Alzheimer's Disease: Dietary Considerations

What We Know

› According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), Alzheimer’s disease (AD) is a debilitating and progressive condition that impairs cognitive function, including function related to memory, thinking, comprehension, orientation, language, emotional control, and social behavior. AD is characterized by the gradual breakdown of nerve cells in the brain, and accounts for more than half of all cases of dementia, making it the most prevalent dementia-causing disease. As of 2010, 4.7 million Americans were estimated to have AD, and its prevalence is expected to increase significantly in coming decades.\(^1\)\(^3\)\(^8\)\(^10\)\(^12\)\(^17\)\(^22\)

• Signs and symptoms of AD include:
  – Memory loss and disorientation; disoriented patients can exhibit pacing and wandering
  – Dysphasia and other impairment in communication
  – Inability to recognize persons, places, or things that once were familiar
  – Inability to learn, comprehend, or reason
  – Weight changes
  – Mood swings, personality and behavioral changes (e.g., aggression, suspicion, agitation), and insomnia
  – Hallucinations and delusions
  – Loss of independence due to inability to perform basic ADLs, including shopping for and preparing food

› Dietary guidelines for the prevention of AD

• Using available evidence, speakers at the International Conference on Nutrition and the Brain in Washington, D.C. (2013) compiled the following list of dietary and lifestyle guidelines for the prevention of AD.\(^2\)
  – Keep intake of saturated and trans fats to a minimum
  – Diets should be primarily plant-based, replacing meats and dairy with vegetables, fruits, whole grains, and legumes as diet staples
  – Consume whole food sources (e.g., seeds, nuts, whole grains, leafy greens) of vitamin E instead of supplements
  – Regularly consume the recommended daily allowance (RDA) of vitamin B\(_{12}\), through food sources (e.g., meat, dairy products, eggs, enriched breads and cereals) or supplements. Have blood levels checked for B\(_{12}\) deficiency, especially with increasing age.\(^3\)\(^2\)
    - Adult RDA for B\(_{12}\)\(^2\)
      - Males and females > 14 years of age: 2.4 mcg
      - Pregnant females: 2.6 mcg
      - Lactating females: 2.8 mcg
  – Do not take multivitamin supplements containing copper, and take iron only under direction of a physician
  – Regularly engage in aerobic exercise equaling at least 120 minutes/week
Dietary considerations for the management of AD

In addition to cognitive deterioration, persons with AD experience variable changes in appetite, dietary patterns, and ability to prepare and consume food. Weight loss, or occasionally weight gain, is a significant sign of progressing dementia (12, 17, 19, 22).

Patients with AD are often unable to communicate the presence of factors that affect their appetite and food intake, including poor dental health, difficulty swallowing, adverse effects of medications, loss or change in ability to taste, having constipation or diarrhea, and being depressed (12, 18, 19, 22).

Risk factors for malnutrition in persons with AD include (12, 19, 22):
- poor economic status
- poor social support
- difficulty with self-feeding
- coexisting conditions (e.g., diabetes mellitus type 2 [DM2], cardiovascular disease [CVD], hypothyroidism)
- agitation, anxiety, or depression

Depression greatly influences food intake in patients with dementia. Many patients develop depression when they lose the ability to eat independently or when they are admitted to an assistive care facility, which results in inadequate dietary intake and weight loss. Promptly recognizing and treating depression can help to delay or prevent malnutrition (18).

Methods for encouraging adequate nutritional intake in persons with AD include the following (2, 5, 6, 7, 19, 27):
- Prepare familiar foods that the person likes
- Plan small, frequent meals that are served on a consistent meal schedule
- Provide finger foods (i.e., foods cut or formed in smaller bite-sized pieces that can be picked up with the fingers) that enable self-feeding
- Supply utensils that are easily held (e.g., with large handles) and/or assist with feeding
- If calorie consumption is inadequate, foods should be fortified with whole milk or protein supplements. Eating high-calorie snacks should be encouraged if appropriate
- Food should be served at a comfortable temperature (i.e., appropriately hot or cold)
- Patients should be provided with a consistent seating location so that mealtime occurs in familiar surroundings
- The dining area should be quiet and have adequate lighting
- Playing soft, low-tempo music in the dining room can mask noises that could cause agitation in a person with AD and interfere with eating
- Physical activity should be encouraged, if possible, to stimulate appetite and circulation

Research findings on AD and diet

Results of studies show that preventing and managing chronic health conditions such as DM2, CVD, and obesity can prevent or slow the onset of AD (3, 17, 21, 25).

Study results show a strong link between insulin resistance in the brain and early AD, suggesting that AD could be considered to be a neuroendocrine disorder of the brain or diabetes mellitus, type 3 (28).

Researchers suspect that defects in insulin production and signaling contribute to both diabetes and AD, a mechanism that appears to be amplified by a high-fat diet. Evidence reported from an animal study supports the theory that there is a vicious cycle between AD and diabetes; furthermore, a single insulin injection is able to rapidly reverse the deleterious effects of the high-fat diet on this cycle (29).

Research results indicate that individuals who follow the Mediterranean diet have a reduced risk of developing AD, DM2, CVD, and obesity (16, 23, 24, 25, 26).

In the Mediterranean diet saturated fats are replaced with unsaturated fats (predominantly olive oil); eating a variety of fresh fruits, vegetables, and minimally processed foods and limiting dairy products, eggs, and red meat is encouraged. Emphasis is placed on using seasonal, fresh, and locally grown foods (21, 24, 26).

Researchers report that cognitively normal individuals who participate in moderate physical activity and follow the Mediterranean diet model exhibit the lowest level of burden on AD-susceptible regions of the brain. Evidence also reveals that cognitively normal individuals who maintain a sedentary lifestyle with low adherence to the Mediterranean diet model have a significant increase in the AD burden in the brain long before clinical symptoms of AD are evident (14).

A magnetic resonance imaging (MRI) study has revealed that cognitively normal individuals who exhibit low adherence to the Mediterranean diet have cortical thinning in the same regions of the brain as individuals with clinically evident AD (15).
• The omega-3 fatty acid metabolites eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which can be found in fatty fish (e.g., salmon, mackerel), walnuts, soybeans, and flax seeds, exhibit protective activity against dementia. Results of clinical studies show lower levels of omega-3 fatty acids in patients with AD, and researchers report that supplementation with omega-3 fatty acids can reduce depression and aggressive behavior in persons with AD.2,4,16,20
• The results of a meta-analysis of seven studies showed a significant positive relationship between dietary intake of beta-carotene and vitamins E and C and reduced risk for AD. Researchers noted that vitamin E exhibited the most protective effects.11 Researchers reported that women with higher dietary intake of vitamin D were less likely to develop AD than women with lower vitamin D intake.2
• The ability to absorb vitamin B12 diminishes as persons age, with notable decrease occurring after the age of 50.32 Results of studies show that there are significantly low levels of vitamin B12 and folate in patients with AD and patients with vascular dementia. Researchers who conducted a study involving 900 patients aged 60–74 years with elevated psychiatric distress concluded that long-term supplementation with vitamin B12 and folate can improve cognitive function.31
• A study that recorded the functional MRI of 12 healthy adults who consumed either green tea or placebo while performing a task related to working memory showed that green tea extract appears to mediate working memory processing in the brain by modulating brain activity in the dorsolateral prefrontal cortex.4
• Curcumin treatment has shown potential for improving spatial memory disorders such as AD. Researchers report that curcumin inhibits the activation of astrocytes and regulates the expression of glial fibrillary acidic protein, which are key factors in the early pathology of AD. This evidence supports the theory that curcumin may prevent AD.30
• Results of studies indicate that moderate consumption of red wine appears to be protective against several age-related diseases, including AD and CVD, due to its immunomodulating properties.9,13

What We Can Do
› Learn about dietary considerations related to AD so you can accurately assess your patients’ personal characteristics and health education needs; share this information with your colleagues
› Assess your patients’ health and diet history and risk factors for AD
› Educate the family members and other caregivers of your patients with AD about the importance of maintaining a consistent dining schedule and environment and providing finger foods, calorie-dense snacks, and small, frequent meals to encourage dietary intake

References


