

# Maintaining Cognitive Function with Diet

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**P**reventing or slowing the advance of Alzheimer disease (AD), vascular dementia, and mild cognitive impairment can improve the quality of life for many older adults. Researchers are looking for dietary patterns and specific nutrients and supplements that will enhance brain function and reduce the risk of developing dementia and AD.

Nutritional disorders can cause cognition problems. Confusion and poor memory are symptoms of vitamin B12 deficiency. Up to 40% of older adults have an age-related loss of stomach acid that prevents absorption of this vitamin, so they require supplementation to prevent anemia and neurologic damage. One investigation<sup>1</sup> of vitamin B12 found that older adults absorbed the vitamin from dairy foods more efficiently than from meat or fish.

Dehydration may cause disorientation that mimics dementia. The symptoms of dehydration are similar to other disorders so it may be difficult to identify dehydration as a cause of dementia. Prolonged, excessive alcohol consumption, another cause of cognitive impairment, cannot be reversed, even with good nutrition and hydration.

## VASCULAR DEMENTIA

Multi-infarct dementia, a type of vascular dementia, is caused by a series of small strokes or changes in blood supply to the brain, resulting in the death of brain tissue. For this reason, older adults with atherosclerosis that can narrow the arteries to the brain and the heart are at higher risk for dementia. A diet rich in fruits, vegetables, and low-fat dairy products and poor in saturated fat and sodium lowers blood pressure and LDL-cholesterol levels in people of all ages, including older adults. Known as the DASH diet (Dietary Approaches to Stop Hypertension), it is really an antidementia diet because of its ability to reduce the risk of stroke.<sup>2</sup>

## ANTIOXIDANTS, CALORIES, AND HOMOCYSTEINE AND SUPPLEMENTS

The antioxidant vitamins C and E and ginkgo biloba have been related to enhanced brain function or reduction in risk of dementia. High blood levels of ApoE, a protein responsible for carrying cholesterol in the blood, and homocysteine, as well as high fat and calorie intake, were as-

sociated with increased risk of AD in certain studies.

Population research shows that vitamin E may protect against oxidative damage to the brain. In a Dutch study,<sup>3</sup> older adults with the highest intake of dietary vitamin E had a 67% lower risk of developing AD than a group with the lowest intake. There was no significant change in risk for people in the study who took vitamin E supplements, other antioxidant supplements, or a general multivitamin. Dietary intake of beta carotene and vitamin C seemed to protect against dementia, although the relationship was not statistically significant. The protective effect of dietary vitamin E was strongest in people who did not have the genetic marker for AD known as Apoe4.

The presence of the Apoe4 allele (a gene variation) indicates increased risk of developing AD. The risk is higher in White older adults with Apoe4 than in Black or Hispanic adults. Older adults with the Apoe4 genetic predisposition to AD who ate the most calories and fat had a seven-fold increased risk of developing AD compared with those with no genetic marker and a lower fat and calorie diet.<sup>4</sup> The latter group also consumed more antioxidants, possibly explaining some of the difference in risk.

The DASH diet, developed as a treatment to lower blood pressure and prevent stroke, also lowers blood homocysteine levels. Several studies have shown a relationship between high blood levels of homocysteine and increased risk of developing dementia. Research conducted on 1000 men and women who were followed for a total of 16 years showed a steady rise in homocysteine levels that corresponded with a rise in incidence of dementia. The group with the highest homocysteine levels had twice the risk of developing AD.<sup>5</sup>

Of significance, B vitamins (particularly B6 and B12) and folic acid can lower blood homocysteine levels. Fruits, vegetables, and dairy products are good sources of these vitamins.

But as with aluminum and AD, a relationship between a physiologic factor and dementia does not prove it is a cause or cure of dementia. When research found higher levels of aluminum in the brains of people with AD than those without it, some scientists tried to document aluminum toxicity as a cause of AD. Most now believe, however, that not enough evidence exists to consider

aluminum intake from food or food cooked in aluminum pots as a cause of AD. Likewise, the statistical relationship between vitamins E and C and dementia could be incidental if the foods that are good sources of these vitamins also supply another substance that is protective but wasn't tested.

Statistical relationships between nutrients and cognition must be tested in clinical trials. The vitamin E study cited above showed no relationship between vitamin E supplements and reduction in the risk of developing cognitive problems. The length of time study subjects have taken supplements, the form of the supplement, or the type of person who chooses to take a supplement (perhaps people with existing cognitive problems) can affect the statistical outcome of this kind of research.

## GINKGO BILOBA AND HYPERZINE A

Two dietary supplements show a positive effect on cognition: ginkgo biloba and hyperzine A. Ginkgo biloba is a top selling supplement that, in several studies, slowed the progression of dementia in AD patients, although the effect was minimal and inconsistent. A clinical trial of ginkgo biloba for memory enhancement in healthy subjects showed no benefit to memory when it was taken according to manufacturer's instructions for 6 weeks.<sup>6</sup> There is also a potential for increased bleeding time with ginkgo biloba supplementation, especially when combined with other medicines and supplements such as vitamin E or coumadin.

Hyperzine A, a traditional Chinese medicine, has an effect similar to prescription medicines approved for AD treatment, but like many supplements, it is not standardized for dosage or regulated for consistency of content.

Clinical trials are under way to test the usefulness of nutrients and supplements for improved cognition. The National Cancer Institute's Selenium and Vitamin E Prostate Cancer Prevention Trial (SELECT) is looking into the effect of these 2 nutrients on preventing cognitive decline in healthy men 60 years old and older. Other studies are testing vitamin C, folate, and beta carotene in men and women. For information on these studies, visit the Alzheimer's Disease Education and Referral Center website at [www.alzheimers.org](http://www.alzheimers.org).

Until more definitive research is conducted, experts can offer no specific recommendations on the amounts of nutrients or supplements needed to prevent cognitive decline. A healthy diet with plenty of vitamins and minerals and a calorie/activity balance that promotes a healthy appetite are still the best ways to ensure protection against cognitive decline in older adults.

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