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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 • Performance characteristics evaluated in ≥1 community or clinical setting	• Admin ≤5 min and simple • Validated in community or PC • Misclassification rate ≤ MMSE • NPV ≥ MMSE	• Studied in patients ≥60 years • Criterion to diagnose dementia acceptable	• Admin time suitable for PC in UK • Geriatric PC screens for cognitive change	• Tools most frequently used in PC • Tools recommended or newly used in PC	• Tools identified by the VA as alternatives to the MMSE
Comparison criteria	• Face validity, sensitivity, and specificity • Sociodemographic biases • Comparison with MMSE • Acceptability • Ease of use by nonspecialists	• Study validity • Applicability to PC • Psychometric properties • Administration characteristics	• Admin time • Study quality • Likelihood ratios • Domains tested • Utility in special situations	• Practicality • Feasibility • Applicability • Psychometric properties	• Summary of other studies and strength/weaknesses of tools • Newer tools that address weaknesses	• Relevance of study to the VA setting • Admin time • Sensitivity • Specificity • 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

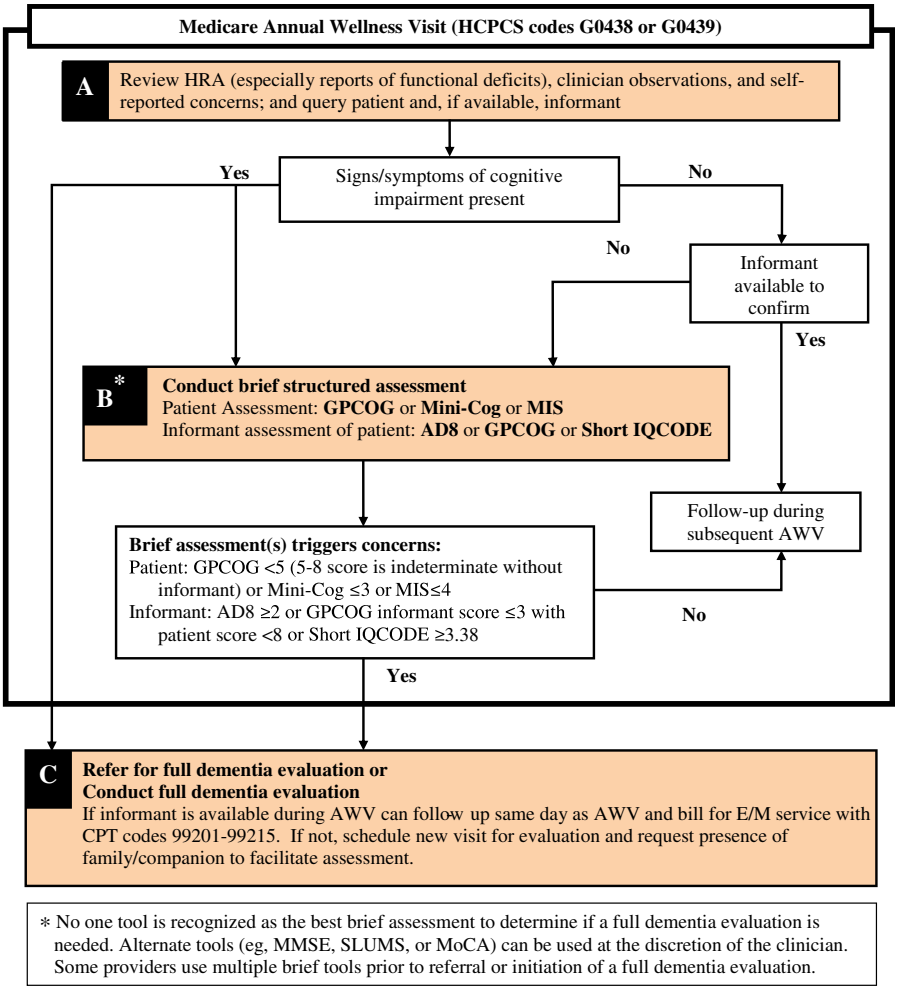

Fig. 1. Alzheimer's Association Medicare Annual Wellness Visit Algorithm for Assessment of Cognition.

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