

Arresting Alzheimer's with Diet and Lifestyle

Part of the Food as Medicine series

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Dementia is not a normal part of aging. It is caused by brain cell damage that may be largely preventable.

Credit: Ocskay Bence, stock.adobe.com

Introduction

Dementia is a general term for symptoms that range from memory problems and impaired judgment to a severe loss of language and self-care skills. [Alzheimer's disease](https://www.alz.org/alzheimers-dementia/difference-between-dementia-and-alzheimer-s) (<https://www.alz.org/alzheimers-dementia/difference-between-dementia-and-alzheimer-s>) is the most common form of dementia, accounting for [nearly 70%](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705925/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705925/>) of all cases.

Although dementia symptoms, including Alzheimer's disease, often occur after age 65, dementia is [not a normal part of aging](https://www.nia.nih.gov/health/memory-forgetfulness-and-aging-whats-normal-and-whats-not). (<https://www.nia.nih.gov/health/memory-forgetfulness-and-aging-whats-normal-and-whats-not>) It is caused by brain cell damage that may be preventable. Most dementia is caused by other diseases, such as central nervous system infections, brain tumors, vascular disease, drug toxicity and poor nutrition. Many of these are [lifestyle factors](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6601685/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6601685/>) we can control.

Brain anatomy

The brain is made up of three main parts.

- The cerebrum is responsible for thinking, decision-making, language, visual processing, speech, learning and memory.
- The cerebellum coordinates muscles and movements, posture, balance, and actions like walking and talking.
- The brainstem controls heartbeat, blood pressure, body temperature, breathing, thirst, hunger and digestion.

All brain sections can be affected by the degeneration of nerve cells, called *neurons*. Neurons have branch-like projections creating a neuron forest. Nerve signals travel through the forest, jumping from one tree to another across gaps called ***synapses***.

In Alzheimer's, neurons, which cannot regenerate, die due to abnormal adhesions that block the flow of nutrients and transmissions. These include beta-amyloid ***plaques*** and neurofibrillary ***tangles***.

Plaques (https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour_part_2) are proteins produced by nerve cells and secreted into the fatty membranes around nerve cells. With Alzheimer's disease, these do not degrade. Instead, they build up and cluster between nerve cells, blocking transmissions.

Tangles (https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour_part_2) are made up of proteins called tau proteins. They are designed to protect the tracks or pathways along which nutrients flow. Tau proteins become twisted, forming tangles inside nerve cells and destroying the pathways. Nutrients cannot reach brain cells, and neurons begin to die, causing the brain to shrink and lose function.

Lifestyle factors

Research has found a relationship between cognitive decline and lifestyle. **Factors include** (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6601685/>) high blood pressure and blood sugars, excess abdominal fat, inflammation, a sedentary lifestyle and excess cortisol from stress.

Since the brain uses 20%–25% of the body's blood and 20% of its oxygen, **diseases** (<https://pubmed.ncbi.nlm.nih.gov/18457531/>) that reduce circulation (such as high blood pressure, arterial disease, stroke and diabetes) may be major contributors to Alzheimer's risk.

The food choices we make can increase risk, but they can also be a powerful tool in **preventing** (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3207358/>) or slowing the onset of Alzheimer's and other forms of dementia.

Foods that hurt

Saturated and trans fats

[The Women's Health Study](https://pubmed.ncbi.nlm.nih.gov/22605573/)

(<https://pubmed.ncbi.nlm.nih.gov/22605573/>) showed that older women with the highest intake of saturated fats had 60%–70% lower brain function scores, equivalent to six years of brain deterioration.

Those with the highest adherence to a [low-fat diet](https://pubmed.ncbi.nlm.nih.gov/23680940/) (<https://pubmed.ncbi.nlm.nih.gov/23680940/>), such as the Mediterranean or DASH diets, had the lowest incidence of Alzheimer's disease.



Diets high in fruits and vegetables and low in meat and fat can protect from Alzheimer's.

Credit: bit24, stock.adobe.com

Sugar

Impaired glucose utilization is associated with the initial stages of cognitive impairment.

A 2008 study published in the Journal of Diabetes Science and Technology refers to Alzheimer's as [Type 3 diabetes](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769828/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769828/>), defined as chronic insulin resistance confined to the brain.

Tau proteins are regulated by insulin-like growth factors, which may contribute to the deterioration of these proteins into tangles.

Meat and animal products

Diets high in animal products, saturated fat and cholesterol are associated with an increased risk of dementia, especially Alzheimer's disease. In [observational studies](https://pubmed.ncbi.nlm.nih.gov/27454859/), (<https://pubmed.ncbi.nlm.nih.gov/27454859/>) lower meat consumption was associated with a 53% reduction in risk for Alzheimer's.

Sirtuins are proteins that regulate cellular health and promote healthy aging. However, [glycotoxins](https://pubmed.ncbi.nlm.nih.gov/22254007/) (<https://pubmed.ncbi.nlm.nih.gov/22254007/>) — found in cigarettes, high-fat foods, chicken, pork, beef, fish and dairy products — suppress sirtuins, causing higher levels of cognitive decline. Glycotoxins are also produced when meat is fried or grilled at high temperatures.

Vitamin deficiency

Vitamin B12: [Cobalamin \(B12\)](https://www.mountsinai.org/health-library/supplement/vitamin-b12-cobalamin) (<https://www.mountsinai.org/health-library/supplement/vitamin-b12-cobalamin>) is essential for healthy nerve cells and for the production of DNA and RNA. Vitamin B12 deficiency may cause cognitive deficits and dementia. Alzheimer's patients are likely to have low B12 levels. Doctors may recommend patients take vitamin B12 supplements, either in a chewable form or in a pill placed under the tongue.

Vitamin D: Studies show vitamin D deficiency is associated with the risk of all-cause dementia and Alzheimer's. Patients with Alzheimer's and other dementia test low in vitamin D. Supplementing with 800 to 2,000 international units (IU) per day is recommended.

B vitamins: Thiamin, niacin, riboflavin, B6 and folate can help prevent cognitive decline. These B vitamins are found in grains, vegetables, legumes, nuts and seeds. Health experts recommend people get vitamin B from whole food rather than supplements.

Foods that help

Plant-based diets

Diets high in fruits and vegetables and low in meat and fats can protect you from Alzheimer's. Study participants who adhered to the [MIND Diet](https://pubmed.ncbi.nlm.nih.gov/25681666/), (https://pubmed.ncbi.nlm.nih.gov/25681666/) a mix of the Mediterranean and [DASH](https://www.nhlbi.nih.gov/health-topics/dash-eating-plan) (https://www.nhlbi.nih.gov/health-topics/dash-eating-plan) diets, reduced their risk for Alzheimer's by 53%.

Dark fruits

Blueberries and other berries contain anthocyanins and [flavonols](https://www.nia.nih.gov/health/what-do-we-know-about-diet-and-prevention-alzheimers-disease), (https://www.nia.nih.gov/health/what-do-we-know-about-diet-and-prevention-alzheimers-disease) powerful antioxidants that help reduce the formation of plaques. Pomegranates contain [punicalagin](https://pubmed.ncbi.nlm.nih.gov/29234773/) (https://pubmed.ncbi.nlm.nih.gov/29234773/), which reduces inflammation and slows the degeneration of immune cells known as microglia in the central nervous system. Polyphenol antioxidants (found in dark fruit, such as berries) also slow the formation of plaques.

Tomatoes contain [lycopene](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6558668/pdf/S2048679019000168a.pdf) (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6558668/pdf/S2048679019000168a.pdf) which reduces tumor formation and inflammation in the brain.

Dark leafy greens

[Chlorophyll](https://www.nationalgeographic.org/encyclopedia/chlorophyll/) (https://www.nationalgeographic.org/encyclopedia/chlorophyll/) in greens mimics hemoglobin in the blood, amplifying oxygen transport.

High homocysteine levels are independent risk factors for Alzheimer's disease. They are usually the result of low B6 and folate, which can be increased by eating green leafy vegetables daily.

Greens also contain [calcium](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5713908/) (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5713908/), which helps store and retrieve memories and release neurotransmitters.

[Nitric oxide](https://en.wikipedia.org/wiki/Biological_functions_of_nitric_oxide), (https://en.wikipedia.org/wiki/Biological_functions_of_nitric_oxide) made from nitrates in raw greens, improves vascular circulation and reduces the risk of arterial blockages, heart attack and stroke.

Green leafy vegetables also contain small amounts of vitamin E, a fat-soluble vitamin believed to play a role in delaying dementia.

Cruciferous vegetables

Researchers found cruciferous vegetables had the largest effect in helping women retain memory. Those who ate 1 1/2 cups per day had 13%–15% lower levels of brain inflammation.

Sulforaphane, a powerful phytochemical found in cruciferous vegetables such as broccoli, bok choy and cabbage, protects against neurodegenerative diseases.

Cruciferous vegetables also include arugula, Brussels sprouts, green and purple cabbage, cauliflower, collard greens, horseradish, kale, kohlrabi, mustard leaves, radish, rutabaga, turnip and watercress.

TIP: Download [Dr. Michael Greger's free Daily Dozen \(https://nutritionfacts.org/daily-dozen/\)](https://nutritionfacts.org/daily-dozen/) app to your phone to help track your intake of brain-healthy foods.

Omega-3 fatty acids

Omega-3 fats may reduce brain inflammation and prevent cognitive decline, but supplementation with omega-3 fatty acids is not conclusive.

Alpha-linolenic acid, frequently referred to by its acronym ALA, is an essential omega-3 fatty acid found in algae, ground flax, chia seeds, hemp seeds, soy and walnuts. Add 2 tablespoons of seeds or 1 ounce of nuts daily to your diet.

Omega-3 fatty acids docosahexaenoic acid (often called DHA) and eicosapentaenoic acid (EPA) are nonessential and can be found in cold-water fish. A 3-ounce portion of tuna, salmon or sardines no more than two times per week is optimal.

Other foods

Spices like saffron, turmeric, ginger, rosemary and cinnamon have anti-inflammatory properties.

Green tea contains [EGCG \(https://www.alzforum.org/therapeutics/epigallocatechin-gallate-egcg\)](https://www.alzforum.org/therapeutics/epigallocatechin-gallate-egcg), a flavonoid that protects against the formation of plaques and may impede tau protein tangling.

Other lifestyle factors

Sleep

Alzheimer's patients often have disrupted sleep patterns. They have trouble staying asleep, lie awake for longer periods and experience disrupted dream stages.

Sleep plays an important role in clearing beta-amyloid from the brain. Sleep deprivation or poor sleep can lead to a build-up of beta-amyloid proteins in the hippocampus and thalamus, regions affected by Alzheimer's disease. Those who sleep six hours or fewer per night are more likely to develop dementia later in life.

Exercise

Older adults who regularly exercise at moderate levels have significantly lower rates of dementia and Alzheimer's. Exercise improves blood flow to the brain and lowers cholesterol, reducing the risk of heart attack and stroke.

Experts recommend three to six hours of exercise per week or 30 minutes per day of moderate-intensity exercise like walking or bicycling. Exercise can also help older adults to socialize.



Exercise reduces dementia risk.

Credit: Mladen, © Adobe Stock photo

Socialization

Our brains are designed to be stimulated by social interactions and relationships. A [2008 study](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2424087/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2424087/>) found that older women with larger social networks were less likely to develop Alzheimer's or dementia than older women with smaller social networks. A [2011 study](https://www.cambridge.org/core/journals/journal-of-the-international-neuropsychological-society/article/abs/latelife-social-activity-and-cognitive-decline-in-old-age/91C0CD4DF1817938EB16E3179567D76E) (<https://www.cambridge.org/core/journals/journal-of-the-international-neuropsychological-society/article/abs/latelife-social-activity-and-cognitive-decline-in-old-age/91C0CD4DF1817938EB16E3179567D76E>) showed that being social can reduce dementia risk by 70%.

A [2016 study](https://journals.sagepub.com/doi/abs/10.1177/1046878116645736) (<https://journals.sagepub.com/doi/abs/10.1177/1046878116645736>) found older adults derive social and emotional benefits from playing digital games.

Brain exercises

The [ACTIVE study](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700828/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700828/>) (Advanced Cognitive Training for Independent and Vital Elderly) found that participants who played brain-training games had a 29% reduction in dementia risk after 10 years of follow-up.

Brain training can include solving visual puzzles, written riddles and learning a new dance or language.

For example, try the [Stroop](https://lesley.edu/article/what-the-stroop-effect-reveals-about-our-minds) (<https://lesley.edu/article/what-the-stroop-effect-reveals-about-our-minds>) Test. As quickly as possible, read aloud the COLOR you see, not the word you read.

Best practices

- Adopt a MIND Diet low in fat and cholesterol and high in fruits, vegetables, nuts, seeds, legumes and intact grains. Include cruciferous and raw greens daily.
- Limit consumption of animal products to no more than twice a week.
- To flavor foods, use herbs and such spices as turmeric, rosemary, cinnamon, saffron and ginger instead of salt.
- Drink green tea daily in place of sweetened beverages.
- Add a dietary supplement for vitamins B12 and D.
- Aim for seven to nine hours of restful sleep per night.
- Get 30 minutes of physical activity and 30 minutes of social interactions daily.
- Use brain-training games to keep your brain active.



One study found that being social can reduce dementia risk by 70%.

Credit: belahoche, © Adobe Stock photo

References

Adalier, N., H. Parker. 2016. [Vitamin E, turmeric and saffron in treatment of Alzheimer's disease](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5187538/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5187538/>). *Antioxidants*.

Akhondzadeh, S., M. Shafiee-Sabet, M.H. Harirchian, et al. 2010. [Saffron in the treatment of patients with mild to moderate Alzheimer's disease: A 16-week, randomized and placebo-controlled trial](https://pubmed.ncbi.nlm.nih.gov/20831681/). (<https://pubmed.ncbi.nlm.nih.gov/20831681/>) *Journal of Clinical Pharmacy and Therapeutics*.

[Anatomy of the brain](https://www.aans.org/en/Patients/Neurosurgical-Conditions-and-Treatments/Anatomy-of-the-Brain). (<https://www.aans.org/en/Patients/Neurosurgical-Conditions-and-Treatments/Anatomy-of-the-Brain>) American Association of Neurological Surgeons.

Arab, L., M. Sabbagh. 2010. [Are certain lifestyle habits associated with lower Alzheimer disease risk?](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3207358/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3207358/>) *Journal of Alzheimers Disease*.

Ayati, Z. 2020. [Saffron for mild cognitive impairment and dementia: A systematic review and meta-analysis of randomised clinical trials](https://alz-journals.onlinelibrary.wiley.com/doi/abs/10.1002/alz.047491). (<https://alz-journals.onlinelibrary.wiley.com/doi/abs/10.1002/alz.047491>) *Alzheimer's & Dementia*.

Berti, V., M. Walters, J. Sterling, et al. 2018. [Mediterranean diet and 3-year Alzheimer brain biomarker changes in middle-aged adults](https://pubmed.ncbi.nlm.nih.gov/29653991/). (<https://pubmed.ncbi.nlm.nih.gov/29653991/>) *Neurology*.

[Biological functions of nitric oxide](https://en.wikipedia.org/wiki/Biological_functions_of_nitric_oxide) (https://en.wikipedia.org/wiki/Biological_functions_of_nitric_oxide). Wikipedia.

Braidy, N., T. Jayasena, A. Poljak, P.S. Sachdev. 2012. [Sirtuins in cognitive ageing and Alzheimer's Disease](https://pubmed.ncbi.nlm.nih.gov/22327552/). (<https://pubmed.ncbi.nlm.nih.gov/22327552/>) *Current Opinion in Psychiatry*.

Cai, W., J. Uribarri, L. Zhu, et al. 2014. [Oral glycotoxins are a modifiable cause of dementia and the metabolic syndrome in mice and humans](https://pubmed.ncbi.nlm.nih.gov/24567379/). (<https://pubmed.ncbi.nlm.nih.gov/24567379/>) *Proceedings of the National Academy of Sciences of the United States of America*.

[Can dementia be prevented?](https://www.nhs.uk/conditions/dementia/dementia-prevention/) (<https://www.nhs.uk/conditions/dementia/dementia-prevention/>) National Health Service.

Cechetto, D., V. Hachinski, S. Whitehead. 2008. [Vascular risk factors and Alzheimer's disease](https://pubmed.ncbi.nlm.nih.gov/18457531/). (<https://pubmed.ncbi.nlm.nih.gov/18457531/>) *Expert Review of Neurotherapeutics*.

[Chlorophyll](https://www.nationalgeographic.org/encyclopedia/chlorophyll/). (<https://www.nationalgeographic.org/encyclopedia/chlorophyll/>) Resource Library National Geographic.

Clementi, M.E., B. Sampaolese, G. Lazzarino, B. Giardina. 2015. [Effect of punicalagin and resveratrol on methionine sulfoxide reductase: A possible protective contribution against Alzheimer's disease](https://pubmed.ncbi.nlm.nih.gov/29234773/). (<https://pubmed.ncbi.nlm.nih.gov/29234773/>) *Journal of Prevention of Alzheimer's Disease*.

Crooks, V.C., J. Lubben, D.B. Petitti, et al. 2008. [Social network, cognitive function and dementia incidence among elderly women](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2424087/). (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2424087/>) *American Journal of Public Health*.

Crowe-White, K.M., T.A. Phillips, A.C. Ellis. 2019. [Lycopene and cognitive function](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6558668/pdf/S2048679019000168a.pdf). (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6558668/pdf/S2048679019000168a.pdf>) *Journal of Nutritional Science*.

De la Monte, S., J.R. Wands. 2008. [Alzheimer's disease is Type-3 diabetes-evidence reviewed.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769828/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769828/>) *Journal of Diabetes Science and Technology*.

[Dementia vs. Alzheimer's disease: What is the difference?](https://www.alz.org/alzheimers-dementia/difference-between-dementia-and-alzheimer-s) (<https://www.alz.org/alzheimers-dementia/difference-between-dementia-and-alzheimer-s>) Alzheimer's Association.

Edwards, G.A., N. Gamez, G. Escobedo, et al. 2019. [Modifiable risk factors for Alzheimer's disease.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6601685/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6601685/>) *Frontiers in Aging Neuroscience*.

Edwards, J.D., H. Xu, D.O. Clark, et al. 2017. [Speed of processing training results in lower risk of dementia.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700828/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700828/>) *Alzheimer's and Dementia Journal*.

Elwood, P., J. Galante, J. Pickering, et al. 2013. [Healthy lifestyles reduce the incidence of chronic diseases and dementia: Evidence from the Caerphilly cohort study.](https://pubmed.ncbi.nlm.nih.gov/24349147/) (<https://pubmed.ncbi.nlm.nih.gov/24349147/>) *PloS One*.

[Epigallocatechin Gallate \(EGCG\).](https://www.alzforum.org/therapeutics/epigallocatechin-gallate-egcg) (<https://www.alzforum.org/therapeutics/epigallocatechin-gallate-egcg>) *Therapeutics, AlzForum*.

Grant, W.B. 2016. [Using multicounty ecological and observational studies to determine dietary risk factors for Alzheimer's disease.](https://pubmed.ncbi.nlm.nih.gov/27454859/) (<https://pubmed.ncbi.nlm.nih.gov/27454859/>) *Journal of the American College of Nutrition*.

Holth, J.K., S.K. Fritschi, C. Wang, et al. 2021. [The sleep-wake cycle regulates brain interstitial fluid tau in mice and CSF tau in humans.](https://pubmed.ncbi.nlm.nih.gov/30679382/) (<https://pubmed.ncbi.nlm.nih.gov/30679382/>) *Science*.

Hong, M., V.M. Lee. 1997. [Insulin and insulin-like growth factor-1 regulate tau phosphorylation in cultured human neurons.](https://pubmed.ncbi.nlm.nih.gov/9235959/) (<https://pubmed.ncbi.nlm.nih.gov/9235959/>) *Journal of Biological Chemistry*.

[Inside the brain: A tour of how the mind works.](https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour) (https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour) Part 1: Brain Basics. Alzheimer's Association.

[Inside the brain: A tour of how the mind works.](https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour_part_2) (https://www.alz.org/alzheimers-dementia/what-is-alzheimers/brain_tour_part_2) Part 2: Alzheimer's Effect. Alzheimer's Association.

James, B.D., R.S. Wilson, L.L. Barnes, D. Bennett. 2011. [Late-life social activity and cognitive decline in old age.](https://www.cambridge.org/core/journals/journal-of-the-international-neuropsychological-society/article/abs/latelife-social-activity-and-cognitive-decline-in-old-age/91C0CD4DF1817938EB16E3179567D76E) (<https://www.cambridge.org/core/journals/journal-of-the-international-neuropsychological-society/article/abs/latelife-social-activity-and-cognitive-decline-in-old-age/91C0CD4DF1817938EB16E3179567D76E>) *Journal of the International Neuropsychological Society*.

Jiang, Y., S.H. Wu, X.O. Shu, et al. 2014. [Cruciferous vegetable intake is inversely correlated with circulating levels of proinflammatory markers in women.](https://jandonline.org/article/S2212-2672(13)01891-1/fulltext) ([https://jandonline.org/article/S2212-2672\(13\)01891-1/fulltext](https://jandonline.org/article/S2212-2672(13)01891-1/fulltext)) *Journal of the Academy of Nutrition and Dietetics*.

Jiang, X., J. Huang, D. Song, et al. 2017. [Increased consumption of fruits and vegetables is related to a reduced risk of cognitive impairment and dementia: A meta-analysis.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5293796/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5293796/>) *Frontiers in Aging Neuroscience*.

- Kaufman, D., L. Sauve, L. Renaud, et al. 2016. [Older adults' digital gameplay: Patterns, benefits and challenges.](https://journals.sagepub.com/doi/abs/10.1177/1046878116645736) (<https://journals.sagepub.com/doi/abs/10.1177/1046878116645736>) *Sage*.
- Keenan, T.D., E. Agron, J.A. Mares, et al. 2020. [Adherence to a Mediterranean diet and cognitive function in the Age-Related Eye Disease Studies 1 & 2.](https://alz-journals.onlinelibrary.wiley.com/doi/10.1002/alz.12077) (<https://alz-journals.onlinelibrary.wiley.com/doi/10.1002/alz.12077>) *Journal of the Alzheimer's Association*.
- Kim, H., G. Kim, W. Jang, et al. 2014. [Association between intake of B vitamins and cognitive function in elderly Koreans with cognitive impairment.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4290102/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4290102/>) *Nutrition Journal*.
- [Lack of sleep in middle age may increase dementia risk.](https://www.nih.gov/news-events/nih-research-matters/lack-sleep-middle-age-may-increase-dementia-risk) (<https://www.nih.gov/news-events/nih-research-matters/lack-sleep-middle-age-may-increase-dementia-risk>) National Institutes of Health.
- Littlejohns, T.J., W.E. Henley, I.A. Lang, et al. 2014. [Vitamin D and the risk of dementia and Alzheimer disease.](https://pubmed.ncbi.nlm.nih.gov/25098535/#:~:text=Vitamin%20D%20and%20the%20risk%20of%20dementia%20and,the%20role%20of%20vitamin%20D%20in%20nonskeletal%20conditions) (<https://pubmed.ncbi.nlm.nih.gov/25098535/#:~:text=Vitamin%20D%20and%20the%20risk%20of%20dementia%20and,the%20role%20of%20vitamin%20D%20in%20nonskeletal%20conditions>) *Neurology*.
- Lourida, I., M. Soni, J. Thompson-Coon, et al. 2013. [Mediterranean diet, cognitive function and dementia: A systematic review.](https://pubmed.ncbi.nlm.nih.gov/23680940/) (<https://pubmed.ncbi.nlm.nih.gov/23680940/>) *Epidemiology*.
- Luevano-Contreras, C., K. Chapman-Novakofski. 2010. [Dietary advanced glycation end products and aging.](https://pubmed.ncbi.nlm.nih.gov/22254007/) (<https://pubmed.ncbi.nlm.nih.gov/22254007/>) *Nutrients*.
- [Memory, forgetfulness and aging: What's normal and what's not?](https://www.nia.nih.gov/health/memory-forgetfulness-and-aging-whats-normal-and-whats-not) (<https://www.nia.nih.gov/health/memory-forgetfulness-and-aging-whats-normal-and-whats-not>) NIH National Institute on Aging.
- Morris, M.C., C.C. Tangney, Y. Wang, et al. 2015. [MIND diet associated with reduced incidence of Alzheimer's disease.](https://pubmed.ncbi.nlm.nih.gov/25681666/) (<https://pubmed.ncbi.nlm.nih.gov/25681666/>) *Alzheimer's and Dementia*.
- Morris, M.C., C.C. Tangney, Y. Wang. 2015. [MIND diet slows cognitive decline with aging.](https://pubmed.ncbi.nlm.nih.gov/26086182/) (<https://pubmed.ncbi.nlm.nih.gov/26086182/>) *Alzheimer's and Dementia*.
- Mosconi, L., M. Walters, J. Sterling, et al. 2018. [Lifestyle and vascular risk effects on MRI-based biomarkers of Alzheimer's Disease: A cross-sectional study of middle-aged adults from the broader New York City area.](https://pubmed.ncbi.nlm.nih.gov/29574441/) (<https://pubmed.ncbi.nlm.nih.gov/29574441/>) *British Medical Journal Open*.
- Okereke, O.I., B.A. Rosner, D.H. Kim, et al. 2012. [Dietary fat types and 4-year cognitive change in community-dwelling older women.](https://pubmed.ncbi.nlm.nih.gov/22605573/) (<https://pubmed.ncbi.nlm.nih.gov/22605573/>) *Annals of Neurology*.
- Osimani, A., A. Berger, J. Friedman, et al. 2005. [Neuropsychology of vitamin B12 deficiency in elderly dementia patients and control subjects.](https://pubmed.ncbi.nlm.nih.gov/15681626/) (<https://pubmed.ncbi.nlm.nih.gov/15681626/>) *Journal of Geriatric Psychiatry and Neurology*.
- Plassman, B.L., K. M. Langa, G.G. Fisher, S.G. Heeringa, et al. 2007. [Prevalence of dementia in the United States: The aging, demographics and memory study.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705925/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705925/>) *Neuroepidemiology*.

Quadri, P., C. Fragiaco, R. Pezzati, et al. 2001. [Homocysteine, folate and vitamin B12 in mild cognitive impairment, Alzheimer disease and vascular dementia.](https://academic.oup.com/ajcn/article/80/1/114/4690266) (<https://academic.oup.com/ajcn/article/80/1/114/4690266>) *American Journal of Clinical Nutrition*.

Ravaglia, G., P. Forti, F. Maioli, et al. 2005. [Homocysteine and folate as risk factors for dementia and Alzheimer disease.](https://academic.oup.com/ajcn/article/82/3/636/4863002) (<https://academic.oup.com/ajcn/article/82/3/636/4863002>) *American Journal of Clinical Nutrition*.

Shishtar, E., G.T. Rogers, J.B. Blumberg, et al. 2020. [Long-term dietary flavonoid intake and risk of Alzheimer disease and related dementias in the Framingham Offspring Cohort.](https://academic.oup.com/ajcn/article/112/2/343/5823790) (<https://academic.oup.com/ajcn/article/112/2/343/5823790>) *American Journal of Clinical Nutrition*.

[Sleep deprivation increases Alzheimer's protein.](https://www.nih.gov/news-events/nih-research-matters/sleep-deprivation-increases-alzheimers-protein) (<https://www.nih.gov/news-events/nih-research-matters/sleep-deprivation-increases-alzheimers-protein>) National Institutes of Health.

Sonawane, S.K., H. Chidambaram, D. Boral D., et al. 2020. [EGCG impedes human tau aggregation and interacts with tau.](https://www.nature.com/articles/s41598-020-69429-6) (<https://www.nature.com/articles/s41598-020-69429-6>) *Scientific Reports*.

Sun, Y., T. Yang, L. Mao, F. Zhang. 2017. [Sulforaphane protects against brain diseases: Role of cytoprotective enzymes.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5880051/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5880051/>) *Austin Journal of Cerebrovascular Disease and Stroke*.

Sydenham E., A.D. Dangour, W.S. Lim. 2012. [Omega 3 fatty acid for the prevention of cognitive decline.](https://pubmed.ncbi.nlm.nih.gov/22696350/) (<https://pubmed.ncbi.nlm.nih.gov/22696350/>) *Cochrane Database of Systematic Reviews*.

[The DASH eating plan.](https://www.nhlbi.nih.gov/health-topics/dash-eating-plan) (<https://www.nhlbi.nih.gov/health-topics/dash-eating-plan>) NIH National Heart, Lung and Blood Institute.

Uribarri, J., S. Woodruff, S. Goodman, et al. 2012. [Advanced glycation end products in foods and a practical guide to their reduction in the diet.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3704564/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3704564/>) *Journal of the American Dietetic Association*.

[Vitamin B12 fact sheet for health professionals.](https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/) (<https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/>) National Institutes of Health Office of Dietary Supplements.

Wang, H., W. Sun, Y. Chang, et al. 2019. [Effect of green tea consumption on human brain function in resting-state functional MRI.](https://pubmed.ncbi.nlm.nih.gov/31826371/) (<https://pubmed.ncbi.nlm.nih.gov/31826371/>) *Asia Pacific Journal of Clinical Nutrition*.

Wang, Y., Y. Shi, H. Wei. 2017. [Calcium dysregulation in Alzheimer's Disease: A target for new drug development.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5713908/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5713908/>) *Journal of Alzheimer's Disease and Parkinsonism*.

[What do we know about diet and prevention of Alzheimer's disease?](https://www.nia.nih.gov/health/what-do-we-know-about-diet-and-prevention-alzheimers-disease) (<https://www.nia.nih.gov/health/what-do-we-know-about-diet-and-prevention-alzheimers-disease>) NIH National Institute on Aging.

[What the Stroop Effect reveals about our minds.](https://lesley.edu/article/what-the-stroop-effect-reveals-about-our-minds) (<https://lesley.edu/article/what-the-stroop-effect-reveals-about-our-minds>) Lesley University.

Wightman, E.L., C.F. Haskell-Ramsay, K.G. Thompson, et al. 2015. [Dietary nitrate modulates cerebral blood flow parameters and cognitive performance in humans: A double-blind, placebo-controlled, crossover investigation.](https://pubmed.ncbi.nlm.nih.gov/26037632/) (<https://pubmed.ncbi.nlm.nih.gov/26037632/>) *Physiology and Behavior*.

Zhang, F., S. Wang, L. Gan, et al. 2012. [Protective effects and mechanism of sirtuins in the nervous system.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3242010/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3242010/>)

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