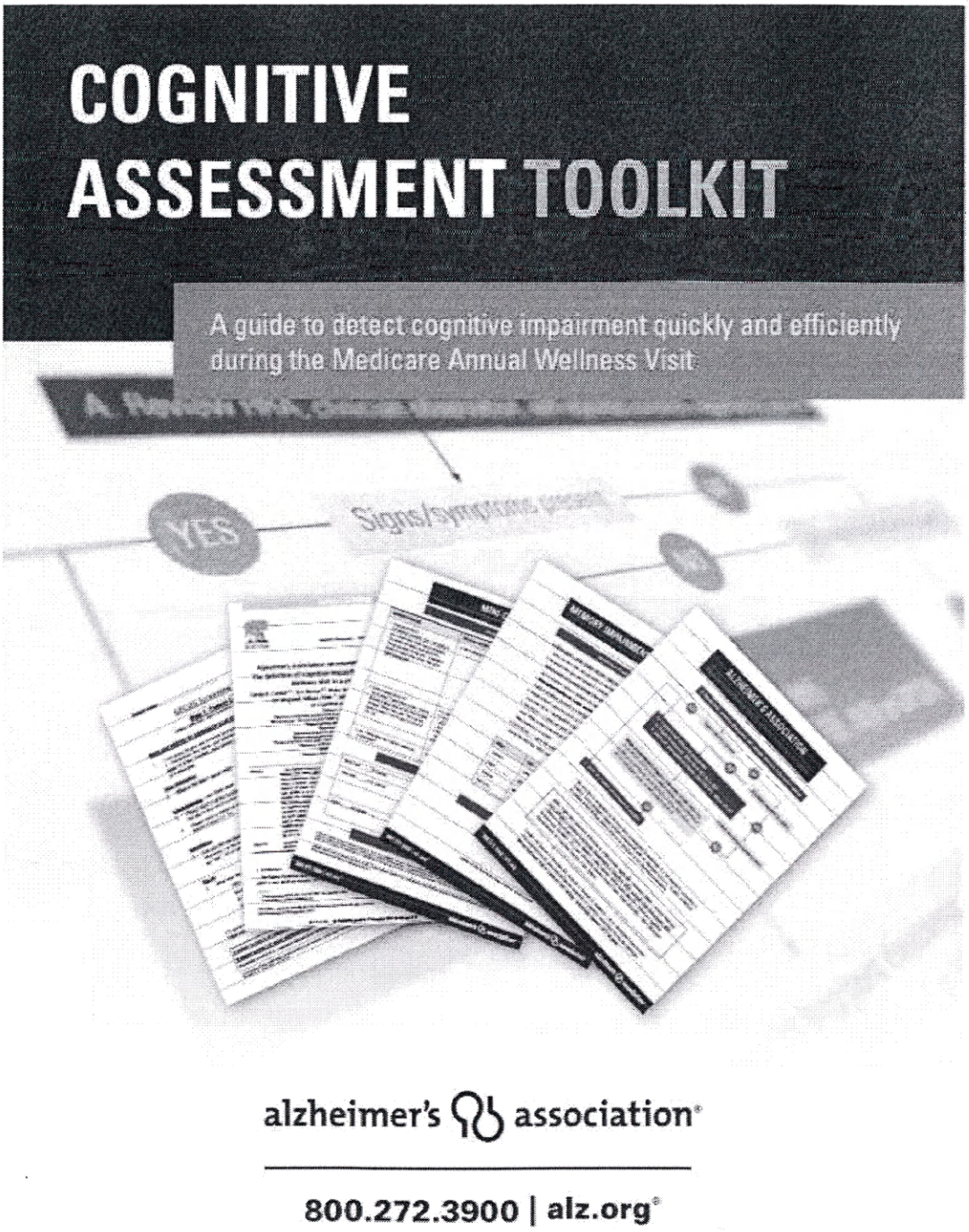
| Resource | Website |
|---|---|
| MLN Matters Article MM9271, Advance Care Planning (ACP) as an Optional Element of an Annual Wellness Visit (AWV) | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/MM9271.pdf |
| MLN Matters Article MM10000, Billing for Advance Care Planning (ACP) Claims | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/MM10000.pdf |
| MLN Matters Article SE1338, Improve Your Patients' Health with the Initial Preventive Physical Examination (IPPE) and Annual Wellness Visit (AWV) | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/SE1338.pdf |
| MLN Matters Articles on Medicare-covered Preventive Services | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/MLNPrevArticles.pdf |
| Preventive Services Educational Tool | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/MLN-Publications-Items/CMS1243319.html |
| Resources for Medicare Beneficiaries Publication | CMS.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/MLN-Publications-Items/ICN905183.html |

**Hyperlink Table**

| Embedded Hyperlink | Complete URL |
|---|---|
| The ABCs of the Initial Preventive Physical Examination (IPPE) | https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/MLN-Publications-Items/CMS1243320.html |
| Advisory Committee on Immunization Practices<br>ACIP | https://www.cdc.gov/vaccines/acip |
| Framework for Patient-Centered Health Risk Assessments Publication | https://www.cdc.gov/policy/hst/HRA/FrameworkForHRA.pdf |
| Medicare Preventive Services Webpage | https://www.cms.gov/Medicare/Prevention/PrevntionGenInfo |
| Preventive Services Educational Tool | https://www.cms.gov/Medicare/Prevention/PrevntionGenInfo/medicare-preventive-services/MPS-QuickReferenceChart-1.html |
| United States Preventive Services Task Force<br>USPSTF | https://www.uspreventiveservicestaskforce.org |
| Your MAC | https://www.cms.gov/Research-Statistics-Data-and-Systems/Monitoring-Programs/Medicare-FFS-Compliance-Programs/Review-Contractor-Directory-Interactive-Map |

## APPENDIX E

### Alzheimer's Association Cognitive Assessment Toolkit



# TABLE OF CONTENTS

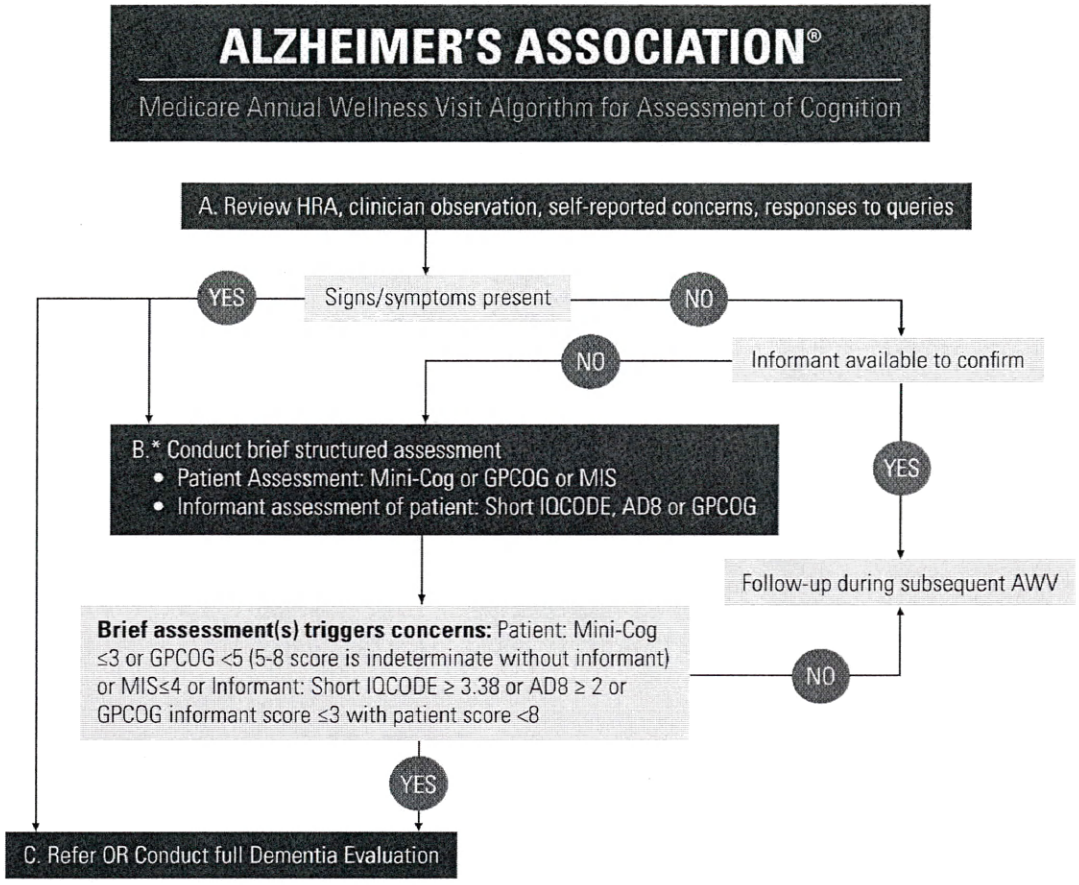
# OVERVIEW

The Alzheimer's Association – dedicated to fueling the advancement of early detection and diagnosis of dementia – has developed an easy-to-implement process to assess cognition during the Medicare Annual Wellness Visit. Developed by a group of clinical dementia experts, the recommended process outlined on page 4 allows you to efficiently identify patients with probable cognitive impairment while giving you the flexibility to choose a cognitive assessment tool that works best for you and your patients.

This Cognitive Assessment Toolkit contains:

- The Medicare Annual Wellness Visit Algorithm for Assessment of Cognition, incorporating patient history, clinician observations, and concerns expressed by the patient, family or caregiver
- Three validated patient assessment tools: the General Practitioner Assessment of Cognition (GPCOG), the Memory Impairment Screen (MIS) and the Mini-Cog™. All tools:
  - Can be administered in 5 minutes or less
  - Are equal to or superior to the Mini-Mental State Exam (MMSE) for detecting dementia
  - Are easily administered by medical staff members who are not physicians
  - Are relatively free from educational, language and/or cultural bias
- Three validated informant assessment of patient tools: the Short Form of the Informant Questionnaire on Cognitive Decline in the Elderly (Short IQCODE), the Eight-item Informant Interview to Differentiate Aging and Dementia (AD8) and the GPCOG
- The "Alzheimer's Association Recommendations for Operationalizing the Detection of Cognitive Impairment During the Medical Annual Wellness Visit in a Primary Care Setting," as published in the journal Alzheimer's and Dementia.

For more information on the detection, diagnosis and treatment of Alzheimer's disease, as well as direct access to patient and caregiver resources, please visit our Health Care Professionals and Alzheimer's center at **alz.org/hcps**.




* No one tool is recognized as the best brief assessment to determine if a full dementia evaluation is needed. Some providers repeat patient assessment with an alternate tool (e.g., SLUMS, or MoCA) to confirm initial findings before referral or initiation of full dementia evaluation.

**AD8** = Eight-item Informant Interview to Differentiate Aging and Dementia; **AWV** = Annual Wellness Visit; **GPCOG** = General Practitioner Assessment of Cognition; **HRA** = Health Risk Assessment; **MIS** = Memory Impairment Screen; **MMSE** = Mini Mental Status Exam; **MoCA** = Montreal Cognitive Assessment; **SLUMS** = St. Louis University Mental Status Exam; **Short IQCODE** = Short Informant Questionnaire on Cognitive Decline in the Elderly

Cordell CB, Borson S, Boustani M, Chodosh J, Reuben D, Verghese J, et al. Alzheimer's Association recommendations for operationalizing the detection of cognitive impairment during the Medicare Annual Wellness Visit in a primary care setting. *Alzheimers Dement.* 2013;9(2):141-150. Available at http://download.journals.elsevierhealth.com/pdfs/journals/1552-5260/PIIS1552526012025010.pdf.

5

Patient name:_____ Date: _____

# GPCOG Screening Test

## Step 1: Patient Examination

*Unless specified, each question should only be asked once*

**Name and Address for subsequent recall test**

1. "*I am going to give you a name and address. After I have said it, I want you to repeat it. Remember this name and address because I am going to ask you to tell it to me again in a few minutes: John Brown, 42 West Street, Kensington.*" (Allow a maximum of 4 attempts).

| **Time Orientation** | **Correct** | **Incorrect** |
|---|---|---|
| 2. *What is the date?* (exact only) | ☐ | ☐ |
| **Clock Drawing** – use blank page | | |
| 3. *Please mark in all the numbers to indicate the hours of a clock* (correct spacing required) | ☐ | ☐ |
| 4. *Please mark in hands to show 10 minutes past eleven o'clock* (11.10) | ☐ | ☐ |
| **Information** | | |
| 5. *Can you tell me something that happened in the news recently?* (Recently = in the last week. If a general answer is given, eg "war", "lot of rain", ask for details. Only specific answer scores). | ☐ | ☐ |
| **Recall** | | |
| 6. *What was the name and address I asked you to remember* | | |
| John | ☐ | ☐ |
| Brown | ☐ | ☐ |
| 42 | ☐ | ☐ |
| West (St) | ☐ | ☐ |
| Kensington | ☐ | ☐ |

(*To get a total score, add the number of items answered correctly*
**Total correct** (score out of 9) ☐ /9

| |
|---|
| **If patient scores 9, no significant cognitive impairment and further testing not necessary .** |
| **If patient scores 5-8, more information required. Proceed with Step 2, informant section.** |
| **If patient scores 0-4, cognitive impairment is indicated. Conduct standard investigations.** |

6

# Informant Interview

**Date:** _____

**Informant's name:** _____

**Informant's relationship to patient, i.e. informant is the patient's:** _____

**These six questions ask how the patient is compared to when s/he was well, say 5 – 10 years ago**

***Compared to a few years ago:***

| | Yes | No | Don't Know | N/A |
|---|---|---|---|---|
| ▪ Does the patient have more trouble remembering things that have happened recently than s/he used to? | ☐ | ☐ | ☐ | |
| ▪ Does he or she have more trouble recalling conversations a few days later? | ☐ | ☐ | ☐ | |
| ▪ When speaking, does the patient have more difficulty in finding the right word or tend to use the wrong words more often? | ☐ | ☐ | ☐ | |
| ▪ Is the patient less able to manage money and financial affairs (e.g. paying bills, budgeting)? | ☐ | ☐ | ☐ | ☐ |
| ▪ Is the patient less able to manage his or her medication independently? | ☐ | ☐ | ☐ | ☐ |
| ▪ Does the patient need more assistance with transport (either private or public)? (If the patient has difficulties due only to physical problems, e.g bad leg, tick 'no') | ☐ | ☐ | ☐ | ☐ |

***(To get a total score, add the number of items answered 'no', 'don't know' or 'N/A')***

**Total score (out of 6)** ☐

**If patient scores 0-3, cognitive impairment is indicated. Conduct standard investigations.**


Brodaty et al, *JAGS* 2002; 50:530-534

# MEMORY IMPAIRMENT SCREEN (MIS)

## Instructions for Administration

1. Show patient a sheet of paper with the 4 items to be recalled in 24-point or greater uppercase letters (on other side), and ask patient to read the items aloud.
2. Tell patient that each item belongs to a different category. Give a category cue and ask patient to indicate which of the words belongs in the stated category (eg, "Which one is the game?"). Allow up to 5 attempts. Failure to complete this task indicates possible cognitive impairment.
3. When patient identifies all 4 words, remove the sheet of paper. Tell patient that he or she will be asked to remember the words in a few minutes.
4. Engage patient in distractor activity for 2 to 3 minutes, such as counting to 20 and back, counting back from 100 by 7, spelling WORLD backwards.
5. FREE RECALL — 2 points per word: Ask patient to state as many of the 4 words he or she can recall. Allow at least 5 seconds per item for free recall. Continue to step 6 if no more words have been recalled for 10 seconds.
6. CUED RECALL — 1 point per word: Read the appropriate category cue for each word not recalled during free recall (eg, "What was the game?").

| Word | Cue | Free recall (2 pts.) | Cued Recall (1 pts) |
|---|---|---|---|
| Checkers | Game | | |
| Saucer | Dish | | |
| Telegram | Message | | |
| Red Cross | Organization | | |

## Scoring

**The maximum score for the MIS is 8.**

- 5-8 No cognitive impairment
- ≤ 4 Possible cognitive impairment

8

## WORD LIST

CHECKERS

SAUCER

TELEGRAM

RED CROSS

**Mini-Cog™**

# Instructions for Administration & Scoring

ID: _____ Date: _____

## Step 1: Three Word Registration

Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).

The following and other word lists have been used in one or more clinical studies.[1-3] For repeated administrations, use of an alternative word list is recommended.

| **Version 1** | **Version 2** | **Version 3** | **Version 4** | **Version 5** | **Version 6** |
|---|---|---|---|---|---|
| Banana | Leader | Village | River | Captain | Daughter |
| Sunrise | Season | Kitchen | Nation | Garden | Heaven |
| Chair | Table | Baby | Finger | Picture | Mountain |

## Step 2: Clock Drawing

Say: "Next, I want you to draw a clock for me. First, put in all of the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 11."

Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.

## Step 3: Three Word Recall

Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the word list version number and the person's answers below.

Word List Version: ____ Person's Answers: _____ _____ _____

## Scoring

| | |
|---|---|
| Word Recall: _____ (0-3 points) | 1 point for each word spontaneously recalled without cueing. |
| Clock Draw: _____ (0 or 2 points) | Normal clock = 2 points. A normal clock has all numbers placed in the correct sequence and approximately correct position (e.g., 12, 3, 6 and 9 are in anchor positions) with no missing or duplicate numbers. Hands are pointing to the 11 and 2 (11:10). Hand length is not scored.<br>Inability or refusal to draw a clock (abnormal) = 0 points. |
| Total Score: _____ (0-5 points) | Total score = Word Recall score + Clock Draw score.<br><br>A cut point of <3 on the Mini-Cog™ has been validated for dementia screening, but many individuals with clinically meaningful cognitive impairment will score higher. When greater sensitivity is desired, a cut point of <4 is recommended as it may indicate a need for further evaluation of cognitive status. |

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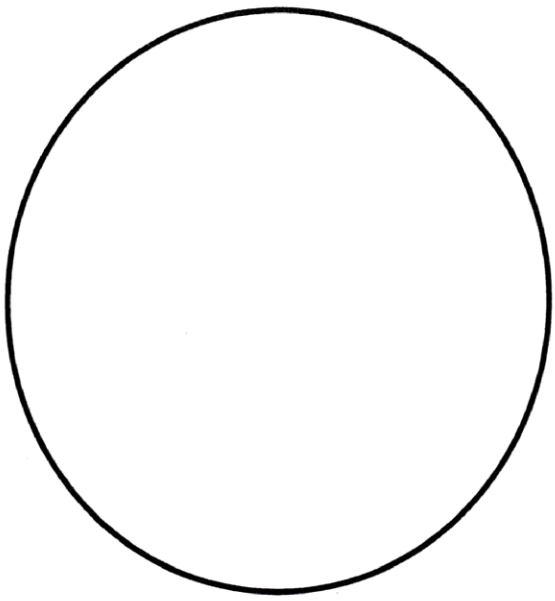
## Clock Drawing

ID: _____ Date: _____



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# Short Form of the Informant Questionnaire on Cognitive Decline in the Elderly (Short IQCODE)[1]

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Note: As used in published studies, the IQCODE was preceded by questions to the informant on the subject's sociodemographic characteristics and physical health.

Now we want you to remember what your friend or relative was like 10 years ago and to compare it with what he/she is like now. 10 years ago was in 20__.* Below are situations where this person has to use his/her memory or intelligence and we want you to indicate whether this has improved, stayed the same or got worse in that situation over the past 10 years. Note the importance of comparing his/her present performance with 10 years ago. So if 10 years ago this person always forgot where he/she had left things, and he/she still does, then this would be considered "Hasn't changed much". Please indicate the changes you have observed by circling the appropriate answer.

Compared with 10 years ago how is this person at:

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Remembering things about family and friends e.g. occupations, birthdays, addresses | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 2. Remembering things that have happened recently | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 3. Recalling conversations a few days later | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 4. Remembering his/her address and telephone number | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 5. Remembering what day and month it is | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 6. Remembering where things are usually kept | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 7. Remembering where to find things which have been put in a different place from usual | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 8. Knowing how to work familiar machines around the house | Much improved | A bit improved | Not much change | A bit worse | Much worse |

| | | | | | |
|---|---|---|---|---|---|
| 9. Learning to use a new gadget or machine around the house | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 10. Learning new things in general | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 11. Following a story in a book or on TV | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 12. Making decisions on everyday matters | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 13. Handling money for shopping | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 14. Handling financial matters e.g. the pension, dealing with the bank | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 15. Handling other everyday arithmetic problems e.g. knowing how much food to buy, knowing how long between visits from family or friends | Much improved | A bit improved | Not much change | A bit worse | Much worse |
| 16. Using his/her intelligence to understand what's going on and to reason things through | Much improved | A bit improved | Not much change | A bit worse | Much worse |

*The original tool was published in 1994.
The Alzheimer's Association updated the year 19__ as published in the original tool to 20__ .
Tool Reference: Jorm AF. A short form of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): development and cross-validation. Psychol Med 1994; 24: 145–153.

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## AD8 Dementia Screening Interview

Patient ID#:_____
CS ID#:_____
Date:_____

| Remember, "Yes, a change" indicates that there has been a change in the last several years caused by cognitive (thinking and memory) problems. | **YES, A change** | **NO, No change** | **N/A, Don't know** |
|---|---|---|---|
| **1.** Problems with judgment (e.g., problems making decisions, bad financial decisions, problems with thinking) | | | |
| **2.** Less interest in hobbies/activities | | | |
| **3.** Repeats the same things over and over (questions, stories, or statements) | | | |
| **4.** Trouble learning how to use a tool, appliance, or gadget (e.g., VCR, computer, microwave, remote control) | | | |
| **5.** Forgets correct month or year | | | |
| **6.** Trouble handling complicated financial affairs (e.g., balancing checkbook, income taxes, paying bills) | | | |
| **7.** Trouble remembering appointments | | | |
| **8.** **Daily** problems with thinking and/or memory | | | |
| **TOTAL AD8 SCORE** | | | |

Adapted from Galvin JE et al, The AD8, a brief informant interview to detect dementia, Neurology 2005:65:559-564

**The AD8 Administration and Scoring Guidelines**

*A spontaneous self-correction is allowed for all responses without counting as an error.*

The questions are given to the respondent on a clipboard for self–administration or can be read aloud to the respondent either in person or over the phone. It is preferable to administer the AD8 to an informant, if available. If an informant is not available, the AD8 may be administered to the patient.

When administered to an informant, specifically ask the respondent to rate change in the patient.

When administered to the patient, specifically ask the patient to rate changes in his/her ability for each of the items, ***without*** attributing causality.

If read aloud to the respondent, it is important for the clinician to carefully read the phrase as worded and give emphasis to note changes due to cognitive problems (not physical problems). There should be a one second delay between individual items.

No timeframe for change is required.

The final score is a sum of the number items marked "Yes, A change".

**Interpretation of the AD8** (Adapted from Galvin JE et al, The AD8, a brief informant interview to detect dementia, Neurology 2005:65:559-564)

A screening test in itself is insufficient to diagnose a dementing disorder. The AD8 is, however, quite sensitive to detecting early cognitive changes associated many common dementing illness including Alzheimer disease, vascular dementia, Lewy body dementia and frontotemporal dementia.

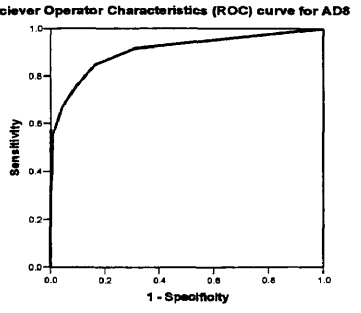
Scores in the impaired range (see below) indicate a need for further assessment. Scores in the "normal" range suggest that a dementing disorder is unlikely, but a very early disease process cannot be ruled out. More advanced assessment may be warranted in cases where other objective evidence of impairment exists.

Based on clinical research findings from 995 individuals included in the development and validation samples, the following cut points are provided:

- 0 – 1: Normal cognition
- 2 or greater: Cognitive impairment is likely to be present

Administered to either the informant (preferable) or the patient, the AD8 has the following properties:

- Sensitivity > 84%
- Specificity > 80%
- Positive Predictive Value > 85%
- Negative Predictive Value > 70%
- Area under the Curve: 0.908; 95%CI: 0.888-0.925



**Permission Statement**

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Alzheimer's & Dementia

# Alzheimer's Association recommendations for operationalizing the detection of cognitive impairment during the Medicare Annual Wellness Visit in a primary care setting

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**Abstract** The Patient Protection and Affordable Care Act added a new Medicare benefit, the Annual Wellness Visit (AWV), effective January 1, 2011. The AWV requires an assessment to detect cognitive impairment. The Centers for Medicare and Medicaid Services (CMS) elected not to recommend a specific assessment tool because there is no single, universally accepted screen that satisfies all needs in the detection of cognitive impairment. To provide primary care physicians with guidance on cognitive assessment during the AWV, and when referral or further testing is needed, the Alzheimer's Association convened a group of experts to develop recommendations. The resulting Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition includes review of patient Health Risk Assessment (HRA) information, patient observation, unstructured queries during the AWV, and use of structured cognitive assessment tools for both patients and informants. Widespread implementation of this algorithm could be the first step in reducing the prevalence of missed or delayed dementia diagnosis, thus allowing for better healthcare management and more favorable outcomes for affected patients and their families and caregivers.


*Keywords:* Annual Wellness Visit; AWV; Cognitive impairment; Assessment; Screen; Dementia; Alzheimer's disease; Medicare; Algorithm; Patient Protection and Affordable Care Act

## 1. Introduction

The Patient Protection and Affordable Care Act of 2010 added a new Medicare benefit, the Annual Wellness Visit (AWV), effective January 1, 2011. The AWV includes routine measurements such as height, weight, and blood pressure; a review of medical and family history; an assessment to detect cognitive impairment; and establishment of a list of current medical providers, medications, and schedule for future preventive services. In addition, during the first AWV only, beneficiaries are to be screened for depression (if

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not completed under a separate Medicare benefit) and for functional difficulties using nationally recognized appropriate screening questions or standardized questionnaires. Although the U.S. Preventive Services Task Force (USPSTF) in 2003 concluded that there was insufficient published evidence of better clinical outcomes as a result of routine screening for cognitive impairment in older adults, the Task Force recognized that the use of cognitive assessment tools can increase the detection of cognitive impairment [1]. As per the Centers for Medicare and Medicaid Services (CMS) regulation, the AWV requires detection of cognitive impairment by "... assessment of an individual's cognitive function by direct observation, with due consideration of information obtained by way of patient report, concerns raised by family members, friends, caretakers, or others" [2]. During the public comment period, several organizations, including the Alzheimer's Association, noted that the use of a standardized tool for assessment of cognitive function should be part of the AWV.

These comments are supported by a number of studies showing that cognitive impairment is unrecognized in 27%–81% of affected patients in primary care [3–7]. The use of a brief, structured cognitive assessment tool correctly classifies patients with dementia or mild cognitive impairment (MCI) more often than spontaneous detection by the patients' own primary care physicians (83% vs 59%, respectively) [8].

In response to concerns submitted during public comment, CMS elected not to recommend a specific tool for the final AWV benefit because "There is no nationally recognized screening tool for the detection of cognitive impairments at the present time..." [9]. However, CMS recognizes that without clarification, the full intended benefits of the AWV cognitive assessment may not be realized [10]. CMS is working with other governmental agencies (e.g., National Institutes on Aging) on recommendations for use of specific tools.

Understanding that, under the present regulation, each healthcare provider who conducts an AWV would have to determine how best to "detect cognitive impairment," the Alzheimer's Association convened the Medicare Detection of Cognitive Impairment Workgroup to develop recommendations for operationalizing the cognitive assessment component in primary care settings. This workgroup was comprised of geographically dispersed USA experts with published works in the field of detecting cognitive impairment during primary care visits. The focus on primary care was deliberate, as most Medicare beneficiaries will receive their AWV in this setting.

## 2. Guiding principles for recommendations

### 2.1. Consensus on general principles

Based on their expertise, the workgroup agreed on the following general principles to guide the development of recommendations for cognitive assessment:

- Detection of cognitive impairment is a stepwise, iterative process.
- Informal observation alone by a physician is not sufficient (i.e., observation without a specific cognitive evaluation).
- Detection of cognitive impairment can be enhanced by specifically asking about changes in memory, language, and the ability to complete routine tasks.
- Although no single tool is recognized as the "gold standard" for detection of cognitive impairment, an initial structured assessment should provide either a baseline for cognitive surveillance or a trigger for further evaluation.
- Clinical staff can offer valuable observations of cognitive and functional changes in patients who are seen over time.
- Counseling before and after cognitive assessment is an essential component of any cognitive evaluation.
- Informants (family member, caregiver, etc.) can provide valuable information about the presence of a change in cognition.

### 2.2. Principles specific to the AWV

- The AWV requires the completion of a Health Risk Assessment (HRA) by the patient either before or during the visit. The HRA should be reviewed for any reported signs and symptoms indicative of possible dementia.
- The AWV will likely occur in a primary care setting. Tools for initial cognitive assessments should be brief (<5 min), appropriately validated, easily administered by non-physician clinical staff, and available free of charge for use in a clinical setting.
- If further evaluation is indicated based on the results of the AWV, a more detailed evaluation of cognition should be scheduled for a follow-up visit in primary care or through referral to a specialist.

## 3. Review of available brief tools for use during the AWV

### 3.1. Workgroup review process

Although there is no single cognition assessment tool that is considered to be the gold standard, there is a plethora of tools in the literature. A MEDLINE (PubMed) search conducted in October 2011, using the key words "screening or detection of dementia or cognitive impairment," yielded over 500 publications. To narrow the search to tools more applicable to the AWV, the workgroup sought to determine whether the literature offered a consensus regarding brief cognitive assessment during time-limited primary care visits.

The workgroup focused on systematic evidence review (SER) studies published since 2000 resulting in four studies by Lorentz et al, Brodaty et al, Holsinger et al, and Milne et al [11–14]. Although each SER had a similar objective—to determine which tools were best for administration during

Table 1
Review articles of brief cognitive assessment tools—select inclusion and comparison criteria

| | Lorentz et al, 2002 [11] | Brodaty et al, 2006 [12] | Holsinger et al, 2007 [13] | Milne et al, 2008 [14] | Ismail et al, 2010 [15] | Kansagara and Freeman, 2010 [16] |
|---|---|---|---|---|---|---|
| Inclusion criteria | • Admin ≤10 min<br>• Performance characteristics evaluated in ≥1 community or clinical setting | • Admin ≤5 min and simple<br>• Validated in community or PC<br>• Misclassification rate ≤ MMSE<br>• NPV ≥ MMSE | • Studied in patients ≥60 years<br>• Criterion to diagnose dementia acceptable | • Admin time suitable for PC in UK<br>• Geriatric PC screens for cognitive change | • Tools most frequently used in PC<br>• Tools recommended or newly used in PC | • Tools identified by the VA as alternatives to the MMSE |
| Comparison criteria | • Face validity, sensitivity, and specificity<br>• Sociodemographic biases<br>• *Comparison with MMSE*<br>• Acceptability<br>• Ease of use by nonspecialists | • Study validity<br>• Applicability to PC<br>• Psychometric properties<br>• *Administration characteristics* | • Admin time<br>• Study quality<br>• Likelihood ratios<br>• *Domains tested*<br>• Utility in special situations | • Practicality<br>• Feasibility<br>• Applicability<br>• Psychometric properties | • Summary of other studies and strength/weaknesses of tools<br>• Newer tools that address weaknesses | • Relevance of study to the VA setting<br>• Admin time<br>• Sensitivity<br>• Specificity<br>• Cost |

Abbreviations: MMSE, Mini-Mental State Examination; NPV, negative predictive value; PC, primary care; UK, United Kingdom; VA, US Department of Veteran Affairs.

primary care visits—different comparison criteria to select the tools were applied (Table 1). Two other studies were also considered relevant to the development of the workgroup recommendations: Ismail et al [15] conducted a literature review designed to identify widely used and most promising newer brief cognitive tools being used in primary care and geriatrics, and an SER by Kansagara and Freeman [16] of six brief cognitive assessment tools that could serve as possible alternatives to the Mini-Mental State Examination (MMSE) for use by the U.S. Department of Veterans Affairs (VA). Neither study was designed to determine which brief tool is the "best," but both provided evidence related to primary care use and performance characteristics of brief assessments of cognition (Table 1).

### 3.2. *Workgroup review results*

Of the five publications that focused specifically on identifying brief cognitive assessments most suitable or most used in primary care settings [11–15], all selected the Memory Impairment Screen (MIS), and four of these publications [11,12,14,15] also selected the General Practitioner Assessment of Cognition (GPCOG) and the Mini-Cog (Table 2).

The following attributes of the GPCOG, Mini-Cog, and the MIS contributed to their selection as most suited for routine use in primary care:

- Requires 5 minutes or less to administer.
- Is validated in a primary care or community setting.
- Is easily administered by medical staff members who are not physicians.
- Has good to excellent psychometric properties.
- Is relatively free from educational, language, and/or culture bias.
- Can be used by clinicians in a clinical setting without payment for copyrights.

Charging a fee for clinical use of brief cognitive assessment tool has become an issue because of increased enforcement of the MMSE copyright. First published in 1975 [17], the MMSE copyright is now held by Psychological Assessment Resources, Inc., which charges a fee for each use (for exact fees see www.parinc.com). The comparative SER within the VA [16] evaluated alternatives to the proprietary MMSE, including the GPCOG and the Mini-Cog, along with four other brief tools (Table 2). The Mini-Cog and MIS are copyrighted, but the owners, Soo Borson, MD, and Albert Einstein College of Medicine, respectively, allow free use by clinicians as clinical tools with distribution restrictions for other entities (e.g., commercial companies). The GPCOG has similar use rules.

### 3.3. *Patient structured cognitive assessment tools recommended for AWV*

In alignment with the workgroup's guiding principles and supported by data in the six selected SERs/reviews,

Table 2
Brief cognitive assessment tools evaluated in multiple review articles

| Assessment Tool | Lorentz et al, 2002 [11] | Brodaty et al, 2006 [12] | Holsinger et al, 2007 [13] | Milne et al, 2008 [14] | Ismail et al, 2010 [15] | Kansagara and Freeman, 2010* [16] |
|---|---|---|---|---|---|---|
| 7-Minute Screener | X | X | X | X | | |
| AMT | | X | X | X | X | |
| CAMCOG | | X | Suited† | | | |
| CDT | X | X | Suited‡ | X | X | |
| GPCOG | Most suited | Most suited | X | Most suited | Most suited | X |
| Mini-Cog | Most suited | Most suited | X | Most suited | Most suited | X |
| MIS | Most suited | Most suited | Suited‡ | Most suited | Most suited | |
| MMSE | X | X | Suited§ | X | X | |
| MoCA | | | Suited† | | X | X |
| RUDAS | | X | | | X | |
| SAS-SI | X | X | X | | | |
| SBT (BOMC, 6-CIT) | X | X | X | X | | X |
| SPMSQ | X | | | X | | |
| STMS | X | X | X | | | X |
| T&C | X | X | | | | |

Abbreviations: 6-CIT, 6-Item Cognitive Impairment Test; AMT, Abbreviated Mental Test; BOMC, 6-item Blessed Orientation-Memory-Concentration Test; CAMCOG, Cambridge Cognitive Examination; CDT, Clock Drawing Test; GPCOG, General Practitioner Assessment of Cognition; MIS, Memory Impairment Screen; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; RUDAS, Rowland Universal Dementia Assessment; SAS-SI, Short and Sweet Screening Instrument; SBT, Short Blessed Test; SLUMS, St Louis Mental Status; SPMSQ, Short Portable Mental Status Questionnaire; STMS, Short Test of Mental Status; T&C, Time and Change Test.

X = assessment reviewed, but not identified as most suited for general use in primary care.

Suited = tool appropriate for the following clinical issue: † available time is not limited; ‡ available time is limited; and § cognitive impairment is at least moderate. Most suited = tool identified as most suited for routine use in primary care.

*Kansagara and Freeman evaluated six tools, including the SLUMS, which was not evaluated in any other review.

the GPCOG, Mini-Cog, and MIS are brief structured tools that are suitable for assessment of cognitive function during the AWV. Each tool has unique benefits. The GPCOG has patient and informant components that can be used alone or together to increase specificity and sensitivity [18]. The Mini-Cog has been validated in population-based studies and in community-dwelling older adults heterogeneous with respect to language, culture, and education [19–22]. The MIS is a verbally administered word-recall task that tests encoding as well as retrieval [23], and is an option for patients who have motor impairments that prevent use of paper and pencil.

### *3.4. Structured cognitive assessment tools for use with informants*

Cognitive assessment combined with informant-reported data improves the accuracy of assessment [24–27]. If an informant is present during the AWV, use of a structured informant tool is recommended. Similar to cognitive assessment tools for use with patients, there is no single "gold standard" informant tool; however, relatively few brief informant tools have been validated in community and/or primary care settings. Brief tools appropriately validated include the Short IQCODE [25], the AD8 [28], which can be administered in-person or by telephone, and the aforementioned GPCOG [18], which has both patient and informant components.

## 4. Recommended algorithm for detection of cognitive impairment during the AWV

### *4.1. Incorporating assessment of cognition during the AWV*

The Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition for consistency (Figure 1) illustrates a stepwise process. The process is intended to detect patients with a high likelihood of having dementia. The AWV algorithm includes both structured assessments discussed previously and other less structured patient- and informant-based evaluations. By assessing and documenting cognitive status on an annual basis during the AWV, clinicians can more easily determine gradual cognitive decline over time in an individual patient—a key criterion for diagnosing dementia due to Alzheimer's disease and other progressive conditions affecting cognition.

For patients with a previous diagnosis of MCI or dementia, this should be documented and included in their AWV list of health risk factors. Annual unstructured and structured cognitive assessments could be used to monitor significant changes in cognition and potentially lead to a new diagnosis of dementia for those with MCI or new care recommendations for those with dementia.

### *4.2. Detection of cognitive impairment during the AWV—initial HRA review, conversations, and observations*

The first step in detection of cognitive impairment during the AWV (Fig. 1, Step A), involves a conversation between

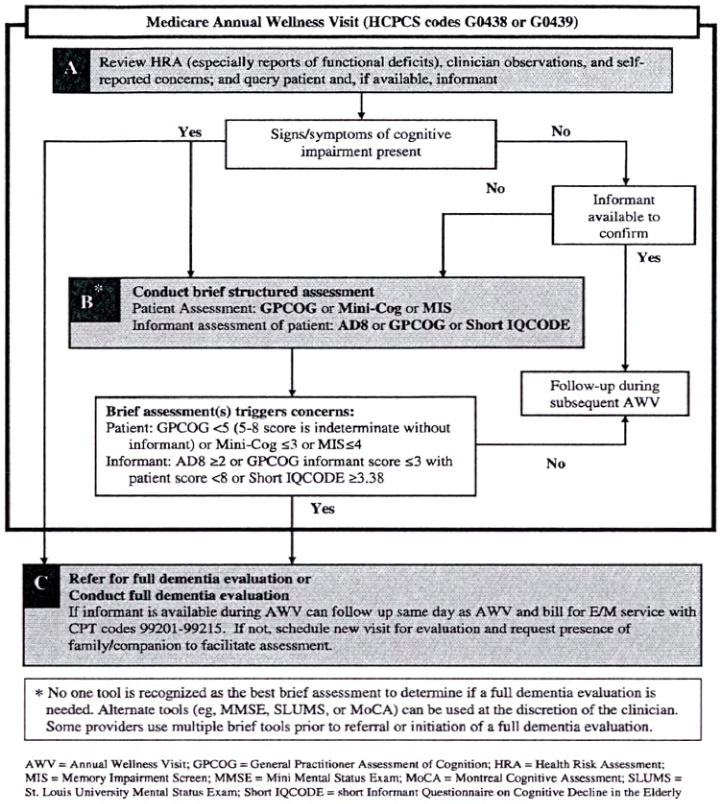


Fig. 1. Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition.

a clinician and the patient and, if present, any family member or other person who can provide collateral information. This introduces the purpose and content of the AWV, which includes: a review of the HRA; observations by clinicians (medical and associated staff); acknowledgment of any self-reported or informant-reported concerns; and conversational queries about cognition directed toward the patient and others present. If any concerns are noted, or if an informant is not present to provide confirmatory information, further evaluation of cognition with a structured tool should be performed.

Patient completion of an HRA is a required element of the AWV and can be accomplished with the help of a family member or other knowledgeable informants, including a professional caregiver. Published CMS guidance offers healthcare professionals flexibility as to the specific format, questions, and delivery methods that can be used for an AWV HRA [29]. The following questions may be suitable for the AWV HRA and have been tested and evaluated in the general population through the Behavioral Risk Factor Surveillance System or presented as HRA example questions:

1. During the past 12 months, have you experienced confusion or memory loss that is happening more often or is getting worse [30]?
2. During the past 7 days, did you need help with others to perform everyday activities such as eating, getting dressed, grooming, bathing, walking, or using the toilet [29]?
3. During the past 7 days, did you need help from others to take care of things such as laundry and housekeeping, banking, shopping, using the telephone, food preparation, transportation, or taking your own medications [29]?

A noted deficit in activities of daily living (ADLs) (e.g., eating and dressing) or instrumental activities of daily living (IADLs) (e.g., shopping and cooking) that cannot be

attributed to physical limitations should prompt concern, as there is a strong correlation between decline in function and decline in cognitive status across the full spectrum of dementia [31]. In addition to clinically observed concerns, any patient- or informant-reported concerns should trigger further evaluation [13]. Positive responses to conversational queries, such as "Have you noticed any change in your memory or ability to complete routine tasks, such as paying bills or preparing a meal?" should be followed up with a structured assessment of cognition.

Upon realizing the time constraints of a typical primary care visit, if no cognitive concerns surface during the initial evaluation and this information is corroborated by an informant, the clinician may elect not to perform a structured cognitive assessment and assume that the patient is not currently demented. This approach is supported by studies in populations with low rates of dementia that suggest the absence of memory difficulties reported by informants and patients reduces the likelihood that dementia is present [32,33].

### *4.3. Structured cognitive assessment tools for use with patients and informants during the AWV*

The second step in detection of cognitive impairment during the AWV (Figure 1, Step B) requires cognitive assessment using a structured tool. Based on synthesis of data from the six review articles previously discussed, patient tools suitable for the initial structured assessment are the GPCOG, Mini-Cog, and MIS.

Recognizing that there is no single optimal tool to detect cognitive impairment for all patient populations and settings, clinicians may select other brief tools to use in their clinical practice, such as those listed in Table 3. The 15 brief tools listed were evaluated in multiple review articles (passed through at least two review search criteria for tools possibly suited for primary care) or are used in the VA. Tools listed in Table 3 are subject to the inclusion/exclusion criteria of each review and do not represent the entire listing of the >100 brief cognitive assessment tools that may be suitable for primary care practices.

If an informant is present, defined as someone who can attest to a patient's change in memory, language, or function over time, it is suitable to use the AD8, the informant component of the GPCOG, or the Short IQCODE, during the AWV.

### *4.4. Primary care workflow considerations*

According to the algorithm, any patient who does not have an informant present should be assessed with a structured tool. For such patients (and for practices that implement structured assessments during all AWVs), completion of this structured assessment can be administered by trained medical staff as the first step for cognitive impairment detection. This could improve office efficiency. To increase acceptance of a structured assessment, the reason provided to the patient can be normalized with a statement such as, "This is something I do for all of my older patients as part of their annual visit." When the initial assessment prompts further evaluation, explanation of results should be deferred until a more comprehensive evaluation has been completed. "There are many reasons for not getting every answer correct. More evaluation will help us determine that," is an example statement that may encourage patients to pursue further testing.

## 5. Full dementia evaluation

Patients with assessments that indicate cognitive impairment during the AWV should be further evaluated to determine appropriate diagnosis (e.g., MCI, Alzheimer's disease) or to identify other causes. As reflected in the algorithm (Figure 1, Step C), initiation of a full dementia evaluation is outside the scope of the AWV, but can occur in a separate visit either on the same day, during a newly scheduled visit, or through referral to a specialist. Specialists who have expertise in diagnosing dementia include geriatricians, geriatric psychiatrists, neurologists, and neuropsychologists. The two-visit approach has been cited as a time-effective process to evaluate suspected dementia in primary care [34] and is consistent with the two-step approach widely used in epidemiologic research on dementia. Regardless of the timing and setting, clinicians are encouraged to counsel patients to include an informant in the diagnostic process.

Components of a full dementia evaluation can vary depending on the presentation and include tests to rule in or out the various causes of cognitive impairment and establish its severity. Diagnostic evaluations include a complete medical history; assessment of multiple cognitive domains, including episodic memory, executive function, attention, language, and visuospatial skills; neurologic exam (gait, motor function, reflexes); ADL and IADL functioning; assessment for depression; and review for medications that may adversely affect cognition. Standard laboratory tests include thyroid-stimulating hormone (TSH), complete blood count (CBC), serum $B_{12}$, folate, complete metabolic panel, and, if the patient is at risk, testing for sexually transmitted diseases (human immunodeficiency virus, syphilis). Structural brain imaging, including magnetic resonance imaging (MRI) or computed tomography (CT), is a supplemental aid in the differential diagnosis of dementia, especially if neurologic physical exam findings are noted. An MRI or CT can be especially informative in the following cases: dementia that is of recent onset and is rapidly progressing; younger onset dementia (<65 years of age); history of head trauma; or neurologic symptoms suggesting focal disease.

## 6. Discussion

Unfortunately, up to 81% of patients who meet the criteria for dementia have never received a documented diagnosis

Table 3
Key advantages and limitations of brief cognitive assessment tools evaluated in multiple reviews and/or for use in the VA

| Assessment* | Time (~min) | Advantages | Limitations |
|---|---|---|---|
| 7-Minute Screener [48] | 7–12 | • Little or no education bias<br>• Validated in primary care | • Difficult to administer<br>• Complex logarithmic scoring |
| AMT [49] | 5–7 | • Easy to administer<br>• Verbal memory test (no writing/drawing) | • Education/language/culture bias<br>• Limited use in US (mostly used in Europe)<br>• Does not test executive function or visuospatial skills |
| CAMCOG [50] | 20 | • Tests many separate domains (7) | • Difficult to administer<br>• Long administration time |
| CDT [51] | ≤1 | • Very brief administration time<br>• Minimal education bias | • Lacks standards for administration and scoring |
| GPCOG† [18] | | | |
| Patient | 2–5 | • Developed for and validated in primary care | • Patient component scoring has an indeterminate range that requires an informant score to assess as pass or fail |
| Informant | 1–3 | • Informant component useful when initial complaint is informant-based<br>• Little or no education bias<br>• Multiple languages accessible at www.gpcog.com.au | • Informant component alone has low specificity<br>• Lacks data on any language/culture biases |
| Mini-Cog† [8, 19] | 2–4 | • Developed for and validated in primary care and multiple languages/cultures<br>• Little or no education/language/race bias<br>• Short administration time | • Use of different word lists may affect failure rates<br>• Some study results based on longer tests with the Mini-Cog elements reviewed independently |
| MIS [23,52] | 4 | • Verbal memory test (no writing/drawing)<br>• Little or no education bias | • Does not test executive function or visuospatial skills |
| MMSE [17] | 7–10 | • Most widely used and studied worldwide<br>• Often used as reference for comparative evaluations of other assessments<br>• Required for some drug insurance reimbursements | • Education/age/language/culture bias<br>• Ceiling effect (highly educated impaired subjects pass)<br>• Proprietary—unless used from memory, test needs to be purchased at www.parinc.com<br>• Best performance for at least moderate cognitive impairment |
| MoCA† [53] | 10–15 | • Designed to test for mild cognitive impairment<br>• Multiple languages accessible at www.mocatest.org<br>• Tests many separate domains (7) | • Lacks studies in general practice settings<br>• Education bias (≤12 years)<br>• Limited use and evidence due to published data relatively new (2005)<br>• Admin time ≥10 min |
| RUDAS [54] | 10 | • Designed for multicultural populations<br>• Little or no education/language bias | • Validated in Australian community<br>• Limited use and evidence due to published data relatively new (2004) |
| SAS-SI [55] | 10 | • Detected dementia better than neuropsychologic testing in a community population | • Does not test memory<br>• Lacks data on any education/language/culture biases |
| SBT (BOMC† and 6-CIT) [56,57] | 4–6 | • Verbal test (no writing/drawing) | • Education/language/cultural/race bias<br>• Scoring can be cumbersome<br>• Does not test executive function |
| SLUMS† [58] | 7 | • No education bias<br>• Tests many separate domains (7)<br>• Available at: http://aging.slu.edu/pdfsurveys/mentalstatus.pdf | • Limited use and evidence due to published data relatively new (2006)<br>• Studied in VA geriatric clinic (predominantly white males) |
| SPMSQ [59] | 3–4 | • Verbal test (no writing/drawing) | • Scoring can be cumbersome<br>• Does not test short-term memory |
| STMS† [60] | 5 | • Validated in primary care<br>• Tests many separate domains (7) | • Education/language/race bias<br>• Studied in relatively educated subjects, may not be applicable to general population |
| T&C [61] | ≤1 | • Very brief administration time<br>• Little or no education bias | • Strong language/cultural bias |

Abbreviations: 6-CIT, 6-Item Cognitive Impairment Test; AMT, Abbreviated Mental Test; BOMC, 6-item Blessed Orientation-Memory-Concentration Test; CAMCOG, Cambridge Cognitive Examination; CDT, Clock Drawing Test; GPCOG, General Practitioner Assessment of Cognition; MIS, Memory Impairment Screen; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; RUDAS, Rowland Universal Dementia Assessment; SAS-SI, Short and Sweet Screening Instrument; SBT, Short Blessed Test; SLUMS, St Louis University Mental Status; SPMSQ, Short Portable Mental Status Questionnaire; STMS, Short Test of Mental Status; T&C, Time and Change Test.

*References provide descriptions of assessments.

†Brief tools used in the VA healthcare system reviewed by Kansagara and Freeman.

[35]. Delayed or missed diagnosis deprives affected individuals of available treatments, care plans, and services that can improve their symptoms and help maintain independence. Studies show that interventions tailored to patients with dementia can improve quality of care, reduce unfavorable dementia-related behaviors, increase access to community services for both the patient and their caregivers, and result in less caregiver stress and depression [36–42]. Early diagnosis of dementia also provides families and patients an opportunity to plan for the future while the affected individual is still able to participate in the decision-making processes.

Early detection and medical record documentation may improve medical care. The medical record could inform all clinicians, including those who may be managing comorbidities on a sporadic basis, that treatment and care should be adjusted to accommodate cognitive impairment. According to a 2004 Medicare beneficiary survey, among patients with dementia, 26% had coronary heart disease, 23% had diabetes, and 13% had cancer [43].

It is important to note that the unstructured and structured cognitive assessments being recommended for the AWV are only the first steps in diagnosing dementia, and cognitive assessment is best as an iterative process. For example, clinicians concerned with HRA information about decline in function may proceed directly to a structured assessment or continue to query the patient for additional information; a self-reported memory concern coupled with a failed structured cognitive assessment should always result in a full dementia evaluation.

Not all who are referred for further assessment will ultimately receive a dementia diagnosis. In a USA primary care population aged ≥65 years (N = 3340), 13% failed a brief screen for cognitive impairment and approximately half (n = 227) agreed to be further evaluated for dementia [7]. Among the 107 patients ultimately diagnosed with dementia, 81% were newly diagnosed based on the absence of any medical record of dementia, thus facilitating appropriate medical and psychosocial interventions [7].

Despite the many advantages of early dementia diagnosis, several barriers to diagnosis still exist. These include physician concerns of the time burden resulting from testing and counseling [35] and stigma concerns among physicians, patients, and caregivers [35,44,45]. Despite these barriers, successful widespread implementation of a brief cognitive assessment has been reported. McCarten et al [22] evaluated the Mini-Cog for routine cognitive assessment of veterans presenting for primary care. Of the 8342 veterans approached, >96% agreed to be assessed and those that failed the brief assessment exhibited no serious reactions upon disclosure of test results.

The AWV provides an unprecedented opportunity to overcome current barriers and initiate discussions about cognitive function among the growing population most at risk for Alzheimer's disease. Detection of cognitive impairment during the AWV is further supported by previously published quality indicators that state all vulnerable elders (defined as persons ≥65 years who are at risk for death or functional decline) should be evaluated annually for cognitive and functional status [46].

There are limitations to these recommendations. They are based on assessment of recommendations from review articles and on expert opinion, not on a new, comprehensive review of original research to define the optimal approach to detection of cognitive impairment or review of emerging technologies that could assist in testing (e.g., use of online or electronic tablet applications). Further complicating SERs of brief cognitive assessment tools is that sensitivity and specificity will vary depending on the dementia prevalence of the study population, the tool(s) used, and the cut score selected for each tool. Brodaty et al [12] recognized that published research concerning cognitive impairment screening tools is uneven in quantity and quality. The literature also is lacking in comparative validity of brief cognitive assessment tools in low-education or illiterate populations.

The Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition is based on current validated tools and commonly used rule-out assessments. The use of biomarkers (e.g., CSF tau and beta amyloid proteins, amyloid tracer positron emission tomography scans) was not considered as these measures are not currently approved or widely available for clinical use.

In 2011, greater than two million Medicare beneficiaries received their AWV preventive service [47]. There are no data available as to what methods were used to detect cognitive impairment or how many beneficiaries were assessed as having cognitive impairment. For future AWVs, the Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition provides guidance to primary care practices on a process to operationalize this required AWV element. With widespread implementation of the algorithm, the AWV could be the first step in reducing the prevalence of missed or delayed dementia diagnoses, thus allowing for better healthcare management and more favorable outcomes for affected patients and their families and caregivers.

## 7. Author Disclosures

Soo Borson is the developer of the Mini-Cog and is the owner of its copyrights.

Over the past 5 years, Malaz Boustani has received research support for investigator- initiated projects from Forest Pharmaceutical and Novartis; honoraria from Norvartis and Pfizer, Inc.; and research support for investigator-initiated projects from the NIH and AHRQ. Dr Boustani was a member of the US Preventive Services Task Force that published

the systematic evidence review, *Dementia Screening*, for the AHRQ in 2003.

## RESEARCH IN CONTEXT

1. Systematic review: Our research included comparing five systematic evidence reviews (SER) of brief dementia screening tools published since 2000 and a 2010 literature review of newer brief assessments of cognition. Our research focused on determining if there was a consensus among the published SERs as to which tool is most suited for primary care and if there were any common results across the publications.
2. Interpretation: Our research concluded there is a consensus in the literature concerning suitable tools for screening for dementia in primary care. We also reaffirmed that many validated tools are available, and that screening for dementia should not be solely based on a tool, but should be a stepwise process to include other assessments.
3. Future directions: Further validation of existing and emerging screening tools (e.g., iPad applications, gait monitoring) may result in newer tools being recognized more suitable and practical for primary care settings.

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# APPENDIX F

## Mild Cognitive Impairment Screening Survey

If you agree to take this survey, your answers serve as your consent. If you would like to receive the results and implications from this study, please provide your email address below. (Answers will not be associated with email addresses when statistics are analyzed; survey responses will remain completely anonymous.)

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Questions:

1. In what state do you primarily practice?
   _____

2. What is your professional title?
   a. MD
   b. NP
   c. PA

3. What is your primary area of practice?
   a. Family Practice
   b. Internal Medicine
   c. Geriatrics/Long Term Care
   d. Urgent Care
   e. Emergency Room

4. What is your age?
   a. 21-35
   b. 36-50
   c. 51-65
   d. 65+

5. Which response best describes your screening practices for Mild Cognitive Impairment in patients aged 65 and older?
   a. I do not screen patients for Mild Cognitive Impairment.
   b. I screen patients if they or their family mention a concern over memory problems or a decline in ability to perform ADL's.
   c. I screen every patient aged 65 and older every year at their wellness visit.

6. If a patient over 65 years of age comes into your clinic without any obvious signs of cognitive impairment, how likely are you to screen this patient for Mild Cognitive Impairment?
    a. I will not screen
    b. I am not likely to screen
    c. I am somewhat likely to screen
    d. I will very likely screen

7. Which factor/factors make you more likely to screen patients over 65 years of age for Mild Cognitive Impairment? *Choose all relevant answers.
    a. Patient has not been screened in at least 12 months
    b. Patient's family mentions deterioration or changes in patient's behavior
    c. Patient appears somewhat "lost" in the conversation
    d. Patient admits to forgetfulness or memory loss issues
    e. Guidelines that dictate how often the patient should be screened
    f. Other _____

8. Which factor/factors make you less likely to screen patients over 65 years of age for Mild Cognitive Impairment? *Choose all relevant answers.
    a. Concerns over unnecessary testing.
    b. Lack of clear guidelines as to when and how to screen
    c. Lack of guidelines as to which screening tool to use
    d. Lack of adequate time with each patient
    e. Other _____

9. When/If you do screen patients for Mild Cognitive Impairment, what screening tool do you use?
    a. Mini Mental State Examination
    b. Short Portable Mental Status Questionnaire (SPMSQ)
    c. Mini-Cog
    d. Clock Test
    e. 3 Word Recall Test
    f. Health Risk Assessment
    g. Another screening tool
    h. I do not use any screening tools

10. Does your current clinic/place of employment have set guidelines in place for screening for Mild Cognitive Impairment?
    a. Yes
    b. No