

Alzheimer's Disease and Dementia

Introduction

Dementia is a term that describes a variety of diseases and conditions that develop when nerve cells in the brain (known as neurons) no longer function normally. The death or malfunction of neurons causes changes in memory, behavior, and ability to think clearly. There are many types and forms of dementia, including vascular dementia (caused by a series of strokes or changes in the blood supply to the brain) and dementia due to chronic alcoholism. Alzheimer's disease (AD) is the most common form of dementia, accounting for 60 to 80% of dementia cases (1). Individuals with other forms of dementia may exhibit some of the same signs and symptoms as those with AD.

Alzheimer's disease is characterized by abnormal clumps of amyloid beta clumps (plaques) and neurofibrillary tangles (tau) in the brain (1,2). It is irreversible and is progressive over time, advancing from mild to moderate to severe. Treatment can slow the progression of AD and sometimes help manage symptoms, but there is no cure. Alzheimer's disease often begins with a worsening ability to remember new information. Common symptoms of the stages of AD are listed in the table below (3).

Common Symptoms of Alzheimer's Disease

Mild	Moderate	Severe
<ul style="list-style-type: none"> • Memory loss • Taking longer than normal to accomplish daily tasks • Poor judgment leading to bad decisions • Mood and personality changes, including increased anxiety and/or aggression • Confusion about the location of familiar places • Trouble handling money or paying bills • Loss of spontaneity and sense of initiative 	<ul style="list-style-type: none"> • Increasing memory loss and confusion • Inappropriate outbursts of anger • Difficulty with language • Difficulty organizing thoughts and thinking logically • Restlessness, agitation, anxiety, tearfulness, or wandering • Shortened attention span • Problems recognizing friends and family members • Problems reading, writing, and working with numbers • Inability to learn new things or cope with new situations • Repetitive statements or movements 	<ul style="list-style-type: none"> • Inability to recognize loved ones • Impaired ability to carry out basic functions such as speaking, walking, and swallowing • Skin infections • Lack of bowel and bladder control • Inability to communicate • Weight loss • Increased sleeping

Alzheimer's Disease Facts and Figures

Alzheimer's disease is not a normal part of aging but the risk of developing it increases with age (4). By one estimate, approximately 5.2 million Americans of all ages have Alzheimer's disease (1). This includes about 5 million people ages 65 and older and 200,000 under age 65 who have younger-onset AD (1). One in nine people age 65 and older (11% of the population) has AD, and about one-third of those age 85 and older (32%) have AD (1).

Individuals progress to severe AD at different rates. The time from diagnosis to death varies from as little to 3 or 4 years in older persons to as long as 10 years in those who are younger when diagnosed (5). It is difficult to determine how many people die each year from AD because the cause of death is often listed as pneumonia or another complication of debilitating illness. However, by one estimate, 450,000 people in the U.S. died of AD in 2013 alone (1).

The cost of AD to the United States (U.S.) health care system is significant. In 2013, the direct costs of caring for those with AD totaled an estimated \$203 billion, including \$142 billion to Medicare and Medicaid. Average per-person Medicare costs for those with AD and other forms of dementia are three times higher than for those without these conditions (1).

Diagnosing Alzheimer's Disease (5)

A definitive diagnosis of AD can be made only through autopsy after death by linking clinical measures with an examination of brain tissue. However, health care providers have several tools to help them determine fairly accurately whether a person who is having memory problems has "possible AD" (symptoms may be due to another cause), "probable AD" (no other cause for the symptoms can be found), or some other problem. To diagnose AD, providers ask questions about overall health, past medical problems, ability to carry out daily activities, and changes in behavior and personality. They will also conduct tests of memory, problem solving, attention, counting, and language and may perform brain scans to distinguish AD from other causes of symptoms.

New techniques for diagnosing AD are being studied, including the analysis of body fluids (blood and cerebrospinal fluid) to look for the proteins tau and beta-amyloid which are commonly found in people with the disease. In addition, scientists have developed new imaging systems that may help measure the earliest changes in brain function or structure to identify people in the very first stages of AD well before they develop obvious signs or symptoms (3).

Risk Factors for Alzheimer's Disease

Some risk factors for AD, such as age and genetic profile, can't be controlled. Scientists are studying a number of other factors that could make a difference in preventing the disease. Research suggests that certain lifestyle factors, such as a nutritious diet, exercise, social engagement, and mentally stimulating pursuits, might help to reduce the risk of cognitive decline and AD. Scientists are also investigating associations between cognitive decline and heart disease, hypertension, diabetes, and obesity. Understanding these relationships will help understand whether reducing risk factors for these diseases may help with AD as well. A growing body of evidence suggests that certain dietary components (such as antioxidant nutrients, fish, unsaturated fats, and B-vitamins, and omega-3 fatty acids) may play a protective role in the risks of age-related cognitive decline and AD (6,7). Diet patterns higher in vegetables, fruits, nuts, legumes, and seafood are generally associated with a reduced risk of age-related cognitive impairment, dementia, and/or AD. Patterns higher in red and/or processed meats are generally associated with greater age-related cognitive impairment (8). As research unfolds, health care professionals may be able to recommend specific diet and/or lifestyle changes to help prevent AD.

Treatment

Current approaches in treatment focus on helping people maintain mental function, managing behavioral symptoms, and slowing or delaying the symptoms of the disease. Five medications are approved by the U.S. Food and Drug Administration to treat AD. Donepezil (Aricept®), rivastigmine (Exelon®), and galantamine (Razadyne®) are used to treat mild to moderate AD. Memantine (Namenda®), and Donepezil (Aricept®) are used to treat moderate to severe AD. These drugs work by regulating neurotransmitters, the chemicals that transmit messages between neurons. They may help maintain thinking, memory, and speaking skills, and may help with certain behavioral problems. However, they do not change the underlying disease process, are effective for some but not all people, and may help only for a limited time (9).

Medical Nutrition Therapy for Alzheimer's Disease

A comprehensive nutrition assessment should be a routine part of the care of individuals with AD. There is no specific nutrition prescription for AD or other forms of dementia (4). A number of issues can affect the nutritional status of a person with AD but each individual will have a different nutrition diagnosis.

Medications or poorly-fitting dentures can affect food intake. As cognitive status declines, changes in neurologic function can result in problems with eating (2). Cognitive losses can impair attention span, reasoning, and judgment and the ability to recognize feelings of hunger, thirst, and satiety. As AD

progresses, the individual may forget how to use eating utensils, forget to chew without verbal cues, and forget how to swallow. Motor skills may decline, resulting in a need for feeding assistance. Excessive pacing and the inability to consume adequate nutrients may both contribute to weight loss. Unintended weight loss is often unavoidable in those with advanced dementia possibly due to the disease process, although the exact reasons are not clear (2,4).

Nutrition interventions will vary depending on the stage of the disease and symptoms of each individual. Potential interventions for people with AD include (2,4,10):

- Consistency-modified diets for those with chewing or swallowing difficulty. Finger foods to facilitate self-feeding of those with loss of motor skills and/or cognitive decline.
- Fortified foods or oral nutritional supplements to provide additional calories. Frequent, nutrient-dense snacks.
- Cueing and/or feeding assistance.
- Adaptive feeding equipment to facilitate self-feeding.
- Changing the dining environment: Provide a quiet environment, without distractions. Limit choices by providing foods one at a time. Serve food on colorful plates to differentiate food from the plate.

Therapeutic diets that restrict sodium, concentrated sweets, or other components of the diet are generally not recommended in people with end-stage AD because the primary goal of care is to prevent unintended weight loss and provide the highest quality of life possible.

End of Life Nutrition Issues

As meal intake declines in the individual with advanced AD, families and/or responsible parties may want to consider placement of a feeding tube for artificial nutrition and hydration. Multiple studies have shown that feeding tubes are seldom effective in improving nutrition, maintaining skin integrity by increasing protein intake, preventing aspiration pneumonia, minimizing suffering, improving functional status, or extending life in dementia patients (11). Based on the evidence available, most experts agree that hand feeding of food and fluids rather than tube feeding should be recommended for the best quality of life during end-of-life care (12). However, the decisions regarding end-of-life nutrition are not always based on facts alone, but on other factors, including emotions and religious and cultural beliefs. Despite the evidence supporting hand feeding rather than tube feeding, some families will desire the initiation of tube feeding.

When a person with end-stage dementia is hand fed, food and fluids may need to be altered in consistency for easier consumption or to manage swallowing problems. The individual should be encouraged to consume foods that bring them comfort or are associated with pleasure or good memories. Unlike tube feeding, hand feeding may not meet 100% of a person's nutrition and fluid needs. It can, however, satisfy other important basic needs like enjoying the process of eating, appreciating flavors and textures of food, and the routine of sharing a meal with others.

Diet and Nutrition Interventions

There is no one diet recommended for treatment of AD or dementia. Each individual will require different nutritional interventions depending on their comorbidities, condition, and symptoms. Clinical judgement is required to prioritize interventions and each resident's (or their representative's) goals should take precedence in developing a plan of nutrition care.

Adapted from: Dorner B. *Diet and Nutrition Care Manual: A Comprehensive Nutrition Care Guide*. Naples FL: Becky Dorner & Associates; 2016. Available for purchase at <https://www.beckydorner.com/dietmanuals>.

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