

Perspective

I Have to Pay to Use the Montreal Cognitive Assessment: What Should I Do?

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Background: For many years, the Montreal Cognitive Assessment (MoCA) has been one of the most commonly used cognitive screening instruments in ambulatory care settings. Because the MoCA will no longer be in the free public domain by the end of 2020, it is important to consider cognitive screening tests that are comparable and free. **Methods:** We briefly review three cognitive screening instruments, the Saint Louis University Mental Status examination, the Short Test of Mental Status, and the Addenbrooke's cognitive examination, and compare these tests with the MoCA.

Conclusion: The Addenbrooke's cognitive examination is a comprehensive cognitive examination that is too long for administration in primary care. The Short Test of

Mental Status uses a 38-point scale, does not account for education, and is available only in English. The Saint Louis University Mental Status is an ideal candidate to replace the MoCA because similar to the MoCA, it is based on a 30-point scale and available in many languages. In addition to dementia, it has been validated for diagnosing mild cognitive impairment. While the MoCA has more tests suited for detecting dysexecutive dementias, it is possible to supplement the Saint Louis University Mental Status with comparable public domain executive function tests. In summary, we believe the Saint Louis University Mental Status to be a suitable free alternative to the MoCA.

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Cognitive testing is an essential component of assessing for neurocognitive disorders in our patients. For decades, the Folstein Mini Mental State Examination (MMSE) was the primary instrument for office and bedside cognitive testing. The MMSE, originally introduced in 1975, was free, requires only a paper and pen to administer, and has strong psychometrics for detecting dementia due to Alzheimer's disease (the most common type of dementia in the United States). Use of the MMSE quickly dwindled about 15 years ago because of copyright issues (which took it out of the free public domain) and also because of its inability to detect mild cognitive impairment which for many patients is a precursor to dementia. Two other cognitive tests were introduced around this time, the Montreal Cognitive Assessment (MoCA) and Saint Louis University Mental Status Exam (SLUMS), and for many health care providers replaced the MMSE as standard instruments in the brief assessment of cognitive

function. Like the MMSE, these tests can be easily used in the clinic or at the bedside, are based on a 30-point scale, assess different facets of cognition, and are sensitive and specific for detecting dementia. Importantly, they are both superior to the MMSE in their ability to detect mild cognitive impairment and in this regard were necessary replacements of the MMSE.

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Use of the Montreal Cognitive Assessment

The developers of the MoCA recently decided to take it out of the public domain, requiring certification at a fee of \$125 per user. This will go into effect at the end of this year. For health care systems using the MoCA, the total cost will quickly rise. Consequently, many providers are facing the question of whether to pay for MoCA certification or to use an alternative instrument. Multiple free alternatives exist for testing cognition. Some comparable instruments for ambulatory care settings include the SLUMS, the Short Test of Mental Status, and the Addenbrooke's cognitive evaluation (ACE).

Early in the course of illness, different dementias affect domains of cognitive function differently. For example, short term memory loss is one of the first symptoms of Alzheimer's dementia; executive dysfunction may be one of the first symptoms of frontotemporal or vascular dementia; and visual spatial impairment and executive dysfunction may be the first symptoms of Lewy body spectrum-related dementias. Cognitive tests differ in their emphasis of domains of cognitive function tested; it stands to reason that this can limit detection of cognitive dysfunction from one dementia to another. While all of the tests listed previously assess memory through delayed recall (making them useful for detecting Alzheimer's disease), their biggest differences are in their assessment of executive and visual spatial function (making some less useful for detecting dysexecutive and non-Alzheimer's dementias). The MoCA provides assessment of executive function (through its additional tests of task switching, letter fluency and abstraction) and of visual spatial function (through its test of cube copy). Indeed, the MoCA has been shown to be a better option for identifying patients with dysexecutive dementias compared with the MMSE, which has made it one of the most commonly used 30-point mental status examinations in clinical practice.^{1,2}

The Short Test of Mental Status assesses cognition over multiple domains, including executive function. Like the MoCA and SLUMS, it has been shown to be superior to the MMSE for detection of mild cognitive impairment.³ However, this instrument is based on a 38-point scale and in that regard can be confusing to providers who have become used to the more familiar 30-point scale. In addition, it does not account for education or language bias. The ACE is a 100-point cognitive test battery created to detect dementia and to distinguish Alzheimer's dementia from

frontotemporal dementia. It provides the examiner with a global score as well as a cognitive profile via subscores across five cognitive domains (memory, fluency, language, attention, visuospatial). It has been shown to differentiate Alzheimer's dementia from frontotemporal dementia.⁴ However, this cognitive screening test takes about 20–25 minutes to administer and may be better suited for use in cognitive care specialty clinics. A shorter version of the ACE is available (the mini ACE); this instrument assesses patients across four cognitive domains (though is heavily weighted toward language and memory); the mini ACE is relatively new and does not have clearly established and widely validated cutoff scores for dementia diagnosis.⁵

Although the Short Test of Mental Status and ACE are alternatives to the MoCA, we would like to focus on making a comparison between the SLUMS and MoCA because the SLUMS is familiar to many clinicians, is based on a 30-point scale, and shares many features with the MoCA. Like the MoCA, the SLUMS is available in many languages; this is an important consideration given the shifting demographics in the older adult population in the United States. In addition, both account for educational bias by providing an additional point for persons with less than a high school education. Both screening instruments include a clock draw test, which is a measure of executive function, allowing for the detection of early cognitive impairment. In this regard, it is important to note that both have been shown to be comparable in their ability to detect mild cognitive impairment in regard to sensitivity, specificity, and predictive value.^{6,7} Both assess delayed memory by measuring the spontaneous recall of 5 words. The MoCA provides prompts for further assessment of recognition memory (useful in distinguishing disorders of memory storage from disorders of memory retrieval); while this is not a part of the SLUMS, it can be easily included while administering the SLUMS.

There are important differences as well. The SLUMS can be administered in 5–10 minutes, versus 10–15 minutes with the MoCA. The SLUMS provides cutoff scores for mild cognitive impairment and dementia, while the MoCA provides only a single cutoff value for normal. The SLUMS is weighted heavily toward tests of memory and therefore may miss deficits in executive function. Although studies have not been published that compare the SLUMS with the MoCA for the assessment of dysexecutive dementias,

the SLUMS may not perform as well. In circumstances where a provider is concerned about a non-Alzheimer's dementia, additional tests comparable to those found on the MoCA which are not on the SLUMS, such as task switching and figure copy tests, can be administered separately. These tests can be used without cost and can be easily interpreted. In this regard, they make a useful supplement to the SLUMS if there is concern about a patient's frontal lobe function or there is need for additional visual spatial testing.

Both the MoCA and SLUMS have the necessary characteristics of a good screening instrument: they are

easy to administer, they are reliable, and they are valid. However, soon the MoCA will no longer fulfill a very important criteria, and that is cost. We believe the SLUMS should be considered as the cognitive test of choice based on its ease of administration and ability to detect both mild cognitive impairment and dementia syndromes at zero cost.

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