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### Alzheimer's Disease

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# Alzheimer's Disease

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## Introduction

- In the early 1900's, Dr. Alois Alzheimer discovered the disease which would later bear his name.
- He observed an institutionalized patient with severe memory impairment coupled with odd behavioral symptoms.
- After the patient's death, Dr. Alzheimer examined the brain. He was able to identify amyloid plaques and neurofibrillary tangles within the structure.
- These findings helped to link the pathology with the clinical symptoms associated with the disease (Grabher, 2018)..

Alzheimer's is a degenerative disease of the brain which affects tens of millions of people around the world. It is estimated to include over 5 million patients in the United States. Over 200,000 patients with Alzheimer's disease (AD) live in Ohio (2019 Alzheimers disease facts and figures, 2019). The numbers can be staggering. However, the selection of this topic of study was limited to a single patient. He was this writer's father. The impact of observing the disease process steal the function, memory and identity of a loved one cannot be overstated.

## Case Study

A 73-year-old woman presented for neurological evaluation with a 3-year history of memory impairment. Patient was a high school graduate and worked as a secretary until retiring at age 65. She had lived alone maintained her own home and finances since the death of her husband. Her brother noticed gradually worsening memory and difficulty finding words, but the patient became angered at the suggestion that she may have a progressive impairment.

- Elevated blood pressure during a few office visits but no prescribed medication.
- No children and previous hysterectomy.
- Well-groomed, alert and friendly.
- General and elemental neurological exams were normal.

- Anomic aphasia.
- Refers to items as "things" and "stuff".
- Able to provide her name.
- Unable to provide her age, date of birth, or the current year.
- On formal testing, she scored well below average in all cognitive domains.
- Perservates both verbal and motor responses.

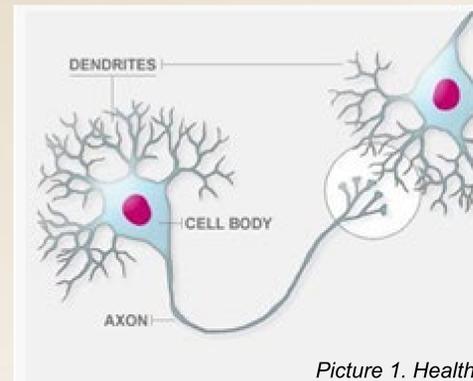
The conclusion of the evaluation was that she met research criteria for probable Alzheimer's disease. The patient would require around the clock supervision and would benefit from social stimulation provided in assisted living environment (Johnson & Becker, n.d.).

## Pathophysiological Processes

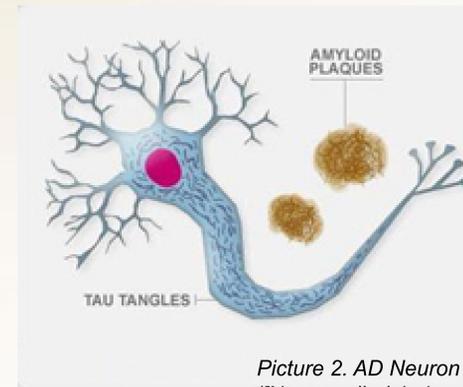
There is no one singularly known cause of AD. There are multiple theories which attempt to explain the pathogenesis. However, more research is required (Atri, 2019). Despite this AD is characterized by two distinctive features; the affected brain contains amyloid plaques and neurofibrillary tangles (NFT's). These abnormal protein fragments are found surrounding and incorporated within the neurons. Amyloid plaques consist of a dense deposit of beta amyloid enveloping the exterior of the neuron. Plaque interfere with the communication ability of the neuron at the synapse. As the plaque develop, the irritation of its presence creates tau proteins. Tau proteins collect within the neuron. They present in a fibrous tangle preventing the transport of nutrients to the neuron. The presence of these proteins causes disruption of neuronal function followed by neuronal death (Cummings, 2019).

Amyloid plaques and tangles can be found in patients without impaired memory, dementia, or cognitive dysfunction. However, this may indicate an increased risk of developing AD. A definitive diagnosis of AD requires both the cognitive changes associated with dementia along with the plaques and NFT's (Atri, 2019).

Inflammation and atrophy are also present in the AD brain. The additional insult of the amyloid plaques and tangles is the activation of an immune response in the brain. Microglia work to remove the amyloid and tau proteins, dead cells and other debris. However, the when the microglia are unable to keep up with the cascade, an inflammatory reaction occurs (Cummings, 2019). Atrophy occurs due to neuronal death. The brain structures shrink with cellular loss.



Picture 1. Healthy Neuron  
([Nerve-cell], 2019).



Picture 2. AD Neuron  
([Nerve-cell-alzheimer], 2019).

## Signs and Symptoms

Some of the earliest signs and symptoms of AD appear years before a diagnosis. Patients may experience changes in mood, sleep disruptions, and increased anxiety/depression. They are forgetful, and unable to create new memories. Symptoms can be overlooked as they can be associated with other etiologies or confused with age related changes (Atri, 2019).

- Memory loss that disrupts daily life
- Challenges in planning or solving problems
- Difficulty in completing tasks at home, work or leisure
- Confusion with time or place
- New problems with words in speaking or writing
- Misplacing things and losing the ability to retrace steps
- Decreased or poor judgement
- Withdrawal from work or social activities
- Trouble understanding visual images or spatial relationships
- Changes in mood and personality (Alzheimer's Association, 2019).

## Nursing Considerations

Care considerations of the AD patient should focus on maintaining the highest level of independence safely possible. Implementation of strategies to preserve cognitive function, provide socialization and retain functional abilities must be prioritized in any setting the AD patient is present. Early diagnosis and treatment can slow progression. Patients and families should be assisted in the identification of risk factors associated with AD. Lifestyle modifications can be encouraged. Interventions put into place promptly can slow the decline and avert further disability. Caregivers and family members should be included whenever possible (Grabher, 2018).

- maintain quality of life
  - maximize function in daily activities
  - enhance cognitive mood and behavior
  - foster a safe environment promote social engagement
- (Aigbogun, Stellhorn, Krasa, & Kostic, 2017).

## Conclusion

AD continues to overwhelm the world's population. It impacts citizens of every country. 44 million people worldwide are currently affected. As populations are living longer, it is expected the number of AD patients will double by 2050 (Grabher, 2018). The medical, emotional, and financial burdens this will create are confounding. It is imperative research continue to discover a cure for this disease

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