

Alzheimer/Dementia Disease – Overview

In 2015 the total estimated worldwide cost of dementia was approximately \$818 billion, which represents 1.09% of global Gross Domestic Product (GDP). In 2018 the global cost of dementia rose above a trillion dollars in the United States.

More than 5 million Americans are living with Alzheimer's, a number that could triple by 2050. Every 68 seconds, someone is diagnosed with this devastating disease, which is the sixth-leading cause of death in the United States. In community settings there are 16.1 million Americans providing an estimated 18.4 billion hours of unpaid care for a person with Alzheimer's or other dementias.

Caring for someone with any form of dementia can be physically and emotionally draining. A breaking point can sneak up on even the most committed caregiver. The person with dementia may not remember his or her name or address and become disoriented, even in familiar places. Individuals with Alzheimer's tend to pace, six in ten people with dementia will wander off. The average life span of Alzheimer's disease is seven years and it can last as long as 20 years with increasingly challenging care issues. The disease can manifest in a person by becoming violent or cause a public disturbance.

Dementia care requires constant adjustments. New challenges arise, meaning that a caregiver must be constantly observant to behavioral changes. Persuasion may be necessary to bathe, dress or eat a meal. He or she may become very obsessive about safety, constantly checking doors and windows, and wanting to take out the garbage, only to go outside and forget how to get back inside.

Alzheimer's disease is a type of dementia (a general term used to describe various diseases and conditions that damage brain cells). Alzheimer's disease accounts for 60 to 80 percent of dementia.

- * A progressive brain disorder that damages and eventually destroys brain cells
- * Leads to memory loss and changes in thinking and reasoning skills
- * It usually develops slowly and gradually gets worse as brain function declines
- * Ultimately, Alzheimer's is fatal, and currently, there is no cure

RISK FACTORS: A healthy lifestyle can help reduce the risk of Alzheimer's disease and other dementias. It has been estimated that up to half the cases of Alzheimer's disease worldwide may be the result of key modifiable risk factors such as: diabetes, high blood pressure, obesity, smoking, depression, cognitive inactivity or low education, and physical inactivity.

AGE: The greatest known risk factor for Alzheimer's is advancing age. For example, 1:9 people age 65 or older has a diagnosis of Alzheimer's, nearly 1:3 people age 85 or older has the disease. One of the greatest mysteries of Alzheimer's disease is why risk rises so dramatically as we grow older.

FAMILY HISTORY: Another strong risk factor is family history. Those who have a parent, brother, sister or children with Alzheimer's are more likely to develop the disease. The risk

increases if more than one family member has the illness. When diseases tend to run in families, either heredity (genetics) or environmental factors, or both, may play a role.

GENETICS (HEREDITY): Scientists know genes are involved in Alzheimer's. There are two types of genes that can play a role in affecting whether a person develops a disease—risk genes and deterministic genes. Alzheimer's genes have been found in both categories. Risk genes increase the likelihood of developing a disease, but do not guarantee it will happen (APOE-E4). Deterministic genes directly cause a disease, guaranteeing that anyone who inherits them will develop the disorder. (APP) (PS-1) (PS-2). Scientists have identified factors that increase the risk of Alzheimer's. The most important risk factors—age, family history and heredity—can't be changed, but evidence suggests there may be other factors we can influence.

HEAD TRAUMA: There may be a strong link between serious head injury and future risk of Alzheimer's, especially when trauma occurs repeatedly or involves loss of consciousness. Protect your brain by buckling your seat belt, wearing your helmet when participating in sports, and “fall-proofing” your home.

HEART-HEAD CONNECTION: Growing evidence links brain health to heart health. Your brain is nourished by one of your body's richest networks of blood vessels. Every heartbeat pumps about 20 to 25 percent of your blood to your head, where brain cells use at least 20 percent of the food and oxygen your blood carries. These connections are linked to high blood pressure, heart disease, stroke, diabetes and high cholesterol. Work with your doctor to monitor your heart health and treat any problems that arise.

GENERAL HEALTHY AGING: Other lines of evidence suggest that strategies for overall healthy aging may help keep your brain as well as your body fit. Try to keep your weight within recommended guidelines, avoid tobacco and excess alcohol, stay socially connected, and exercise both your body and mind.

Signs of Alzheimer's disease:

Memory loss that disrupts daily life may be a symptom of Alzheimer's disease. There are a few warning signs and symptoms that every individual with Alzheimer's disease may experience one or more of these signs in a different degree.

MEMORY LOSS THAT DISRUPTS DAILY LIFE - One of the most common signs of Alzheimer's is memory loss, especially forgetting recently learned information. Others include forgetting important dates or events; asking for the same information over and over; increasingly needing to rely on memory aids (e.g., reminder notes or electronic devices) or family members for things they used to handle on their own.

CHALLENGES IN PLANNING OR SOLVING PROBLEMS - Some people may experience changes in their ability to develop and follow a plan or work with numbers. They may have trouble following a familiar recipe or keeping track of monthly bills. They may have difficulty concentrating and take much longer to do things than they did before.

DIFFICULTY COMPLETING FAMILIAR TASKS AT HOME, AT WORK OR AT LEISURE - People with Alzheimer's often find it hard to complete daily tasks. Sometimes, people may have trouble driving to a familiar location, managing a budget at work or remembering the rules of a favorite game.

CONFUSION WITH TIME OR PLACE - People with Alzheimer's can lose track of dates, seasons and the passage of time. They may have trouble understanding something if it is not happening immediately. Sometimes they may forget where they are or how they got there.

TROUBLE UNDERSTANDING VISUAL IMAGES AND SPATIAL RELATIONSHIPS - For some people, having vision problems is a sign of Alzheimer's. They may have difficulty reading, judging distance and determining color or contrast, which may cause problems with driving.

NEW PROBLEMS WITH WORDS IN SPEAKING OR WRITING - People with Alzheimer's may have trouble following or joining a conversation. They may stop in the middle of a conversation and have no idea how to continue or they may repeat themselves. They may struggle with vocabulary, have problems finding the right word or call things by the wrong name (e.g., calling a "watch" a "hand-clock").

MISPLACING THINGS AND LOSING THE ABILITY TO RETRACE STEPS - A person with Alzheimer's disease may put things in unusual places. They may lose things and be unable to go back over their steps to find them again. Sometimes, they may accuse others of stealing. This may occur more frequently over time.

DECREASED OR POOR JUDGMENT - People with Alzheimer's may experience changes in judgment or decision-making. For example, they may use poor judgment when dealing with money, giving large amounts to telemarketers. They may pay less attention to grooming or keeping themselves clean.

WITHDRAWAL FROM WORK OR SOCIAL ACTIVITIES - A person with Alzheimer's may start to remove themselves from hobbies, social activities, work projects or sports. They may have trouble keeping up with a favorite sports team or remembering how to complete a favorite hobby. They may also avoid being social because of the changes they have experienced.

CHANGE IN MOOD AND PERSONALITY - The mood and personalities of people with Alzheimer's can change. They can become confused, suspicious, depressed, fearful or anxious. They may be easily upset at home, at work, with friends or in places where they are out of their comfort zone.

While symptoms of dementia can vary greatly, at least two of the following core mental functions must be significantly impaired to be considered dementia: Memory, communication and language, ability to focus and pay attention, reasoning and judgment, and visual perception.

Many dementias are progressive, meaning symptoms start out slowly and gradually get worse. Professional evaluation may detect a treatable condition. And even if symptoms suggest

dementia, early diagnosis allows a person to get the maximum benefit from available treatments and provides an opportunity to volunteer for clinical trials or studies. It also provides time to plan for the future.

Dementia is caused by damage to brain cells. This damage interferes with the ability of brain cells to communicate with each other. When brain cells cannot communicate normally, thinking, behavior and feelings can be affected.

The brain has many distinct regions, each of which is responsible for different functions (for example, memory, judgment and movement). When cells in a particular region are damaged, that region cannot carry out its functions normally.

Different types of dementia are associated with particular types of brain cell damage in particular regions of the brain. For example, in Alzheimer's disease, high levels of certain proteins inside and outside brain cells make it hard for brain cells to stay healthy and to communicate with each other. The brain region called the hippocampus is the center of learning and memory in the brain, and the brain cells in this region are often the first to be damaged. That's why memory loss is often one of the earliest symptoms of Alzheimer's.

While most changes in the brain that cause dementia are permanent and worsen over time, thinking and memory problems caused by the following conditions may improve when the condition is treated or addressed: Depression, medication side effects, excess use of alcohol, thyroid problems and vitamin deficiencies.

There is no one test to determine if someone has dementia. Doctors diagnose Alzheimer's and other types of dementia based on a careful medical history, a physical examination, laboratory tests, and the characteristic changes in thinking, day-to-day function and behavior associated with each type. Doctors can determine that a person has dementia with a high level of certainty. But it's harder to determine the exact type of dementia because the symptoms and brain changes of different dementias can overlap. In some cases, a doctor may diagnose "dementia" and not specify a type. If this occurs it may be necessary to see a specialist such as a neurologist or geropsychologist.

Types of Dementia:

Alzheimer's Disease (AD) – AD is the most common type of dementia. It affects memory first and later progresses to affect other cognitive (brain) abilities, such as speech, ability to reason, and movement.

Multi-Infarct Dementia or Vascular Dementia - This type of dementia is often the result of a stroke in which small areas of the brain are irreversibly damaged. Onset of vascular dementia is often sudden. Symptoms depend upon the area of the brain affected, but often memory and other cognitive functions, such as decision-making, are impaired.

Dementia with Lewy Bodies (DLB) - leads to a decrease in cognitive ability, hallucinations, movement problems, and delusions.

Frontotemporal Dementia - this type of dementia affects personality and speech, but not memory.

Diagnosis

1. Biomarkers for earlier detection - that can be measured to accurately and reliably indicate the presence of disease.
2. Brain Imaging/ neuroimaging - standard workup for Alzheimer's disease often includes imaging with magnetic resonance imaging (MRI) or computed tomography (CT). These tests are currently used chiefly to rule out other conditions that may cause symptoms similar to Alzheimer's but require different treatment. Imaging can reveal tumors, evidence of small or large strokes, and damage from severe head trauma or a buildup of fluid in the brain.

Hallmark brain changes of Alzheimer's

Scientists have identified several hallmark Alzheimer's brain abnormalities, including:

- **Plaques**, microscopic clumps of a protein fragment called beta-amyloid
 - **Tangles**, twisted microscopic strands of the protein tau
 - **Loss of connections among brain cells** responsible for memory, learning and communication. These connections, or synapses, transmit information from cell to cell
 - **Inflammation**, triggered by the body's immune system
 - **Eventual death of brain cells** and severe tissue shrinkage
3. Cerebrospinal fluid (CSF) proteins – spinal tap.
 4. Proteins in blood or other parts of the body – still under research
 5. Genetic testing

TREATMENT: FDA-approved drugs

The U.S. Food and Drug Administration (FDA) have approved five medications to treat the symptoms of Alzheimer's disease. These medications temporarily help memory and thinking problems in about half of the people who take them. But these medications do not treat the underlying causes of Alzheimer's.

Drug name	Brand name	Approved For	FDA Approved
1. donepezil	Aricept	All stages	1996
2. galantamine	Razadyne	Mild to moderate	2001
3. memantine	Namenda	Moderate to severe	2003
4. rivastigmine	Exelon	All stages	2000
5. donepezil and memantine	Namzaric	Moderate to severe	2014

Care giver Tips: Research efforts are under way to develop effective treatments and ways to prevent the disease. Researchers are also working to develop better ways to care for affected people and better ways to support their families, friends and caregivers.

Try not to take behaviors personally.

Remain patient and calm.

Explore pain as a trigger.

Don't argue or try to convince.

Accept behaviors as a reality of the disease and try to work through it.

- **Schedule wisely.** Establish a routine to make each day less agitating and confusing. People with Alzheimer's disease can still learn and follow routines. Often it is best to schedule tasks, such as bathing or medical appointments, when the person is most alert and refreshed. Allow some flexibility within the routine for spontaneous activities.
- **Take your time.** Expect things to take longer than they used to. Allow the person with Alzheimer's disease to have frequent breaks. Schedule more time for tasks so that you don't need to hurry him or her.
- **Involve the person.** Allow as much participation as possible with the least amount of assistance. For example, people with Alzheimer's disease might be able to set the table with the help of visual cues or dress independently if you lay out clothes in the order they go on.
- **Provide choices.** Fewer options are better but give the person with Alzheimer's disease choices every day. For example, provide two outfits to choose from, ask if he or she prefers a hot or cold beverage, or ask if he or she would rather go for a walk or see a movie.
- **Provide simple instructions.** People with Alzheimer's disease best understand clear, one-step communication.
- **Reduce distractions.** Turn off the TV and minimize other distractions at mealtime and during conversations to make it easier for the person with Alzheimer's disease to focus.

Behavior:

Many caregivers find changes in behavior caused by dementia to be challenging and distressing effects of the illness. A main cause of behavioral symptoms is the progressive deterioration of brain cells. Medication, environmental influences and some medical condition can cause behavioral symptoms or worsen behavior.

In early stages, people may experience behavior and personality changes such as irritability, anxiety and depression. In later stages, other symptoms may occur including aggression, anger, anxiety, agitation, emotional distress, verbal outburst, physical outbursts, restlessness, pacing, hallucinations, delusions, sleep disorder and sun-downing.

How to Approach Someone with Dementia

For many caregiving tasks, using the following positive approach will help people with dementia to better understand what is going on and reduce anxiety, especially in middle to late stages of dementia.

- **Approach from the front:** This will help people with dementia be aware that someone is coming. Approaching from the back can produce anxiety. In some cases peripheral vision is limited.

- Walk slowly: Allow time for people with dementia to take in that someone is approaching.
- Stand to the side: This is a supportive stance, whereas standing right in front of persons with dementia may feel confrontational to them.
- Call persons with dementia by name: Use their names to get their attention. As dementia progresses, persons may respond best to their first names, as people often remember their given names the best.
- Crouch low: Getting down to the level of the persons with dementia if they are seated or lying down helps them to feel less threatened.
- Offer a hand: Responses to this gesture will give caregivers an idea of whether persons with dementia would welcome further touch, such as hugs. While touch can be reassuring and pleasant, people differ as to whether or not they like to be touched.

Everyone's day goes much more smoothly and is much more enjoyable when working with, rather than against, persons with dementia. The following tips will assist caregivers in gaining the cooperation of care recipients suffering from dementia while allowing them to keep their dignity and autonomy. They will also help to ease the individual's anxiety which in itself can be the cause of one's unwillingness to cooperate.

- Keep instructions short, simple, and concrete. Also use visual and tactile (touch) cues.
- Offer simple choices rather than asking yes or no questions.
- Ask persons with dementia for their help.
- Ask persons with dementia to try.
- Break the task down into simple steps.
- If it does not go well back off, review your approach compared to these guidelines, and try again.

Caregivers are amazing, selfless people who would do anything and everything they can to care for a person with Alzheimer's disease or another form of dementia. However, providing care for people with a dementia diagnosis can be exceptionally draining for caregivers in terms of time, emotions, and effort. Caregivers need support, and as recent studies have shown, support for caregivers greatly improves their quality of life as they provide the day to day care to people with dementia.

Resources:

1. Alzheimers Foundation of America; <https://alzfdn.org/caregiving-resources/>
2. Kaiser Family Foundation: 2019 <https://khn.org/news/learning-to-live-well-with-dementia>
3. Prevention of dementia by targeting risk factors. Mika Kivimäki and Archana Singh-Manoux volume 391, issue 10130. [VOLUME 391, ISSUE 10130](https://doi.org/10.1016/S0140-6736(18)30578-6), P1574-1575, APRIL 21, 2018: [https://doi.org/10.1016/S0140-6736\(18\)30578-6](https://doi.org/10.1016/S0140-6736(18)30578-6)
4. Dementia Care Central: 2019 <https://www.dementiacarecentral.com/assisted-living-home-care-costs>
5. Alzheimer's Association 2019 <https://www.alz.org>