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What is Alzheimer's Disease?

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ALZHEIMER'S DISEASE
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WHAT IS ALZHEIMER'S DISEASE?

"With Alzheimer's people, there's no such thing as having a day which is like another day. Every day is separate....it's as if every day you have never seen anything before like what you're seeing right now."--Cary Henderson

This excerpt from the journal of a man with Alzheimer's disease offers a glimpse of what it's like to be one of the 4,000,000 people in the United States who have this progressive, degenerative brain disorder. Cary Henderson, a history professor in Virginia, was diagnosed with Alzheimer's disease at age 55.

Alzheimer's disease is one of the most common causes of the loss of **mental** function known broadly as dementia. This type of dementia proceeds in stages, gradually destroying memory, reason, judgment, language, and eventually the ability to carry out even the simplest of tasks.

"You just feel that you are half a person," Henderson says in his narrative, which was dictated on a tape recorder in the early stages of the disease. "And you so often feel that you are stupid for not remembering things or for not knowing things....Just the knowledge that I've goofed again or I said something wrong or I feel like I did something wrong or that I didn't know what I was saying or I forgot--all of these things are just so doggone common...."

Such personal accounts inevitably make one ask, why? What causes this disease? Can't anything be done to stop it? To prevent it? Scientists ask essentially the same questions, and this booklet describes their search for answers. It provides a brief overview of dozens of paths that are bringing us closer to ways of managing, and eventually defeating, Alzheimer's disease.

BASICS

A report like this one would not have been possible 20 years ago, when very little was known about Alzheimer's disease. But it is by no means a new disease. Ancient Greek and Roman writers described symptoms similar to those of Alzheimer's disease. In the 16th century, Shakespeare wrote about very old age as a time of "second childishness and mere oblivion," suggesting that the symptoms of Alzheimer's disease, or something quite similar, were known and recognized then.

These characteristic symptoms acquired a name in the early part of the 20th century when Alois Alzheimer, a German physician, described the signs of the disease in the brain. Alzheimer had a patient in her fifties who suffered from what seemed to be a **mental** illness. But when she died in 1906, an autopsy revealed dense deposits, now called NEURITIC PLAQUES, outside and around the nerve cells in her brain. Inside the cells were twisted strands of fiber, or NEUROFIBRILLARY TANGLES. Today, a definite diagnosis of Alzheimer's disease is still only possible when an autopsy reveals these hallmarks of the disease.

Plaques and tangles remained mysterious substances until the 1980's, when NEUROSCIENTISTS--the scientists who study the brain--discovered the proteins that make up these telltale anomalies. As research progresses, it is turning up clues to how plaques and tangles develop and how they relate to other changes in the brain.

In the meantime, much more about the disease has come to light. We now know that Alzheimer's begins in the entorhinal cortex and proceeds to the HIPPOCAMPUS, a waystation important in memory formation. It then gradually spreads to other regions, particularly the CEREBRAL CORTEX. This is the outer area of the brain, which is involved in functions such as language and reason. In the regions attacked by Alzheimer's, the nerve cells or NEURONS degenerate, losing their connections or SYNAPSES with other neurons. Some neurons die.

THE COURSE OF THE DISEASE

As the hippocampal neurons degenerate, short-term memory falters. Often the ability to perform routine tasks begins to deteriorate as well. Henderson describes the difficulty and frustration he feels when he tries to open a can of food for the family's dog. "...the best I could do was to try to dig a hole, make a little perforation and see if I could extend the side of it--and it was something like a panic....I'm too clumsy because of the Alzheimer's....Right now, the doggie seems to be in fairly good shape. I'm not too sure I am."

As Alzheimer's disease spreads through the cerebral cortex, it begins to take away language. "Lately, I've had trouble with words (practically have to play charades)" says Letty Tennis, a North Carolina woman with Alzheimer's disease who also kept a journal.

Tennis talks about how her judgment is changing and refers to the emotional outbursts that are common in this disease. "We had a great time shopping, but...I bought everything in sight....My poor dear husband didn't stop me very much unless it was too outrageous and then I'd get very angry. I bought a pair of boots--galoshes really...and I told George it's something I've always wanted so we bought them and when we got home I had no memory of buying them--they were awful and cost \$40...I used to be the sensible one in the family."

Disturbing behaviors, such as wandering and agitation, beset many people as the disease progresses. In its final stages Alzheimer's disease wipes out the ability to recognize even close family members or to communicate in any way. All sense of self seems to vanish, and the individual becomes completely dependent on others for care.

Patients often live for years with this condition, dying eventually from pneumonia or other diseases. The duration of Alzheimer's disease from time of diagnosis to death can be 20 years or more. The average length is thought to be in the range of 4 to 8 years.

PROGRESS

This bleak picture is countered by the continued, rapid pace of research. Many neuroscientists think that a means to prevent or treat Alzheimer's disease will be found in the foreseeable future.

Studies of Alzheimer's disease can be divided into three broad, interacting categories. The first is research on causes, the second is diagnosis, and the third is treatment, which includes caregiving. The following chapters give a brief overview of what is known about each topic. They highlight some key findings to date, the clues researchers are now pursuing, and the paths that are expected to lead to answers about the disease.

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DEFINITIONS

Dementia: A group of symptoms characterized by a decline in intellectual functioning severe enough to interfere with a person's normal daily activities and social relationships.

Alzheimer's Disease: The most common cause of dementia among older people. It is marked by progressive, irreversible declines in memory, performance of routine tasks, time and space orientation, language and communication skills, abstract thinking, and the ability to learn and carry out mathematical calculations. Other symptoms of Alzheimer's disease include personality changes and impairment of judgment.

Age-Associated Memory Impairment: A decline in short-term memory that sometimes accompanies **aging**; also called benign senescent forgetfulness. It does not progress to other cognitive impairments as Alzheimer's disease does.

Senile Dementia: An outdated term once used to refer to any form of dementia that occurred in older people.

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FURTHER READING

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