Brief Screening Instruments for Dementia in Primary Care

MARK H. EBELL, MD, MS, University of Georgia, Athens, Georgia


Clinical Question
What is the best brief screening instrument for dementia in the primary care setting?

Evidence Summary
In addition to identifying patients who may benefit from pharmacotherapy, early detection of dementia helps families anticipate the patient’s needs and helps physicians identify those in need of additional support. In a recent study of 371 community-dwelling older adults (231 had dementia or mild cognitive impairment), physicians correctly classified only 59 percent of all participants and only 41 percent of those with mild cognitive impairment. Although the Mini-Mental State Examination (MMSE) has been widely recommended for identifying patients with dementia, it is fairly lengthy. A recent systematic review found that the MMSE was 80 percent sensitive and 86 percent specific for dementia, and a second systematic review estimated that it took seven to 10 minutes to complete. Thus, there is a need for a brief, practical, and accurate alternative.

Several recent studies have reviewed brief screening instruments for dementia. The first study identified 13 tests that could be performed in less than 10 minutes and that had been prospectively validated in at least one sample of older adults. These tests assess cognition, function (by means of simple tasks), or both. Very short screening tests, taking less than two minutes to complete, include the clock drawing test, the time and change test, and a test in which the patient spells “world” backwards. In the clock drawing test, the patient draws a clock face set to a specific time. In the time and change test, the patient reads the time from a clock face and also makes change for a dollar. The study showed that, although the clock drawing test had the best accuracy among the very short tests, none were considered reliable or accurate enough for routine clinical use. All of the studies concluded that among the tests taking between two and five minutes to administer, only the General Practitioner Assessment of Cognition (GPCOG), the Memory Impairment Screen (MIS), and the Mini-Cognitive Assessment Instrument (Mini-Cog) had accuracy similar to or better than the MMSE and had been validated in the primary care setting.

The GPCOG screening instrument (Figure 1) consists of six items for the patient being evaluated, with an optional second set of six questions that are asked of someone who knows the patient well. In a group of 283 community-dwelling older adults, the first part of the GPCOG was 82 percent sensitive and 70 percent specific (positive likelihood ratio [LR+] = 2.7, negative likelihood ratio [LR–] = 0.26), using a cutoff of 7 points or less for dementia. The two-part GPCOG was 82 percent sensitive and 83 percent specific (LR+ = 4.8, LR– = 0.22).
In the MIS, patients are given a sheet of paper with the names of four items (an animal, a vegetable, a city, and a musical instrument). The paper is taken away after the patient reads the items aloud. The patient is then asked to recall an item from each category (e.g., “What was the vegetable?”). After a brief delay, during which the patient counts from one to 20 and back, the patient is asked to name all of the items. If the patient misses an item, the examiner cues the patient with the category (e.g., “What was the vegetable?”). The patient receives two points for each item recalled without cueing, and one point for each item recalled with cueing (maximum score of 8 points). In a study of 483 community-dwelling older adults, a cutoff of 5 points or less was 86 percent sensitive and 91 percent specific for dementia (LR+= 9.6, LR− = 0.15), and was 92 percent sensitive and 91 percent specific for Alzheimer dementia (LR+ = 10.2, LR− = 0.09).5

A study of 249 community-dwelling older adults (124 were non-English speakers) compared the Mini-Cog (Figure 2) with the MMSE.2 The final clinical diagnosis, based on all available medical, cognitive, and laboratory data, was used as the reference standard. The MMSE was 91 percent sensitive and 92 percent specific for dementia, whereas the Mini-Cog was 99 percent sensitive and 93 percent specific (LR+ = 14.1, LR− = 0.01). The Mini-Cog was faster to administer than the MMSE (3.2 versus 7.3 minutes for patients with dementia, and 2.5 versus 5.6 minutes for patients...
Based on its speed, convenience, and accuracy, as well as the fact that it does not require fluency in English, the Mini-Cog is the preferred test for primary care practice.

### Mini-Cognitive Assessment Instrument (Mini-Cog)

**Mini-Cognitive Assessment Instrument (Mini-Cog)**

**Step 1.** Ask the patient to repeat three unrelated words, such as “ball,” “dog,” and “television.”

**Step 2.** Ask the patient to draw a simple clock set to 10 minutes after eleven o’clock (11:10). A correct response is a drawing of a circle with all of the numbers placed in approximately the correct positions, with the hands pointing to the 11 and 2.

**Step 3.** Ask the patient to recall the three words from Step 1. One point is given for each item that is recalled correctly.

<table>
<thead>
<tr>
<th>Number of items correctly recalled</th>
<th>Clock drawing test result</th>
<th>Interpretation of screen for dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal</td>
<td>Positive</td>
</tr>
<tr>
<td>0</td>
<td>Abnormal</td>
<td>Positive</td>
</tr>
<tr>
<td>1</td>
<td>Normal</td>
<td>Negative</td>
</tr>
<tr>
<td>1</td>
<td>Abnormal</td>
<td>Positive</td>
</tr>
<tr>
<td>2</td>
<td>Normal</td>
<td>Negative</td>
</tr>
<tr>
<td>2</td>
<td>Abnormal</td>
<td>Positive</td>
</tr>
<tr>
<td>3</td>
<td>Normal</td>
<td>Negative</td>
</tr>
<tr>
<td>3</td>
<td>Abnormal</td>
<td>Negative</td>
</tr>
</tbody>
</table>

**Figure 2.**

Mini-Cog screening instrument for dementia.

*Information from reference 9.*

### Applying the Evidence

A female patient’s family is concerned about her memory. What is the best way to screen for dementia in a busy primary care practice?

**Answer:** You administer the Mini-Cog screening instrument for dementia. The patient can only recall one out of three items, places most of the numbers correctly on the right side of the clock, and incorrectly places the clock hands. Because she recalled only one out of three items and the result of her clock drawing test was abnormal, she screens positive for dementia. You perform a full evaluation for dementia, including a more detailed interview, to confirm the diagnosis and an assessment for secondary causes.

*Mark H. Ebell, MD, MS, is associate professor in the Department of Epidemiology and Biostatistics in the College of Public Health at the University of Georgia, Athens.*

*Address correspondence to ebell@uga.edu. Reprints are not available from the author.*

*Author disclosure: Nothing to disclose*

### REFERENCES


This guide is one in a series that offers evidence-based tools to assist family physicians in improving their decision making at the point of care.