

How Sugar Harms Your Brain and Drives Alzheimer's Epidemic

Analysis by [Dr. Joseph Mercola](#)

✓ Fact Checked

January 07, 2023

STORY AT-A-GLANCE

- › One in 3 seniors in the U.S. dies with Alzheimer's, and the disease kills more than breast and prostate cancers combined
- › A growing body of research suggests there's a powerful connection between your diet and your risk of developing Alzheimer's disease, via similar pathways that cause Type 2 diabetes
- › Some research shows that sugar and other carbohydrates can disrupt your brain function even if you're not diabetic or have any signs of dementia
- › Long-term, sugar can contribute to the shrinking of your hippocampus, which is a hallmark symptom of Alzheimer's disease
- › The researchers propose that lowering glucose levels, even if they're within the "normal" range, may have a positive influence on cognition in older people

Alzheimer's disease, a severe form of dementia, affects more than 6 million Americans, according to 2022 statistics.¹ One in 9 seniors over the age of 65 has Alzheimer's; and the disease kills more than breast and prostate cancers combined.

A growing body of research suggests there's a powerful connection between your diet and your risk of developing Alzheimer's disease, via similar pathways that cause type 2 diabetes. Seventy-three percent of people with Alzheimer's are over age 75; two-thirds of Americans with Alzheimer's are women.

Contrary to popular belief, your brain does not require glucose, and actually functions better burning alternative fuels, especially ketones, which your body makes in response to digesting healthy fats.

According to experts at Emory School of Medicine, Alzheimer's and other brain disorders are associated with proteins that regulate glucose metabolism. Previously, they had determined that abnormalities in the process by which the brain breaks down glucose were associated with amyloid plaques in the brain and the onset of memory loss.

Interestingly, Alzheimer's disease was tentatively dubbed "Type 3 diabetes" in early 2005² when researchers discovered that in addition to your pancreas, your brain also produces insulin, and this brain insulin is necessary for the survival of brain cells.

"What we found is that insulin is not just produced in the pancreas, but also in the brain," researchers said in a press release at the time. "And we discovered that insulin and its growth factors, which are necessary for the survival of brain cells, contribute to the progression of Alzheimer's."

Sugar Damages Brain Structure and Function

In your brain, insulin helps with neuron glucose-uptake and the regulation of neurotransmitters, such as acetylcholine, which are crucial for memory and learning. This is why reducing the level of insulin in your brain impairs your cognition.

Research³ has also shown that Type 2 diabetics lose more brain volume with age than expected — particularly gray matter. This kind of brain atrophy is yet another contributing factor for dementia.

Studies have found that people with lower levels of insulin and insulin receptors in their brain often have Alzheimer's disease. But according to research published in the journal *Neurology*,⁴ sugar and other carbohydrates can disrupt your brain function even if you're not diabetic or have any signs of dementia.

To test their theory, they evaluated short- and long-term glucose markers in 141 healthy, non-diabetic, non-demented seniors. Memory tests and brain imaging were administered to assess their brain function and the actual structure of their hippocampus. As reported by Scientific American:⁵

"Higher levels on both glucose measures were associated with worse memory, as well as a smaller hippocampus and compromised hippocampal structure.

The researchers also found that the structural changes partially accounted for the statistical link between glucose and memory. According to study co-author Agnes Flöel, a neurologist at Charité, the results 'provide further evidence that glucose might directly contribute to hippocampal atrophy.'"

The findings suggest that even if you're not diabetic or insulin resistant, of which about 80% of Americans are, sugar consumption can still disrupt your memory. Long-term, it can contribute to the shrinking of your hippocampus, which is a hallmark symptom of Alzheimer's disease. (Your hippocampus is involved with the formation, organization and storage of memories.)

The authors of the study suggest that "strategies aimed at lowering glucose levels even in the normal range may beneficially influence cognition in the older population."

'Normal' Blood Sugar Levels May Still Be Too High

Normally, a fasting blood sugar level between 100 and 125 mg/dl is diagnosed as a prediabetic state.⁶ A fasting blood sugar level of 90 to 100 is considered "normal." But in addition to the featured research, other studies have also found that brain atrophy occurs even in this "normal" blood sugar range.

Neurologist Dr. David Perlmutter insists that being very strict in limiting your consumption of sugar and non-vegetable carbs, and consuming healthy fats,⁷ are some of the most important steps you can take to prevent Alzheimer's disease for this very reason.

He cites research from the Mayo Clinic,⁸ which found that diets rich in carbohydrates are associated with an 89% increased risk for dementia. Meanwhile, high-fat diets are associated with a 44% reduced risk.⁹

Sugar Lobby Threatens Organizations, Buries Science

Compelling research shows that your brain has great plasticity, which you control through your diet and lifestyle choices. Unfortunately, the American public has been grossly brainwashed by the sugar and processed food industries into believing that sugar is a perfectly reasonable "nutrient" that belongs in a healthy diet.

Without accurate information, it's certainly more difficult to make health-affirming choices. Newsweek¹⁰ recently ran an article revealing just how far the sugar industry will go to defend its market share:

"According to a new report¹¹ from the Center for Science and Democracy ... industry groups representing companies that sell sweeteners, like the Sugar Association and the Corn Refiners Association ... have poured millions of dollars into countering science that indicates negative health consequences of eating their products.

For example, when a University of Southern California study from 2013 found that the actual high fructose corn syrup content in sodas 'varied significantly' from the sugar content disclosed on soda labels, the Corn Refiners Association considered paying for its own counter research.

A consultant suggested that the counter research should only be published if the results aligned with their goal of disputing the USC study: 'If for any reason the results confirm [the University of Southern California study], we can just bury the data,' the consultant wrote, according to the report."

According to the Center for Science report, the Sugar Association even threatened the director general of the World Health Organization (WHO). WHO had published a paper on

sugar, recommending a 10% limit on added sugars, stating that added sugars "threaten the nutritional quality of diets."

The Sugar Association shot off a letter to the director general, warning him that, unless WHO withdrew the study, the Sugar Association would persuade the US Congress to withdraw the WHO's federal funding. The following year, when WHO published its global health strategy on diet and health, there was no mention of the offending sugar study.

Sugar Lobby Deserves Blame for Fueling Chronic Disease

Indeed, despite overwhelming evidence showing that sugar, and processed fructose in particular, is at the heart of our burgeoning obesity and chronic disease epidemics, the sugar lobby spent decades trying to dissuade regulatory agencies from looking at the "factual" dangers of sugar.

As a result, today, according to Centers for Disease Control and Prevention (CDC) data,¹² 3 in 5 Americans aged 2 years and older exceed the CDC's recommendation to consume less than 10% of total calories in a day. On average adult men in the U.S. eat 19 teaspoons of added sugars a day; adult women eat an added 15. This adds up to about 14.1% of the average American's food consumption.¹³

In the U.K., a report¹⁴ by the Scientific Advisory Committee on Nutrition (SACN) recommends limiting added sugar intake to just 5%, in order to avoid obesity and Type 2 diabetes. They calculate this to be the equivalent of 25 grams of sugar (5 to 6 teaspoons) per day for women, and 35 grams (7 to 8 teaspoons) for men.

This matches my own recommendations for healthy, noninsulin-resistant individuals — with one key difference. I recommend restricting sugar/fructose consumption to 25 grams from ALL sources, not just added sugar. This includes limiting your non-vegetable carbohydrates as well.

Crazy enough, the Scientific Advisory Committee on Nutrition still recommends you get 50% of your daily energy intake in the form of starchy carbohydrates, which will undoubtedly and significantly raise your risk of insulin resistance.

If you're insulin/leptin-resistant, diabetic, overweight or have high blood pressure, heart disease or cancer, I recommend restricting your sugar/fructose consumption to a maximum of 15 grams per day from all sources, until your insulin/leptin resistance has been resolved.

Dietary Guidelines for Maintaining Healthy Brain Function

It's becoming increasingly clear that the same pathological process that leads to insulin resistance and type 2 diabetes may also hold true for your brain. As you over-indulge on sugar and grains, your brain becomes overwhelmed by the consistently high levels of glucose and insulin that blunts its insulin signaling, leading to impairments in your thinking and memory abilities, eventually causing permanent brain damage.

Additionally, when your liver is busy processing fructose (which your liver turns into fat), it severely hampers its ability to make cholesterol, an essential building block of your brain that is crucial for optimal brain function. Indeed, mounting evidence supports the notion that significantly reducing fructose consumption is a very important step for preventing Alzheimer's disease.

Because of the very limited treatments, and no available cure as of yet, you're really left with just one solid solution, and that is to prevent Alzheimer's from happening to you in the first place. As explained by neurologist Perlmutter, Alzheimer's is a disease predicated primarily on lifestyle choices, the two main culprits being excessive sugar and gluten consumption.

Another major factor is the development and increased consumption of genetically engineered (GE) grains which are now pervasive in most processed foods sold in the US. The beauty of following my optimized nutrition plan is that it helps prevent and treat virtually ALL chronic degenerative diseases, including Alzheimer's.

Dr. Perlmutter's book, "[Grain Brain: The Surprising Truth about Wheat, Carbs, and Sugar – Your Brain's Silent Killers](#)," also provides powerful arguments for eliminating grains from your diet, particularly if you want to protect the health of your brain. In terms of

your diet, the following suggestions may be among the most important for Alzheimer's prevention:

Avoid sugar and refined fructose — Ideally, you'll want to keep your total sugar and fructose below 25 grams per day, or as low as 15 grams per day if you have insulin resistance or any related disorders. In one recent animal study, a junk food diet high in sugar resulted in impaired memory after just one week!¹⁵ Place recognition, specifically, was adversely affected.

As a general rule, you'll want to keep your fasting insulin levels below 3, and this is indirectly related to fructose, as it will clearly lead to insulin resistance. However, other sugars (sucrose is 50% fructose by weight), grains, and lack of exercise are also important factors. Lowering insulin will also help lower leptin levels, which is another factor for Alzheimer's.

Avoid gluten and casein (primarily wheat and pasteurized dairy, but not dairy fat, such as butter) — Research shows that your blood-brain barrier, the barrier that keeps things out of your brain where they don't belong, is negatively affected by gluten.

Gluten also makes your gut more permeable, which allows proteins to get into your bloodstream, where they don't belong. That then sensitizes your immune system and promotes inflammation and autoimmunity, both of which play a role in the development of Alzheimer's.

Eat a nutritious diet, rich in folate, such as the one described in my nutrition plan. Vegetables, without question, are your best form of folate, and we should all eat plenty of fresh raw veggies every day. Avoid supplements like folic acid, which is the inferior synthetic version of folate.

Increase consumption of all healthful fats, including animal-based omega-3 — Beneficial health-promoting fats that your brain needs for optimal function include organic butter from raw milk, clarified butter called ghee, organic grass fed raw

butter, olives, organic virgin olive oil and coconut oil, nuts like pecans and macadamia, free-range eggs, wild Alaskan salmon, and avocado.

Contrary to popular belief, the ideal fuel for your brain is not glucose but ketones. Ketones are what your body produces when it converts fat (as opposed to glucose) into energy. The medium-chain triglycerides (MCTs) found in coconut oil are a great source of ketone bodies, because coconut oil is about 66% MCTs.

Also make sure you're getting enough animal-based omega-3 fats, such as krill oil. (I recommend avoiding most fish because, although fish is naturally high in omega-3, most fish are now severely contaminated with mercury.) 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.

Optimize your gut flora by regularly eating fermented foods or taking a high-potency and high-quality probiotic supplement.

Eat blueberries — Wild blueberries, which have high anthocyanin and antioxidant content, are known to guard against Alzheimer's and other neurological diseases.

Other Helpful Dietary Tips and Valuable Supplements

Another helpful tip is to reduce your overall calorie consumption, and/or intermittently fast. As mentioned above, ketones are mobilized when you replace carbs with coconut oil and other sources of healthy fats. A one-day fast can help your body to "reset" itself, and start to burn fat instead of sugar.

As part of a healthy lifestyle, I prefer an intermittent fasting schedule that simply calls for limiting your eating to a narrower window of time each day. By restricting your eating to a six- to eight-hour window, you effectively fast 16 to 18 hours each day.

Also be aware that when it comes to cholesterol levels and Alzheimer's, lower is NOT better. Quite the contrary. Research shows that elderly individuals with the lowest cholesterol levels have the highest risk for Alzheimer's.¹⁶ They also have the highest risk for dying. As he says, the war on cholesterol is fundamentally inappropriate and harmful.

Finally, there's a short list of supplement recommendations worth noting for their specific benefits in preventing and treating dementia. So, although your fundamental strategy for preventing dementia should involve a comprehensive lifestyle approach, you may want to take special note of the following natural dietary agents. These four natural foods/supplements have good science behind them, in terms of preventing age-related cognitive changes:

1. **Ginkgo biloba** – Many scientific studies have found that Ginkgo biloba has positive effects for dementia. A 1997 study from JAMA showed clear evidence that Ginkgo improves cognitive performance and social functioning for those suffering from dementia.

Another 2006 study found Ginkgo as effective as the dementia drug Aricept (donepezil) for treating mild to moderate Alzheimer's type dementia. A 2010 meta-analysis also found Ginkgo biloba to be effective for a variety of types of dementia.

2. **Alpha lipoic acid (ALA)** – ALA has been shown to help stabilize cognitive functions among Alzheimer's patients and may slow the progression of the disease.
3. **Vitamin B12** – A small Finnish study published in the journal *Neurology*¹⁷ found that people who consume foods rich in B12 may reduce their risk of Alzheimer's in their later years. For each unit increase in the marker of vitamin B12 the risk of developing Alzheimer's was reduced by 2%. Remember sublingual methylcobalamin may be your best bet here.

Lifestyle Strategies That Can Help Ward off Alzheimer's

Lifestyle choices such as getting regular sun exposure and exercise, along with avoiding toxins, are also important factors when it comes to maintaining optimal brain health. Here are several of my lifestyle suggestions:

Optimize your vitamin D levels with safe sun exposure – Strong links between low levels of vitamin D in Alzheimer's patients and poor outcomes on cognitive tests have been revealed.¹⁸ Researchers believe that optimal vitamin D levels may enhance the amount of important chemicals in your brain and protect brain cells by increasing the effectiveness of the glial cells in nursing damaged neurons back to health.

Vitamin D may also exert some of its beneficial effects on Alzheimer's through its anti-inflammatory and immune-boosting properties. Sufficient vitamin D is imperative for proper functioning of your immune system to combat inflammation that is also associated with Alzheimer's.

Exercise regularly – It's been suggested that exercise can trigger a change in the way the amyloid precursor protein is metabolized,¹⁹ thus, slowing down the onset and progression of Alzheimer's.

Exercise also increases levels of the protein PGC-1alpha. Research has also shown that people with Alzheimer's have less PGC-1alpha in their brains²⁰ and cells that contain more of the protein produce less of the toxic amyloid protein associated with Alzheimer's. I would strongly recommend reviewing the Peak Fitness Technique for my specific recommendations.

Avoid and eliminate mercury from your body – Dental amalgam fillings, which are 50% mercury by weight, 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 aluminum, such as antiperspirants, non-stick cookware, vaccine adjuvants, etc.

Avoid flu vaccinations as most contain both mercury and aluminum, well-known neurotoxic and immunotoxic agents.

Avoid anticholinergics and statin 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 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.

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 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.

Sources and References

- ¹ Alzheimer's Association. Alzheimer's Disease Facts and Figures
- ² EurekAlert! March 7, 2005
- ³ Diabetes Care. v.36(12); 2013 Dec
- ⁴ Neurology November 12, 2013; 81(20); 1746-1752
- ⁵ Scientific American June 12, 2014
- ⁶ CDC. Diabetes Tests
- ⁷ David Perlmutter MD
- ⁸ J Alzheimers Dis. 2012 Jan 1; 32(2): 329–339

- ⁹ David Perlmutter MD. Eating Fat, Fighting Alzheimer's
- ¹⁰ Newsweek June 27, 2014
- ¹¹ Center for Science and Democracy, Union of Concerned Scientists
- ¹² CDC. Be Sugar Smart
- ¹³ Am J Clin Nutr. 2014 Sep; 100(3): 901–907
- ¹⁴ British Nutrition Foundation. Sugar
- ¹⁵ Worldhealth.net December 30, 2013
- ¹⁶ Neurology. 2010 Nov 23; 75(21): 1888–1895
- ¹⁷ Neurology October 19, 2010: 75(16); 1402-3
- ¹⁸ Neurology. 2014 Sep 2; 83(10): 920–928
- ¹⁹ Journal of Neuroscience, April 27, 2005: 25(17); 4217-4221
- ²⁰ Journal of Alzheimer's Disease, 2011: 25(1); 151-62