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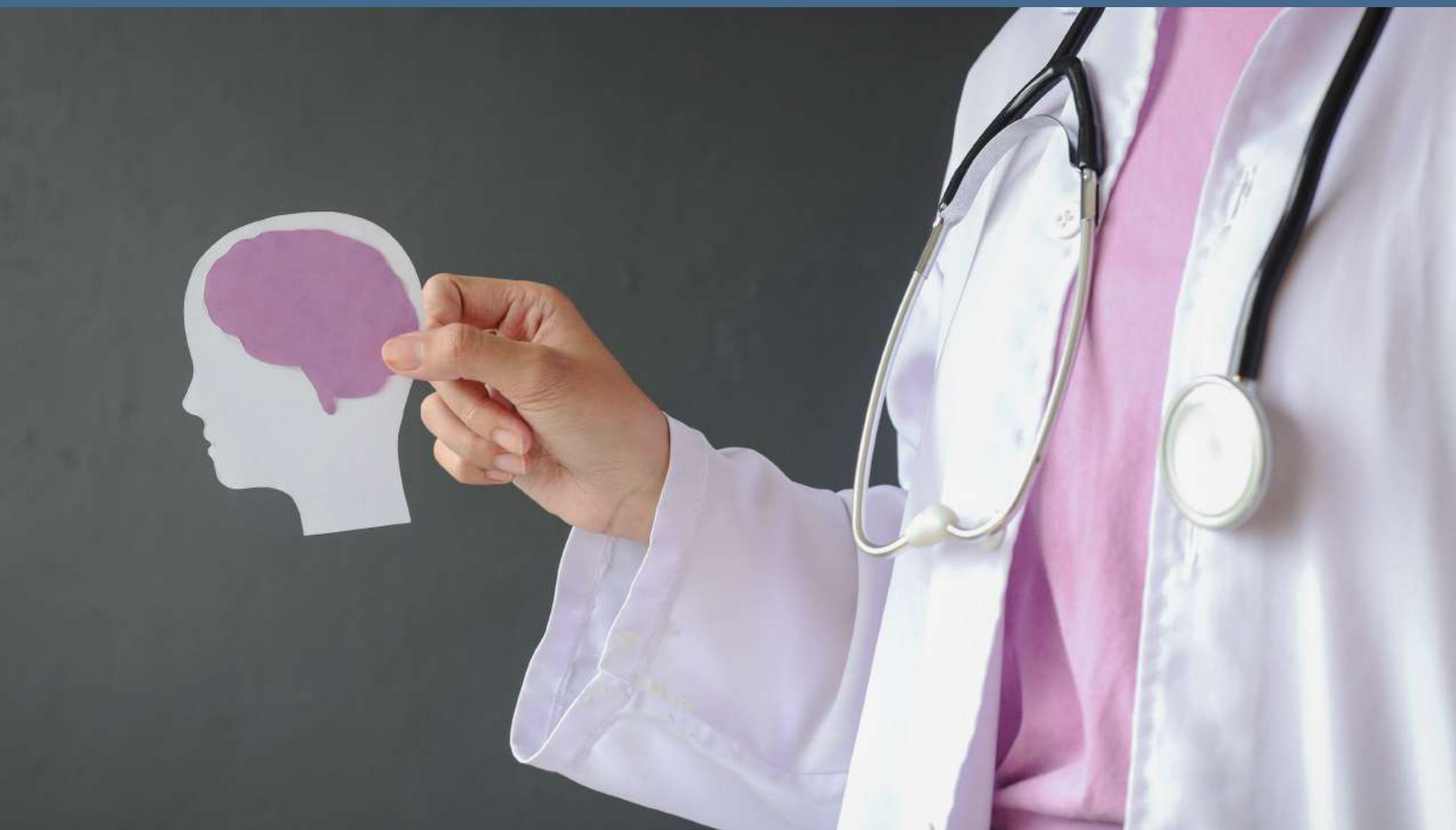
Recognizing Alzheimer's and Delivering Effective Care



Section 1: Introduction

Memory changes are a typical and expected part of the aging process. When these changes disrupt daily life, these memory lapses can signify a greater problem and possibly point to the onset of Alzheimer's disease (CDC, 2024c). It is estimated that 6.2 million Americans and 44 million people worldwide are living with Alzheimer's disease (Bomasang-Layno & Bronsther, 2021), and, without the development of a significant clinical breakthrough in the prevention and treatment of this disease, the number of affected Americans is expected to grow to 13.8 million individuals by 2060 (Alzheimer's Association, 2024).

Alzheimer's disease not only affects the individual experiencing cognitive decline, but also their family and community. In 2023, it was estimated that over 11 million family members and other unpaid caregivers provided approximately 18.4 billion hours of care to those with Alzheimer's disease and other types of dementia (Alzheimer's Association, 2024). The financial impact of Alzheimer's disease is astounding, with an annual cost of over $355 billion in 2021 in the United States alone. The cost of this disease in the United States is expected to rise to over $1.5 trillion by 2050 (Bomasang-Layno & Bronsther, 2021).

Nurses and other healthcare workers commonly interact with those experiencing Alzheimer's disease. Healthcare workers can have a positive impact on clinical care and access to community-based services and supports (Alzheimer's Association, 2024). Nurses who care for these patients and interact with their caregivers must be aware of what Alzheimer's disease is, its risk factors, signs, and symptoms, current best practices for diagnosis and treatment, and the nurse's role in caring for those experiencing this challenging disease.

Section 2: What is Alzheimer's Disease?

In 1906, Dr. Alois Alzheimer presented a study to his colleagues in Germany describing his findings after examining the brain of Auguste Deter, a woman who had been admitted to the hospital five years earlier due to memory loss, hallucinations, and other symptoms of cognitive decline. His examination of her brain revealed amyloid plaques and neurofibrillary tangles, hallmarks of what is now known as Alzheimer's disease (Kiani & Hodson, 2024).

Alzheimer's disease is a type of dementia. Dementia is a term that describes any decline in mental ability that disrupts an individual's daily life, affecting memory, thinking, and behavior. Alzheimer's disease is the most common type of dementia, accounting for 60-80% of cases (CDC, 2024a). This progressive neurodegenerative disorder (Safiri et al., 2024) is characterized by the accumulation of abnormal plaques and neurofibrillary tangles in the brain, accompanied by neuronal loss, specifically in the basal forebrain and neocortex (Kumar, Sidhu, Lui, & Tsao, 2024). The abnormal plaques are due to amyloid-ß proteins, and the neurofibrillary tangles are due to hyperphosphorylated tau proteins (Bomasang-Layno & Bronsther, 2021). While the brain typically becomes smaller as a normal part of the aging process, it does not lose large numbers of neurons. Alzheimer's disease disrupts vital processes that neurons depend on, including communication, metabolism, and repair. This causes the neurons to lose their ability to function properly, lose communication with other neurons, and eventually die (NIA, 2024).

Two major hypotheses aim to explain the causes of these changes in the brain. The first is the cholinergic hypothesis, which proposes that reduced amounts of acetylcholine in the brain due to neuronal loss contribute to the development of Alzheimer's disease. The amyloid hypothesis, which is most widely accepted, suggests that specific enzymes act on the amyloid precursor protein, producing

amyloid beta peptides, which are toxic to neurons (Kumar, Sidhu, Lui, & Tsao, 2024).

The rate of progression of Alzheimer's disease varies and is affected by the severity when the disease is diagnosed, untreated cardiovascular risks, and other factors (Mayo Clinic Staff, 2025). As Alzheimer's disease progresses, daily functioning becomes more inhibited (Mayo Clinic, 2024). Pneumonia, dehydration, malnutrition, falls, and other infections are complications associated with Alzheimer's disease (Mayo Clinic Staff, 2025). These complications can be fatal (Mayo Clinic, 2024). While significant improvement has been made in recent decades in mortality due to HIV, stroke, and cardiovascular disease, the mortality of Alzheimer's disease increased by 140% between 2000 and 2021, with 119,399 deaths in the United States in 2021 attributed to the disease (Alzheimer's Association, 2024).

Section 2 Personal Reflection

Why is Alzheimer's disease considered a type of dementia? What are the two major hypotheses used to explain the cause of Alzheimer's disease? Why do you think daily functioning becomes more inhibited as the disease progresses?

Case Study

Throughout this course, we will follow a case study of Mrs. Anderson, a 78-year-old female. She is accompanied to the primary care clinic by her son, who has concerns about his mother's mental status.

Section 3: Risk Factors

Alzheimer's disease is associated with many risk factors and is considered a multifactorial condition. The most significant risk factor for this condition is advanced age (Kumar, Sidhu, Lui, & Tsao, 2024). It is estimated that more than 20% of individuals older than 80 years of age experience Alzheimer's disease (Litke et al., 2021). Starting at age 65, the prevalence of Alzheimer's disease doubles for every five-year increase in age (Kumar, Sidhu, Lui, & Tsao, 2024). Some risk factors, like age, are not modifiable, while others, such as poor diet and lack of physical activity, are modifiable. Nurses must be aware of actions individuals can take to lower their risk by improving their modifiable risk factors. Research suggests that 45% of cases of dementia could be delayed or reduced through decreasing risk by making lifestyle and health-related changes (Livingston et al., 2024).

Genetics is considered to account for 60-80% of the risk of Alzheimer's disease (Scheltens et al., 2021). The risk of experiencing Alzheimer's disease is increased when there is a first-degree relative, such as a parent or sibling, who has been diagnosed with the condition (Mayo Clinic Staff, 2024). Those with two or more siblings diagnosed with late-onset Alzheimer's disease are at three times greater risk (Kumar, Sidhu, Lui, & Tsao, 2024). The genetic factors that contribute to Alzheimer's disease are complex, and all aspects of the role of genetics in the risk for this disease are not yet understood. One genetic factor identified is the apolipoprotein E (APOE) gene. Approximately 25-30% of the population carries the APOE e4 form of the gene, and these Individuals are at increased risk for Alzheimer's disease. Those who carry two copies of this gene are at even more risk than those who carry one copy of the gene. It is important to note, however, that not all individuals who have this gene develop Alzheimer's disease. Scientists have identified three rare genes that often guarantee an eventual diagnosis of

Alzheimer's disease; however, the presence of these genes accounts for less than 1% of cases of the condition (Mayo Clinic Staff, 2024).

There is an increased prevalence of Alzheimer's disease among individuals with Down syndrome, a condition in which individuals have three copies of chromosome 21. This is because the genetic code for the amyloid precursor protein, a known contributor to developing Alzheimer's disease, is located on the 21st chromosome. Research has found that nearly all individuals with Down syndrome have neuritic plaques and neurofibrillary tangles, indicative of Alzheimer's disease, by age 40. Though the neuropathological changes that identify Alzheimer's disease are widespread in this population, not all individuals will develop symptoms. The timing of diagnosis varies due to the lack of evidence-based standard diagnostic assessments for Alzheimer's disease for use with individuals with Down Syndrome (Rubenstein et al., 2024).

Among individuals diagnosed with Alzheimer's disease who are older than 65, almost two-thirds are women. In part, this is likely because women tend to live longer than men, and advanced age also increases risk. When matched age for age, women are not at increased risk for other types of dementia but are more likely than men to be diagnosed with Alzheimer's disease. Researchers believe that amyloid deposits in the brain may be part of the brain's immune system, and women are twice as likely as men to have an autoimmune disease. Some theorize that this is because women, in general, tend to have stronger immune systems than men. More research is necessary to validate these theories (Budson, 2022).

Race can affect an individual's risk for developing Alzheimer's disease. Research has found that Black Americans are 1.5-2 times as likely to develop Alzheimer's disease compared to white individuals. In part, this may be due to a higher prevalence of risk factors in this population. However, research has also found that Black Americans were 35% less likely to be diagnosed with Alzheimer's

disease or related dementias, despite the presence of symptoms. Research suggests that, more than white study participants, Black participants were not diagnosed until their symptoms were more severe. After taking into account demographic and educational differences, Black individuals with Alzheimer's disease have been found to experience more neuropsychiatric symptoms, including hallucinations, as well as increased agitation, loss of inhibition, irritability, abnormal sleep, aggression, and behavioral changes (Lennon et al., 2022). Hispanic individuals are 1.5 times more likely than white individuals to be diagnosed with Alzheimer's disease or a related dementia. More research is needed to determine the specific causes of these differences (Royse et al., 2021).

Cardiovascular disease is considered a modifiable risk factor for Alzheimer's disease, as it can be improved with lifestyle changes (Kumar, Sidhu, Lui, & Tsao, 2024). Cardiovascular disease and Alzheimer's disease both take decades to develop, though symptoms of cardiovascular disease usually become apparent many years before the onset of Alzheimer's disease-related symptoms. As a result, cardiovascular disease and its associated risk factors are a potential predictor of the development of Alzheimer's disease (Saeed et al., 2023). Hypertension promotes the accumulation of amyloid plaques. The sequelae associated with atherosclerosis, including hypoxia, inflammation, and oxidative stress, contribute to increased deposition and decreased clearance of amyloid plaques. Although much has been learned about the relationship between heart and brain health in recent years, more research is needed to investigate further how cardiovascular health affects the risk for developing Alzheimer's disease (Saeed et al., 2023).

Obesity and type 2 diabetes mellitus are considered modifiable risk factors for Alzheimer's disease. Obesity can lead to type 2 diabetes, which can cause inflammation in the brain (Selman et al., 2022). Neuroinflammation has been shown to significantly contribute to the development of neurodegenerative disorders, including Alzheimer's disease. Adipokines, which are secreted by

adipose tissue, contribute to the progression of Alzheimer's disease, and leptin resistance develops. Research has found that leptin can exert neuroprotective effects in the central nervous system (Flores-Cordero et al., 2022). Midlife obesity, specifically, has been associated with later increased risk of Alzheimer's disease. It is estimated that those with mid- to late-life obesity have a 20% greater risk of developing Alzheimer's disease. Individuals with type 2 diabetes are at 46% increased risk of developing dementia (Safiri et al., 2024).

An individual's diet impacts their risk for developing Alzheimer's disease. A low-nutritional-quality diet is strongly associated with an increased risk. A western diet, typically high in refined carbohydrates, increases risk by promoting inflammation, altering metabolism, and reducing cerebral perfusion (Safiri et al., 2024). One study found that those who consume more ultra-processed foods experience significantly faster rates of cognitive decline and loss of executive function (Gomes Gonçalves et al., 2023).

Smoking increases the risk for many adverse health conditions, including Alzheimer's disease. Chronic smoking has been associated with learning and memory deficits, decline in executive and intellectual abilities, as well as brain atrophy. Those who are lifetime smokers have a 70% greater risk of developing Alzheimer's disease. This risk increases with increased smoking exposure. Cigarette smoke is cytotoxic and contains oxidizing components. It also increases proinflammatory cytokine concentrations in the brain and decreases antioxidant concentrations. This oxidative stress can lead to the pathological changes that lead to Alzheimer's disease (Safiri et al., 2024).

Poor sleep quality has been associated with increased risk for developing Alzheimer's disease. This includes those who have difficulty falling asleep and those who are unable to stay asleep. Sleep apnea has also been shown to increase risk (Mayo Clinic Staff, 2024). Those who experience long-term sleep difficulty are

exposed to oxidative stress, increased amyloid deposits, neuroinflammation, and other factors that increase the risk for Alzheimer's disease. Poor sleep also contributes to elevated glucocorticoid levels, reduces brain protein synthesis necessary for neuronal growth, and reduces the number of synapses in the nervous system, contributing to the development and progression of Alzheimer's disease (Lv et al., 2022).

Chronic stress significantly impacts cognition. Studies have found that, like poor sleep quality, chronic stress elevates glucocorticoid levels, leading to degenerative changes in neurons. Eventually, these changes can lead to cognitive decline (Safiri et al., 2024). Dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis can occur when an individual experiences significant, prolonged stress. This, along with increased levels of cortisol, is commonly found in patients with Alzheimer's disease and impacts the progression of the disease. Research has found that some people are genetically predisposed to heightened HPA axis reactivity in response to stress, and that these individuals may be at increased risk of developing Alzheimer's disease (Milligan Armstrong et al., 2021).

Physical inactivity has been associated with increased risk of developing Alzheimer's disease. In a large meta-analysis, evidence showed a 28-45% reduction in the prevalence of Alzheimer's disease for those who are physically active when compared to those who are not. The benefits of physical activity include a cascade of cellular and molecular processes that positively impact brain health and reduce pathological factors that can lead to the development of Alzheimer's disease (Safiri et al., 2024). In older adults, more time spent engaged in sedentary behaviors correlated with increased incidence of all types of dementia (Raichlen et al., 2023). While research has found that moderate physical activity can reduce the risk of the development and progression of Alzheimer's disease by slowing the accumulation of amyloid deposits, more research is needed to more clearly understand how physical activity protects the brain from

degenerative changes and what guidance should be given to patients to help reduce their risk (Yau et al., 2025).

While moderate alcohol intake has been found to reduce the incidence of Alzheimer's disease, excessive alcohol consumption increases risk. It is believed that this is due to reduced glymphatic function, the process by which waste is removed from the brain, associated with excessive alcohol intake. This can lead to an accumulation of proteins associated with Alzheimer's disease (Safiri et al., 2024). Excessive alcohol use has been specifically linked to increased risk of early-onset dementia (Mayo Clinic Staff, 2024).

A lack of cognitive stimulation increases risk for cognitive decline. Activities that engage the brain, such as hobbies and leisure activities, social interactions, higher education, and occupational involvement, have been shown to enhance the brain's ability to compensate for damage (Safiri et al., 2024). Those who have cognitively stimulating jobs were found to have a lower risk for all types of dementia than those who had non-stimulating jobs. This is due to the lower levels of the specific plasma proteins that increase the risk of dementia found in those who experience regular cognitive stimulation (Kivimäki et al., 2021). Social isolation has been found to exacerbate cognitive decline and potentially contribute to the progression of Alzheimer's disease (Ren et al., 2023). In recent years, specific attention has been focused on the effect of social isolation related to the development of Alzheimer's disease in the aftermath of the widespread and prolonged social isolation that occurred during the COVID-19 pandemic (Shafighi et al., 2023).

Hearing loss is considered a risk factor for developing Alzheimer's disease. Hearing loss affects the brain in multiple ways. Research suggests that when hearing is impaired, the brain must allocate more resources to communication at the expense of thinking and memory. Since a lack of cognitive stimulation is also a risk

factor, poor hearing can lead individuals to be less socially engaged, thereby decreasing their daily cognitive stimulation (CDC, 2024b).

Research has found that air pollution contributes to increased risk of Alzheimer's disease and other types of dementia (Livingston et al., 2024). A large meta-analysis found that elevated levels of air pollution increased individual risk for developing Alzheimer's disease. Among other factors, this may be due to air pollution contributing to systemic inflammation (Rogowski et al., 2025). In a study that examined the brains of deceased individuals with known Alzheimer's disease, those exposed to higher levels of fine particulate matter air pollution were likely to have more advanced Alzheimer's disease-related changes in the brain. This suggests air pollution can exacerbate Alzheimer's disease (Kim et al., 2025).

Traumatic brain injury (TBI) is a risk factor for Alzheimer's disease. Researchers believe this could be due to direct causation, shared vulnerability, or acceleration of existing pathology. Oxidative stress, inflammation, amyloid accumulation, elevated proteins that lead to Alzheimer's disease, and disruption in the blood-brain barrier that occurs with TBI may also be contributing factors. TBI also negatively impacts the way the brain processes the proteins that can lead to Alzheimer's disease (Bamel et al., 2025).

Other medical conditions are associated with an increased risk for Alzheimer's disease. Those with depression have a 65% increased risk of developing Alzheimer's disease. Studies have found that those with hypothyroidism are also at increased risk, with a 12% increase in risk for every six months of elevated TSH levels (Safiri et al., 2024). Recent research has found that poor eyesight and elevated LDL cholesterol levels also increase risk for developing Alzheimer's disease and other forms of dementia (Livingston et al., 2024).

Section 3 Personal Reflection

Why are some risk factors considered modifiable while others are not? How can comorbid health conditions impact risk for Alzheimer's disease? How does genetics affect risk? Were any risk factors surprising to you?

Case Study

The nurse, Kendra, interviews Mrs. Anderson and her son to gather relevant history. Kendra learns that Mrs. Anderson retired from teaching high school math more than ten years ago. Family history reveals Mrs. Anderson's mother had memory problems in later age, and Mrs. Anderson's older brother was diagnosed with Alzheimer's disease a few years ago. Mrs. Anderson's weight is within a healthy range, but her son reports she has never enjoyed cooking. Her diet mainly consists of foods she can easily access, such as frozen dinners and other processed foods. She is currently taking medication to help lower her cholesterol and is followed routinely in the clinic for hypertension. Mrs. Anderson was a smoker for many years, but quit about 20 years ago. She occasionally drinks alcohol. She walks regularly in her neighborhood with her dog. When asked about hobbies, Mrs. Anderson states she used to sew quilts, but her eyesight has become too poor to continue sewing.

What aspects of Mrs. Anderson's history are risk factors for Alzheimer's disease? Select all that apply.

- Age
- Female sex
- Higher education
- Career as a high school math teacher

- Multiple close family members diagnosed with dementia
- Healthy weight
- Ultra-processed diet
- History of cardiovascular disease
- History of smoking
- Occasional alcohol use
- Regular exercise
- Poor eyesight
- Lack of engagement in hobbies

Section 4: Signs and Symptoms

To understand the signs and symptoms of Alzheimer's disease, it is necessary to review the typical memory changes that occur as individuals age. These normal lapses in memory include forgetting where you placed your car keys, struggling to remember a particular word, but later recalling it, forgetting the name of an acquaintance, and forgetting the most recent events. These memory lapses do not significantly interfere with daily life, and overall, cognition and memory remain intact, including knowledge and experience gained in life, old memories, and language (CDC, 2024d). Though individuals can experience varying symptoms due to Alzheimer's disease, memory difficulties are often one of the earliest signs. Eventually, cognitive decline disrupts daily life, with increased confusion and behavioral changes (NIA, 2022b).

The signs and symptoms of Alzheimer's disease are categorized into groups based on the level of advancement of the disease. Preclinical brain changes can be

observed even before symptoms occur; however, not everyone with preclinical brain changes will go on to develop Alzheimer's disease (NIA, 2022b).

In cases of mild Alzheimer's disease, an individual may be considered generally healthy; however, they experience gradually increasing memory changes that disrupt daily life, often first observed by family members. In addition to memory loss, other subtle symptoms can include poor judgement, lack of spontaneity or sense of initiative, losing track of dates or knowing current location, taking more extended amounts of time to complete routine daily tasks, repeating questions or forgetting recently learned information, trouble handling money or paying bills, challenges in problem solving and planning, wandering or getting lost, losing things or misplacing them in odd places, difficulty completing personal hygiene tasks, mood and personality changes, and increased anxiety or aggression (NIA, 2022b).

Progression to moderate Alzheimer's disease occurs when an individual begins to require more intensive supervision and care. Symptoms of moderate Alzheimer's disease may include increased confusion and memory loss, including forgetting events or personal history, withdrawal from social activities, inability to retain new information, difficulty with reading, writing, and math, difficulty organizing thoughts, shortened attention span, difficulty coping with new situations, changes in sleeping patterns, increased difficulty with familiar personal care routines, occasional challenges in recognizing family and friends, neuropsychiatric symptoms such as hallucinations, delusions, and paranoia, impulsive behavior, inappropriate emotional outbursts, restlessness, agitation, anxiety, and repetitive statements or movements. Family and other caregivers may report especially increased agitation and wandering in the late afternoon or evening (NIA, 2022b).

When Alzheimer's disease advances to the severe stage, the ability to effectively communicate is lost, and individuals become completely dependent on others for

their care. In addition to the inability to communicate, symptoms during this stage include no awareness of recent experiences or environment, weight loss, poor appetite, seizures, general physical decline, difficulty swallowing, groaning, increased sleeping, and loss of bowel and bladder control (NIA, 2022b). Primitive reflexes may be present in advanced Alzheimer's disease. As an individual with Alzheimer's disease approaches the end of life, they often enter into a persistent vegetative state (Kumar, Sidhu, Lui, & Tsao, 2024). Complications of Alzheimer's disease include a general decline in physical health, increased infections, seizures, trouble breathing or swallowing, pressure ulcers, malnutrition, dehydration, falls, and other injuries (Cleveland Clinic, 2025). Aspiration pneumonia is a common cause of death for those with Alzheimer's disease due to dysphagia (NIA, 2022b).

Section 4 Personal Reflection

Why do you think it can be difficult for individuals to recognize the early signs of Alzheimer's disease? What signifies progression of Alzheimer's disease from the mild stage to the moderate stage? What symptoms indicate progression to the severe stage? Why do you think a decline in overall health is associated with advanced Alzheimer's disease?

Case Study

When asked about their concerns, Mrs. Anderson states she has been frustrated lately because she has a hard time remembering to take her medications. She states she sometimes forgets how to get home when she is out and must drive around a bit until she recognizes landmarks. Her son states that in recent months, his mother has begun repeating the same questions because she cannot remember the answers. He states he recently took responsibility for her finances

after she failed to pay her utility bills for three consecutive months. He states his mother tends to become confused in the evenings.

Kendra recognizes that Mrs. Anderson may be experiencing dementia. Given the family history of Alzheimer's disease, what stage of Alzheimer's disease would it be reasonable for Kendra to expect?

a. Preclinical cognitive changes

b. Mild Alzheimer's disease

c. Moderate Alzheimer's disease

d. Advanced Alzheimer's disease

Section 5: Diagnosis

An early diagnosis of Alzheimer's disease is beneficial in preventing the progression of the disease. With an early diagnosis, healthcare workers can provide coping strategies and medications to manage cognitive and behavioral changes. Early diagnosis can also allow an individual to plan, address financial or legal matters, address potential safety issues, learn about different living arrangements, and develop support networks. Given the abundance of current research in this field, an early diagnosis may also enable an individual to participate in a clinical trial testing new treatments for Alzheimer's disease (NIA, 2022a).

In the primary care setting, screening tools are frequently used to identify individuals who may require further testing for Alzheimer's disease or other types of dementia. The most well-known screening tool is the Folstein Mini-Mental Status Examination (MMSE). This 11-item, 30-point questionnaire was developed in 1975 and takes 8-10 minutes to administer. Developed in 2005, the Montreal

Cognitive Assessment (MoCA) is the most widely used and validated screening tool for cognitive decline. This test evaluates visual naming recognition and takes approximately 10-12 minutes to administer. The Saint Louis University Mental Status Exam (SLUMS), developed in 2006, assesses episodic and rote memory to determine whether an individual can recall embedded details of a story, a necessary skill for understanding medication instructions. It also assesses visual-spatial executive function, which is necessary for driving, using a clock drawing test. This test is more sensitive than many other screening tools, but is less specific for dementia than other tests. The SLUMS test takes 8-10 minutes to administer (Siddiqui et al., 2023).

The clock drawing test is not validated as a stand-alone test for Alzheimer's disease and other types of dementia; however, it is included in several screening tools. This quickly administered test requires many cognitive functions to complete, including attention, visual-spatial function, memory, language, planning, and organization. In this test, an individual is given a blank piece of paper. They are then asked to draw the face of a clock, write in the numbers, and set the hands to a particular time. Any time can be given, but research has found that the most sensitive time to use is "ten after eleven" because the individual must also record the "ten minutes" to a numerical two on the clock. Different types of errors on this test can indicate different cognitive deficits. For example, if an individual places all twelve numbers on one side of the clock, they may be experiencing problems with cognitive planning. A clock that contains all zeros may indicate difficulty in producing numbers, indicative of a language problem. While any healthcare worker can administer the clock drawing test, the results are typically interpreted by a physician or neuropsychologist (Freedman, 2022).

In busy primary care settings, it is not always possible to administer lengthy cognition tests. At times, rapid screening is necessary and more realistic to use in the emergency care setting. The Mini-Cog is a rapid screening tool designed to

identify individuals who may require a more comprehensive cognitive assessment. During the Mini-Cog test, the individual is asked to remember three words, then perform the clock-drawing test, and finally recall the three words given at the beginning of the test. This test only takes three minutes to administer. The MiniMoCA, published in 2015, is an abbreviated version of the MoCA tool, which takes only five minutes to administer. The Rapid Cognitive Screen, also published in 2015, uses three SLUMS items, including a five-word delayed recall, the clock-drawing test, and one item of embedded memory from a story. This test only takes three minutes to administer (Siddiqui et al., 2023).

When evaluating an individual who is suspected of having Alzheimer's disease, the provider must obtain a thorough medical history, physical and mental status exam, basic lab work, and neuroimaging studies. The information gathered can help rule out other potential causes of cognitive decline. They also help inform the provider if the patient has Alzheimer's disease or is more likely to have another type of dementia (Bomasang-Layno & Bronsther, 2021).

In recent years, more diagnostic tools have been identified as helpful in establishing a diagnosis of Alzheimer's disease. Volumetric data, gathered from specialized MRI software, can determine if there have been volume changes in specific regions of the brain, providing valuable information on the likelihood of progression from mild cognitive impairment to Alzheimer's disease. Diffusion Tensor Imaging can also detect specific patterns of neurodegeneration associated with Alzheimer's disease. A PET scan can identify proteins associated with Alzheimer's disease and is also used to measure disease progression. Cerebrospinal fluid (CSF) obtained through lumbar puncture can be tested for amyloid- ß and tau proteins, which can be measured decades before Alzheimer's disease becomes clinically significant. There are also highly sensitive and specific tests that can measure tau proteins in the blood. Mass spectrometry can detect beta-amyloid in the blood, which is lower in individuals with Alzheimer's disease

(Bomasang-Layno & Bronsther, 2021). In 2025, the US Food and Drug Administration approved the use of a blood test measuring certain amyloid- ß and tau proteins to diagnose Alzheimer's disease in patients over age 55 who have signs and symptoms of the disease (FDA, 2025).

Section 5 Personal Reflection

How do screening tools help primary care providers identify those who may have cognitive decline? What are the benefits of early diagnosis of Alzheimer's disease? How can a blood test help identify Alzheimer's disease earlier in more individuals compared to CSF testing and imaging studies?

Case Study

Kendra relays the information gathered to the provider. Before the provider assesses the patient, they ask Kendra to administer the clock-drawing test to Mrs. Anderson as a part of a cognitive screening tool.

Why is the clock-drawing test often included in screening tools for cognitive decline? Select all that apply.

- The clock-drawing test involves multiple brain processes that can indicate cognitive decline.
- People who can tell time are not experiencing dementia
- Errors made on the clock-drawing test can provide information regarding what type of dementia the patient may be experiencing
- People who can draw a complete circle do not typically have Alzheimer's disease

- The clock-drawing test provides a lot of information in a short period of time
- The clock-drawing test takes more than 30 minutes, allowing the provider to bill for a longer patient encounter

What other tests may be ordered for Mrs. Anderson? Select all that apply.

- Blood tests
- MRI
- Glucose tolerance test
- PET scan
- End-tidal CO_2

Section 6: Treatment

There is currently no cure for Alzheimer's disease, though in the past few decades, treatment options to slow the progression of the disease have been developed and are widely used. These treatments include medications and non-pharmacological interventions.

Cholinesterase inhibitors, including donepezil (Aricept), rivastigmine (Exelon), and galantamine (Razadyne), are medications used to treat Alzheimer's disease. These medications inhibit cholinesterase, an enzyme that breaks down acetylcholine at brain synapses. These medications have been found to slow the decline in cognitive functioning and the ability to complete activities of daily living. They also delay the emergence of adverse behaviors. Side effects of cholinesterase inhibitors include gastrointestinal symptoms, dizziness, vertigo, fatigue, insomnia,

hallucinations, bradycardia, syncope, and muscle cramps (Bomasang-Layno & Bronsther, 2021).

When glutamatergic activity is overstimulated in the brain, excitotoxicity occurs, eventually leading to a decline in synaptic function. This neurodegeneration is associated with the pathology of Alzheimer's disease. Memantine, an N-methyl-D-aspartate (NMDA) receptor antagonist, is a medication used to reduce glutamate-induced excitotoxicity, resulting in decreased delusions, agitation, aggression, and other symptoms of moderate to severe Alzheimer's disease (Bomasang-Layno & Bronsther, 2021). Aducanumab, donanemab, and lecanemab are monoclonal antibodies used to treat Alzheimer's disease. These medications are given as an infusion and target amyloid proteins (Cleveland Clinic, 2025). They have been found to slow the progression of cognitive impairment (Bomasang-Layno & Bronsther, 2021).

Other medications may be used to treat the symptoms of Alzheimer's disease. Antidepressants are prescribed to treat patients with anxiety, restlessness, mood swings, and depression (Cleveland Clinic, 2025). However, tricyclic antidepressants are typically avoided because, due to their anticholinergic activity, they can worsen cognitive impairment (Kumar, Sidhu, Lui, & Tsao, 2024). Antipsychotics may be used to treat symptoms of paranoia, hallucinations, and agitation. Antiseizure medications are sometimes used to treat mood changes (Cleveland Clinic, 2025).

Many non-pharmaceutical interventions are used to manage Alzheimer's disease. Caregivers should be advised to provide a familiar, safe environment, monitor and address personal comfort needs, provide security objects, redirect attention, remove dangerous items, and avoid confrontational situations. Sleep disturbances should be addressed to improve the patient's quality of life and minimize caregiver burden. Non-pharmaceutical interventions that may improve sleep

quality include exposure to sunlight, providing daytime physical activity, and establishing a consistent bedtime routine. Regular aerobic exercise is also beneficial in slowing the progression of Alzheimer's disease (Kumar, Sidhu, Lui, & Tsao, 2024). Cognitive stimulation is an effective intervention and uses techniques such as reminiscence therapy and reality-oriented therapy to mitigate cognitive decline in patients with mild-to-moderate dementia. Music therapy has been found to aid distraction and coping skills, and to mitigate behavioral and psychological symptoms, improving the patient's ability to recall episodic memories. Occupational therapy is often used to help patients and caregivers learn compensatory skills and improve coping skills. Other recommended interventions include lifestyle changes. In addition to exercise and adequate sleep, a healthy diet, socialization, and engagement in hobbies are effective tools for managing Alzheimer's disease (Safiri et al., 2024).

Section 6 Personal Reflection

How are medications used to slow the progression of Alzheimer's disease? What non-pharmaceutical interventions can help slow progression? Why do you think there is an abundance of clinical research being conducted to identify new ways to treat Alzheimer's disease?

Case Study

After further testing, the provider shares with Mrs. Anderson and her son that it is most likely that Mrs. Anderson has mild Alzheimer's disease. Kendra begins educating Mrs. Anderson and her son on non-pharmaceutical interventions that can help slow the progression of the disease.

What information should Kendra share with Mrs. Anderson and her son?

a. Discontinue exercise, maintain the current diet, and avoid social interactions.

b. Physical and occupational therapy are not necessary for people with memory loss.

c. A healthy diet, engagement in cognitively stimulating activities, healthy sleep habits, and continued physical activity can help slow disease progression.

d. Non-pharmaceutical interventions are necessary because medications are not used to manage Alzheimer's disease.

Section 7: Nursing Implications

Nurses are a significant part of the healthcare team when caring for patients with Alzheimer's disease. In addition to a thorough assessment, nurses can improve patient outcomes by ensuring adequate nutrition, assisting with activities of daily living, providing structure and routine, encouraging interactions with others, and minimizing agitation. Nurses are also responsible for monitoring patients, paying close attention to their sleep routine, abrupt changes in mental status or behavior, and supervising wandering that may occur (Kumar, Sidhu, Lui, Tsao, et al., 2024). Nurses should regularly review medications with caregivers to ensure there are no redundant medications or issues with administration (Merenda, 2022).

Specific nursing interventions can help nurses provide safe and comfortable care for patients with Alzheimer's disease. Nurses should be aware that while a patient may have decreased verbal communication, they may still maintain environmental awareness. Distracting noises, such as television or loud conversations, can make

communicating more difficult. Patients may become scared if an in-room intercom is used to communicate. Patients should be approached from the front, and the caregiver may need to state their name with each interaction. Eye contact and short, simple sentences can aid in communication. Nurses and other caregivers should avoid testing the patient's memory by asking questions about what they remember, as this can lead to agitation. Any devices necessary for communication, including hearing aids, glasses, and dentures, should be made available to the patient. It can be helpful to assign the same staff to care for those with Alzheimer's disease whenever possible. Room changes can create confusion and anxiety. Due to limited communication, patients may not report pain, so a thorough pain assessment is essential. Directions should be simple and given one step at a time, allowing for rest in between stimulating events. For patients experiencing dysphagia, it can be helpful to give frequent reminders to swallow during mealtimes (Merenda, 2022).

Coordination of care is necessary to ensure patients with Alzheimer's disease receive quality healthcare. There are multiple disciplines, including physical therapists, occupational therapists, pharmacists, physicians, and others, who contribute to the patient's care. Nurses are essential to establishing effective communication routines and ensuring that patients and caregivers are aware of changes in the care plan (Kumar, Sidhu, Lui, Tsao, et al., 2024).

Patient and caregiver education is a necessary aspect of Alzheimer's disease care. Caregivers require extensive support, and nurses can educate family members about the prognosis and available community support resources. Social workers are often integral to caring for someone with cognitive decline. Providing the family with contact information for a social worker can help ensure they can access the resources they need (Kumar, Sidhu, Lui, Tsao, et al., 2024).

Section 7 Personal Reflection

How can nursing interventions improve care for those with Alzheimer's disease? Why do you think it is important to ensure effective multidisciplinary team information? Why do you think it is essential for nurses to advocate for patients with Alzheimer's disease? How can nurses support family members and caregivers of those who have Alzheimer's disease?

Case Study

Mrs. Anderson's son asks Kendra how he can help his mother as her disease progresses.

What information can Kendra share that may be helpful? Select all that apply.

- While Mrs. Anderson's condition remains mild, help her plan for the future, including care options and estate planning.
- Encourage her to take all medications as prescribed and set up a reminder system if needed.
- Monitor for changes in functional status
- No longer allow Mrs. Anderson to make decisions about her healthcare
- Identify caregiver support resources in the community
- Create and maintain routines
- Eliminate hazardous objects in the home environment
- Rearrange the furniture in the home often for cognitive stimulation
- Remind Mrs. Anderson that she has been told the answer each time she repeats a question

- Contact information for a social worker

Section 8: Conclusion

The rate of progression of Alzheimer's disease and the severity of symptoms vary widely among individuals. Nurses and other healthcare workers must be aware of the causes, signs and symptoms, diagnostic tools, treatment options, and nursing implications related to Alzheimer's disease to provide competent care. The field of research in diagnostic tools, prevention strategies, and treatment modalities for Alzheimer's disease is highly active, with new findings regularly published. In addition to reviewing fundamental aspects of Alzheimer's disease, nurses and other healthcare workers must routinely review the literature for updates and potential changes in best practices. While there continues to be no cure for Alzheimer's disease, nurses can improve outcomes for both patients and their families by providing excellent care.

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