

Alzheimer's Care: Getting Better

As I was growing up, I still remember going to my grandparents' house every day after elementary school and eating orange sherbet, riding bikes around the neighborhood, and going to the library to get books to read. I saw my grandparents so much as a child that they basically helped to raise me alongside my parents. They were the only grandparents I knew, since my father's parents had passed long before I was brought into this world. I was their only granddaughter out of four grandchildren as well, so there was a special bond there that cannot even begin to be compared with anything else. Both of my grandparents were eventually diagnosed with Alzheimer's disease. It affected both of their lives dramatically, as well everybody in my family's lives. The treatments and therapies for Alzheimer's disease are rapidly evolving, which is great news for future generations.

My grandmother, Charmaine Mooring, or Mema as I called her, met my grandfather, Arthur Earl Ferguson, or Pa, during World War II. He was a soldier in the army, and she was an army nurse. They met when my grandfather's brother, Charles Ferguson, who was also in the army, had been injured by a booby trap, and my grandmother was his nurse. Charles passed on soon after this incident, but my grandmother and grandfather kept communicating throughout the duration of the war and soon after it was over, they were married. (Pate).

My grandparents lived a very healthy lifestyle and did not face any major medical issues until 2005, when my grandfather had to have his gallbladder removed. It was at that time that he was diagnosed with Alzheimer's disease, although the doctor said it was in the very early stages. My family and I had noticed my grandfather's memory and ability to recall words had been diminishing, although we just attributed it to getting older; we had no idea that there was an actual dementia causing it. A very long and exhausting seven years later, my grandfather passed on

October 19, 2012. (Pate). This devastation in my life made me very passionate about learning about the disease and how it progresses, the best current treatment strategies, as well as the future of the disease.

Alzheimer's disease is "one of the most devastating and untreatable disorders among older adults" (Petersen 4). Generally more women suffer from the disease than men, which is largely attributed to the fact that women typically live longer than men (Petersen 5). Alzheimer's Disease, or AD, currently affects almost 4 million adults in the United States alone, although if a cure is not found, that number is estimated to double every twenty years (Khachaturian 4). This number is expected to increase so rapidly because of technological advances that are helping people live longer lives (Petersen 5). Although it is a well-known fact that memory lapses are more prevalent in elderly people, usually referred to as senility (Petersen 10), AD and other dementias are very well distinguished from these normal occurrences (Khachaturian 4). It is different in that 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 abilities to learn" (Khachaturian 4).

Alzheimer's disease is classified as a neurodegenerative disease, and although this occurs naturally with aging, significantly more neurons are deteriorated under the influence of AD than naturally occurs with normal aging (Petersen 20). The development of Alzheimer's disease is characteristic with the buildup of defective Amyloid proteins in the brain that would normally be disposed of by healthy cells, however, the presence of a neurodegenerative disorder allows these proteins to accumulate, clump together, and interfere with the function of the normal nerve cells that remain in the brain (Petersen 20). Although the physiology of Alzheimer's disease is known,

the cause for the degeneration of nerve endings is not known, as well as how these clumps of Amyloid proteins interfere with the remaining functioning nerve endings (Petersen 22).

Although this explanation infers that this process is occurring all over the brain, there is evidence that suggests that many neuronal subgroups are very resistant to the degenerative process (Becker 25). Studies done by Constantin Bouras, Pandelis Giannakopoulos, and Philippe G. Vallet of the University of Geneva School of Medicine have shown that “lesion distribution follows certain organization schemes and that these regional and laminar patterns may regulate cortical circuits to clinical symptoms (Becker 26). In other words, the degeneration of neurons around the brain follows a distinct pattern, research that correlates with symptoms, and the causes of these symptoms, experienced by Alzheimer’s patients in their correct chronological order. The first loss of these neurons occurs in the hippocampus, which is a huge component of memory (Petersen 27). Usually, one of the first symptoms of Alzheimer’s disease experienced by a patient is memory loss, which is caused by the initial degeneration of neurons in the hippocampus as well as the inferior temporal cortex (Becker 26). As neurons are then damaged in other parts of the limbic system, such as the amygdala, other cognitive functions begin to be impacted. These functions include “the ability to plan, make judgments and perform simple tasks.” Other effects seen during the degeneration of these neurons include paranoia and aggressive behavior, since the limbic system influences emotions and instincts. (Petersen 28)

As my grandfather went through the degenerative process, I can vividly recall each of these symptoms. My grandfather was never an aggressive man at all in his lifetime, but after he reached the late stages of his disease he would often become terrified when someone came near him who he did not know or did not remember. This fear would then lead to aggressive behavior in the form of self-defense. When my grandfather was in the nursing home, I can remember just

how appalled I was when one of the nurses informed me that he had pushed another patient to the ground earlier that day. My mother had to constantly remind me that it was the disease making him do these things, which was a concept that was very hard for me to understand as a thirteen-year-old girl without ability to comprehend the magnitude of what was happening in my grandfather's brain.

One common problem among clinicians treating Alzheimer's patients is the decision as to whether the patient will respond more rapidly or more effectively to either behavioral or drug therapy. If the patient is seeing more behavioral side effects, such as mood changes, the doctor is likely to prescribe behavioral treatments because changes in personality are typically resistant to drug therapy. These patients should also be kept on regular routines "so that their functional abilities are maintained as much as possible". (Jarvik 7)

In regards to drug therapy, there are numerous drugs that have been approved by the U.S. Food and Drug Administration (FDA). In order to inhibit acetylcholinesterase, a doctor can prescribe Donepezil, Rivastigmine, and Galantamine (Grossberg, George T. and Sanjeeve M. Kamat 35-36). Acetylcholinesterase destroys acetylcholine, which is necessary for adequate nerve function, especially in the brain. Acetylcholine is what stimulates nerve endings throughout the brain to fire. In the normal healthy brain acetylcholine is overproduced and acetylcholinesterase is needed in order to prevent the over stimulation of nerve endings. In a brain with Alzheimer's, acetylcholine is not overproduced; therefore the degeneration of it by acetylcholinesterase has dire effects. The nerves stop firing because there is not enough acetylcholine. By inhibiting acetylcholinesterase, enough acetylcholine remains so that the brain has relatively normal function. Donepezil was the first of these drugs to be approved by the FDA, and it was not approved for use in patients with mild to moderate Alzheimer's disease until

1996. Rivastigmine is an even newer drug, not having been approved for prescription until the year 2000. Galantamine is the newest of these drugs, having been approved in 2001 for the treatment of mild to moderate Alzheimer's. (Grossber, George T. and Sanjeeve M. Kamat 36). Alzheimer's was not researched in depth until the early 1900s (Petersen III). So, in relation to the overall timeframe of research regarding Alzheimer's disease and its physiology, all three of these drugs are very new. They have helped change the quality of life that Alzheimer's patients endure, and have help these patients to be self-sustainable for much longer.

Behavioral therapy is becoming more and more widely used in the treatment of individuals with dementia as well. Behavioral Therapy includes certain exercises and rituals to provide these patients with coping mechanisms once stress has become overwhelming causing a change in their mood or behavior. Occupational Therapy, which can be a form of behavioral therapy, has also proven to be an effective method for patients with Alzheimer's disease to manage their stress and tackle daily tasks that have now become challenges. The most essential part of this therapy however is the preservations of the capabilities of these people. If individuals are able to sustain their abilities to perform simple daily tasks, then they prolong their ability to live independently, which ultimately lessens the impact the disease is able to have. For instance, Gitlin suggests that making these individuals wake up at their preretirement time will decrease how quickly the short-term memory fades away. (Gitlin 9). Physical Therapy can also be used in order to decrease the number of falls person whose cognitive skills are beginning to decline will likely experience (Gitlin 180). Clarfield and and Dwolatzky recently did a study on the impact of long-term group exercise in patients with Alzheimer's and found that it made a significant positive impact, even in those individuals who had already began to lose some of their cognitive functioning (902). Therapeutic practices like these are relatively new to the treatment of

Alzheimer's, and will help Alzheimer's patients maintain their independence and quality of life. As these therapies evolve and become even more effective, the side effects of Alzheimer's will continue to diminish, therefore diminishing the severity of the disease.

Even though current treatments are evolving in relation to the care of Alzheimer's disease, much more could be done in order to drastically reduce the effects of this dramatic disease. Since many advancements in these therapies have been made in the last two decades, it is probable that more research will lead to an increased knowledge and number of breakthroughs in the near future. These evolutions in therapies are essential to finding a cure for Alzheimer's disease.

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