CONDITION

Alzheimer disease

Learn how Alzheimer disease affects memory and thinking, how it is diagnosed, and which treatments, safety steps, and support options may help.

WHAT IT IS
Progressive brain disorder causing dementia

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Memory loss, thinking problems, language difficulty, behavior changes

WHAT CAUSES IT
Unknown, sometimes inherited

HOW IT IS DIAGNOSED
Cognitive evaluation and amyloid or tau biomarker testing

MAIN TREATMENT
Medicines, supportive care, safety measures

CAN IT BE CURED?
No, treatment does not reverse it

IS IT AN EMERGENCY?
Sometimes, sudden severe confusion

LONG-TERM OUTLOOK
Progressive decline with increasing care needs

Overview

Alzheimer disease is a progressive brain disorder that affects memory, thinking, behavior, and the ability to manage daily life. It is the most common cause of dementia. Dementia is a general term for problems with thinking and memory that are serious enough to interfere with everyday activities.

Alzheimer disease is not a normal part of aging. Occasional forgetfulness can happen at any age, especially during stress, illness, poor sleep, or medication changes. Alzheimer disease causes ongoing decline that becomes more noticeable over time.

Changes in the brain often begin years before symptoms appear. Two important changes are the buildup of beta-amyloid protein into plaques and abnormal forms of tau protein into tangles. These changes damage connections between nerve cells. Over time, brain cells stop

working and die.

Some people first develop mild cognitive impairment, or MCI. This means they have measurable changes in memory or thinking but can still complete most daily activities independently. Not everyone with MCI has Alzheimer disease, and not everyone with MCI progresses to dementia.

As Alzheimer disease advances, people may need help with finances, medicines, transportation, personal care, eating, and safety. Early evaluation matters because other medical problems can cause similar symptoms. An early diagnosis can also give the person and family more time to discuss treatment, support, legal planning, and future care preferences.

Symptoms

Symptoms usually begin gradually and worsen over months or years. The pattern differs from person to person.

Memory loss is often an early symptom. A person may repeat questions, forget recent conversations, miss appointments, or depend more on notes and family reminders. Older memories may remain clear at first.

Other possible symptoms include:

Later symptoms may include confusion about time and place, difficulty recognizing familiar people, changes in walking, loss of bladder or bowel control, and the need for help with dressing, bathing, and eating.

Behavioral symptoms can occur at any stage. These may include anxiety, irritability, depression, agitation, suspiciousness, hallucinations, or sleep disruption. Pain, constipation, infection, medication effects, hunger, noise, or an unfamiliar setting can worsen these symptoms.

A sudden change is not typical of Alzheimer disease progression. New confusion developing over hours or days may be delirium, which can be caused by infection, dehydration, medication effects, or another medical problem. It needs prompt medical assessment.

Call emergency services for sudden facial weakness, arm weakness, trouble speaking, a severe new headache, loss of consciousness, a seizure, serious injury, or sudden severe confusion. These symptoms can have causes other than Alzheimer disease and should not be assumed to be part of dementia.

- Difficulty planning, organizing, paying bills, or following a recipe
- Trouble finding words or following a conversation

- Becoming lost in familiar places
- Problems judging distance, recognizing objects, or navigating
- Misplacing items and being unable to retrace steps
- Poor judgment, such as unsafe spending or driving decisions
- Withdrawal from work, hobbies, or social activities
- Changes in mood, sleep, personality, or motivation

Causes and risk factors

The exact reason Alzheimer disease develops is not fully understood. Most cases result from a combination of age-related brain changes, genetics, health conditions, and environmental or lifestyle factors.

Increasing age is the strongest known risk factor, but age alone does not cause Alzheimer disease. Family history can also affect risk. The APOE gene has several forms. One form, called APOE-e4, raises the likelihood of developing Alzheimer disease, but it does not make the disease certain. Many people with APOE-e4 never develop it, while many people without this form do.

Rare inherited changes in the APP , PSEN1 , or PSEN2 genes can cause Alzheimer disease at a younger age. These changes account for only a small portion of cases and often affect several family members across generations. Genetic counseling is important before testing for inherited disease.

People with Down syndrome have a higher risk because the chromosome involved also carries the APP gene.

Other factors associated with a higher risk of cognitive decline or dementia include high blood pressure, diabetes, smoking, limited physical activity, hearing loss, stroke, and traumatic brain injury. These factors do not prove that a person will develop Alzheimer disease. Treating cardiovascular conditions, staying physically and socially active, addressing hearing loss, and avoiding tobacco support overall brain and heart health.

Diagnosis

There is no single office test that diagnoses every case. Evaluation usually combines the person's history, information from someone who knows them well, cognitive testing, a physical and neurological examination, laboratory tests, and brain imaging.

The clinician will ask when symptoms began, how they have changed, and whether they interfere with work, finances, driving, medicine use, cooking, or personal care. A trusted family member or friend can often provide useful observations.

Brief tests may assess memory, attention, language, problem-solving, and visual-spatial skills. More detailed neuropsychological testing may help identify the pattern and severity of changes, especially when symptoms are mild or the diagnosis is uncertain.

The medical review may look for other causes or contributors, including:

Blood tests are selected according to the person's history and examination. MRI or CT imaging can identify strokes, tumors, fluid buildup, or other structural problems. Imaging can also show patterns of brain shrinkage, although these patterns are not enough to confirm Alzheimer disease by themselves.

Specialized tests can look for amyloid and tau changes. These include cerebrospinal fluid testing, amyloid PET scans, and certain blood biomarker tests. Availability and insurance coverage vary. Blood biomarkers are developing quickly, but results require careful interpretation and may need confirmation. Biomarker testing is particularly important before considering treatments that target amyloid.

Routine genetic testing is not needed for most people. It may be considered when symptoms begin unusually early or when the family history suggests a rare inherited form. Testing APOE does not diagnose Alzheimer disease, although it can help estimate treatment-related risks for some anti-amyloid medicines.

- Depression, anxiety, grief, or severe stress
- Sleep apnea or other sleep disorders
- Medication or substance effects
- Thyroid disease or vitamin B12 deficiency
- Hearing or vision problems
- Stroke, brain injury, seizures, or another neurological condition
- Delirium from an acute illness

Treatment and management

There is currently no treatment that reverses Alzheimer disease. Care focuses on supporting function, treating symptoms, reducing safety risks, and helping caregivers. Some medicines can slow decline in selected people or temporarily improve certain symptoms.

Donepezil, rivastigmine, and galantamine are cholinesterase inhibitors. They affect a brain chemical involved in memory and communication. Memantine works through a different brain signaling system and is generally used in moderate to severe disease. These medicines may provide modest benefits for thinking or daily function, but they do not stop the underlying disease. Side effects and benefits should be reviewed regularly.

Lecanemab and donanemab are anti-amyloid treatments. They are intended for selected people with confirmed brain amyloid who are in the mild cognitive impairment or mild dementia stage of Alzheimer disease. Clinical trials found that they slowed decline over the study period; they did not restore lost memory or prevent future progression.

These medicines are given by intravenous infusion and require specialist assessment. They can cause amyloid-related imaging abnormalities, known as ARIA. ARIA may involve temporary brain swelling or small areas of bleeding. It often causes no symptoms, but it can sometimes be serious. MRI monitoring is required. APOE-e4 status, blood-thinning medicines, existing brain bleeding, and other health factors may affect risk and should be discussed with the treating team.

Non-drug care remains important at every stage. Helpful approaches may include:

Behavioral symptoms should first be assessed for triggers such as pain, infection, constipation, poor sleep, overstimulation, or an unfamiliar environment. Calm communication and environmental changes may help. Medication may be considered when symptoms are severe or create a risk of harm, but some medicines-especially antipsychotics like olanzapine or risperidone -can cause serious adverse effects in older adults with dementia. Decisions should be individualized and reviewed often.

Driving ability should be reassessed as symptoms progress. Warning signs include getting lost, new dents, near misses, delayed reactions, or confusion at intersections. Planning for transportation before driving becomes unsafe can make the transition easier.

Advance care planning is also part of treatment. While the person can still participate fully, they may wish to document health care preferences, choose a medical decision-maker, review finances, and discuss future living arrangements.

- A predictable daily routine with simple instructions
- Regular physical activity suited to the person's ability
- Social contact and meaningful, familiar activities
- Treatment of hearing, vision, sleep, pain, and dental problems
- Pill organizers or supervised medicine administration

- Home safety changes, including fall and wandering precautions
- Support and respite care for family caregivers

Complications

Progressive problems with judgment, movement, and self-care can lead to falls, burns, medication errors, financial exploitation, wandering, or unsafe driving.

Eating and swallowing may become difficult in later stages. This can contribute to weight loss, dehydration, choking, or aspiration pneumonia, which occurs when food or liquid enters the lungs. Reduced mobility can also increase the risk of pressure injuries, blood clots, constipation, and infections.

People with Alzheimer disease are vulnerable to delirium during illness, surgery, hospitalization, or major changes in surroundings. Delirium can cause a sudden decline in attention and alertness. It is different from the gradual progression of dementia and requires medical evaluation.

Caregiving can affect sleep, work, finances, and physical and emotional health. Caregiver stress is a health issue, not a personal failure. Respite services, support groups, social workers, home health services, and community aging agencies may help.

Follow up

Routine follow-up is used to review changes in memory, daily function, mood, behavior, sleep, mobility, nutrition, and caregiver needs. The clinician may also review medicine benefits and side effects, driving, home safety, advance care plans, and whether more support is needed.

Arrange an earlier appointment for a noticeable but gradual decline, repeated falls, weight loss, new swallowing trouble, increasing wandering, major sleep changes, or behavior that is becoming difficult to manage.

Seek prompt medical care for confusion that appears suddenly, fever, new weakness, repeated vomiting, dehydration, a significant fall, or a sudden inability to walk or communicate.

Call emergency services for stroke symptoms, a seizure, loss of consciousness, severe breathing difficulty, serious head injury, or behavior that creates an immediate danger to the person or others.

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