



Neurology II-2

Dementia

Dementia is an acquired, generalized, and usually progressive impairment of cognitive function.

Normal aging may be associated with minor alterations in neurologic function and with neuroanatomic changes, such as enlargement of cerebral ventricles and cortical sulci seen on computed tomography (CT) or magnetic resonance imaging (MRI) scans.

Mild cognitive impairment (MCI)

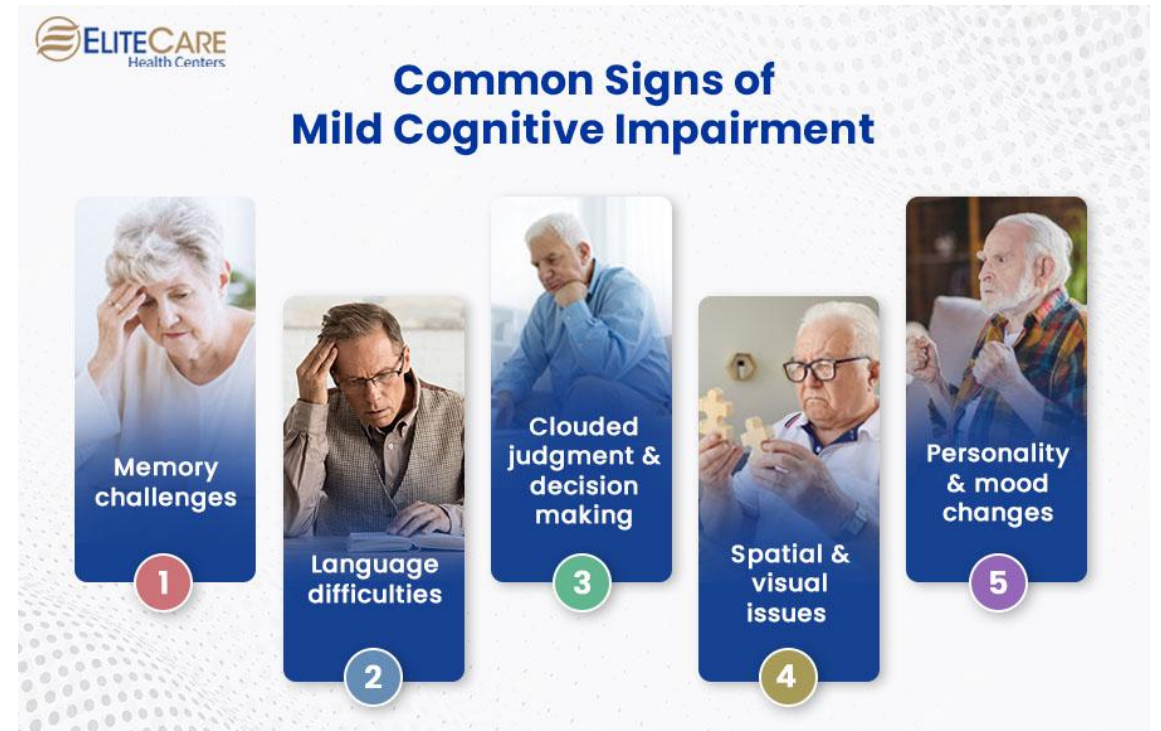
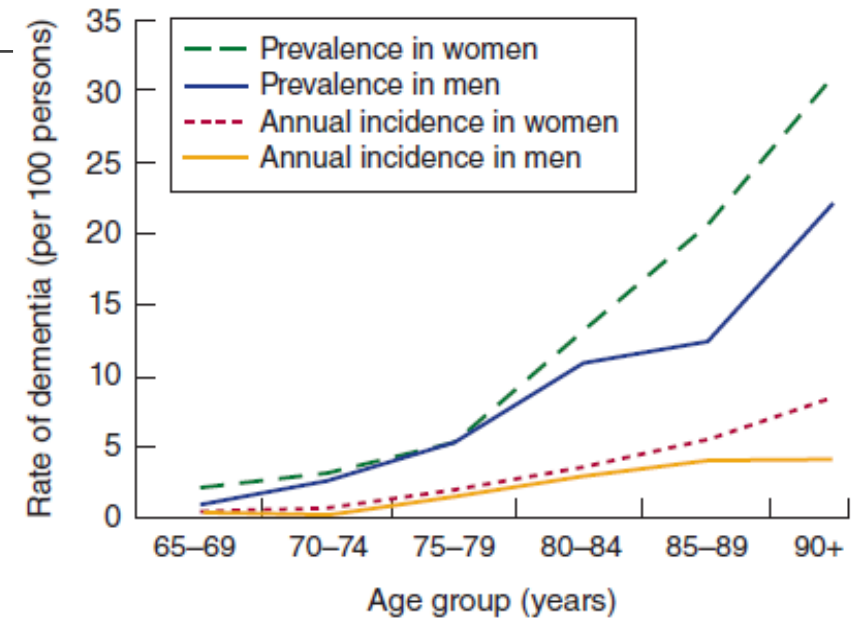


Table 5-1. Neurologic Changes in Normal Aging.

Cognitive
Slowed information processing
Impaired learning and recall of new information
Reduced spontaneous word finding and verbal fluency
Increased reaction time
Neuro-ophthalmologic
Small, sluggishly reactive pupils
Impaired upgaze
Impaired convergence
Motor
Atrophy of intrinsic hand and foot muscles
Increased muscle tone
Flexion (stooped) posture
Small-stepped or broad-based gait
Sensory
Reduced visual acuity
Reduced auditory acuity
Reduced gustatory acuity
Reduced olfactory acuity
Reduced vibration sense
Reflexes
Primitive reflexes
Absent abdominal reflexes
Absent ankle reflexes



▲ **Figure 5-1.** Relationship between advancing age and incidence and prevalence of dementia. (Used with

Table 5-2. Differences Between Acute Confusional States and Dementia.

Feature	Acute Confusional State	Dementia
Level of consciousness	Impaired	Not impaired, except occasionally late in course
Course	Acute to subacute; fluctuating	Chronic; steadily progressive
Autonomic hyperactivity	Often present	Absent
Prognosis	Usually reversible	Usually irreversible ¹

HISTORY

Because dementia implies deterioration in cognitive ability, it is important to establish that the patient's level of functioning has declined.

Course of deterioration; associated symptoms such as headache, gait disturbance, or incontinence; family history.

Medical illnesses; and the use of alcohol and therapeutic or recreational drugs

Table 5-3. Clinical Features Helpful in the Differential Diagnosis of Dementia.

Feature	Most Suggestive of
History	
Unprotected sexual intercourse, intravenous drug abuse, hemophilia, or blood transfusions	HIV-associated dementia
Family history	Huntington disease, Wilson disease
Headache	Brain tumor, chronic subdural hematoma
Vital signs	
Hypothermia	Hypothyroidism
Hypertension	Vascular dementia
Hypotension	Hypothyroidism
Bradycardia	Hypothyroidism

GENERAL PHYSICAL EXAMINATION

Meningismus, Jaundice, Kayser–Fleischer rings

General examination	
Meningismus	Chronic meningitis
Jaundice	Acquired hepatocerebral degeneration
Kayser–Fleischer rings	Wilson disease
Mental status examination	
Prominent memory loss	Alzheimer disease
Aphasia	Frontotemporal dementia (semantic dementia, progressive nonfluent aphasia)
Hallucinations	Lewy body disease
Cranial nerves	
Papilledema	Brain tumor, chronic subdural hematoma
Argyll Robertson pupils	Neurosyphilis
Ophthalmoplegia	Progressive supranuclear palsy
Pseudobulbar palsy	Vascular dementia, progressive supranuclear palsy

MENTAL STATUS EXAMINATION

The mental status examination helps to determine whether the level or the content of consciousness is impaired and whether cognitive dysfunction is global or circumscribed.

These include memory, language, parietal lobe functions (pictorial construction, right–left discrimination, localization of objects in space), and frontal lobe or diffuse cerebral cortical functions (judgment, abstraction, thought content, the ability to perform previously learned acts).

Table 5-5. Minimental Status Examination.

Item	Points ¹
Orientation	
Time (1 point each for year, season, month, date, and day of the week)	5
Place (1 point each for state, county, city, building, and floor or room)	5
Registration	
Repeat names of three objects (1 point per object)	3
Attention and calculation	
Serial 7s or spell "world" backward (1 point per subtraction or letter)	5
Recall	
Recall names of three objects repeated previously (1 point per object)	3
Language	
Name pencil and watch (1 point each)	2
Repeat "no ifs, ands, or buts"	1
Follow three-step command (1 point per step)	3
Read and follow: "close your eyes"	1
Write a complete sentence	1
Construction	
Copy two intersecting pentagons	1
Total	30

¹A total score of < 24 should generally lead to more detailed investigation of the possibility of dementia, although norms vary to some extent with age and education.

Table 5-4. Comprehensive Mental Status Examination.

Level of consciousness
Arousability Orientation Attention Concentration
Language and speech
Comprehension Repetition Fluency Naming Reading Writing Calculation Speech

NEUROLOGIC EXAMINATION

Certain disorders that produce dementia also affect vision, coordination, or motor or sensory function. Detecting such associated neurologic abnormalities can help to establish an etiologic diagnosis.

Mood and behavior

Mood
Content of thought
Hallucinations
Delusions
Abstraction
Judgment

Memory

Immediate recall
Recent memory
Remote memory

Integrative sensory function

Astereognosis
Agraphesthesia
Two-point discrimination
Allesthesia
Extinction
Unilateral neglect and anosognosia
Disorders of spatial thought

Integrative motor function

Apraxia

Motor	
Limb apraxia	Corticobasal degeneration
Tremor	Lewy body disease, corticobasal degeneration, acquired hepatocerebral degeneration, Wilson disease, HIV-associated dementia
Asterixis	Acquired hepatocerebral degeneration
Myoclonus	Creutzfeldt-Jakob disease, HIV-associated dementia
Rigidity	Lewy body disease, corticobasal degeneration, acquired hepatocerebral degeneration, Creutzfeldt-Jakob disease, progressive supranuclear palsy, Wilson disease
Chorea	Huntington disease, Wilson disease
Other	
Gait apraxia	Normal-pressure hydrocephalus
Hyporeflexia (from associated polyneuropathy)	Neurosyphilis, vitamin B ₁₂ deficiency, HIV-associated dementia

LABORATORY INVESTIGATIONS

Laboratory studies that can help to identify the cause of dementia are listed here:

Table 5-6. Laboratory Studies in Dementia.

Test	Most Useful In Diagnosis of
Blood	
Hematocrit, mean corpuscular volume (MCV), peripheral blood smear, vitamin B ₁₂ level	Vitamin B ₁₂ deficiency
Thyroid function tests	Hypothyroidism
Liver function tests	Acquired hepatocerebral degeneration, Wilson disease
Ceruloplasmin, copper	Wilson disease
FTA or MHA-TP	Neurosyphilis
Cerebrospinal fluid	
VDRL	Neurosyphilis
Cytology	Leptomeningeal metastases
14-3-3 protein	Creutzfeldt-Jakob disease
Aβ42, tau, phospho-tau	Alzheimer disease
HIV mRNA	HIV-associated dementia
CT scan or MRI	Brain tumor, chronic subdural hematoma, vascular dementia, normal-pressure hydrocephalus, Alzheimer disease, frontotemporal dementia
PET Scan	Alzheimer disease
EEG	Creutzfeldt-Jakob disease

DIFFERENTIAL DIAGNOSIS

A wide variety of diseases can produce dementia, but only a few do so commonly. In its most typical presentation— with gradual cognitive decline in an elderly (≥ 65 years) patient—the most common causes of dementia are Alzheimer disease, vascular (formerly “multi-infarct”) dementia, frontotemporal dementia, Lewy body disease, and Parkinson disease.

ALZHEIMER DISEASE

Alzheimer disease is the most common cause of dementia, accounting in whole or part for an estimated 60% to 70% of cases.

Alzheimer disease is defined by characteristic histopathologic features, especially neuritic (senile) plaques and neurofibrillary tangles.

Risk Factors

The factors most conclusively associated with increased risk for Alzheimer disease are increasing age, female sex, and *APOE4* genotype.

Definitive evidence that the risk of Alzheimer disease can be reduced by diet, drugs, or lifestyle changes is lacking.

However, cognitive engagement, physical activity, a low-fat and vegetable-rich diet, and light to moderate alcohol intake are all supported by some data.

Clinical Findings

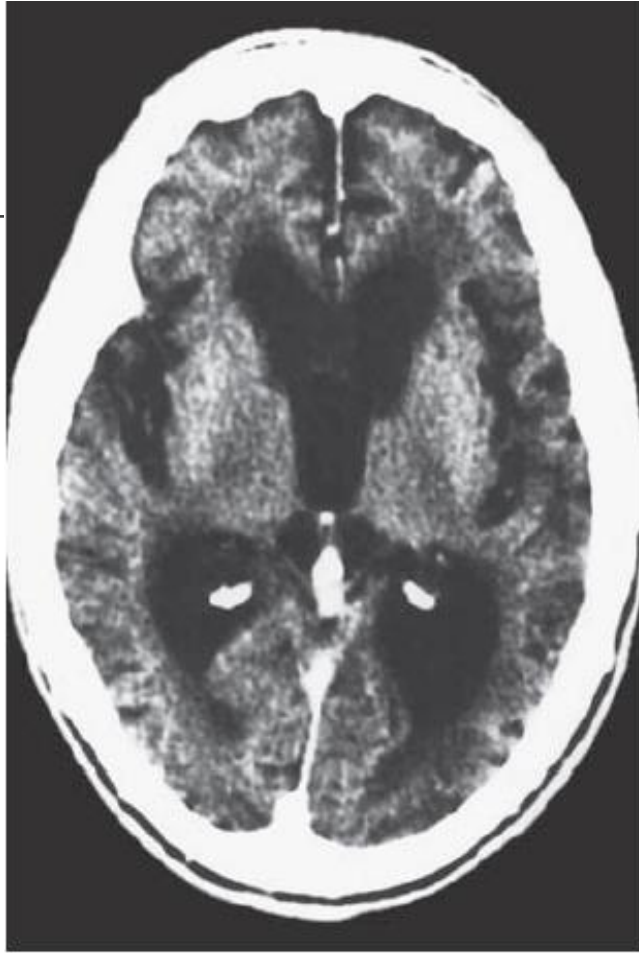
1. **Early manifestations**—The term **mild cognitive impairment (MCI)** is sometimes used to describe the early phase of cognitive decline observed in patients who later receive a diagnosis of Alzheimer disease.
2. **Late manifestations**—In the late stages, previously preserved social graces are lost, and psychiatric symptoms, including psychosis with paranoia, hallucinations, or delusions, may be prominent.

Investigative Studies

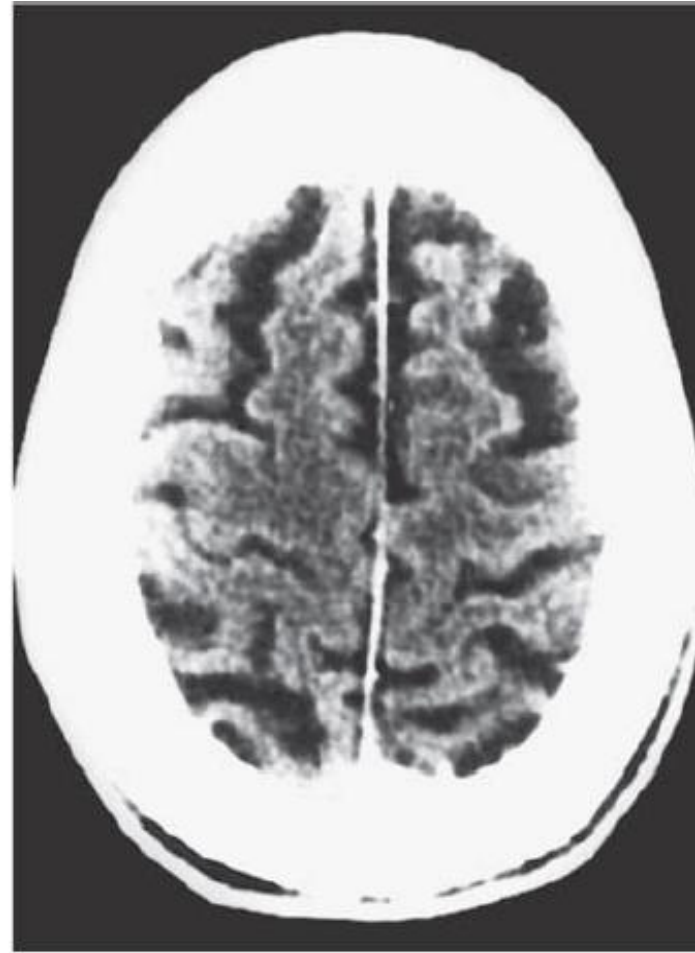
Laboratory investigations can exclude other disorders, including reversible or otherwise treatable conditions.

Cognitive testing may also be useful in helping to distinguish between Alzheimer disease and other causes of dementia.

In patients with Alzheimer disease, the CT scan or MRI often shows cortical (especially medial temporal lobe) atrophy and enlarged ventricles, but such changes are nonspecific.



A



B

5-2. CT scan in cerebrocortical atrophy, showing ventricular dilation (A) and prominent cortical sulci (B).

Differential Diagnosis

Early Alzheimer disease may resemble depression or pure memory disorders such as the Korsakoff amnestic syndrome. More advanced Alzheimer disease must be distinguished from Lewy body dementia, vascular dementia, Creutzfeldt-Jakob disease, and other dementing disorders.

Treatment

No currently available treatment has been shown to reverse existing deficits or to arrest disease progression.

However, **memantine**, an NMDA-type glutamate receptor antagonist drug, may produce modest improvement in patients with moderate or severe Alzheimer disease.

Cholinergic replacement therapy has also been used for symptomatic treatment of cognitive dysfunction.

Antipsychotic drugs, antidepressants, and anxiolytics may be useful in controlling behavioral disturbances associated with Alzheimer disease.

Prognosis

Early in the course of the disease, patients can usually remain at home and continue social, recreational, and limited professional activities.

Patients in advanced stages of the disease may require care in a nursing facility and the use of psychoactive medications. These patients must be protected and prevented from injuring themselves and their families by injudicious actions or decisions.

Death from inanition or infection generally occurs 5 to 10 years after the first symptoms.