



# LINK BETWEEN VITAMIN D DEFICIENCY AND DEMENTIA CONFIRMED

By Dr. Mercola

Vitamin D has been shown to improve a number of brain disorders, including dementia and its most severe form, Alzheimer's disease,<sup>1</sup> the latter of which now affects an estimated 5.2 million Americans.

The latest mortality statistics places Alzheimer's in the top three killer diseases in the US, right behind heart disease and cancer.<sup>3</sup> Vitamin D deficiency is also rampant. Researchers estimate that half of the general population is at risk of vitamin D deficiency or insufficiency.

Among seniors, that estimate reaches as high as 95 percent. While certainly not the sole cause of dementia, evidence suggests vitamin D may be a very important factor for successful prevention.

A wide variety of brain tissue contains vitamin D receptors, and when they're activated by vitamin D, it facilitates nerve growth in your brain. Researchers also believe that optimal vitamin D levels boosts levels of important brain chemicals, and protect brain cells by increasing the effectiveness of glial cells in nursing damaged neurons back to health.

Vitamin D may also exert some of its beneficial effects on your brain through its anti-inflammatory and immune-boosting properties, which are well established.

## 'Most Robust Study of Its Kind' Confirms Link Between Low Vitamin D and Dementia

The link between low vitamin D and dementia has again been confirmed with the publication of a robust six-year long study<sup>4</sup> conducted by an international team of researchers. As reported by Science Daily:<sup>5</sup>

**"Study participants who were severely vitamin D deficient were more than twice as likely to develop dementia and Alzheimer's disease..."**

**Adults in the study who were moderately deficient in vitamin D had a 53 percent increased risk of developing dementia of any kind, and the risk increased to 125 percent in those who were severely deficient.**

**Similar results were recorded for Alzheimer's disease, with the moderately deficient group 69 percent more likely to develop this type of dementia, jumping to a 122 percent increased risk for those severely deficient."**

The authors concluded that: "Our results confirm that vitamin D deficiency is associated with a substantially increased risk of all-cause dementia and Alzheimer disease. This adds to the ongoing debate about the role of vitamin D in nonskeletal conditions."

The findings also suggest there's a threshold level of circulating vitamin D, below which your risk for



dementia increases. This threshold was found to be right around 50 nmol/L, or 20 ng/ml. Higher levels were associated with good brain health.

Based on previous research, I believe 20 ng/ml is still too low, and potentially dangerously so... When it comes to vitamin D, you really want to be in the optimal or clinically relevant range, and as the years have gone by, researchers have progressively moved that target range upward.

At present, based on the evaluation of healthy populations that get plenty of natural sun exposure, the optimal range for general health appears to be somewhere between 50 and 70 ng/ml, or 125-175 nmol/L—a far cry from the threshold suggested in this study.

VITAMIN D LEVELS 25 HYDROXY D			
Deficient	Optimal	Treat Cancer and Heart Disease	Excess
< 50 ng/ml	50-70 ng/ml	70-100 ng/ml	> 100 ng/ml
Multiply ng/ml by 2.5 to convert to nmol/litre			

## Sun Exposure Is the Ideal Way to Optimize Your Vitamin D Level

I believe sensible sun exposure is the ideal way to optimize your vitamin D levels. As a general rule, you'll want to expose large amounts of bare skin to the sun until it turns the lightest shade of pink, if you're light-skinned.

This typically occurs in about half the time it would normally take you to burn. So if you know you tend to get sunburned after 30 minutes, you'd want to stay in the sun for about 15 minutes.

Those with darker skin may need to pay closer attention to notice when this slight reddening occurs. It's really impossible to give any firm recommendations for how long you need to stay in the sun to optimize vitamin D production, as it varies greatly depending on a number of factors, such as:

Antioxidant levels and diet in general	Age
Skin color and/or current tan level	Use of sunscreen
Latitude and altitude (elevation)	Cloud cover and pollution
Ozone layer	Surface reflection
Season	Time of day
Weight	Altitude



## Other Alternatives: UVB emitting lights or Supplements

Your second-best option would be to use lights that emit UVB.

If your circumstances prevent either of these strategies, then you're left with taking a vitamin D supplement. GrassrootsHealth has a helpful chart showing the average adult dose required to reach healthy vitamin D levels based upon your measured starting point. Many experts agree that 35 IUs of vitamin D per pound of body weight could be used as an estimate for your ideal dose.

Be sure to take vitamin D3—not synthetic D2—and take vitamin K2 in conjunction with it. The biological role of vitamin K2 is to help move calcium into the proper areas in your body, and without sufficient amounts, calcium may build up in areas such as your arteries and soft tissues.

This can cause calcification that can lead to hardening of your arteries—a side effect previously thought to be caused by vitamin D toxicity. We now know that inappropriate calcification is actually due more to lack of K2 than simply too much vitamin D.

## Magnesium Is Also Important for Vitamin D Activity

Magnesium is another important player—both for the proper function of calcium, and for the activity of vitamin D, as it converts vitamin D into its active form. Magnesium also activates enzyme activity that helps your body use the vitamin D. In fact, all enzymes that metabolize vitamin D require magnesium to work. Magnesium also appears to play a role in vitamin D's immune-boosting effects. As noted by magnesium expert Dr. Carolyn Dean, MD, ND:6

“The effectiveness and benefits of vitamin D are greatly undermined in the absence of adequate levels of magnesium in the body. Magnesium acts with and is essential to the activity of vitamin D, and yet most Americans do not get their recommended daily allowance (RDA) of this important mineral.”

As with vitamin D and K2, magnesium deficiency is also common, and if you're lacking in magnesium and take supplemental calcium, you may exacerbate the situation. Vitamin K2, magnesium, calcium, and vitamin D all work in tandem with each other, which is why it's important to pay attention to their ratios. Vitamin A, zinc, and boron are other important cofactors that interact with vitamin D, and indeed, zinc deficiency has also been identified as a contributing factor to Alzheimer's disease.

When taking supplements, it can be easy to create lopsided ratios, so getting these nutrients from an organic whole food diet and sensible sun exposure is generally your best bet. Dietary sources of magnesium include sea vegetables, such as kelp, dulse, and nori. Vegetables can also be a good source. As for supplements, magnesium citrate and magnesium threonate are among the best.

## My Alzheimer's Prevention Strategies

Because there are so few treatments for Alzheimer's, and no available cure, you're really left with just one solid solution, and that is to prevent it from happening to you in the first place. Diet is part and parcel of a successful prevention plan, and my optimized nutrition plan can set you on the right



path in this regard. As explained by neurologist Dr. David Perlmutter, author of the book, *Grain Brain*, 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 heavily contaminated with glyphosate—a herbicide thought to be worse than DDT, and DDT has already been linked to the development of Alzheimer's... GE sugar and grains are now pervasive in most processed foods sold in the US, so swapping out processed fare for whole foods is an important part of the equation. In terms of your diet and other lifestyle factors, 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 sugar levels to a minimum and your total fructose below 25 grams per day, or as low as 15 grams per day if you have insulin/leptin resistance or any related disorders.

**Avoid gluten and casein** (primarily wheat and pasteurized dairy, but not dairy fat, such as butter). Research shows that your blood-brain barrier 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.

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

**Increase consumption of all healthy fats, including animal-based omega-3.** Healthy fats that your brain needs for optimal function include organically-raised grass-fed meats, coconut oil, olives and olive oil, avocado, nuts, organic pastured egg yolks, and butter made from raw grass-fed milk. High intake of the omega-3 fats EPA and DHA are also helpful for preventing cell damage caused by Alzheimer's disease, thereby slowing down its progression, and lowering your risk of developing the disorder.

**Reduce your overall calorie consumption, and/or intermittently fast.** Ketones are mobilized when you replace carbs with coconut oil and other sources of healthy fats. As mentioned above intermittent fasting is a powerful tool to jumpstart your body into remembering how to burn fat and repair the insulin/leptin resistance that is also a primary contributing factor for Alzheimer's. To learn more, please see this previous article.

**Improve your magnesium levels.** Preliminary research strongly suggests a decrease in Alzheimer symptoms with increased levels of magnesium in the brain. Unfortunately, most magnesium supplements do not pass the blood brain levels, but a new one, magnesium threonate, appears to and holds some promise for the future for treating this condition and may be superior to other forms.

**Eat a nutritious diet, rich in folate.** 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.



**Exercise regularly.** It's been suggested that exercise can trigger a change in the way the amyloid precursor protein is metabolized,<sup>7</sup> thus, slowing down the onset and progression of Alzheimer's. Exercise also increases levels of the BDNF, (brain derived neurotropic factor) and PGC-1alpha. Research has shown that people with Alzheimer's have less PGC-1alpha in their brains 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.

**Optimize your vitamin D levels with safe sun exposure.** Sufficient vitamin D is imperative for proper functioning of your immune system to combat inflammation that is also associated with Alzheimer's.

**Avoid and eliminate mercury from your body.** Dental amalgam fillings, which are 50 percent 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 and eliminate aluminum from your body:** Sources of aluminum include antiperspirants, non-stick cookware, vaccine adjuvants, etc. For tips on how to detox aluminum, please see my article, "First Case Study to Show Direct Link between Alzheimer's and Aluminum Toxicity."

**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.

**Avoid electromagnetic fields (EMF) created by wireless devices.** The BioInitiative Report,<sup>8</sup> initially published in 2007, and again in 2012 by an international working group of scientists, researchers, and public health policy professionals, concluded that the existing standards for public safety are completely inadequate to protect your health. The report includes evidence that electromagnetic fields and exposure to radiofrequencies can have a detrimental impact on Alzheimer's disease, along with a whole host of other chronic health problems.

## How Vitamin D Performance Testing Can Help Optimize Your Health

A robust and growing body of research clearly shows that vitamin D is absolutely critical for good



health and disease prevention. Vitamin D affects your DNA through vitamin D receptors (VDRs), which bind to specific locations of the human genome. Scientists have identified nearly 3,000 genes that are influenced by vitamin D levels, and vitamin D receptors have been found throughout the human body.

Is it any wonder then that no matter what disease or condition is investigated, vitamin D appears to play a crucial role? This is why I am so excited about the D\*Action Project by GrassrootsHealth. Dr. Heaney is the Research Director of GrassrootsHealth and is part of the design of the D\*action Project as well as analysis of the research findings. GrassrootsHealth shows how you can take action today on known science with a consensus of experts without waiting for institutional lethargy. It has shown how by combining the science of measurement (of vitamin D levels) with the personal choice of taking action and, the value of education about individual measures that one can truly be in charge of their own health.

In order to spread this health movement to more communities, the project needs your involvement. This was an ongoing campaign during the month of February, and will become an annual event.

To participate, simply purchase the D\*Action Measurement Kit and follow the registration instructions included. (Please note that 100 percent of the proceeds from the kits go to fund the research project. I do not charge a single dime as a distributor of the test kits.)

As a participant, you agree to test your vitamin D levels twice a year during a five-year study, and share your health status to demonstrate the public health impact of this nutrient. There is a \$65 fee every six months for your sponsorship of this research project, which includes a test kit to be used at home, and electronic reports on your ongoing progress. You will get a follow up email every six months reminding you "it's time for your next test and health survey."