Mini-Cog: Administration and Scoring

The topic of this training session is Mini-Cog Administration and Scoring. The objectives for this session are to learn how to administer the Mini-Cog and understand scoring procedures and how to interpret a patient's performance on the tool. We will score the Mini-Cog for sample patients Sam and Colleen and use additional sample clocks for practice. To get the most out of this session, it would be helpful to have a copy of the Mini-Cog form in front of you as we go along to reference administration and scoring procedures. Be aware that as the Mini-Cog was researched in various capacities over the last 15 years or more with different populations of interest, the tool itself, as well as its scoring procedure, and cutoff scores were modified and updated to take into account the cumulative research data. [Link provided: http://www.alz.org/documents/mndak/SOO_Bors_on_Mini_Cog_V01_16_13.pdf].

Therefore, if you were to Google the Mini-Cog form, you would likely come across multiple versions, many of which are out of date. It is very important to be using the most current measure, which you will find at the link shown as well as on the Act on Alzheimer's website. Before continuing with this session, please take a moment also to view the Mini-Cog exams conducted with real patients Sam and Colleen at the link shown [www.actonalz.org/provider-practice-tools], and try to score their performance along the way so we can review their scores together in a few moments. The Mini-Cog tool is a simple, fast, yet highly reliable cognitive screening tool that can be incorporated easily into clinic settings. The measure includes two components: a word list recall, and a clock drawing task.

There are multiple advantages of the Mini-Cog. It is quick and easy to administer, and the combination of the word list with the clock draw means that multiple cognitive domains are measured, including memory, visuospatial functioning, and executive thinking. First, you give a patient three words to repeat back and to try to remember for later. This is followed by the clock draw, in which you instruct individuals to draw a clock, include all the numbers, and set the time to 10 past 11. The Mini-Cog is then scored on a five-point scale. A successful clock draw is worth a total of two points, and the list recall after the clock is worth up to three points. This screen shows the updated version of the Mini-Cog. The first page offers instructions for introducing the two components of the test and provides room in the middle of the page for the patient to draw the clock.

At the bottom, you see that there is room for scoring. The second page offers specific instructions regarding how to interpret the clock drawing portion of the task by listing the required elements for full credit and showing sample clocks drawn by real patients. Notice that at the bottom of the form, there is an email address that can be used to contact the creator of the Mini-Cog, Dr. Sue Borson, for questions, for more

information, or for permission to use the tool in a non-clinical or research context [soob@uw.edu]. This screen shows an alternative format of the same up-to-date version of the Mini-Cog with instructions and scoring procedures, just like in the previous example. On this form in the upper right-hand corner, you will see that six alternative word lists are provided for use with the instrument.

This is particularly helpful for serial or longitudinal administrations of the Mini-Cog over time with the same patient. It is highly recommended that you carefully review all instructions before trying to administer the Mini-Cog for the first time. The first task is to introduce the word list to your patient. Say, 'I am going to say three words that I want you to remember now and later. The words are,' and then you would include the three words from one of the Mini-Cog word lists. The second task is to introduce the clock drawing. Say, 'Please draw a clock in this place below. Start by drawing a large circle.' When they finish drawing the circle say put all the numbers in the circle if you happen to be working with a patient and they draw tick marks instead of numbers or only include the anchor numbers 12, 6, 3, and 9, ask them to include all of the numbers.

When the patient is finished with the numbers, you would then say, 'Now set the hands to show 10 past 11.' The third and final task after the clock drawing is to ask the patient, 'What were the three words I asked you to remember?' Before administering the Mini-Cog, make sure that you have a patient's full attention. Speak clearly and in a reasonable volume to avoid confounds related to hearing loss. When saying the three words, do so at a rate of about one second apart. Note that you can repeat the word list two more times after the initial administration if a patient has difficulty registering the words. If a patient is unable to repeat back all three words after three attempts, move on.

After a patient successfully repeats all of the words, do not remind them that they will need to remember the words again later. For the clock draw, it is your choice whether you use a blank piece of paper or one with a pre-drawn circle on it. If you do allow a patient to draw their own circle, make sure that it is large enough so that you can appropriately interpret what goes on inside. It is important to recognize that you can also repeat the instructions for the clock as often as necessary. This is not a memory test. When giving instructions for the clock draw, never alter the wording of the instructions. Always use the phrase '10 past 11.' This specific phrasing was chosen because it requires more mental manipulation on the part of patients to figure out compared to other phrases.

If you do change the wording of the instructions, you will lose the reliability and validity of the measure as a whole. It is important to keep in mind that if the patient is unable to complete the clock drawing in three minutes, discontinue the task and move on to word recall. To score the word list component of the Mini-Cog, each word successfully recalled verbatim after the clock drawing portion is scored one point for

a total possible three points. The clock draw is scored all or nothing, that is, a full two points or no points. The clock scoring is weighted in this way because it has been shown to be an early and sensitive indicator of the types of cognitive decline that are common in the setting of dementing conditions like Alzheimer's disease.

A full-credit clock includes all of the numbers 1 through 12 in their correct location to evaluate. Look at the anchor numbers—the 12, 6, and 3—and to make sure that they are roughly in their correct locations. There can be no missing or duplicate numbers. Two hands of the clock must be present: one to the 11 and the other to the 2. It is important to recognize that the length of the hands for Mini-Cog scoring does not matter and is not incorporated into scoring. This is because many patients will draw the hands in haste and not be specific with regard to length. Refusal to draw the clock at all is scored zero points. The scoring parameters and recommended cutoff score of the Mini-Cog have been refined over time to increase the sensitivity of the instrument.

A passing score is a 4 or 5. A failing score is a score of 3 or less. As mentioned previously, the Mini-Cog has been extensively researched in a variety of settings and with diverse patient populations. This is just a short list of research findings on the tool. It has been shown that performance on the Mini-Cog is relatively unaffected by education level or language. The tool has also been validated in numerous populations, including African American, Asian American, and Native American, among others. Even though the Mini-Cog is much shorter to administer than the Folstein Mini Mental Status Exam, research has shown it has the same level of sensitivity and specificity when working up patients with cognitive impairment. The Mini-Cog has also been shown not to disrupt the workflow in primary care and not surprisingly increases the capture rate of diagnosis.

Interestingly, failure on this simple tool has also been shown to be associated with functional ability of patients, including inability to fill a pillbox. This information is valuable to the clinician, as a score on the Mini-Cog can shed light on both cognitive status and real-world functional capacity. If you have not already viewed the Mini-Cog exam with real patient Sam, please do so now. The video is on the Act on Alzheimer's website, and the exact link is also shown at the bottom of your screen [www.actonalz.org/provider-practice-tools]. Next, we will walk through the scoring of Sam's Mini-Cog performance, starting with his clock. To evaluate his clock, you will notice that all of the numbers 1 through 12 are included, and in their correct locations. The anchor numbers are also in the right places.

There are no duplicate numbers and no missing numbers. However, when it came time to set the hands for 10 past 11, Sam did not perform that part correctly. Therefore, Sam's clock would be worth zero points because the hands of the clock are not in the correct position. When asked to recall the three words immediately after the clock, Sam was initially unable to remember any of the words. However,

less than a minute later, he spontaneously recalled the word 'season'. I would give Sam the benefit of the doubt and give him one point for remembering that word. Therefore, his total score on the Mini-Cog is a 1 out of 5. Unfortunately, this is a screen failure, and in this case, we would recommend additional screening or moving forward with a full dementia work-up.

If you have not already viewed the Mini-Cog exam with real patient Colleen, please do so now. This video is also on the Act on Alzheimer's website, and the exact link is shown at the bottom of your screen [www.actonalz.org/provider-practice-tools]. In evaluating Colleen's clock, you'll notice two things. First, the number 4 and 5 have been transposed. Secondly, when setting the hands to the clock, one of the hands points to the ten and one to the two. Because of these errors, her clock would be given zero points. After the clock, Colleen was able to spontaneously recall two words sunrise and banana therefore she receives one point for each of the words successfully recalled. Her total score on the Mini-Cog is two out of five. This is also a screen failure and therefore we would recommend additional screening and moving forward with a dementia work-up. Of all scoring procedures on the Mini-Cog, interpreting a patient's clock performance is probably the most nuanced.

Therefore, we'll take a little bit of time to practice with other sample clocks. One of the first things you might notice in clock number 1 is spacing errors. There's a big gap between the numbers 2 and 3, as well as between the numbers 11 and 12. If you look at the anchor numbers, you will quickly see that the number 10 is where the number 9 would normally go. This means that this clock would be scored zero points. You will also quickly recognize, for clock number 2, that there are significant spacing errors, particularly between numbers 11 and 12. The number 10 or 11 are where the number 9 would be, and in this case, there's only one hand. This, of course, also does not meet criteria for a full credit clock, and therefore would be scored zero points.

The patient who drew clock number three drew the numbers on the outside of the circle. For purposes of scoring, it does not matter whether patients include the numbers on the inside or the outside of the circle. You will see that there are minor spacing issues in this example, but the anchor numbers 12, 6, 3, and 9 are all roughly in their correct location. The hands are appropriately set with one pointing to the 11 and one pointing to the 2. This means that this is considered a full credit two-point clock. In clock number 4, all of the numbers 1 through 12 are represented with no duplicate or missing numbers. The anchor numbers are also roughly in their correct location. However, this patient, instead of including hands of the clock, drew a small x between the number 10 and 11.

Because no hands are present, the scoring for this clock would be zero points. For clock number five, you will see that the patient trailed off in their ability to include numbers after the number six. This is a relatively common occurrence among

individuals with dementia. Because not all of the numbers are represented and no hands are present, this clock would be given zero points. In evaluating clock number 6, you will see that all of the numbers 1 through 12 are represented. However, in this example, the patient accidentally drew two number 8s in a row. They spontaneously recognized this error, crossed out the second 8, and were forced to draw the 9 a bit higher on the clock. Because the patient spontaneously recognized and corrected their error, we would give them the benefit of the doubt when setting the hands. They appropriately drew one hand to the eleven and a second hand to the two. Therefore, this would be a full credit two-point clock.

It is important to recognize that it is not necessary for the fulcrum of the hands to be in the exact center of the circle. In clock number seven, again, all of the numbers one through 12 are represented. There are none missing, no duplicates, and all numbers are roughly in their correct locations. In addition, the patient has correctly set the hands to 10 past 11, and therefore, this clock receives a full two points. In the last example, you will see significant spacing errors between the number 5 and 6 as well as between 11 and 12. In this example, the number 4 is where the 3 would go and the number 10 is in the 9 position. For these reasons, this would be scored zero points.

For more guidance on the appropriate next steps and workflow in cases in which patients pass or fail a cognitive screening test such as the Mini-Cog, please see the Act on Alzheimer's website. There you will find evidence-based provider tools like this one that simplify assessment, diagnosis, and the care of individuals with memory loss and dementia. This is a screenshot of the workflow for cognitive screening with patients. In the red banner on the right, it offers examples of initial cognitive screening measures to consider. The tool also provides guidance for how to move forward when patients pass or fail these screening tools. For more information and to download free copies of these evidence-based provider tools, please see the Act on Alzheimer's website at the link shown on your screen [www.actonalz.org/provider-practice-tools]. You can also contact Act on Alzheimer's staff directly at the email address shown here [For more information: email info@actonalz.org; web: www.actonalz.org].

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