Dementia: Diagnosis & Evaluation

Axel Juan, MD
Geriatrics Institute
Email: axel.juan@med.va.gov
Tel: 305-575-3388

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Principal medical contributor: Axel Juan, MD

Consulting contributors:
Alan Katz, MD       Marcos Mianez, MD
Bernard Roos, MD    Michael Mintzer, MD
Jorge Ruiz, MD      Rose Van Zuilen, PhD

Narrator: Axel Juan, MD

Instructional Designer/Developer: Yat-Soon Lee, MS
How do you diagnose dementia?
To diagnose dementia, you must understand the diagnostic criteria and the clinical features of various types of dementia.
Learning Objectives

Given a clinical scenario:

- Identify individuals who meet the diagnostic criteria for dementia
- Identify examples of memory loss, apraxia, agnosia, aphasia, and executive dysfunction
- Choose targeted diagnostic tests to help identify the type of dementia.

At the end of this section, you will be able to:

- Identify individuals who meet the diagnostic criteria for dementia
- Identify examples of memory loss, apraxia, agnosia, aphasia, and executive dysfunction
- Choose targeted diagnostic tests to help identify the type of dementia
Although there are many types of dementia, they all share the following features:

A memory loss and at least one of the following cognitive disturbances: aphasia, apraxia, agnosia, or disturbed executive functioning.
Diagnostic Criteria (2/2)

- Impaired social or occupational functioning
- Decline from a previous level of functioning
- Symptoms **NOT** a result of delirium

The cognitive disturbances must also be severe enough to impair social or occupational functioning. They must represent a significant decline from a previous level of functioning, and must not occur exclusively during the course of a delirium.
### Cognitive Disturbances

<table>
<thead>
<tr>
<th>Cognitive Disturbance</th>
<th>Description</th>
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<tbody>
<tr>
<td>Memory loss</td>
<td>Loss of short-term and later long-term memory</td>
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<tr>
<td>Aphasia</td>
<td>Difficulty using or understanding language</td>
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<tr>
<td>Apraxia</td>
<td>Impaired motor activities despite intact motor function</td>
</tr>
<tr>
<td>Agnosia</td>
<td>Failure to identify objects despite intact sensory function</td>
</tr>
<tr>
<td>Executive dysfunction</td>
<td>Difficulties in planning, organizing, abstracting</td>
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</tbody>
</table>

Let’s look further at the cognitive disturbances in dementia. By definition all dementias have memory loss. Short-term memory loss precedes long-term memory loss. For example, persons with dementia may be able to remember details from childhood but not the movie they saw the day before or the phone conversation they had 10 minutes ago. Other symptoms include frequently misplacing objects or asking repetitive questions.

Aphasia is the loss of the ability to use and understand language. Commonly, it manifests as word-finding difficulties and the “tip-of-the-tongue phenomenon” where the person talks around a subject and substitutes a series of descriptions or simpler words for the blocked one. An example is the person who is unable to find the word “telephone,” and who then substitutes the phrase, “the thing you talk to people with.”

Apraxia refers to the inability to carry out purposeful movements despite having no detectable motor or sensory impairment. With this disturbance, a person might have difficulty translating an idea into a proper body movement. For example, a person who has difficulty buttoning his shirt, even though he has normal fine motor movements.

Agnosia is a failure to identify familiar objects or persons despite having intact sensory function. Example is the person who fails to recognize family members or other familiar items despite having good vision.

Executive dysfunction includes problems with abstract thinking, planning, and organizing and with performing complex tasks. An example is the person who used to prepare complex recipes from memory but who now is able only to prepare a microwave meal. Executive dysfunction can also manifest as socially inappropriate behavior or poor judgment and reasoning, such as the person who chooses to leave a baby alone at home or chooses to wear a winter coat on a hot day.
Once dementia is suspected or recognized, a search for underlying diagnoses should be undertaken. The most common dementias of the elderly are degenerative and vascular. Identifying the type of dementia can often be achieved through a careful history and physical exam. Some of the clinical features are as follows:

Alzheimer’s Disease (approximately 50-60% of dementias):
- Memory loss is prominent in the earliest stages of the disease
- Language difficulties occur early in the illness
- Normal motor, sensory and cerebellar findings are not present until the late stages
- The course is slow but steadily progressive

Diffuse Lewy Body Disease (15-20% of dementias):
- Fluctuating attention and alertness are common
- Parkinsonian motor abnormalities and falls occur early in the course of the disease
- Detailed visual hallucinations are present in 93% of cases

Vascular Dementia (15-20% of dementias):
- The dementia is temporally related to strokes
- Focal neurologic signs are often present (e.g., hemiparesis, gait disorder, abnormal reflexes)
- There is a progressive course, commonly with a step-wise decline related to each new stroke
- 10-15% of cases occur concomitantly with Alzheimer’s dementia

Parkinson's Dementia (1-3% of cases):
- Dementia develops late in the course of the disease

Frontotemporal Dementia (1-2% of cases):
- It may present with loss of judgment accompanied by disinhibition or social misconduct that is more prominent than the memory loss
- Alternatively, it may present as withdrawal or apathy, also out of proportion to the memory loss
- Calculation and visual-spatial skills remain intact until late in illness
The following dementias account for a small percentage of all dementias, but it is especially important to identify them because they may be partially reversible or arrestable. Let’s review some of the clinical features of these dementias:

Dementia with vitamin B12 deficiency usually occurs in the context of other classical neurological features (peripheral neuropathy and posterior column findings). Macrocytosis and megaloblastic anemia may be absent.

Dementia with hypothyroidism occurs in the setting of severe thyroid deficiency. Rarely do cognitive symptoms occur without classical systemic features, including apathy, fatigue, constipation, and delayed relaxation phase of tendon reflexes.

Dementia due to neurosyphilis typically occurs 15 to 30 years after acute exposure. Prominent behavioral disturbances such as delusions, emotional lability, hallucinations, and mania are early signs of dementia.

In dementia due to normal pressure hydrocephalus, a gait disturbance is prominent early in the course of the dementia. This gait disturbance is characterized by short steps and poor turning ability. Patients may report that they feel that their feet are stuck to the floor, i.e., “magnetic gait.” Urinary incontinence is variably expressed, but supports the diagnosis. Psychosis is rare.

The toxic causes of dementia include chronic alcohol use.
Several factors may contribute to worsening cognition including medications, depression and systemic illness. In some cases they may be confused with a dementia. It is important to consider these factors in all patients with a dementia or other cognitive decline.

In your medication review, hypnotics, narcotics, anticholinergics, antihistamines, antipsychotics, and steroids are important classes to consider as potential causes.

With respect to depression:
• Older adults present atypically, often with multiple somatic complaints rather than mood complaints
• Self reported complaints of memory loss often exceed objectively measured deficits
• Language and motor skill usually remain intact
• Routine screening for depression is indicated in patients presenting with cognitive complaints

Virtually any systemic illnesses can worsen cognitive problems. Common systemic illnesses include anemia, electrolyte abnormalities, uremia and other causes associated with delirium.
### Laboratory Tests

<table>
<thead>
<tr>
<th>Routine</th>
<th>Special Cases</th>
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</thead>
<tbody>
<tr>
<td>➢ TSH level</td>
<td>➢ Serologic test for syphilis</td>
</tr>
<tr>
<td>➢ Vitamin B12 levels</td>
<td>➢ Lumbar puncture</td>
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<tr>
<td>➢ Complete blood cell count</td>
<td>➢ HIV testing</td>
</tr>
<tr>
<td>➢ Liver-function tests</td>
<td>➢ Others</td>
</tr>
<tr>
<td>➢ Electrolytes (include calcium)</td>
<td></td>
</tr>
<tr>
<td>➢ BUN / creatinine</td>
<td></td>
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<tr>
<td>➢ Glucose</td>
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After considering the clinical features, laboratory testing can aid in the differential diagnosis. They can help identify specific treatable diseases that cause dementia and systemic illnesses that might contribute to a patient’s problems with cognition.

Examples of routine tests that are recommended in all patients include:

- Thyroid stimulating hormone level, vitamin B12 levels, complete blood cell count, liver-function tests, serum electrolytes (include calcium), BUN / creatinine, and glucose.

Certain diagnostic tests, although not recommended in the routine evaluation, may be warranted in some patients:

- A serologic test for syphilis, once considered routine, is now recommended only in persons with appropriate risk factors or persons living in high incidence areas.
- A lumbar puncture is indicated in persons with a short duration of cognitive disturbance or evidence of meningitis, fever, metastatic cancer, positive treponemal antibody, or history of hydrocephalus.
- HIV testing should be done for patients with the appropriate risk factors.
- Finally, depending on the circumstances other tests may be selected, including tests for heavy metals, lyme titer, or ESR (for vasculitis).
In addition to laboratory testing, brain imaging is also used to identify specific treatable causes of dementia such as a subdural hematoma, hydrocephalus, or a brain tumor, or when vascular causes are being considered. Imaging is not necessary for every person, especially someone with a long, slow progressive course without neurological deficits.

Consider imaging when:
• The person is under 60 years.
• Neurological signs or symptoms such as abnormal reflexes, abnormal motor tone or strength, hemisensory loss, gait disorder, or seizures are found.
• A rapid decline is noted, from weeks to months rather than months to years. This increases the likelihood of an underlying treatable condition.
When choosing the imaging procedure:

- A MRI is more sensitive for ischemia, infarction and subcortical or brain stem pathology. It is the best test to order for patients with focal neurological signs in whom you are considering vascular causes.
- A CT is likely to be adequate to search for mass lesions, hydrocephalus, a recent cerebral hemorrhage, or when an imaging procedure is being done to explain an atypical course.
Key Points

- Dementia is acquired and affects daily life
- Impairments in many higher brain functions
- Search for reversible causes

Key points to remember are that dementia is an acquired syndrome of decline in memory, and in at least one other cognitive area, sufficient to affect daily life in an alert person.

Impairments in language, motors skills, sensory recognition, judgment and planning are typical cognitive findings in patients with dementia.

It is important to search for an underlying diagnosis, especially potentially reversible or arrestable causes.
Resources