

Link Between Sugar and Alzheimer's Strengthens

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✓ Fact Checked

STORY AT-A-GLANCE

- › Alzheimer's disease – for which there is no effective conventional treatment or cure – affects an estimated 5.4 million Americans and prevalence is projected to triple by 2050
- › Lifestyle choices such as diet, exercise and sleep can have a significant impact on your risk. Prevention guidelines are included
- › Having one or two ApoE4 genes raises your lifetime risk for Alzheimer's between 30 and 50% respectively. Meanwhile, research suggests high-carb diets can increase your risk of dementia by 89%, while high-fat diets lower it by 44%
- › Alzheimer's disease is intricately connected to insulin resistance; even mild elevation of blood sugar is associated with an elevated risk for dementia
- › Curcumin may have long-term effects on your cognitive function by protecting against brain inflammation. Compared to controls, patients who took 90 mg of curcumin for 18 months experienced a 28% improvement in memory; brain scans also show they had less brain plaques associated with Alzheimer's disease

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Alzheimer's disease – for which conventional medicine believes there is no effective treatment or cure – currently affects an estimated 5.4 million Americans¹ and

prevalence is projected to triple by 2050.^{2,3} Within the next two decades, this severe and lethal form of dementia may affect as much as one-quarter of the U.S. population.

Already, more than half a million Americans die from the disease each year.^{4,5} While statistics in 2022 list it as the seventh leading cause of death in the U.S.,⁶ the National Institutes of Health says that correct estimates may be closer to No. 3, behind heart disease and cancer.⁷

The good news is that lifestyle choices such as diet, exercise and sleep can have a significant impact on your risk. As previously noted by Dr. Richard Lipton⁸ of the Albert Einstein College of Medicine where they study healthy aging, lifestyle changes “look more promising than the drug studies so far.”

As with health in general, your diet plays a crucial role. Processed foods tend to be nearly devoid of healthy fat while being excessive in refined sugars, and this combination appears to be at the heart of the problem.

High-Sugar Diet Significantly Raises Your Risk of Dementia

One of the most striking studies⁹ on carbohydrates and brain health revealed that high-carb diets increase your risk of dementia by a whopping 89%, while high-fat diets lower it by 44%. According to the authors, “A dietary pattern with relatively high caloric intake from carbohydrates and low caloric intake from fat and proteins may increase the risk of mild cognitive impairment or dementia in elderly persons.”

Studies also strongly suggest Alzheimer’s disease is intricately connected to insulin resistance;¹⁰ even mild elevation of blood sugar is associated with an elevated risk for dementia.¹¹ Diabetes and heart disease¹² are also known to elevate your risk, and both are rooted in insulin resistance.

This connection between high-sugar diets and Alzheimer’s was again highlighted in a longitudinal study published in the journal *Diabetologia* in January 2018.¹³ Nearly 5,190 individuals were followed over a decade, and the results showed that the higher an individual’s blood sugar, the faster their rate of cognitive decline.

Another study, published in 2021, also concluded that “total sugar intake may adversely affect cognitive function over time, and it may increase risk of Alzheimer’s dementia.”¹⁴

Diabetics Have Higher Risk for Alzheimer’s

The connection between sugar and Alzheimer’s was first broached in 2005, when the disease was tentatively dubbed “Type 3 diabetes.” At that time researchers discovered that your brain produces insulin necessary for the survival of your brain cells.¹⁵ A toxic protein called ADDL removes insulin receptors from nerve cells, thereby rendering those neurons insulin resistant, and as ADDLs accumulate, your memory begins to deteriorate.

Curiously, while low insulin levels in your body are associated with improved health, the opposite appears to be true when it comes to the insulin produced in your brain. Reduced brain insulin actually contributes to the degeneration of brain cells, and studies have found that people with lower levels of insulin and insulin receptors in their brain often have Alzheimer’s disease.

According to researchers,¹⁶ “These abnormalities do not correspond to Type 1 or Type 2 diabetes, but reflect a different and more complex disease process that originates in the central nervous system.”

In 2016, researchers at John’s Hopkins department of biology discovered that nerve growth factor, a protein found in your nervous system that is involved in the growth of neurons, also triggers insulin release in your pancreas.¹⁷ So there appears to be a rather complex relationship between body insulin, brain insulin and brain function, and we’ve probably only begun to tease out all of these connections.

Case in point: Even Type 1 diabetics are at increased risk for Alzheimer’s, even though their bodies don’t produce insulin at all. Melissa Schilling, a professor at New York University, investigated this paradox in 2016. As reported by The Atlantic:¹⁸

“Schilling posits this happens because of the insulin-degrading enzyme, a product of insulin that breaks down both insulin and amyloid proteins in the brain – the same proteins that clump up and lead to Alzheimer’s disease.

People who don't have enough insulin, like those whose bodies' ability to produce insulin has been tapped out by diabetes, aren't going to make enough of this enzyme to break up those brain clumps.

Meanwhile, in people who use insulin to treat their diabetes and end up with a surplus of insulin, most of this enzyme gets used up breaking that insulin down, leaving not enough enzyme to address those amyloid brain clumps. According to Schilling, this can happen even in people who don't have diabetes yet – who are in a state known as 'prediabetes.'"

Sugar Damages Brain Structure and Function

Research¹⁹ published in 2013 showed that sugar and other carbohydrates can disrupt your brain function even if you're not diabetic or have any signs of dementia. Here, short- and long-term glucose markers were evaluated in healthy, nondiabetic, nondemented seniors. Memory tests and brain imaging were also used to assess brain function and the actual structure of their hippocampus.

The findings revealed that the higher the two blood glucose measures, the smaller the hippocampus, the more compromised its structure, and the worse the individual's memory was. According to the authors, the structural changes in the hippocampus alone can partially account for the statistical link we see between glucose and memory, as your hippocampus is involved with the formation, organization and storage of memories.

The results suggest glucose directly contributes to atrophy of the hippocampus, which means that even if you're not insulin resistant or diabetic, excess sugar can still hamper your memory. The authors suggest that "strategies aimed at lowering glucose levels even in the normal range may beneficially influence cognition in the older population."

A similar study²⁰ published in 2014 found that Type 2 diabetics lose more gray matter with age than expected, and this brain atrophy also helps explain why diabetics have a higher risk for dementia, and have earlier onset of dementia than nondiabetics.

As noted by Dr. Sam Gandy, director of the Center for Cognitive Health at Mount Sinai Hospital in New York City, these findings suggest that "there may be a difference between the dementia related to full-blown diabetes, which seems to be primarily dementia caused by hardening of the arteries in the brain, and the mental impact of insulin resistance," and that "Conceivably, there is also a disease of defective insulin signaling, which this paper would support."²¹

Even Mild Insulin Resistance Speeds Cognitive Decline

A study²² published just last year also confirmed the link between insulin resistance and dementia, particularly among those with existing heart disease. Nearly 490 seniors were followed for two decades, and as in other studies, those with the highest levels of insulin resistance scored the worst on cognitive tests, especially tests for memory and executive function.

A take-home message here is that you don't have to be a diabetic to be at increased risk. As noted by senior study author Dr. David Tanne, a faculty member of Tel Aviv University in Israel, "Even people with mild or moderate insulin resistance ... are at increased risk over time ... Exercising, maintaining a balanced and healthy diet and watching your weight will help you prevent insulin resistance and, as a result, protect your brain as you get older."

Progress Made in Development of Blood Test for Alzheimer's

In related news, researchers have announced great strides being made in the development of a blood test to detect Alzheimer's.²³ The test is designed to detect amyloid beta, the toxic protein known to accumulate in the brains of Alzheimer's patients.

In a 2018 trial,²⁴ the test was 90% accurate in detecting the disease in a pool of 370 participants. The test is not yet available outside of clinical trials, but in January 2022, Dr. Julio Rojas-Martinez of University of California, San Francisco's Memory and Aging

Center, who is using the test on trial subjects, said the tests that when they do become available to the general population, they “will be revolutionary, in that we will be able to detect who’s at risk.”

In the meantime, the only way to measure amyloid beta is by brain scan or a spinal tap, both of which are invasive and expensive, and can only detect the disease once it has sufficiently progressed. While promising, further trials must be done to confirm the diagnostic accuracy of the blood test before it can be released and used in medical practice.

One of the most comprehensive assessments of Alzheimer’s risk is Dr. Dale Bredeesen’s ReCODE protocol, which evaluates 150 factors known to contribute to the disease. This protocol also identifies your disease subtype or combination of subtypes so that an effective treatment protocol can be devised.

In his book, “The End of Alzheimer’s: The First Program to Prevent and Reverse Cognitive Decline.”²⁵ you will find a list of suggested screening tests and the recommended ranges for each test, along with some of Bredeesen’s treatment suggestions.

Turmeric May Lower Alzheimer’s Risk, Study Shows

Other developments include a study showing curcumin supplementation may lower the risk of Alzheimer’s by improving memory and focus.²⁶ The double-blind, placebo-controlled study, published in the American Journal of Geriatric Psychiatry,²⁷ included 40 adults between the ages of 50 and 90 who reported mild memory lapses.

None had a diagnosis of dementia at the time of their enrollment. Participants randomly received either 90 milligrams of curcumin (Theracurmin supplement) twice a day for 18 months, or a placebo.

A standardized cognitive assessment was administered at the start of the study and at six-month intervals thereafter, and the level of curcumin in their blood was measured at the beginning and end of the study. Thirty of the participants also underwent positron

emission tomography (PET) scans to assess their level of amyloid and tau deposits before and after treatment, both of which are strongly associated with Alzheimer's risk.

Those who received curcumin saw significant improvements in memory and concentration, while the control group experienced no improvement. PET scans confirmed the treatment group had significantly less amyloid and tau buildup in areas of the brain that control memory, compared to controls. Overall, the curcumin group improved their memory by 28 percent over the year-and-a-half-long treatment period.

Curcumin has also been shown to increase levels of brain-derived neurotrophic factor (BDNF),²⁸ and reduced levels of BDNF have been linked to Alzheimer's disease. Yet another way curcumin may benefit your brain and lower your risk of dementia is by affecting pathways that help reverse insulin resistance, hyperlipidemia and other symptoms associated with metabolic syndrome and obesity.²⁹

Preventive Strategies

According to Dr. David Perlmutter, a neurologist and author of "Grain Brain" and "Brain Maker," anything that promotes insulin resistance will ultimately also raise your risk of Alzheimer's. To this I would add that any strategy that enhances your mitochondrial function will lower your risk. Considering the lack of effective treatments, prevention really cannot be stressed strongly enough.

In 2014, Bredesen published a paper that demonstrates the power of lifestyle choices for the prevention and treatment of Alzheimer's. By leveraging 36 healthy lifestyle parameters, he was able to reverse Alzheimer's in 9 out of 10 patients.

This included the use of exercise, ketogenic diet, optimizing vitamin D and other hormones, increasing sleep, meditation, detoxification and eliminating gluten and processed food. You can download Bredesen's full-text case paper online, which details the full program.³⁰ Following are some of the lifestyle strategies I believe to be the most helpful and important:

Eat real food, ideally organic — Avoid processed foods of all kinds, as they contain a number of ingredients harmful to your brain, including refined sugar, processed fructose, grains (particularly gluten), vegetable oils, genetically engineered ingredients and pesticides. Ideally, keep your added sugar to a minimum and your total fructose below 25 grams per day, or as low as 15 grams per day if you already have insulin/leptin resistance or any related disorders.

Opting for organic produce will help you avoid synthetic pesticides and herbicides. Most will also benefit from a gluten-free diet, as gluten makes your gut more permeable, which allows proteins to get into your bloodstream where they sensitize your immune system and promote inflammation and autoimmunity, both of which play a role in the development of Alzheimer's.

Replace refined carbs with healthy fats — Diet is paramount, and the beauty of following my optimized nutrition plan is that it helps prevent and treat virtually all chronic degenerative diseases, including Alzheimer's. It's important to realize that your brain actually does not need carbs and sugars; healthy fats such as saturated animal fats and animal-based omega-3s are far more critical for optimal brain function.

A cyclical ketogenic diet has the double advantage of both improving your insulin sensitivity and lowering your Alzheimer's risk. As noted by Perlmutter, lifestyle strategies such as a ketogenic diet can even offset the risk associated with genetic predisposition. (Estimates suggest genetics account for less than 5 percent of Alzheimer's cases.)

An estimated 75 million Americans have the single allele for ApoE4. Those who are ApoE4 positive have a 30 percent lifetime risk of developing the disease. Approximately 7 million have two copies of the gene, which puts them at a 50 percent lifetime risk. It's unknown how many Americans have the TOMM40 gene³¹ or others that may affect your risk.)

When your body burns fat as its primary fuel, ketones are created, which not only burn very efficiently and are a superior fuel for your brain, but also generate fewer reactive oxygen species and less free radical damage. A ketone called beta hydroxybutyrate is also a major epigenetic player, stimulating beneficial changes in DNA expression, thereby reducing inflammation and increasing detoxification and antioxidant production.

I explain the ins and outs of implementing this kind of diet, and its many health benefits, in my book "[Fat for Fuel](#)." In it, I also explain why cycling through stages of feast and famine, opposed to continuously remaining in nutritional ketosis, is so important.

Pay close attention to the kinds of fats you eat – avoid all trans fats or hydrogenated fats that have been modified in such a way to extend their longevity on the grocery store shelf. This includes margarine, vegetable oils and various butter-like spreads.

Healthy fats to add to your diet include avocados, butter, organic pastured egg yolks, coconuts and coconut oil, grass fed meats and raw nuts such as pecans and macadamia. MCT oil is also a great source of ketone bodies.

Keep your fasting insulin levels below 3 mmol/L – While 5.6 mmol/L is considered normal³² for a fasting level, lowering your insulin even more will also help lower leptin levels, which is another factor for Alzheimer's. If your insulin is high, you're likely consuming too much sugar and need to cut back.

Optimize your omega-3 level – Also make sure you're getting enough animal-based omega-3 fats. High intake of the omega-3 fats EPA and DHA help by preventing cell damage caused by Alzheimer's disease, thereby slowing down its progression and lowering your risk of developing the disorder.

Ideally, get an omega-3 index test done once a year to make sure you're in a healthy range. Your omega-3 index should be above 8 percent and your omega 6-to-3 ratio between 0.5 and 3.0.

Optimize your gut flora – To do this, avoid processed foods, antibiotics and antibacterial products, fluoridated and chlorinated water, and be sure to eat traditionally fermented and cultured foods, along with a high-quality probiotic if needed. Dr. Steven Gundry does an excellent job of expanding on this in his book “The Plant Paradox: The Hidden Dangers in ‘Healthy’ Foods That Cause Disease and Weight Gain.”

Intermittently fast – Intermittent fasting is a powerful tool to jump-start your body into remembering how to burn fat and repair the insulin/leptin resistance that is a primary contributing factor for Alzheimer’s. Once you have worked your way up to where you’ve been doing 20-hour daily intermittent fasting for a month, are metabolically flexible and can burn fat as your primary fuel, you can progress to the far more powerful five-day water fasts.

Move regularly and consistently throughout the day – It’s been suggested that exercise can trigger a change in the way the amyloid precursor protein is metabolized,³³ thus, slowing down the onset and progression of Alzheimer’s.

Exercise also increases levels of the protein PGC-1 alpha. Research has shown that people with Alzheimer’s have less PGC-1 alpha in their brains and cells that contain more of the protein produce less of the toxic amyloid protein associated with Alzheimer’s.

Optimize your magnesium levels – Preliminary research strongly suggests a decrease in Alzheimer symptoms with increased levels of magnesium in the brain. Keep in mind that the only magnesium supplement that appears to be able to cross the blood-brain barrier is magnesium threonate.

Optimize your vitamin D, ideally through sensible sun exposure – Sufficient vitamin D is imperative for proper functioning of your immune system to combat inflammation associated with Alzheimer’s and, indeed, research shows people living in northern latitudes have higher rates of death from dementia and Alzheimer’s than

those living in sunnier areas, suggesting vitamin D and/or sun exposure are important factors.³⁴

If you are unable to get sufficient amounts of sun exposure, take daily supplemental vitamin D3 to reach and maintain a blood level of 60 to 80 ng/ml. That said, it's important to recognize that sun exposure is important for reasons unrelated to vitamin D.

Your brain responds to the near-infrared light in sunlight in a process called photobiomodulation. Research shows near-infrared stimulation of the brain boosts cognition and reduces symptoms of Alzheimer's, including more advanced stages of the disease.

Delivering near-infrared light to the compromised mitochondria synthesizes gene transcription factors that trigger cellular repair, and your brain is one of the most mitochondrial-dense organs in your body.

Avoid and eliminate mercury from your body – Dental amalgam fillings are one of the major sources of heavy metal toxicity, however you should be healthy prior to having them removed. Once you have adjusted to following the diet described in my optimized nutrition plan, you can follow the mercury detox protocol and then find a biological dentist to have your amalgams removed.

Avoid and eliminate aluminum from your body – Common sources of aluminum include antiperspirants, nonstick cookware and vaccine adjuvants. There is some suggestion that certain mineral waters high in silicic acid may help your body eliminate aluminum.

Avoid flu vaccinations – Most flu vaccines contain both mercury and aluminum.

Avoid statins and anticholinergic drugs – Drugs that block acetylcholine, a nervous system neurotransmitter, have been shown to increase your risk of dementia. These drugs include certain nighttime pain relievers, antihistamines, sleep aids, certain

antidepressants, medications to control incontinence and certain narcotic pain relievers.

Statin drugs are particularly problematic because they suppress the synthesis of cholesterol, deplete your brain of coenzyme Q10, vitamin K2 and neurotransmitter precursors, and prevent adequate delivery of essential fatty acids and fat-soluble antioxidants to your brain by inhibiting the production of the indispensable carrier biomolecule known as low-density lipoprotein.

Limit your exposure to non-native electromagnetic fields (cellphones, Wi-Fi routers and modems) – Radiation from cellphones and other wireless technologies trigger excessive production of peroxynitrites,³⁵ a highly damaging reactive nitrogen species. Increased peroxynitrites from cellphone exposure will damage your mitochondria,^{36,37} and your brain is the most mitochondrial-dense organ in your body.

Increased peroxynitrite generation has also been associated with increased levels of systemic inflammation by triggering cytokine storms and autonomic hormonal dysfunction.

Optimize your sleep – Sleep is necessary for maintaining metabolic homeostasis in your brain. Without sufficient sleep, neuron degeneration sets in, and catching up on sleep during weekends will not prevent this damage.^{38,39,40} Sleep deprivation causes disruption of certain synaptic connections that can impair your brain's ability for learning, memory formation and other cognitive functions. Poor sleep also accelerates the onset of Alzheimer's disease.⁴¹

Most adults need seven to nine hours of uninterrupted sleep each night. Deep sleep is the most important, as this is when your brain's glymphatic system performs its cleanout functions, eliminating toxic waste from your brain, including amyloid beta.

Challenge your mind daily – Mental stimulation, especially learning something new, such as learning to play an instrument or a new language, is associated with a decreased risk of dementia and Alzheimer's. Researchers suspect that mental

challenge helps to build up your brain, making it less susceptible to the lesions associated with Alzheimer's disease.

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