Alzheimer's Disease Facts and Figures 2008

A Report from the Alzheimer's Association

The *2008 Alzheimer's Disease Facts and Figures* is a comprehensive statistical abstract of United States data on Alzheimer's disease, the most common type of dementia. To provide background and context for interpreting the data, this article defines dementia, summarizes current knowledge about Alzheimer's disease, and briefly explains other specific types of dementia. Future articles will address prevalence, family caregiving, use and costs of care, mortality, and lifetime risk of Alzheimer's disease.

Statistical benchmarks documented in *Alzheimer's Disease Facts and Figures* include the following:

- Overall number of Americans with Alzheimer's disease nationally and for each state
- Proportion of women and men with Alzheimer's and other dementias
- Projections of the future growth of Alzheimer's disease
- Number of family caregivers, hours of care provided, economic value of unpaid care nationally and for each state, and the impact of caregiving on caregivers
- Use and costs of health care, long-term care (LTC), and hospice care for people with Alzheimer's disease and other dementias
- Impact on Medicare, Medicaid, US businesses, and individuals and their families
- Number of deaths due to Alzheimer's disease nationally and for each state, and death rates by age, gender, and ethnicity
- Remaining lifetime risk for developing Alzheimer's disease and other dementias at age 55

Many of the research studies and surveys included in the report do not differentiate between Alzheimer's disease and other dementias. As a result, the report frequently cites statistics that apply broadly to individuals with all types of dementia. In these cases, the reference is to "Alzheimer's disease and other dementias."

Alzheimer's disease is the most common cause of dementia. This section provides information about the definition of dementia, the characteristics of specific types of dementia and the symptoms, risk factors for, and treatment of Alzheimer's disease. More detailed information on these topics is available at www.alz.org.

Dementia: Definition and Specific Types

Dementia is a clinical syndrome of loss or decline in memory and other cognitive abilities. It is caused by various diseases and conditions that result in damaged brain cells. To be classified as dementia, the syndrome must meet the following criteria:

- It must include decline in memory and in at least 1 of the following cognitive abilities:
  1. Ability to generate coherent speech and understand spoken or written language
  2. Ability to recognize or identify objects, assuming intact sensory function
  3. Ability to execute motor activities, assuming intact motor abilities, sensory function, and comprehension of the required task
  4. Ability to think abstractly, make sound judgments, and plan and carry out complex tasks
- The decline in cognitive abilities must be severe enough to interfere with daily life.

Different types of dementia have been associated with distinct symptom patterns and distinguishing microscopic brain abnormalities. Increasing evidence from long-term epidemiological observation and autopsy studies suggests that many people have microscopic brain abnormalities associated

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with more than 1 type of dementia.

The symptoms of different types of dementia also overlap and can be further complicated by coexisting medical conditions. Table 1 provides information about the most common types of dementia.

Mild cognitive impairment is a condition in which a person has problems with memory, language, or another essential cognitive function that are severe enough to be noticeable to others and show up on tests, but not severe enough to interfere with daily life. Some people with mild cognitive impairment go on to develop dementia. For others, the symptoms of mild cognitive impairment do not progress to dementia, and some people who have mild cognitive impairment at one point in time later revert to normal cognitive status.

More about Alzheimer's Disease

In Alzheimer's disease, as in other types of dementia, increasing numbers of nerve cells deteriorate and die. A healthy adult brain has 100 billion nerve cells, or neurons, with long branching extensions connected at 100 trillion points. At these connections, called synapses, information flows in tiny chemical pulses released by 1 neuron and taken up by the receiving cell. Different strengths and patterns of signals move constantly through the brain's circuits, creating the cellular basis of memories, thoughts, and skills.

In Alzheimer's disease, information transfer at the synapses begins to fail, the number of synapses declines, and eventually cells die. In a

Table 1. Common Types of Dementia and Their Typical Characteristics

Alzheimer's disease	• Most common type of dementia; accounts for 60% to 80% of cases. • Difficulty remembering names and recent events is often an early clinical symptom; later symptoms include impaired judgment, disorientation, confusion, behavior changes, and trouble speaking, swallowing, and walking. • Hallmark abnormalities are deposits of the protein fragment beta-amyloid (plaques) and twisted strands of the protein tau (tangles).
Vascular dementia	• Considered the second most common type of dementia. • Impairment is caused by decreased blood flow to parts of the brain, often due to a series of small strokes that block arteries. • Symptoms often overlap with those of Alzheimer's, although memory may not be as seriously affected.
Mixed dementia	• Characterized by the presence of the hallmark abnormalities of Alzheimer's and another type of dementia, most commonly vascular dementia, but also other types, such as dementia with Lewy bodies, frontotemporal dementia, and normal pressure hydrocephalus.
Dementia with Lewy bodies	• Pattern of decline may be similar to Alzheimer's, including problems with memory, judgment, and behavior changes. • Alertness and severity of cognitive symptoms may fluctuate daily. • Visual hallucinations, muscle rigidity, and tremors are common. • Hallmarks include Lewy bodies (abnormal deposits of the protein alpha-synuclein) that form inside nerve cells in the brain.
Parkinson's disease	• Many people who have Parkinson's disease develop dementia in the later stages of the disease. • The hallmark abnormality is Lewy bodies (abnormal deposits of the protein alpha-synuclein) that form inside nerve cells in the brain.
Frontotemporal dementia	• Involves damage to brain cells, especially in the front and side regions of the brain. • Typical symptoms include changes in personality and behavior and difficulty with language. • No distinguishing microscopic abnormality is linked to all cases. • Pick's disease, characterized by "Pick's bodies," is one type of frontotemporal dementia.
Creutzfeldt-Jakob disease	• Rapidly fatal disorder that impairs memory and coordination and causes behavior changes. • "Variant Creutzfeldt-Jakob disease" is believed to be caused by consumption of products from cattle affected by "mad cow disease." • Caused by the misfolding of prion protein throughout the brain.
Normal pressure hydrocephalus	• Caused by the buildup of fluid in the brain. • Symptoms include difficulty walking, memory loss, and inability to control urine. • Can sometimes be corrected with surgical installation of a shunt in the brain to drain excess fluid.

brain with advanced Alzheimer's, there is dramatic shrinkage from cell loss and widespread debris from dead and dying neurons.

Scientists do not yet fully understand the processes resulting in the catastrophic brain damage associated with Alzheimer's disease. According to a leading theory, called the "amyloid hypothesis," the prime suspect is a tiny protein fragment called beta-amyloid.

Trouble begins when yet-to-be-identified factors trigger overproduction of beta-amyloid or reduce the brain's ability to dispose of it. The excess jams signaling at the synapses, blocking information flow and leading to a cascade of damaging events ending in cell death. Beta-amyloid fragments gradually accumulate into the microscopic "plaques" considered to be one pathological hallmark of Alzheimer's. The other hallmark is "tangles," formed when a different protein called tau twists into strands inside dead and dying neurons. Other abnormalities seen in Alzheimer brain tissue include inflammation and oxidative damage due to highly reactive oxygen-containing products of cellular metabolism.

Symptoms of Alzheimer's Disease

Alzheimer's disease can affect different people in different ways, but the most common symptom pattern begins with gradually worsening difficulty in remembering new information. This is because disruption of brain cells usually begins in regions involved in forming new memories. As damage spreads, individuals also experience confusion, disorganized thinking, impaired judgment, trouble expressing themselves, and disorientation to time, space, and location, which may lead to unsafe wandering and socially inappropriate behavior. In advanced Alzheimer's, people need help with bathing, dressing, using the bathroom, eating, and other daily activities. Those in the final stages of the disease lose their ability to communicate, fail to recognize loved ones, and become bed-bound and reliant on 24/7 care. Alzheimer's disease is ultimately fatal.

Although families generally prefer to keep the person with Alzheimer's at home as long as possible, most people with the disease eventually need more assistance than families can provide and move into a nursing home or other residential care facility.

Risk Factors for Alzheimer's Disease

Although the cause or causes of Alzheimer's disease are not yet known, most experts agree that Alzheimer's, like other common chronic conditions, probably develops as a result of multiple factors rather than a single cause. The greatest risk factor for Alzheimer's disease is advancing age. Most Americans with Alzheimer's disease are age 65 or older, although individuals younger than age 65 can also develop the disease

When Alzheimer's or another type of dementia is recognized in a person under age 65, these conditions are referred to as "younger-onset" or "early-onset" Alzheimer's or "younger-onset" or "early-onset" dementia.

A small percentage of Alzheimer's disease, probably less than 5%, is caused by rare genetic variations found in a small number of families worldwide. In these inherited forms of Alzheimer's, the disease tends to develop before age 65, sometimes in individuals as young as 30.

A genetic factor in Alzheimer's disease that develops after age 65 is Apo lipoprotein E-e4 (APOE-e4). APOE-e4 is 1 of 3 common forms of the APOE gene, which provides the blueprint for a protein that carries cholesterol in the bloodstream. Everyone inherits 1 form of the APOE gene from each of his or her parents. Those who inherit 1 APOE e4 gene have increased risk of developing Alzheimer's disease. Those who inherit 2 APOE e4 genes have an even higher risk, but there is still no certainty that they will develop Alzheimer's.

Treatment and Prevention of Alzheimer's Disease

No treatment is available to delay or stop the deterioration of brain cells in Alzheimer's disease. The US Food and Drug Administration has so far approved 5 drugs that temporarily slow worsening of symptoms for about 6 to 12 months, on average, for about half of the individuals who take them. Based on deepening insight into the underlying biology of Alzheimer's and emerging conceptual frameworks for understanding the disease, researchers have identified several new treatment strategies that may have the potential to change its course. A number of experimental therapies based on the amyloid hypothesis and other targets have reached various stages of clinical testing in human volunteers.

Despite the current lack of disease-modifying therapies, studies

Provider Action

Impact to You

No matter what your specialty, you are likely to be impacted on a regular basis by patients suffering from Alzheimer's disease since 5.2 million Americans currently have Alzheimer's and another 10 million baby boomers will eventually have it.

What You Need to Know

Providers need to know that dementia is a clinical syndrome of loss or decline in memory and other cognitive abilities. Providers must also be knowledgable about the differential diagnosis and the progressive stages of the disease.

What You Need to Do

The starting point is having a process in place to encourage caregivers to bring potential dementia patients forward for diagnosis. Once patients are in your office, making the correct diagnosis, followed by prescribing the most appropriate treatment plan are essential. These treatment plans should incorporate both pharmacologic and nonpharmacologic options.

have consistently shown that active medical management of Alzheimer's and other dementias can significantly improve quality of life through all stages of the disease for diagnosed individuals and their caregivers. Active management includes appropriate use of available treatment options, effective integration of coexisting conditions into the treatment plan and utilization of supportive services, such as counseling, activity and support groups, and adult day programs.

Many scientists consider the emerging field of prevention one of the most exciting recent developments in the dementia research arena. A growing body of evidence suggests that the health of the brain—one of the body's most highly vascular organs—is closely linked to the overall health of the heart and blood vessels.

Some data indicate that management of cardiovascular risk factors, such as high cholesterol, type 2 diabetes, high blood pressure, and obesity, may help avoid or delay cognitive decline. Additional evidence points to a significant role for regular physical exercise in maintaining lifelong cognitive health.

More limited data suggest that a low-fat diet rich in fruits and vegetables may support brain health, as may a robust social network and a lifetime of intellectual curiosity and mental stimulation. MPM