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Brief Cognitive Screening Tools for Primary Care Practice

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Abstract

Early detection and diagnosis of Alzheimer's disease and other cognitive impairment presents as a critical issue facing primary and specialty care providers in Washington State. In order to address the gaps and challenges faced by providers, the Dementia Action Collaborative offers the current paper to provide information and guidance around early detection and diagnosis of memory loss and dementia, including Alzheimer's disease. At the conclusion of this paper, providers should be able to identify indications and opportunities for detection, appropriate tools, and care pathways for individuals and families affected by cognitive impairment and dementia.

Introduction

Alzheimer's Disease (AD) is a neurodegenerative disorder that poses one of the most formidable healthcare challenges of the 21st century. Of the 5.5 million Americans currently diagnosed with AD, 5.1M are over the age of 65, a population expanding by 10,000 people every day (1). The financial burden of AD on the U.S. economy in 2015 alone is estimated to be $226 billion, a cost predicted to significantly swell in upcoming decades (2). A recent study by Kelley and colleagues (3) indicates the average total cost per descendent with dementia exceeds that of all other conditions, including heart disease and cancer. Emerging evidence also highlights the importance of early detection and accurate diagnosis in terms of improving management of comorbid conditions, reducing preventable hospitalizations and emergency room visits, clarifying wishes around end-of-life care and improving advance care planning (4).

> Fewer than half of all patients with dementia carry a diagnosis in their medical record.
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Early detection is a critical issue for treating Mild Cognitive Impairment (MCI) and dementia, including AD. Emerging research suggests that MCI may be slowed or cognition and function improved via modifying cardiovascular and other risk factors through interventions addressing diet, exercise, sleep and alcohol consumption (5-7). Additionally, treating depression and

monitoring and treating metabolic, vitamin and endocrine abnormalities (i.e., preventing hyperhomocysteine) has also been shown to decrease risk of developing AD as well as cerebrovascular disease (5-6, 8). The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER), a two year randomized controlled trial, found a positive effect of the multicomponent intervention on change in cognitive function reinforcing the importance of a shift towards holistic, multimodal interventions aimed at modifying risk factors that occur throughout the life course. Furthermore, behavioral interventions and graduated care plans typically are more successfully implemented at earlier stages of AD (7-9).

Primary care providers are typically the front lines of dementia care and often the first point of contact for patients with concerns about cognitive function. Despite this, fewer than half of all patients with dementia carry a diagnosis in their medical record (1). Physicians are often the most familiar with the longitudinal health and functioning of their patients, making them uniquely suited to screen patients for dementia. However, limited appointment time, unwieldy screening tools and workflow disruption remain significant barriers to regular screening. To best utilize primary care settings for dementia screenings, a brief, easy to administer, and psychometrically robust screening tool is needed. Tools also need to be embedded within streamlined evidence based processes facilitating early detection and diagnosis (10).

The purpose of this paper is to provide guidance for detection of cognitive impairment in primary care settings, thereby promoting early detection of MCI and dementia. Consistent with the goals of the Washington State Plan to Address Alzheimer's Disease and Other Dementias, this paper seeks to promote setting-appropriate, evidence-based best practices around opportunities for case finding and detection, cognitive screening tools, and care pathways for patients with cognitive impairment.

Opportunities for Screening

Several primary care encounters provide opportunity for screening and detection/case finding for cognitive impairment. These include visits or occasions when patients or families:

- Present with concerns or evidence of cognitive impairment
- Have completed either online or community-based cognitive assessments; given variability in administration, measures used and in the absence of additional medical information, these results may shape provider interests in completing more formal evaluation within the primary care environment
- Present for a Welcome to Medicare or Medicare Annual Wellness Visit, for which cognitive screening is also a covered component
- Have increased risk for cognitive impairment, including the presence of significant vascular risk factors and middle age, significant family history of cognitive impairment,

or presence of other medical comorbidities associated with increased risk for cognitive impairment such as brain injury, sleep apnea, psychiatric conditions, polypharmacy, or metabolic syndrome.

While global cognitive screening remains an aspirational goal, implementation of more regular assessment of at risk populations would be an important first step.

Screening Recommendations

Consistent with the recent review by the Medicare Detection of Cognitive Impairment Workgroup recommendations (10), the Dementia Action Collaborative supports a model to rely on objective data around cognitive functioning from patients and collateral informants. Given the unique demands and constraints of the primary care visit, objective screening measures must balance adequate sensitivity, specificity and other psychometric properties with ease of administration, ensuring congruency with operators and context that influences workflow. In addition, the high prevalence of hearing loss in older adults may complicate identification and or treatment as cognitive testing and follow up often relies heavily on a person's ability to hear and respond to questions and instructions. It is recommended that providers initially assess for sensory loss, provide appropriate treatment or referrals for additional diagnostic evaluation, and provide in-clinic assistive devices (e.g., Pocket Talker[1]) before any assessment of cognition is undertaken. There are a variety of screening tools and tests for hearing loss available for self-administration or use by non-hearing professionals[2].

Once sensory issues have been assessed and addressed, the clinician is faced with selection of the appropriate tool for their individual setting and patient. While the Mini-mental State Examination (11) continues to be a frequently used tool, myriad studies outline the suboptimal psychometric properties and the currently charged fees for each administration are barriers for frequent usage. Alternatively, the Montreal Cognitive Assessment (MoCA; 12) yields superior sensitivity and specificity in detecting dementia and MCI and remains the gold standard in relatively brief screening instruments. The MoCA is among the best validated cognitive screening tools, particularly for individuals with mild impairments (11). The test assesses 8 domains of cognitive functioning: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation and requires about 10 to 15 minutes to administer. The measure is psychometrically robust, including high test-retest reliability, internal consistency and content validity. The MoCA has

[1] "Pocket talkers" and other hand-held personal hearing amplifiers are small portable devices consisting of a microphone and sound amplifier, which connect to headphones or earbuds. They are key to communication with persons with hearing loss, who do not wear hearing aids.
[2] For further information contact the Hearing Loss Association of Washington at: info@hearingloss-wa.org

also been translated into many languages and is available in multiple alternate forms with no usage fee.

The MoCA's 15-minute administration time is typically prohibitive for implementation in primary care settings but may be an optimal tool for a more detailed visit dedicated to thorough assessment of cognitive function. A more ideal screening tool for a primary care environment would reduce the administration time of the MoCA while providing comparable psychometric properties, including sensitivity and specificity to MCI and AD profiles. As outlined in the review by Cordell and colleagues, three no-cost measures appear well suited for implementation in primary care visits, including but not limited to the Medicare Annual Wellness Visit. For the patient, these include:

A. **General Practitioner Assessment of Cognition** (GPCOG; 13), which is a multi-dimensional screening tool assessing memory, orientation and aspects of both visuospatial and executive function as well as informant receptions of cognitive and functional changes. Administration time is 2-5 minutes for the patient and one to 3 minutes for the informant with adequate psychometrics, minimal training needs, as well as online administration and training in multiple languages (http://gpcog.com.au/). The GPCOG can be administered by a variety of operators including medical assistants, nursing staff and providers. While there appears to be little to no education bias, there is currently no data on bias related to language or cultural factors. Scores less than 5 are considered abnormal, with scores from 5-8 indeterminate and requiring either further assessment or corroboration from a collateral informant.
B. **Mini-Cog** (14), which assesses memory and components of visuospatial and executive functioning. Administration time is approximate 2-3 minutes with a well-codified scoring algorithm. Psychometric properties are adequate for dementia, although reduced with mild cognitive impairment. The Mini-Cog can be administered by a variety of operators including medical assistants, nurses and other providers, with online training available (http://mini-cog.com/). This measure was developed for and validated in primary care settings and is available in multiple languages with little to no education, language or cultural bias. Scores less than or equal to 3 are considered indicative of impairment.
C. **Memory Impairment Screen** (MIS; 15), which assesses verbal memory only, albeit with greater depth involving free versus cued recall and no demands on writing or motor function. Administration time is approximately 4 minutes, half of which is a distractor activity where other clinical data can be obtained. Psychometric properties are adequate with clear scoring criteria. The MIS can be administered by a variety of operators with minimal training needs

(http://www.alz.org/documents_custom/mis.pdf). There appears to be little to no education bias however lack of assessment of executive functioning are visuospatial skills may decrease sensitivity and specificity, particularly in mild cognitive impairment. Scores less than or equal to 4 are considered indicative of impairment.

Screening measures for care partners or family members include:

A. **GPCOG**, informant version ((http://gpcog.com.au/) administered in conjunction with patient version, given that the informant version alone yields low specificity. Administration time is approximately 2 minutes with a score less than or equal to 3 considered indicative of impairment.
B. **Family Questionnaire** (http://www.actonalz.org/pdf/Family-Questionnaire.pdf). Brief tool consisting of 6 questions obtaining a family member's insights on the individual's cognitive functioning. Administration time is 3 minutes and a score of 3 or greater suggest the need for additional evaluation.
C. **AD8 Dementia Screening Interview** (http://alz.org/documents_custom/ad8.pdf) (16). Assesses change in function and activity secondary to cognitive impairment with self-administration, in person and telephone options. Adequate sensitivity and specificity for dementia although slightly reduced for mild cognitive impairment. Administration time is approximately 2 minutes with a score of 2 or greater considered indicative of impairment.
D. **Informant Questionnaire on Cognitive Decline in the Elderly** (IQCODE; 17). (https://www.alz.org/documents_custom/shortiqcode_english.pdf). Requires more extensive knowledge of the individual (ideally 10 years or more) as well as 10-15 minutes of administration time and slightly more complex scoring. Benefits include adequate sensitivity and specificity for dementia, but suboptimal in MCI (.46). Published in multiple languages with a score of greater than or equal to 3.38 considered indicative of impairment.

Table 1. Screening Measures Matrix – Patient and Informant Versions

	Elements	Administration time	Who can administer	Training to administer
Screening Measures for Patients				
GPCOG (See informant version below)	• Memory • Orientation • Aspects of visuospatial and executive **function**	• 2-5 mins for patient	• Medical assistants • Nursing • Providers (MD, ARNP, PhD)	Minimal Online administration and training in multiple languages
Mini-Cog	• Memory • Components of visuospatial and executive function	• 2-3 minutes	• Medical assistants • Nursing • Providers (MD, ARNP, PhD)	Online training available
Memory Impairment Screen	• Verbal memory only, with greater depth involving free versus cued recall and no demands on writing or motor function	• 4 minutes, half of which is a distractor activity	• Medical assistants • Nursing • Providers (MD, ARNP, PhD)	Minimal training needs
Screening measures for care partners or family members				
GPCOG, Informant Version	• Informant perceptions of cognitive and functional changes	• 2 minutes	• Medical assistants • Nursing • Providers (MD, ARNP, PhD)	Minimal
Family Questionnaire	• Change in cognition and function	• 2 minutes	Self-administered	Minimal
AD8 Dementia Screening Interview	• Change in function and activity secondary to cognitive impairment	• 2 minutes	Self-administered Or Interview	Minimal
IQCODE	• Assesses changes in memory, thinking and planning skills	• 10-15 mins	• Nursing • Providers (MD, ARNP, PhD)	Minimal

Outcome Pathways

Clinical best practices would include integration of cognitive screening tools/results with the electronic medical record, thus serving as a trackable health metric. Once cognitive screening has been completed, results may be entered as a baseline cognitive vital sign for continued assessment. Individuals with notable cognitive concerns or suspected cognitive impairment not detected by screening may return to clinic at a later time for more detailed assessment with the MoCA or other similar measure. Individuals with borderline scores may be retested at subsequent visits or intervals. With appropriate tools and protocols, the vast majority of cases can be detected and managed within the primary care setting. Cases with atypical presentations (i.e. young age of onset, complex neuropsychiatric symptoms, probable mixed etiologies) may trigger referral for detailed evaluation by a specialist, including neurology (particularly behavioral neurologist if available), psychiatry (particularly geriatric if available), neuropsychologist, or comprehensive memory clinic. Individuals with significant impairment and relatively uncomplicated presentations may garner a diagnosis at the point of initial evaluation in the primary care setting with consideration of further standard of care workup such as chemistries and imaging as indicated and endorsed as evidence-based best practices (see Bree Collaborative Workgroup for Alzheimer's/Dementia Guidelines).

Consistent with best practices models, detection of cognitive impairment and/or dementia would result in early referrals to community resources such as the Alzheimer's Association, Alzheimer Society of Washington, Area Agencies on Aging, early stage support groups, programs such as Momentia, and other community supports and services outlined in additional components of the Washington State Plan.

Summary/Conclusions

Given significant increases in the prevalence of cognitive impairment, including mild cognitive impairment and dementia, as well as increases in medical comorbidities which serve as risk factors, early detection and diagnosis presents as a critical issue facing primary care providers in Washington State. In order to address the gaps and challenges faced by providers, the Dementia Action Collaborative promotes the following framework:

1) Detection at early stages provides both a window of opportunity for risk reduction as well as a longer duration for education, planning and access to treatments and community resources which in turn improves dementia care and quality of life.
2) Primary care providers have been identified as the first point of contact for patients and families concerned about changes in cognition and are uniquely situated to detect, diagnose and care for individuals with cognitive impairment.

3) While no one screening tool or care pathway will work for all organizations, clinics or individual providers, the Dementia Action Collaborative (DAC) strongly supports implementation of objective screening protocols and pathways as a general process. Furthermore, it seeks to provide the support and training to guide those on the front lines.
4) Linking rural and community primary care providers and frontline staff to multidisciplinary specialists with expertise in the diagnosis, risk reduction and management of dementia can improve early detection and treatment. Through the DAC initiative, physicians, advanced nurse practitioners and medical staff from rural and underserved communities will also have the opportunity to present challenging cases for discussion, to identify key focus areas and discuss specific recommendations to achieve an optimal care plan.
5) Living with or caring for someone with dementia can be challenging, and with the right supports and tools deeply gratifying. The skills and knowledge gained will help preserve the quality of life for these individuals by giving the health professionals who care for them access to didactics and case-presentation curriculum created with the best evidence. The curriculum will include topics on common issues in the geriatric patient population such as: the diagnosis and management of dementia and delirium, agitated and psychotic behaviors, depression, functional decline, falls, and polypharmacy. Determination of the specifics within these processes rests with providers and health care systems in response to the unique needs of their patients and families.

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