

DEMENTIA

Kurt Kuhlman, D.O.
2025

Dementia: Is a progressive loss of cognitive functioning, especially memory and abstract thinking, and often with a personality change, resulting from organic disease of the brain. It is a slowly progressive disease, and in the last stage of dementia patients lose their ability to speak and move without assistance. Alzheimer's is the sixth leading cause of death in people over 65 years, accounting for more deaths than breast and prostate cancer combined. Currently, there are 6.7 million Americans over 65 living with Alzheimer's. This is predicted to increase to 12.7 million by 2050.

Types of dementia:

1. **Alzheimer's disease:** Is the most common type of dementia and is associated with loss of memory and eventually loss of ability to care for oneself. There is an accumulation of abnormal clumps of protein called amyloid and tau that disrupt normal brain function.
2. **Vascular dementia:** Is the second most common type of dementia and is associated with obesity, diabetes, hypertension, smoking and high cholesterol. It is due to damage of the blood vessels in the brain. It is frequently seen in people with strokes and heart disease.
3. **Lewy body dementia:** Is due to abnormal deposits of a protein in the brain called Lewy bodies that disrupt normal brain signaling. It is associated with Parkinson's disease.
4. **Frontotemporal dementia:** Is due to damage of the neurons in the frontal and temporal lobes of the brain. It affects higher executive functions and emotional regulation and the ability to plan, reason and problem solve. It is difficult to diagnose. A common sign is a loss of boundaries with social and sexual behavior in public.
5. **Alcohol-related dementia:** Is related to the volume of alcohol a person consumes. The more alcohol you drink, the greater your risk of developing dementia.
6. **Brain injury-related dementia:** Is due to any damage of the brain such as after a fall or a concussion. Chronic traumatic encephalopathy is a form of this seen in boxers and football players who suffer repeated brain injuries. It is often marked by angry outbursts and strange behavior years after the brain injury was sustained.
7. **Multiple types of dementia:** Most people with dementia have more than one type at the same time. For example, a typical 75-year-old person with Alzheimer's disease also has a high chance of also having a component of vascular dementia, and may have one or more of the other four types of dementia.

Workup options for dementia:

1. **Standard laboratory workup:** Complete blood count, basic metabolic panel, thyroid studies, B vitamins (B1, B6, B12, folate), liver panel, lipid panel and sedimentation rate. These studies may help determine underlying treatable causes of dementia.
2. **Beta amyloid 42/40:** This new blood test can effectively predict the presence of beta-amyloid in the brain, which is strongly associated with Alzheimer's disease. Additionally, this test can be positive before the person has any signs of dementia. Unfortunately, there can be false positive results. Therefore, current recommendations are that this test should not be done until the person has early memory loss.
3. **Homocysteine levels:** If this is elevated (over 13), it contributes to atherosclerosis and also increases tau neurofibrillary tangles, which significantly increases the risk of developing Alzheimer's disease. By taking B vitamins especially B6, B12, and B9 (folate) it breaks down the homocysteine. The goal is to get the homocysteine level below 10 to help prevent dementia and also strokes and heart attacks.

4. **Lipoprotein(a)/Lp(a):** If atherosclerosis (clogging of the arteries) runs in your family (early heart attacks, strokes, dementia) consider obtaining an Lp(a) level. Normal should be less than 15. Elevated levels, especially if over 30 is strongly associated with atherosclerosis and subsequent heart attacks, strokes and dementia. If you have an elevated level, you should get your LDL and your apolipoprotein B levels below 70. If you do, it can significantly reduce your risk of atherosclerosis. Obviously, you want to do this when you are younger before you develop atherosclerosis.
5. **Apolipoprotein E genotype:** This is a gene that you inherit from your parents. If you have a strong family history of Alzheimer's, consider obtaining this genetic test. There are 3 types: E2 (8% of the population) is protective against dementia, and is also strongly associated with living to 100. E3 (78% of the population) has an average risk of dementia. E4 (14% of the population) is high risk for Alzheimer's, Parkinson's and Lewy body dementia. Two thirds of Alzheimer's patients have at least 1 copy of the E4 gene. You get 1 copy from each parent. Therefore, every person has 2 copies. If you have 1 copy of E4, your risk of developing Alzheimer's is 3 times average. If you are very unlucky and have 2 copies of E4 (1-2% of the population) your risk of developing Alzheimer's is 10 times the national average. Interestingly, women with the E4 genotype have greater cognitive impairment compared to men. It is believed that menopausal loss of estrogen amplifies the negative effect of the E4 gene. Currently, it is felt that about 50% of developing Alzheimer's disease is preventable. Therefore, if you live a healthy lifestyle as described below, an unfortunate person with 2 copies of E4 (one from each parent), can cut their risk of developing Alzheimer's from 10 times down to 2 times the national average.
6. **Brain MRI:** This is a very detailed picture of the brain. It can evaluate many conditions that affect memory. In people with Alzheimer's disease being treated with Lecanemab, frequent MRI scans are required to monitor for the occurrence and severity of amyloid-related imaging abnormalities.
7. **PET scans:** These very detailed imaging studies, will show abnormal beta-amyloid levels and decreased glucose metabolism in the brain of people with Alzheimer's disease. A PET scan is required before starting Lecanemab.
8. **Electroencephalogram (EEG):** This test is used to rule out a seizure disorder.
9. **Carotid ultrasound:** This is to rule out carotid artery stenosis that is associated with strokes.
10. **Montreal Cognitive Assessment (MoCA) test:** This test contains 30 questions and takes 10 minutes to complete. It is used to detect mild cognitive decline and early signs of dementia.
11. **Neuropsychologic testing:** This is a very thorough cognitive examination (about 3 hours long) that can help differentiate many causes of memory loss.
12. **Cerebrospinal fluid (CSF) examination:** CSF is a clear fluid that bathes and cushions the brain and spinal cord. A spinal tap of the CSF can show elevations in tau and beta-amyloid, that are strongly associated with Alzheimer's disease.

Non-preventable risk factors for dementia:

1. **Elderly age:** The longer you live, the more likely you are to have dementia. About 3% of adults age 70-74 have dementia, compared to 22% of adults age 85-89 and 33% of adults age 90 and older.
2. **Female gender:** Women are at higher risk of developing dementia. About two thirds of Alzheimer's patients are female.
3. **Genetics:** As described above, people with the E4 genotype are 3 to 10 times more likely to have Alzheimer's disease.
4. **Race: African-Americans** have 2 times the risk and Hispanic Americans have 1.5 times the risk of developing Alzheimer's disease compared to white Americans.

How to prevent dementia:

1. Eat a healthy diet.
2. Stay physically active. The more intense the exercise, the better. However, the most inactive person who begins any exercise has the most to gain.
3. Drink limited or no alcohol.
4. Do not smoke.
5. Get at least 7 hours of sleep per night.
6. Wear hearing aids if hearing loss is present.
7. Vitamin B supplements to keep the homocysteine level below 10.
8. Omega-3 supplements.
9. Make sure blood pressure is under 120/80.
10. Maintain normal cholesterol levels.
11. Maintain a healthy weight.
12. Early and aggressive treatment of insulin resistance, prediabetes and diabetes.
13. Proactively prevent atherosclerosis and coronary artery disease. 80% of people with Alzheimer's, also have cardiovascular disease.
14. Avoid brain injury/concussions.
15. Consider hormone replacement therapy especially in postmenopausal women.
16. Engage in brain stimulating and social activities. Avoid social isolation.
17. Continue formal education until at least age 20.
18. Take care of your mental health. Depression doubles the risk for Alzheimer's.
19. Avoid air pollution.

Early signs and symptoms of dementia:

1. A decline in memory, attention or thinking.
2. Changes in behavior or mood.
3. A decline in functional ability such as cooking and cleaning.
4. Repeating stories and questions in the same conversation.
5. Changes in language use.

Treatment of Alzheimer's dementia:

1. **Cholinesterase inhibitors:** These medications are used in all stages of Alzheimer's disease, and include **Aricept** (donepezil), Exelon and Razadyne. They are prescribed to treat symptoms related to memory, thinking, language, judgment and other cognitive processes. They can slightly slow the progression of Alzheimer's disease but cannot stop it.
2. **NMDA antagonists: Namenda** (memantine) is used in moderate to severe stages of Alzheimer's disease to improve memory, attention, reason, language and the ability to perform simple tasks. It too can slightly slow the progression of Alzheimer's disease but cannot stop it.
3. **Lecanemab:** Binds to and removes a protein from the brain called amyloid-B, a hallmark of Alzheimer's disease. It has been shown to reduce the rate of disease progression and to slow cognitive and functional decline in adults with Alzheimer's disease. It was FDA-approved in 2023. It consists of IV treatments every 2 weeks. There are serious side effects including swelling and bleeding in the brain (12.6%), confusion, and increased risk of falling. Unfortunately, the highest risk patients—those with the E4 genotype—are 3 to 6 times more likely to develop brain swelling and bleeding. Additionally, it is also very expensive at a cost of \$26,500 per year (it is covered by Medicare). Lecanemab is currently approved to treat people with early Alzheimer's, but it may be used in the future to treat high risk people before they develop cognitive deficits.
4. **GLP-1 receptor agonists (e.g Wegovy, Mounjaro, Semaglutide, Ozempic):** These medications are currently used to treat obesity and diabetes. However, they also decrease inflammation and early studies show that they are also effective in decreasing risk for coronary artery disease, Parkinson's disease and Alzheimer's disease.