

# Vitamin D Reduced Dementia Risk by 40%

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## STORY AT-A-GLANCE

- › A study in a cohort of 12,388 persons showed that vitamin D exposure over 10 years could lower the risk of dementia by 40%; women in the study experienced a greater benefit than men
- › There are 50 million people worldwide with dementia and experts estimate that number will nearly triple by 2050; vitamin D deficiency is also a widespread problem with a worldwide prevalence of up to 1 billion people
- › Vitamin D has a neuroprotective effect, can reduce the percentage of people who move from prediabetes to diabetes, and can help prevent and/or treat certain cancers, gastrointestinal diseases, uterine fibroids, lupus, obesity, and neurodegenerative diseases such as multiple sclerosis
- › There is a synergistic effect with magnesium, vitamin K2 and calcium and an imbalance may raise the risk of heart attack and stroke; the only way to determine how much sun exposure or supplementation you need is to test your vitamin D level

In this 18-minute video, retired nurse educator John Campbell details the results of a 2023' study<sup>1</sup> demonstrating the effect that vitamin D deficiency has on the development of Alzheimer's disease and other forms of dementia. At this point, there is simply no question that optimizing vitamin D levels is a crucial part of maintaining optimal health.

Vitamin D is a fat-soluble vitamin, also referred to as calciferol. It can be found naturally in some foods and is produced endogenously when your skin is exposed to ultraviolet

rays from the sun. Vitamin D supplementation in the U.S. is available as vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol).<sup>2</sup>

If you're unsure of your vitamin D levels, it's important to get tested. Seeking to optimize your vitamin D can potentially help you live longer since low levels have been associated with an increased risk of several health conditions,<sup>3</sup> some of which increase your risk of premature death.

The data demonstrating the efficacy of vitamin D in your health continue to mount and, as Campbell notes in his presentation, "This is cheap, it's natural, it doesn't cost anything and we're not paying thousands of dollars per year to a pharmaceutical company."<sup>4</sup>

## **Vitamin D Deficiency and Dementia**

The researchers in the featured study<sup>5</sup> note that despite vitamin D deficiency having been associated with dementia in past studies, the role it plays remains unclear. The researchers gathered data from 12,388 persons from the National Alzheimer's Coordinating Center who were dementia-free and had an average age of 71 at the time of enrollment.

The researchers measured baseline exposure to vitamin D and compared dementia-free survival between the groups of individuals who were exposed to vitamin D and those who were not. Vitamin D exposure was measured as taking vitamin D3, vitamin D2 or vitamin D3 plus calcium. The results showed that across all these groups, exposure to vitamin D was associated with a significantly longer time period without dementia and a lower incidence rate overall.

The researchers controlled for other covariates such as gender, cognitive status and apolipoprotein E (APOE)  $\epsilon$ 4. As Campbell explains,<sup>6</sup> the APOE gene is known to increase the risk of dementia in those who carry it. Approximately 25% of the population carries one APOE gene and 3% carries two. Individuals who have two genes will have a much higher risk than those who carry one.

The data suggest that all formulations of vitamin D tracked in the study reduced the incidence of dementia by 40% when compared to those who had no exposure. Interestingly, the effect was significantly greater in females versus males and in those with normal cognitive ability versus those who began the study with mild cognitive impairment (MCI).<sup>7</sup>

The effect was also greater in those who were not APOE carriers versus those who were. The researchers concluded that “vitamin D has potential for dementia prevention, especially in the high-risk strata.”

Campbell notes that this was a large effect and while it does not prove correlation or causation, it suggests the results are more likely to be causal. The researchers plotted out the data published in figure A, which showed benefit to those exposed to vitamin D began roughly at the end of the first year and continued to confer greater benefit the longer the participants were followed.

Over the 10 years, Campbell notes that 2,696 of the participants got dementia. Of those, 2,017 (74.8%) had no exposure to vitamin D while only 679 (25.2%) who took vitamin D were diagnosed with dementia, which he calls an “impressive protective effect.”<sup>8</sup>

## **Vitamin D Has Neuroprotective Properties**

Campbell asks why people with the APOE gene do not experience the same benefit from vitamin D as those who do not have the gene. He hypothesizes that they may require higher doses of vitamin D or the gene may override the benefits of the vitamin.<sup>9</sup>

The researchers from the current study<sup>10</sup> note that 50 million people worldwide currently have dementia and the number is expected to nearly triple by 2050. Vitamin D deficiency is also recognized as a widespread problem, “with a worldwide prevalence of up to 1 billion.”

Past research has demonstrated that vitamin D has a neuroprotective effect. It is known to help clear amyloid beta aggregates in the brain,<sup>11,12</sup> which is a hallmark sign of Alzheimer's disease. The researchers know that vitamin D has also demonstrated a

neuroprotective effect against amyloid beta-induced tau hyperphosphorylation,<sup>13</sup> which is implicated in neurofibrillary tangles,<sup>14</sup> another structural abnormality found in Alzheimer's disease.

Past studies have also implicated vitamin D deficiency in the increased risk of dementia. In a study published by the University of South Australia, researchers found those with the strongest association were in people with vitamin D levels below 10 ng/ml (25 nmol/L).<sup>15</sup>

Low vitamin D levels were also associated with lower brain volumes, and genetic analyses suggested there's a causal relationship between vitamin D deficiency and dementia.<sup>16</sup> Further, the researchers found that up to 17% of dementia cases in some populations may be prevented if people raised their vitamin D levels to 20 ng/ml (50 nmol/L).

In a separate study<sup>17</sup> of 1,658 people over a 5.6-year period, vitamin D deficiency was associated with a substantially increased risk of all-cause dementia and Alzheimer's. When measuring Alzheimer's disease specifically, severe vitamin D deficiency was linked to a 122% increased risk as compared to a 69% increased risk for those who were moderately deficient.<sup>18</sup>

## **Deficiency Raises the Risk of More Health Concerns**

Campbell notes that past research has demonstrated that people taking vitamin D experience protection against progressing from prediabetes to diabetes. He notes that those who are more likely to get diabetes are also more likely to get dementia, so with the association of vitamin D and a lower risk of dementia, it "seems to make perfect sense to give these people extra vitamin D."<sup>19</sup>

Vitamin D also has a significant beneficial impact on **cancer risk**, possibly both preventing and treating the disease. In a 2020 reanalysis of a 2018 study<sup>20</sup> that measured the results of giving participants just 2,000 IUs a day, data showed a 17%

reduced risk for metastatic cancer and death and as much as a 38% reduced risk in those who maintained a healthy weight.<sup>21</sup>

This information is significant because initially this same study had concluded that vitamin D doesn't reduce the overall risk of cancer at all, although it did "hint" that it might decrease the risk of cancer deaths. So. In the reanalysis, the team looked specifically at the risk of metastatic or fatal cancer.

When they did that, they found that "body mass may influence the relationship between vitamin D and a decreased risk of advanced cancer." One of the corresponding authors, Dr. Paulette Chandler, commented:

*"These findings suggest that vitamin D may reduce the risk of developing advanced cancers, Vitamin D is a supplement that's readily available, cheap, and has been used and studied for decades. Our findings – especially the strong risk reduction seen in individuals with normal weight – provide new information about the relationship between vitamin D and advanced cancer."*

In still other studies, a 2020 review<sup>22</sup> published in the British Journal of Cancer noted that low vitamin D levels were associated with poor colorectal cancer survival and a 2019 review<sup>23</sup> of 10 randomized controlled trials found the reduction in mortality from cancer was "significant."

As I have written in the past, research has also shown that **higher levels of vitamin D** can help prevent and/or treat gastrointestinal diseases,<sup>24</sup> inflammatory rheumatic diseases,<sup>25</sup> lupus,<sup>26</sup> obesity<sup>27</sup> and neurodegenerative diseases such as multiple sclerosis.<sup>28</sup>

And, as I found in my own peer-reviewed study,<sup>29</sup> vitamin D also reduces the risk for COVID-19 infection. Also, as I discuss in more detail below, vitamin D works even better when it's balanced with other nutrients, such as magnesium and vitamin K2.

A 2022 study<sup>30</sup> also examined how Vitamin D may affect the development and progression of **uterine fibroids**. These are muscular tumors that grow in the wall of the

uterus. They're nearly always benign, but symptoms are difficult to live with. They occur in up to 70% of white women and more than 80% of black women, sometimes without symptoms.<sup>31</sup>

The objective of the study was to find a treatment for fibroids that would preserve fertility. They enrolled 1,610 women and found that serum levels of vitamin D equal to or greater than 20 ng/mL (50 nmol/L) were associated with an estimated 9.7% reduction in the growth of fibroids when compared to people with vitamin D levels less than 20 ng/mL (50 nmol/L).

The researchers also found a 22% reduction in the incidence of fibroids and a 32% increase in fibroid tissue loss in individuals whose vitamin D levels were equal to or greater than 30 ng/mL (75 nmol/L) when compared to individuals whose levels were less.

## **The Interplay of Vitamin D, Calcium, Magnesium and Vitamin K2**

If you are unable to maintain optimal levels of vitamin D from sensible sun exposure, it's important to remember there are synergistic effects with other nutrients when you're supplementing. When taking a vitamin D supplement, you may also need to increase your intake of magnesium, vitamin K2 MK7 and calcium.

Together, these vitamins work in tandem, and an imbalance is why calcium supplements have been associated with an increased risk of heart attack and stroke, and why some experience symptoms of vitamin D toxicity. Here's a summary of some of the most important correlations:

- Excessive vitamin D without adequate vitamin K2 may cause overabsorption of calcium, which in turn may result in calcium deposits in the tissue. Part of the explanation for these adverse side effects is that vitamin K2 keeps calcium in its appropriate place – in your teeth and bones and out of soft tissues and arteries.

While the optimal ratios between vitamin D and vitamin K2 have yet to be established, taking somewhere between 100 and 200 micrograms (mcg) of K2 is

beneficial. Telltale signs of vitamin K2 insufficiency include osteoporosis, heart disease and diabetes. You're also more likely to be deficient if you rarely eat vitamin K2-rich foods.

- Vascular calcification is also a side effect of low magnesium, so when taking vitamin D3, you need both vitamin K2 and magnesium to make sure everything is working properly.
- Maintaining an appropriate calcium-to-magnesium ratio is also important, as magnesium helps keep calcium in your cells so they can function better. Based on your personal health needs an ideal ratio of calcium-to-magnesium may vary from 1-to-1 to an optimal 1-to-2.
- Magnesium and vitamin K2 also complement each other, as magnesium helps lower blood pressure, which is an important component of heart disease.

## **What Are Optimal Levels of Vitamin D?**

I've long recommended a vitamin D level of 60 to 80 ng/ml (150-200 nmol/L) for optimal health and disease prevention. A level upward of 100 ng/mL also appears safe and beneficial for certain conditions, especially cancer.

Remember that the only way to determine how much sun exposure is enough and/or how much vitamin D3 you need to take is to measure your vitamin D level, ideally twice a year. The D\*Action Project by GrassrootsHealth<sup>32</sup> is a cost-effective way to do this, while simultaneously progressing valuable research.

To participate, simply purchase a D\*Action Measurement Kit and follow the registration instructions included. If you need to supplement, then GrassrootsHealth also has a vitamin D calculator<sup>33</sup> to help you estimate the dose you need to reach your target level.

You'll input your weight, current vitamin D supplement, serum level and target level to find the maintenance dose needed to reach your desired level within three months. Once

you've confirmed your vitamin D levels via testing, remember to retest in three to four months to make sure you've reached your target level.

If you have, then you know you're taking the correct dosage and/or getting the right amount of sun exposure. If you're still low (or have reached a level above 80 ng/ml), you'll need to adjust your dosage accordingly and retest again in another three to four months.

## Sources and References

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- <sup>3</sup> [Aging and Disease, 2017;8\(3\)](#)
- <sup>4</sup> [YouTube, March 13, 2023, 14:49](#)
- <sup>6</sup> [YouTube, March 13, 2023, 4:09](#)
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