

# Background on Alzheimer's Disease

## About Dementia

Dementia is a general term for a group of brain disorders, of which Alzheimer's disease is the most common. Alzheimer's disease accounts for 50 to 70 percent of all dementia cases. Other types include vascular dementia, mixed dementia, dementia with Lewy bodies, and frontotemporal dementia. All types of dementia involve mental decline that:

- impairs normal functioning (for example, the person didn't always have a poor memory);
- is severe enough to interfere with usual activities and daily life;
- and affects more than one of the following core mental abilities:
  1. recent memory (the ability to learn and recall new information)
  2. language (the ability to write or speak, or to understand written or spoken words)
  3. visuospatial function (the ability to understand and use symbols, maps, etc., and the brain's ability to translate visual signs into a correct impression of where objects are in space)
  4. executive function (the ability to plan, reason, solve problems, and focus on a task).

## About Alzheimer's Disease

Alzheimer's disease is named for the German physician Alois Alzheimer, who first described the disorder in 1906. Scientists have learned a great deal about this condition in the century since Dr. Alzheimer first drew attention to it. Today we know that Alzheimer's disease:

- **is a progressive and fatal brain disease.** It destroys brain cells, interfering with memory, thinking, and behavior severely enough to affect a person's work, hobbies, and social life. Alzheimer's disease gets worse over time and is fatal.
- **currently has no cure.** But treatments for symptoms, combined with the right services and support, can make life better for the millions of Americans who live with Alzheimer's disease. We've learned most of what is known about Alzheimer's disease in the last fifteen years, and an accelerating worldwide effort is under way to find better methods of treating the disease, delaying its onset, and preventing it from developing.

Today more than five million people in the United States are living with Alzheimer's disease. That number has doubled since 1980 and is expected to be as high as sixteen million by 2050. The direct and indirect costs of Alzheimer's disease and other dementias amount to more than \$148 billion annually. According to a 2004

report that analyzed Medicare claims data, beneficiaries with dementia cost Medicare three times more than other older beneficiaries. Based on current estimates, these costs will double every ten years.

## Changes in the Brain

Just like the rest of our bodies, our brains change as we age. Most of us notice some slowed thinking and occasional problems remembering certain things. But serious memory loss, confusion, and other major changes in the way our minds work are not a normal part of aging. These symptoms may be a sign that brain cells are failing.

The brain has a hundred billion nerve cells, or neurons. Each nerve cell communicates with many others to form networks. Nerve-cell networks have special jobs: some are involved in thinking, learning, and remembering; others help us see, hear, and smell; and others tell our muscles when to move.

To do their work, brain cells operate like tiny factories, taking in supplies, generating energy, constructing equipment, and getting rid of waste. Cells also process and store information. Keeping everything running requires coordination and large amounts of fuel and oxygen. In a brain affected with Alzheimer's disease,

parts of the cells' factories stop running well. It is not known exactly where the trouble starts, but, as in a real factory, backups and breakdowns in one system cause problems in other areas. As damage spreads, cells lose their ability to do their jobs correctly. Eventually they die.

## Plaques and Tangles

Plaques and tangles — abnormal structures that can develop in the brain — are prime suspects in the damage and death of nerve cells. These were among the abnormalities that Dr. Alzheimer noticed in his patients, although he had different names for them.

Plaques build up between nerve cells. They contain deposits of beta-amyloid, a protein fragment. Tangles, which form inside dying cells, are twisted fibers of tau, another protein.

Although most people develop some plaques and tangles as they age, those with Alzheimer's disease tend to develop far more. These plaques and tangles tend to form in a predictable pattern, beginning in areas important for learning and memory and then spreading to other regions.

Scientists researching Alzheimer’s disease are not absolutely sure what role plaques and tangles play. Most believe that they somehow block communication among nerve cells and disrupt the activities that the cells need to survive.

## Stages

Staging systems provide useful frames of reference for understanding how the disease may unfold. It is important to note, though, that not everyone will experience the same symptoms or progress at the same rate. On average, people with Alzheimer’s disease die four to six years after diagnosis, but the duration of the disease can vary from three to twenty years.

Patients are first diagnosed with problems related to memory, thinking, and concentration. Individuals in the early stage typically need minimal assistance with simple daily routines. (At the time of first diagnosis, an individual may have progressed beyond this stage; “early stage” refers to the extent of the disease’s progress.)

The term “early onset” or “young onset” indicates Alzheimer’s disease in a person under the age of sixty-five. Early-onset individuals may be employed or have children still living at home. Among the issues affected families must face are ensuring financial security, obtaining benefits, and helping children

cope with the disease. People who have early-onset dementia may be in any stage of the condition — early, middle, or late. It is estimated that some five hundred thousand people in their thirties, forties, and fifties have Alzheimer’s disease or a related dementia.

## Common Effects of Alzheimer’s Disease

Some change in memory is normal as we grow older, but the effects of Alzheimer’s disease are more severe than simple lapses. They include difficulties with communicating, learning, thinking, and reasoning — impairments severe enough to have an impact on an individual’s work, social activities, and family life in the early and middle stages. Some of the most common effects that people with dementia and Alzheimer’s disease experience are:

- **memory loss.** Forgetting recently learned information is one of the most common early signs of dementia. Some people may begin to forget more and more often or be unable to recall information at a later time.
- **difficulty performing familiar tasks.** Some may find it hard to plan or complete everyday tasks. They may lose track of the steps involved in preparing a meal, placing a telephone call, or playing a game.

- **problems with language.** They may forget simple words or make unusual substitutions, making their speech or writing hard to understand. They may be unable to find their toothbrush, for example, and ask for “that thing for my mouth.”
- **disorientation.** Some may become lost in their own neighborhood, forget where they are and how they got there, and not know how to return home.

- **loss of initiative.** Some people may become very passive, sitting in front of the television for hours, sleeping more than usual, or not wanting to take part in their usual activities.

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- **poor or decreased judgment.** They may dress inappropriately, for example, wearing several layers on a warm day or little clothing on a cold one; they may be easily deceived.
- **problems with abstract thinking.** Some people may have unusual difficulty performing complex mental tasks, such as remembering what numbers are for and how they should be used.
- **misplaced things.** Some people may put things in unusual places: an iron left in the freezer or a wristwatch in the sugar bowl.
- **changes in mood or behavior.** Rapid mood swings—from calm to tears to anger—for no apparent reason are common.
- **changes in personality.** The personalities of people with dementia can change dramatically. They may become extremely confused, suspicious, fearful, or dependent on a family member.







