

The Mental Status Examination

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The mental status examination includes general observations made during the clinical encounter, as well as specific testing based on the needs of the patient and physician. Multiple cognitive functions may be tested, including attention, executive functioning, gnosis, language, memory, orientation, praxis, prosody, thought content, thought processes, and visuospatial proficiency. Proprietary and open-source clinical examination tools are available, such as the Mini-Mental State Examination and the Mini-Cog. Physician judgment is necessary in selecting the most appropriate tool for an individual patient. These tools have varying sensitivity and specificity for neurologic and psychiatric disorders, but none are diagnostic for any mental status disorder. Each must be interpreted in the context of physician observation. The mental status examination is useful in helping differentiate between a variety of systemic conditions, as well as neurologic and psychiatric disorders ranging from delirium and dementia to bipolar disorder and schizophrenia. There are no guidelines to direct further testing in the setting of an abnormal mental status examination; therefore, testing is based on clinical judgment. (*Am Fam Physician*. 2016;94(8):635-641. Copyright © 2016 American Academy of Family Physicians.)

CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz Questions on page 598.

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The mental status examination is a useful tool to assist physicians in differentiating between a variety of systemic conditions, as well as neurologic and psychiatric disorders ranging from delirium and dementia to bipolar disorder and schizophrenia. The examination itself may comprise a few brief observations made during a general patient encounter or a more thorough evaluation by the physician. It also may include the administration of relatively brief standardized tools such as the Mini-Mental State Examination (MMSE) and Mini-Cog. Highly detailed and time-consuming neuropsychological testing is also available, but this is beyond the scope of this article.

Culture, native language, level of education, literacy, and social factors such as sleep deprivation, hunger, or other stressors must be taken into account when interpreting the examination, because these factors can affect performance.¹ Language skills of the physician and patient are critical; the patient must be able to understand the questions and communicate his or her answers, and the physician must be able to interpret the examination results. If possible, the mental status examination should occur when the physician is alone with the patient and again in the presence of the patient's friends or family members who can provide

more longitudinal insight into problems the patient may be having. The physician should maintain a nonjudgmental, supportive attitude during the encounter.¹

The examination begins with a general assessment of the patient's level of consciousness, appearance, activity, and emotional state.^{1,2} Each of these items may be rapidly assessed by a physician in the initial moments of the encounter through history taking and general observation. These findings, combined with a brief memory test, may be all that is needed to ascertain that no pathology is present.¹

If the general assessment does reveal areas of concern, further in-depth investigation is warranted. When a more thorough examination is indicated, it may be separated into two general portions: observations made by the physician about the patient's physical state, and a cognitive evaluation in which the patient's neurologic and psychological functioning is assessed. The cognitive portion involves assessment of 11 different functions: attention, executive functioning, gnosis, language, memory, orientation, praxis, prosody, thought content, thought processes, and visuospatial proficiency. *Table 1* provides information about each portion of the examination, as well as differential diagnoses that may be suggested by abnormalities in each area.¹⁻⁵

Table 1. Components of the Mental Status Examination

<i>Component</i>	<i>Definition/content</i>	<i>What to assess</i>
General observations		
Appearance and behavior	Body habitus, eye contact, interpersonal style, style of dress	Appearance: attention to detail, attire, distinguishing features (e.g., scars, tattoos), grooming, hygiene Behavior: candid, congenial, cooperative, defensive, engaging, guarded, hostile, irritable, open, relaxed, resistant, shy, withdrawn Eye contact: fleeting, good, none, sporadic
Mood and affect	Mood: subjective report of emotional state by patient Affect: objective observation of patient's emotional state by the physician	Body movements/making contact with others, facial expressions (tearfulness, smiles, frowns)
Motor activity	Facial expressions, movements, posture	Akathisia: excessive motor activity (e.g., pacing, wringing of hands, inability to sit still) Bradykinesia: psychomotor retardation (e.g., slowing of physical and emotional reactions) Catatonia: immobility with muscular rigidity or inflexibility
Cognitive functioning		
Attention	Ability to focus based on internal or external priorities	—
Executive functioning	Ordering and implementation of cognitive functions necessary to engage in appropriate behaviors	Testing each cognitive function involved in completing a task
Gnosia	Ability to name objects and their function	—
Language	Verbal or written communication	Appropriateness of conversation, rate of speech (> 100 words per minute is normal; < 50 words per minute is abnormal), reading and writing appropriate to education level
Memory	Recall of past events	Declarative: recall of recent and past events Procedural: ability to complete learned tasks without conscious thought
Orientation	Ability of patient to recognize his or her place in time and space	Time, space, person
Praxis	Ability to carry out intentional motor acts	Apraxia: inability to carry out motor acts; deficits may exist in motor or sensory systems, comprehension, or cooperation

NOTE: Each of these items may be suggestive of various diagnoses, but none are sufficient to make a diagnosis without a comprehensive clinical evaluation.

NA = not applicable.

<i>Sample questions/tests</i>	<i>Potential diagnoses if abnormal</i>
NA	Disheveled: depression, schizophrenia/psychotic disorder, substance use Irritable: anxiety Paranoid: psychotic disorder Poor eye contact: depression, psychotic disorder Provocative: personality disorder or trait
How is your mood? Have you felt sad/discouraged lately? Have you felt energized/out of control lately?	Mood disorder, schizophrenia, substance use
NA	Akathisia: anxiety, drug overdose or withdrawal, medication effect, mood disorder, parkinsonism, posttraumatic stress disorder, schizophrenia Bradykinesia: depression, medication effect, schizophrenia Catatonia: schizophrenia/psychotic disorder, severe depression
Count by sevens or fives Spell a word backwards	Attention-deficit/hyperactivity disorder, delirium, dementia, mood disorder, psychotic disorder
Clock drawing test: ask patient to draw a clock with hands set to 11:10 Trail-making test: ask patient to alternate numbers with letters in ascending order (e.g., A1B2C3)	Delirium, dementia, mood disorder, psychotic disorder, stroke
Show patient a common object (e.g., pen, watch, cellular telephone) and ask if he or she can identify it and describe how it is used	Advanced dementia, stroke
NA	Rapid or pressured speech: mania Slow or impoverished speech: delirium, depression, schizophrenia Inappropriate conversation: personality disorder, schizophrenia Inappropriate reading/writing level: dementia, depression, previous stroke
When is your birthday? What are your parents' names? Where were you born? Where were you on September 11, 2001? Ask patient to repeat three words immediately and again in five minutes Ask patient to sign his/her name while answering unrelated questions (each test must be tailored to the individual patient)	Short-term deficit: amotivation, attention-deficit/hyperactivity disorder, dementia, inattention, substance use Long-term deficit: advanced dementia, amnesia, dissociative disorder, movement disorder, previous stroke
What year/month/day/time is it? What city/building/floor/room are you in? What is your name? When were you born?	Amnesia, delirium, dementia, mania, previous stroke, severe depression
Could you show me how to use this hairbrush/hammer/pencil?	Delirium, dementia, intoxication, stroke

continues

Table 1. Components of the Mental Status Examination (continued)

Component	Definition/content	What to assess
Cognitive functioning (continued)		
Prosody	Ability to recognize the emotional aspects of language	—
Thought content	What the patient is thinking	Delusions, hallucinations, homicidality, obsessions, phobias, suicidality
Thought processes	Organization of thoughts in a goal-oriented pattern	Circumferential: patient goes through multiple related thoughts before arriving at the answer to a question Disorganized thoughts: patient moves from one topic to another without organization or coherence Tangential: patient listens to question and begins discussing related thoughts, but never arrives at the answer
Visuospatial proficiency	Ability to perceive and manipulate objects and shapes in space	—

NOTE: Each of these items may be suggestive of various diagnoses, but none are sufficient to make a diagnosis without a comprehensive clinical evaluation.

Information from references 1 through 5.

Mental Status Screening Tools

Several brief screening tools can assist physicians in obtaining an objective assessment of mental status. However, some instruments have not been studied for use in the primary care setting; for others, research methods were inconsistent, thereby limiting the ability to generalize findings to certain practice environments.⁶ Other screening tools that have been widely researched vary in the time to administer, cognitive skills measured, number of questions, and sensitivity and specificity for dementia or mild cognitive impairment. *Table 2* summarizes several instruments studied in the primary care setting.^{3,4,6} Physician judgment is necessary in selecting the most appropriate tool for an individual patient. No screening tool is diagnostic for any mental status disorder. Although screening may

detect cognitive decline or dementia, there is no evidence that screening improves clinical outcomes.⁶ As the mainstay of diagnosis, clinical judgment must be based on multiple observations made over time. However, these instruments may be beneficial because they provide an objective, standardized method of evaluating mental status.

According to the National Institute on Aging and the Alzheimer's Association, diagnosis of cognitive impairment and dementia requires a deficit in at least two cognitive or behavioral functions, including learning and information recall, reasoning or task completion, visuospatial proficiency, speech, reading and writing, behavior, and personality.⁴ Screening instruments vary in the cognitive and behavioral domains they assess. The most widely researched cognitive

Sample questions/tests	Potential diagnoses if abnormal
Repeat "Why are you here?" with multiple inflections (e.g., happy, surprised, excited, angry, sad) and ask patient to identify the emotion Ask the patient to say the same sentence with each of the above emotional inflections	Autism spectrum disorder, developmental delay, mood disorder, schizophrenia
Do you have thoughts or images in your head that you cannot get out? Do you have any irrational or excessive fears? Do you think people are trying to hurt you in some way? Are people talking behind your back? Do you think people are stealing from you? Do you feel life is not worth living? Do you see things that upset you? Do you ever see/hear/smell/taste/feel things that are not really there? Have you ever heard or seen something other people have not? Have you ever thought about hurting others or getting even with someone who wronged you? Have you ever thought about hurting yourself? If so, how would you do it? Have you ever thought the world would be better off without you?	Delusions: fixed delusions, mania, psychotic disorder/psychotic depression Hallucinations: delirium, dementia, mania, schizophrenia, severe depression, substance use Homicidal: mood disorder, personality disorder, psychotic disorder Obsessions: obsessive-compulsive disorder, posttraumatic stress disorder, psychotic disorder Phobias: anxiety disorder, posttraumatic stress disorder Suicidal: depression, posttraumatic stress disorder, substance use
Generally apparent throughout the encounter	Anxiety, delirium, dementia, depression, schizophrenia, substance use
Ask patient to copy intersecting pentagons or a three-dimensional cube on paper Draw a triangle and ask patient to draw the same shape upside down	Delirium, dementia, stroke

testing tool is the MMSE. It requires about six to 10 minutes to administer, although it may take longer depending on the extent of impairment. In 14 studies, the MMSE had a sensitivity of 88.3% (95% confidence interval [CI], 81.3% to 92.9%) and a specificity of 86.2% (95% CI, 81.8% to 89.7%) for dementia, with a score cutoff of 23 to 25 indicating significant impairment.⁴ A more recent meta-analysis of 108 cohort studies found a sensitivity of 81% (95% CI, 78% to 84%) and specificity of 89% (95% CI, 87% to 91%).⁶ The MMSE assesses a wide range of domains, including attention, language, memory, orientation, and visuospatial proficiency. However, it is proprietary and may not be reproduced without a fee, and the patient's education level must be taken into account when interpreting the results.^{3,4}

The Mini-Cog is a brief (five minutes or less) screening tool that measures executive functioning, memory, and visuospatial proficiency. Estimates of its sensitivity and specificity for dementia vary across studies. However, a recent meta-analysis of cohort studies found a pooled sensitivity of 91% (95% CI, 80% to 96%) and specificity of 86% (95% CI, 74% to 93%).⁴ The Mini-Cog instructs the patient to say three words, engage in a clock drawing task, then repeat the three words. The Mini-Cog is brief, easy to use, and widely available, and it is preferred over the MMSE. However, it demonstrated better performance in patients with dementia compared with those with only mild cognitive impairment, which may account for the variance in sensitivity (76% to 100%) and specificity (54% to 85.2%) in other reviews.⁴

Table 2. Summary of Cognitive Screening Tools

Test	Time to administer (minutes)	Sensitivity (95% confidence interval)	Specificity (95% confidence interval)	Domains assessed	Accessibility
Addenbrooke's Cognitive Examination (revised)	≤ 20	92% (90% to 94%)	89% (84% to 93%)	Attention, executive functioning, language, memory, orientation, visuospatial proficiency	Public domain
Mini-Cog	≤ 5	91% (80% to 96%)	86% (74% to 93%)	Executive functioning, memory, visuospatial proficiency	Public domain
Mini-Mental State Examination	6 to 10	81% (78% to 84%)	89% (87% to 91%)	Attention, language, memory, orientation, visuospatial proficiency	Proprietary
Montreal Cognitive Assessment	≤ 10	91% (84% to 95%)	81% (71% to 81%)	Attention, executive functioning, language, memory, orientation	Public domain

Information from references 3, 4, and 6.

The Montreal Cognitive Assessment is a brief (10 minutes or less) screening tool that assesses attention, executive functioning, language, memory, and orientation. It has better performance in assessing patients with mild cognitive impairment compared with the Mini-COG, MMSE, and the revised Addenbrooke's Cognitive Examination (ACE-R), and it is not proprietary.^{3,4} Its pooled sensitivity and specificity in 20 cohort studies were 91% (95% CI, 84% to 95%) and 81% (95% CI, 71% to 81%), respectively.⁴ Its content is similar to that of the MMSE, for which it may be substituted, but also consists of visuospatial tasks, naming, and memory trials.⁴

The ACE-R is another alternative to the MMSE that is not proprietary.^{3,4} It requires about 20 minutes to administer and assesses attention, executive functioning, language, memory, orientation, and visuospatial proficiency.⁴ In 13 studies, this tool had a pooled sensitivity of 92% (95% CI, 90% to 94%) and specificity of 89% (95% CI, 84% to 93%) for dementia.⁴ Its content and administration are similar to those of the MMSE, but it requires some additional visuospatial tasks.

Other brief screening tools are available, but they are not covered in detail because of their lack of generalizability, inconsistency in scoring, and paucity of high-quality research regarding their use in the primary care setting.³

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	Reference
Interpretation of the mental status examination must take into account the patient's native language, education level, and culture.	C	1
Although screening can detect cognitive decline and dementia, there is no evidence that screening improves patient outcomes.	C	6
The Mini-Cog and revised Addenbrooke's Cognitive Examination are preferred alternatives to the Mini-Mental State Examination for dementia screening, and the Montreal Cognitive Assessment is a preferred alternative to detect mild cognitive impairment.	C	4

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <http://www.aafp.org/afpsort>.

Other Diagnostic Testing

Abnormal results from the individual components of the mental status examination can provide important diagnostic clues that can help physicians determine the cause of cognitive problems. However, mental status examination results may not be sufficient to narrow the differential diagnosis, and findings from the history and physical examination, as well as ancillary testing, are usually necessary for a definitive diagnosis.

There are no consensus guidelines to guide diagnostic testing in the setting of an abnormal mental status examination. Therefore, testing is based on clinical judgment. Although extensive testing is generally unnecessary, initial laboratory studies to consider in patients with an abnormal mental status examination include measurement

Website

http://www.stvincents.ie/dynamic/File/Addenbrookes_A_SVUH_MedEl_tool.pdf

http://www.alz.org/documents_custom/minicog.pdf

<http://www4.parinc.com/products/Product.aspx?ProductID=MMSE>

<http://www.mocatest.org> (free registration required)

of serum glucose, blood urea nitrogen, and creatinine clearance, as well as urinalysis. These studies may reveal a potentially correctable cause, such as hypoglycemia or hyperglycemia, uremia secondary to acute kidney injury, or urinary tract infection. Thyroid function testing is also reasonable, especially in women older than 50 years who have neurologic illness or mood disorders, or in younger women and men with clinical signs of thyroid disease. However, such testing should be avoided if it is unlikely to alter the patient's clinical outcome.⁷ Other tests (e.g., neuroimaging,⁸ electroencephalography,⁹ positron emission tomography,¹⁰ more extensive serum laboratory testing, cerebrospinal fluid analysis) may be indicated for patients with potentially nonpsychiatric symptoms or symptoms that may be caused by a general medical condition.¹¹

Data Sources: PubMed and UpToDate searches were completed using the key terms mental status examination, general mental status examination, special mental status examination, Mini-Mental Status Examination, and Mini-Cog. The searches included meta-analyses, randomized controlled trials, clinical trials, and review articles. Also searched were Essential Evidence Plus and the Cochrane Database of Systematic Reviews. Search dates: September 2, 2015, and October 3, 2015.

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NOTE: This review updates a previous article on this topic by Snyderman and Rovner.⁵

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