Brief Cognitive and Mood Assessments

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This presentation is 15 minutes long, so this brief assessment overview is going to be very brief.

Screening tools showcased here represent a selection from the literature rather than an exhaustive summary. Please don’t get mad at me if I omitted your favorite tool.

I am a neuropsychologist. As you know, we like hours (rather than minutes) for assessments, so recommending brief tools is very painful for me.
Cognitive Screening Tools
Mini-Mental State Examination (MMSE)

**Screening Tool: The Mini-Mental State Examination (MMSE)**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Examiner</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>Score</td>
<td></td>
</tr>
</tbody>
</table>

**Orientation**
- What is the (year) (season) (date) (day) (month)?
- Where are we (state) (country) (town) (hospital) (floor)?

**Registration**
- Name 3 objects: 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat until he/she learns all 3. Count trials and record trials.

**Attention and Calculation**
- Serial 7s: 1 point for each correct answer. Stop after 5 answers. Alternatively spell "world" backward.

**Recall**
- Ask for the 3 objects repeated above. Give 1 point for each correct answer.

**Language**
- Name a pencil and watch.
- Repeat the following "No ifs, ands or buts."
- Follow a 3-stage command: "Take a paper in your hand, fold it in half and put it on the floor."
- Read and obey the following CLOSE YOUR EYES.
- Write a sentence.
- Copy the design shown.

**Total Score**

ASSESS level of consciousness along a continuum

Alert Drowsy Stupor Coma


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1. 10 minute administration
2. Probably the most widely used, studied, and validated tool out there
3. Low sensitivity and specificity for detecting MCI
4. Large age and education effects
5. Now under copyright laws, no longer freely accessible ($$$)
6. MCI: 63% sensitivity, 65% specificity (using various cutoff scores between 25-27)
7. Dementia: 85% sensitivity, 90% specificity (using cutoff score of 24)

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Montreal Cognitive Assessment (MoCA)

- 10 minute administration

- Available in 35 languages; adapted version for visual impairment
- Sensitive to detecting both MCI and dementia
- Formal training available

- Biased by education level
- May not distinguish between MCI and dementia very well
- Emphasizes memory impairment

- MCI: sensitivity 72%, specificity 75% (cutoff scores of 24)\(^1\)
- Dementia: sensitivity 93%, specificity 96% (cutoff score of 20)\(^1\)

\(^1\)Cummings-Vaughn LA, Chavakula NN, Malmstrom TK, Tunosa N, Morley JE, Cruz-Oliver DM. Veterans Affairs Saint Louis University Mental Status Examination Compared with the Montreal Cognitive Assessment and the Short Test of Mental Status. Journal of the American Geriatrics Society. 2014;62(7):1341-1346. doi:10.1111/jgs.12874
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 and try to remember. The words are: [Three 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. For repeated administrations, use of an alternative word list is recommended.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Romeo</td>
<td>Leader</td>
<td>Village</td>
<td>River</td>
<td>Captains</td>
<td>Daughter</td>
</tr>
<tr>
<td>Sunrise</td>
<td>Season</td>
<td>Baby</td>
<td>Nation</td>
<td>Garden</td>
<td>Mountain</td>
</tr>
</tbody>
</table>

**Step 2: Clock Drawing**

Say: "Next, I want you to draw a clock for me. First, put all in the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 6."

Use pre-printed circles (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**

<table>
<thead>
<tr>
<th>Word Recall: ______ (0-3 points)</th>
<th>1 point for each word spontaneously recalled without cueing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock Draw: ______ (0-2 points)</td>
<td>A normal clock has 12 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 11 and 2/10. Hand length is not scored. Inability or refusal to draw a clock or is normal = 0 points.</td>
</tr>
<tr>
<td>Total Score: ______ (0-5 points)</td>
<td>A cut point of 2 on the Mini-Cog® has been validated for dementia screening. However, individuals with clinically significant cognitive impairment will score higher. When greater sensitivity is desired, a cut point of 0 is recommended as it may indicate a need for further evaluation of cognitive status.</td>
</tr>
</tbody>
</table>

Impairment is defined as 0 points on recall or 1-2 points on recall and abnormal clock.

- **3 minute administration**
- **Easy administration (no special forms), requires minimal training**
- **Minimal influence of education on performance**
- **Alternate forms for 3-word registration/recall**

- **Limited to recall + clock drawing**
- **Scoring of clock is subjective**
- **Alternate forms for 3-word registration/recall may not be equivalent**

- **MCI: sensitivity 52%, specificity 80%**
- **Dementia: sensitivity 76%, specificity 73%**

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Short Test of Mental Status (STMS)

Short Test of Mental Status (STMS)
“1 would now like to examine your memory and related items. Please relax, pay attention to the questions I am asking, and answer them as best as you can.”

<table>
<thead>
<tr>
<th>Orientation (8)</th>
<th>Name, address, current location (building, city, state, date (day), month, year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention (7)</td>
<td>Digit span (present 1/sec; record longest correct span) 2, 4, 6, 8, 5, 7, 1, 6, 4, 6, 2, 1, 5, 6, 3, 6, 2</td>
</tr>
<tr>
<td>Immediate recall (4)</td>
<td>Four unrelated words: “apple,” “Mr. Johnson,” “charity,” “tunnel.” Number of trials needed to learn all four.</td>
</tr>
<tr>
<td>Calculation (4)</td>
<td>5 x 13, 65 - 7, 58/2, 29 x 11</td>
</tr>
<tr>
<td>Abstraction (3)</td>
<td>Similarities—orange/banana, dog/horse, telephone/bookcase</td>
</tr>
<tr>
<td>Construction (2)</td>
<td>Draw clock face showing 1:15</td>
</tr>
<tr>
<td>Copy (2)</td>
<td></td>
</tr>
<tr>
<td>Information (4)</td>
<td>President; first President; define an island; number of weeks per year</td>
</tr>
<tr>
<td>Recall (4)</td>
<td>The four words: “apple,” “Mr. Johnson,” “charity,” “tunnel”</td>
</tr>
</tbody>
</table>

Total Score (38): [Raw Score – (number of learning trials - 1)]

- 5-10 minute administration
- Easily administered
- Good sensitivity and specificity for detecting MCI and dementia
- High correlation with more comprehensive measures
- Less widely used
- Less familiar score scale (38 max points)

MCI: sensitivity 68%, specificity 76% (cutoff score of 32)
Dementia: sensitivity 93%, specificity 92% (cutoff score of 29)

Saint Louis University Mental Status (SLUMS)

- 7 minute administration
- Sensitive to MCI
- Includes tasks of executive functioning
- Available in >20 languages
- Limited research on reliability and validity
- Less sensitive than MMSE to cognitive changes over 1 year

MCI: sensitivity 74%, specificity 65% (cutoff score of 26)¹
Dementia: sensitivity 93%, specificity 96% (cutoff score of 20)¹

Addenbrooke’s Cognitive Examination-Revised (ACE-R)

- Developed as an improvement over the MMSE + in 19 languages
- Provides subdomain scores
- Good sensitivity and specificity for detecting dementia
- Longer administration time than similar screening tests
- Heavily emphasizes memory domain
- MCI: sensitivity 68%, specificity 91% (cutoff score of 85.5)\(^1\)
- Dementia: sensitivity 96%, specificity 88% (cutoff score varies from 80-88; 82 most accurate)\(^2\)


## Cognitive Screening Tool Comparison

<table>
<thead>
<tr>
<th>Tool</th>
<th>Admin Time (mins)</th>
<th>Age Range (years)</th>
<th>Score Range</th>
<th>Sensitivity for MCI (%)</th>
<th>Specificity for MCI (%)</th>
<th>Sensitivity for Dementia (%)</th>
<th>Specificity for Dementia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSE</td>
<td>10</td>
<td>18-85</td>
<td>0-30</td>
<td>63</td>
<td>65</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td><strong>MoCA</strong></td>
<td><strong>10</strong></td>
<td><strong>55-85</strong></td>
<td><strong>0-30</strong></td>
<td><strong>72</strong></td>
<td><strong>75</strong></td>
<td><strong>93</strong></td>
<td><strong>96</strong></td>
</tr>
<tr>
<td>Mini-Cog</td>
<td>3</td>
<td>65+ (?)</td>
<td>0-5</td>
<td>52</td>
<td>80</td>
<td>76</td>
<td>73</td>
</tr>
<tr>
<td>STMS</td>
<td>10</td>
<td>65+ (?)</td>
<td>0-38</td>
<td>68</td>
<td>76</td>
<td>93</td>
<td>92</td>
</tr>
<tr>
<td>SLUMS</td>
<td>7</td>
<td>18+</td>
<td>0-30</td>
<td>74</td>
<td>65</td>
<td>93</td>
<td>96</td>
</tr>
<tr>
<td>ACE-R</td>
<td>15</td>
<td>50+</td>
<td>0-100</td>
<td>68</td>
<td>91</td>
<td>96</td>
<td>88</td>
</tr>
</tbody>
</table>
Mood Screening Tools
Geriatric Depression Scale (GDS)

- Widely used
- Short-form available
- Specific to older adult population
- Does not directly assess suicidality
- Short Form: sensitivity 86%, specificity 79%
- Long Form: sensitivity 82%, specificity 86%

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Neuropsychiatric Inventory Questionnaire (NPI-Q)

Please answer the following questions based on changes that have occurred since the patient first began to experience memory problems.

Rate the severity of each symptom (how it affects the patient) in the last 30 days:
0 = No change (not noticed)
1 = Mild (noticeable, but not a significant change)
2 = Moderate (significant, but not a dramatic change)
3 = Severe (very marked or prominent, a dramatic change)

Please answer each question carefully. Ask for assistance if you have any questions.

Delusions
Does the patient have false beliefs, such as thinking that others are stealing from him/her or planning to harm him/her in some way?
SEVERITY: 0 1 2 3

Hallucinations
Does the patient have hallucinations such as false visions or voices? Does he or she seem to hear or see things that are not present?
SEVERITY: 0 1 2 3

Agitation/Aggression
Is the patient resistant to help from others at times, or hard to handle?
SEVERITY: 0 1 2 3

Depression/Dysphoria
Does the patient seem sad or say that he/she is depressed?
SEVERITY: 0 1 2 3

Anxiety
Does the patient become upset when separated from you? Does he/she have any other signs of nervousness such as shortness of breath, sighing, being unable to relax, or feeling excessively tense?
SEVERITY: 0 1 2 3

Elation/Euphoria
Does the patient appear to feel too good or act excessively happy?
SEVERITY: 0 1 2 3

Apathy/Indifference
Does the patient seem less interested in his/her usual activities or in the activities and plans of others?
SEVERITY: 0 1 2 3

• 5 minute administration
• Assesses numerous neuropsychiatric symptoms (i.e., delusions, hallucinations, agitation/aggression, depression/dysphoria, anxiety, elation/euphoria, apathy/indifference)
• Requires an informant
• Despite wide use, limited sensitivity/specificity data
• Limited evidence

1 Lai CK. The merits and problems of Neuropsychiatric Inventory as an assessment tool in people with dementia and other neurological disorders. CIA. 2014;9:1051-1061. doi:10.2147/CIA.S63504
Beck Depression Inventory-II (BDI-II)

- Widely used
- Assesses all diagnostic criteria for major depressive disorder
- Assesses suicidal ideation
- 5-10 minute administration
- Not specifically developed for older adults (age 13-80)
- Less specific for depression in patients with various medical conditions
- Varies by sample, but sensitivity and specificity are generally >70%

Quick Inventory of Depressive Symptoms (QIDS)

- Validated in older adults
- Directly assesses suicidal ideation
- Heavily weighted towards physical symptoms (e.g., 4 of 16 items focused on sleep patterns)
- Sensitivity 86%, specificity 58%¹

<table>
<thead>
<tr>
<th>Tool</th>
<th>Admin Time (mins)</th>
<th>Age Range (years)</th>
<th>Score Range</th>
<th>Sensitivity for Depression (%)</th>
<th>Specificity for Depression (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS (short-form)</td>
<td>2-5</td>
<td>65+</td>
<td>0-15</td>
<td>82</td>
<td>86</td>
</tr>
<tr>
<td>GDS (long-form)</td>
<td>3-7</td>
<td>65+</td>
<td>0-30</td>
<td>86</td>
<td>79</td>
</tr>
<tr>
<td>NPI-Q</td>
<td>5</td>
<td>48-87</td>
<td>0-36</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>BDI-II</td>
<td>5-10</td>
<td>13-80</td>
<td>0-63</td>
<td>&gt;70</td>
<td>&gt;70</td>
</tr>
<tr>
<td>QIDS</td>
<td>5-7</td>
<td>13+</td>
<td>0-42</td>
<td>86</td>
<td>58</td>
</tr>
</tbody>
</table>
Conclusions
Brief Cognitive and Depressed Mood Assessment Conclusions

- There are many ‘brief’ cognitive screening tools available, but most require 7-10 minutes for administration.

- The ACE-R offers an improvement over the MMSE, subdomain scores, and good sensitivity/specificity trade off, but it requires a longer administration time of 15 minutes.

- The best sensitivity/specificity trade off among these cognitive screening tools is for the MoCA, which also has advantages of being freely accessible and available in 35 languages.

- Subjective cognitive complaints (which I didn’t cover today) remain a ‘quick and dirty’ screening method, especially if respondents find complaints ‘concerning’.

- Screening for mood issues can be accomplished in under 5 minutes and has the advantage of self-administration.

- The short-form GDS offers good sensitivity/specificity trade off for adults age 65 and older.

- For patients in their 50s and early 60s, the BDI-II might offer a better solution (despite strong sensitivity, I wouldn’t recommend the QIDS given the false positives that arise from sleep issues).
Brief Cognitive and Depressed Mood Assessment Conclusions

**Short on Time?**

- Administer short-form GDS
- If patient scores >4, proceed with further mood assessment
- If patient endorses item 10 (“Do you feel that you have more problems with memory than most?”), follow-up with “Do you or your loved ones find these issues concerning?”
- If yes, proceed with further cognitive assessment

**Have a Bit More Time?**

- Administer short-form GDS
- If patient scores >4, proceed with further mood assessment
- Administer MoCA
- If patient scores <26 [or patient with lower education level scores <25], proceed with further cognitive assessment

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**Geriatric Depression Scale (GDS) Short Form**

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? **Yes** No
2. Have you dropped many of your activities and interests? **Yes** No
3. Do you feel that your life is empty? **Yes** No
4. Do you often get bored? **Yes** No
5. Are you in good spirits most of the time? **Yes** No
6. Are you afraid that something bad is going to happen to you? **Yes** No
7. Do you feel happy most of the time? **Yes** No
8. Do you often feel helpless? **Yes** No
9. Do you prefer to stay at home rather than going out and doing new things? **Yes** No
10. Do you feel you have more problems with memory than most? **Yes** No
11. Do you think it is wonderful to be alive now? **Yes** No
12. Do you feel pretty worthless the way you are now? **Yes** No
13. Do you feel full of energy? **Yes** No
14. Do you feel that your situation is hopeless? **Yes** No
15. Do you think that most people are better off than you are? **Yes** No


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**Montreal Cognitive Assessment (MoCA)**

- **NAME:**
- **DATE:**
- **EDUCATION:**
- **DATE OF BIRTH:**

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**Visual/Spatial

1. Copy the design into the space provided:

2. Draw a triangle inside a square.

3. Draw a square inside a circle.

4. Draw a circle inside a triangle.

**Executive/Procedural

1. Trace the word "MONTE" (use light strokes).

2. Write the digits 1-9 in order.

3. Name 10 objects drawn on the sheet.

**Linguistic

1. Read a passage aloud and repeat back.

2. Read a list of words and tell me if they are concrete or abstract.

**Attention/Concentration

1. Calculate the number of words in this sentence.

2. Add 3 to 7, then subtract 7, then add 3 again.

3. Subtract 7 from 13, then add 7, then subtract 7 again.

**Construction

- **WORD RECALL:**
  - **Inference:**
    - Name 3 objects that begin with the letter "C".
    - Name 3 animals that begin with the letter "O".

- **TIME:**
  - **Inference:**
    - Name 3 objects that begin with the letter "O".
    - Name 3 animals that begin with the letter "O".

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**Orientation**

- **PLACE:**
- **DATE:**
- **TIME:**
- **MONTH:**
- **YEAR:**
- **DOMINANT HAND:**
- **AGE:**
- **SEX:**

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**Score:**
- **10+ Normal**
- **11-26 Minor Cognitive Impairment**
- **27-30 Severe Cognitive Impairment**

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**www.mocatest.org**

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*Disclaimer: The MoCA is not a diagnostic tool. It is intended to identify individuals with cognitive impairment who may require further evaluation.*
Thank You for Your Attention

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