

Neuropsychological Evaluation in Clinical Practice: Overview and Approach

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QUESTIONS

1. A neuropsychological evaluation can help in distinguishing depression from dementia using measures designed to assess memory. Memory impairments in Alzheimer's disease (AD) differ from those observed in depression in which of the following ways?

- (A) Scores on memory measures fall in the impaired range for patients with AD but not in patients with depression
- (B) Patients with depression will not perform below expectations on memory measures and will perform below expectations only on measures of attention
- (C) Patients with probable AD will display prominent impairments on memory measures that require retention and storage of information, while those with depression will display the greatest difficulties with the encoding and retrieval processes
- (D) Patients with depression will show primary impairments in language and visuospatial functioning

1. The correct answer is C, patients with probable AD will display prominent impairments on memory measures that require retention and storage of information, while those with depression will display the greatest difficulties with the encoding and retrieval processes. Physicians commonly refer patients for a neuropsychological evaluation to determine whether memory impairment is caused by depression or a dementing illness. To answer this question, a neuropsychologist must carefully examine all domains of functioning. In general, however, depressed patients typically exhibit significant deficits in the domains of attention and executive functioning as well as reduced processing speed and frontally mediated memory impairment characterized by impaired encoding and retrieval rather than consolidation of novel information.¹ In fact, a patient who demonstrates considerable difficulty with immediate recall of a word list may have

attentional impairment rather than a frank memory deficit. Often, depressed patients with deficits in attention cannot encode as many items as would be expected when compared with peers of the same age and exhibit difficulty retrieving the information in delayed conditions. However, these patients likely will have consolidated the information and will be successful when presented with a yes/no recognition condition. In contrast, patients with AD exhibit significant difficulty consolidating the information for later retrieval. On a neuropsychological evaluation, these patients often show significant deficits in retrieval after even a short delay and do not benefit from a recognition condition.²

References

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2. A 65-year-old man presents with “short-term memory loss” and a change in personality reported by his wife. Specifically, his wife reports that he had a temper in the past, but within the past 2 years he has become more irritable and tends to “blurt things out” without regard for others' feelings. She also reports that he has diminished interest in people and

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activities that he previously found enjoyable. Neuropsychological testing in conjunction with neurologic evaluation and neuroimaging indicate a behavioral variant of frontotemporal dementia (FTD) as the most likely etiology. Which of the following patterns of neuropsychological evaluation findings is consistent with this etiology?

- (A) Clinical observations of diminished awareness and insight into difficulties and test findings that indicate deficits on measures that require initiation of behavior (on fluency measures), problem solving, shifting of behavior, and inhibitory control; these deficits contrast with relatively intact performance on measures of language, visuospatial functioning, and memory retention
- (B) Difficulties in attention, executive functioning, and visuospatial abilities along with the patient's wife describing variability in cognitive functioning during the day and visual hallucinations
- (C) Impaired orientation and memory performance characterized by deficits in consolidation or storage of information as evidenced by impaired delayed recall measures with no benefit from recognition paradigms; attention and executive functioning are intact
- (D) Impairment in sustained attention that upon further questioning in clinical history is described as lifelong, although perhaps a bit worse as of late
- (E) Slowed processing speed and effortful performance across tasks, with significant benefit from additional structure; the patient complains of cognitive difficulties and poor performance, even when errors are mild, and reports severe symptoms of depression and anxiety on mood inventories

2. **The correct answer is (A), clinical observations of diminished awareness and insight into difficulties and test findings that indicate deficits on measures that require initiation of behavior (on fluency measures), problem solving, shifting of behavior, and inhibitory control; these deficits contrast with relatively intact performances on measures of language, visuospatial functioning, and memory retention.** The diagnosis of FTD is made through a detailed cognitive and behavioral assessment. First, determining whether a patient has FTD or a more common neurodegenerative disorder such as AD is often difficult; however, carefully reviewing the patient's behavioral history

along with the neuropsychological findings can help distinguish between the 2 etiologies. Behavioral symptoms associated with FTD include hyperorality, early loss of social awareness and insight, early signs of disinhibition, difficulties with initiation, and perseverative behaviors, often with insidious onset before age 70 years.¹ Patients with FTD typically exhibit greater impairment on measures of executive functioning as compared with memory measures, which is believed to be the opposite pattern of AD.² Also, patients with FTD benefit more from cueing and typically do not exhibit the rapid forgetting associated with AD.³ Studies have found that patients with FTD are more likely to have problem-solving difficulty on neuropsychological measures, while patients with AD are more likely to exhibit impaired orientation and apraxia.³ Second, although patients with FTD may exhibit impairments in attention, they will not have a lifelong deficit in sustained attention due to this disorder. Rather, longstanding difficulties with sustained attention are often associated with attention deficit/hyperactivity disorder. Third, a patient with FTD will typically exhibit executive dysfunction with a gradually progressive disease course. Fluctuating cognition with associated hallucinations and deficits in visuospatial functioning are more typical of Lewy body dementia. Last, individuals with FTD will often benefit from cueing, as would those suffering from depression; however, individuals with depression generally have more insight into their current difficulties as well as their mood state. Family report measures also may help identify increased behavioral symptoms in patients with FTD, while self-report measures typically are less useful given that these patients can lack insight. Overall, when FTD is an etiologic consideration, behavioral history (eg, lack of awareness, disinhibition, perseverative behaviors), medical history (eg, primitive reflexes, early incontinence, akinesia), onset and course of the disease (insidious onset, typically before age 70 yr, with gradual progression), and neuropsychological findings (often suggestive of deficits in executive functioning, attention, and language and frontally mediated memory problems such as difficulty with encoding and retrieval, with benefit from cueing) should all be considered.¹

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3. To determine whether a patient's cognitive functioning has changed from premorbid status, a neuropsychologist relies on all of the following forms of information concerning the patient EXCEPT

- (A) Educational and occupational history
- (B) Oral single-word reading ability
- (C) Performance on measures of attention
- (D) Performance on tests that are resistant to the effects of neurologic damage

3. The correct answer is (C), performance on measures of attention.

In conducting a neuropsychological evaluation, the neuropsychologist compares a patient's performance to a normative sample and to an estimate of their premorbid level of functioning. To obtain a premorbid estimate, the neuropsychologist uses information about a patient's educational and occupational history and administers tests that are impervious to the effects of neurologic disease/damage.¹ These tests include measures of single-word oral reading, vocabulary knowledge, and general fund of knowledge. Measures that are sensitive to neurologic dysfunction are not used, including measures within the domain of attention. A large network of brain systems interacts to control the many different aspects of attention.² As a result, deficits in the domain of attention are commonly seen across a range of neurologic conditions, making attention a poor measure of premorbid function.

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4. Verbal fluency measures are commonly used within a neuropsychological evaluation and by neurologists as part of mental status examinations. Studies have found that relative difficulties on letter fluency versus semantic fluency tasks can be helpful in making which of the following differentiations?

- (A) Differentiating patients with a focal lesion from those with generalized neurologic impairment
- (B) Differentiating patients with mild versus moderate to severe stages of dementia

- (C) Differentiating patients with strong vocabulary knowledge from those with weaker vocabulary knowledge
- (D) Differentiating patients with temporal involvement from those with frontosubcortical pathology

4. The correct answer is (D), differentiating patients with temporal involvement from those with frontosubcortical pathology.

Physicians who assess verbal fluency typically do so with 2 different tasks: a task in which the patient is provided with letter cues (eg, F-A-S) and another in which the patient is provided with a semantic category cue (eg, animals). These cues differ from one another in the types of constraints they provide, with letter cues far more open-ended and unstructured than semantic cues. The open-ended nature of letter cues generally makes this task quite difficult for patients with executive functioning difficulties. Thus, patients with FTD or subcortical dementias (eg, vascular dementia, Parkinson's disease dementia) tend to have greater difficulty providing responses on this measure than they do on semantic category tasks.¹ In contrast, category fluency measures place demands on semantic memory that make this task particularly sensitive to the semantic memory breakdown associated with temporolimbic involvement, as in AD.²

References

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5. A neurologist who is interested in determining whether a specific new treatment may improve a patient's memory functioning requests a neuropsychological evaluation to help address this question. Which of the following approaches would be most helpful in determining if this treatment is effective?

- (A) Assess only the domain of interest, in this case the patient's memory functioning
- (B) Provide a broad assessment that assesses all domains of cognitive functioning
- (C) Recommend that the patient be seen for a baseline evaluation prior to onset of treatment and for reevaluation at 1- to 6-month intervals following onset of treatment

(D) Recommend that the patient be seen after the treatment has been initiated to determine if the patient's scores on neuropsychological measures are within normal limits

5. The correct answer is (C), recommend that the patient be seen for a baseline evaluation prior to onset of treatment and for reevaluation at 1- to 6-month intervals following onset of treatment. Given this referral question, a neuropsychologist would likely administer measures that assess all domains of cognitive functioning, with special focus on memory, the domain of interest. The most helpful application of a neuropsychological evaluation in determining the

extent to which the patient benefits from a medical intervention would be to monitor the patient's cognition over time, specifically before and after starting the treatment for comparison. Monitoring a patient's status over time with the use of repeat neuropsychological evaluations is 1 of the main goals of neuropsychology and the most pertinent to this case. This information is critical in determining whether there has been further progression of cognitive difficulties or improvement over time. Neuropsychological evaluations are also particularly helpful in this context due to the precise nature of data provided, allowing for a quantitative comparison of change in functioning.

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