MERCOLA
Take Control of Your Health

Why Official Vitamin D Intake Recommendations Are Grossly Inadequate

Analysis by Dr. Joseph Mercola | December 11, 2023

STORY AT-A-GLANCE

- Three November 2023 studies demonstrate that the current governmental dosing recommendations for vitamin D are woefully inadequate, and you need an individualized approach to boost your vitamin D to optimal levels
- Two of the studies were presented before the American Heart Association's Scientific Sessions 2023 in Philadelphia. The third, from Germany, revealed that personalized guidelines were more effective than a one-size-fits-all approach in athletes
- Vitamin D deficiency in athletes is associated with a reduction in endurance parameters, core muscle injuries, muscle strains, bone injuries and stress fractures. Less-than-optimal levels are also associated with uterine fibroids, higher mortality from cancer, respiratory disease, heart disease, all-cause mortality and a higher risk of dementia
- I've long recommended a vitamin D level of 60 to 80 ng/ml (150-200 nmol/L) for optimal health and disease prevention. You need to measure your serum levels to know your vitamin D requirement; JUST supplementing with vitamin D is not enough and could backfire

Two studies published in November 2023 demonstrated that the current governmental dosing recommendations for vitamin D may not help you achieve optimal levels;[1] a third found a personalized approach to supplementation yielded better results in athletes than a one-size-fits-all approach.[2]

Vitamin D is a fat-soluble vitamin, also called calciferol. While it can be found naturally in some foods, your body endogenously produces vitamin D when your skin is exposed to ultraviolet rays from the sun. In the U.S., vitamin D supplements are available as vitamin D2 (ergocalciferol) and vitamin D3 cholecalciferol).[3] Ideally, you can optimize your vitamin D through sensible sun exposure.

However, many are simply unable to get sufficient levels from the sun alone and need a supplement. On a typical sunny day,[4] your body can produce up to 25,000 international units IU of vitamin D. Yet, the current recommended intake[5] is only 600 IU for people between the ages of 1 and 70 years, and 800 IU for those over 70 years.

Two studies[6] presented before the American Heart Association's Scientific Sessions 2023 in Philadelphia demonstrated that the current recommended intakes are far lower than needed to boost your vitamin D to optimal levels. And, as we'll discuss below, when your vitamin D levels are insufficient or deficient, it increases your potential risk for several health problems.

Current Recommendations Won't Raise Vitamin D to Optimal Levels

The two studies[7] presented in November 2023 were from Intermountain Health in Salt Lake City. The data suggest that when research trials are studying the effectiveness of vitamin D treatment to prevent heart disease, it was essential to use sufficient doses to raise vitamin D levels; otherwise the data would be inaccurate.

As the researchers wrote, past studies have demonstrated that low levels of vitamin D are associated with a higher risk of a cardiac event, such as a heart attack or stroke. The lead author, Heidi May, Ph.D., is an epidemiologist at Intermountain Health. She commented on the implications of their findings in a press release:[8]

> *"We've seen a series of studies that report an association between low Vitamin D and poor heart outcomes, but also a few randomized clinical trials that do not report the same association.*

Our findings here show that just giving patients some Vitamin D does not help them achieve optimal levels. If researchers are going to further look at Vitamin D dosing as a possible way to improve heart health, patients need to be given the right doses to reach those ideal levels."

The data showed that without using a personalized approach to supplementation and evaluating blood levels, patients may not have the expected results. Patients were enrolled in a randomized clinical trial to evaluate whether a personalized approach to supplementation could reduce heart-related outcomes. In the first Target-D study, researchers engaged 632 patients and split them into two groups.

The first group received a general recommendation to speak with their health care practitioner about a vitamin D treatment and the second group received a targeted vitamin D treatment. The goal was to raise their 25 hydroxyvitamin D (25[OH] vit D) level to more than 40 nanograms per milliliter (ng/ml), which is the level this study determined was optimal.[9]

Patients in the intervention group had their supplementation dosage determined by an algorithm and every-three-month blood serum assessment to adjust the dosage until their levels reached over 40 ng/ml. In the treatment group, nearly 90% required vitamin D supplementation, and of those, 86.5% needed more than 2,000 IU per day and 14.6% needed more than 10,000 IU per day to reach the serum level goal.

It took three months for less than 65% to achieve 40 ng/ml and six months or more for another 25% to reach the goal. The goal of the second analysis is to determine whether a sufficient level of vitamin D could help prevent heart attacks and stroke.

The participants had to have a heart event within 30 days of enrollment. The trial is planned to continue until at least 104 patients have experienced another heart event or die from heart disease.

In the intervention group, those with a vitamin D Level under 40 ng/ml began with a starting dose of 5,000 IU, which the researchers point out is well over the 600 to 800 IU that is currently the recommended dietary allowance. Viet T. Le is a cardiovascular

researcher and physician assistant at Intermountain Health. He commented on the importance of accurate dosing in a press release:[10]

> *"If Vitamin D can help prevent heart attacks, we want to know it, but our findings are showing that you can't just tell someone to take a single low supplement dose, then set it and forget it. We need to be more intentional in these trials in order to determine if there is a link between Vitamin D supplementation and improved heart health, as well as how to dose it to help our patients if it does."*

It was great that the study used blood levels as an endpoint as many studies fail to do this. However, they seem to have left out some key issues that are mentioned below:

- The best source of vitamin D is from the sun, not a supplement, as it provides far more than vitamin D, as I mentioned in an article in 2022.
- If you do get adequate sun exposure one day, it is important not to take a vitamin D supplement on that day.
- Vitamin K2 and magnesium are important cofactors to produce vitamin D, and if you aren't getting enough in your diet or with supplements, you may be unable to get high enough vitamin D levels.
- The typical adult dose of vitamin D to produce healthy levels would be 8,000 units per day.

Personalized Guidelines More Effective Than One-Size-Fits-All

Vitamin D plays a crucial role in an athlete's health and performance. A 2020 paper[11] in Nutrients acknowledged that athletes have the same potential for low levels of vitamin D as the general population and that vitamin D plays a crucial role in skeletal muscle growth, inflammatory modulation, and cardiopulmonary function, all of which influence athletic performance.

As noted in Nutraingredients,[12] evidence suggests that vitamin D influences power and strength parameters in athletes, including vertical jump and mean power output in

combat sports.

Vitamin D also can influence endurance parameters, which influences athletic performance. In addition to performance, suboptimal or deficient vitamin D levels have a strong correlation with core muscle injuries, muscle strains, bone injuries and stress fractures.

A 2023 randomized controlled intervention study[13] published in Nutrients sought to determine the type of vitamin D supplementation that could help an athlete meet the target of 40 ng/ml over 10 weeks. The study was conducted during the winter months in Germany with 90 athletes who had known insufficient vitamin D levels that were less than 30 ng/ml.

The participants were split into two groups, one of which received a universal dose of 2,000 IU per day of vitamin D. The other group received an individualized supplementation regimen based on a dosing guideline published in 2010 by Lenneke Groningen and colleagues.[14] Serum levels of vitamin D were measured with Mitra tips using volumetric absorptive microsampling technology (VAMS®).

The researchers measured serum vitamin D levels at baseline, at the date they computed that 40 ng/ml would be reached and again at 10 weeks. The researchers found that on the day when the algorithm indicated the athlete would reach 40 ng/ml, the group that had received individualized supplementation had significantly higher serum levels than the group receiving a standard dose.

The researchers believe the data demonstrated the formula they used to estimate optimal vitamin D levels was suitable and "indicates that a personalized approach is more effective than a one-size-fits-all approach in restoring adequate vitamin D levels in athletes."[15] They concluded:

> *"To prevent a possible decline in athletic performance and long failure times due to illness or injuries, athletes need to be informed and adequately supported regarding vitamin D. It has been previously stated that an individualized approach is warranted when correcting vitamin D deficiency.*

The approach used in this study, using independent VAMS® sampling for vitamin D status assessment followed by an individualized supplementation strategy, is an example of how this individual support could be implemented in sports practice."

Less-Than-Optimal Levels Raise Your Risk of Health Problems

In addition to the health issues identified in athletes with low vitamin D levels, suboptimal and deficient vitamin D can also raise your risk of other health problems. A 2022 study[16] examined how levels could affect the development and progression of uterine fibroids. These are muscular tumors that grow in the wall of the uterus and are nearly always benign. However, the symptoms can be difficult to live with.

Treatment for fibroids nearly always destroys fertility. In this study, the researchers were seeking a treatment that would preserve fertility and found an association between vitamin D levels equal to or greater than 30 ng/ml with an "imprecise" reduction of 22% in the incidence of fibroids when compared to those with levels less than 30 ng/ml. The group with serum levels greater than 30 ng/ml also had a 32% increase in fibroid tissue loss.

It is also important to note that while vitamin D is useful in the treatment of fibroids, they are almost always due to excess estrogen and a progesterone deficiency which can't be treated with vitamin D.

A 2022 study[17] showed that people whose vitamin D level could be genetically predicted were 25% more likely to die from any cause compared to those with genetics conducive to healthy vitamin D levels.

Data were gathered from 307,600 people in the UK BioBank, which is a cohort from England, Scotland and Wales. The study also showed that genetically predicted vitamin D deficiency increased the risk of death from cancer, heart disease and respiratory diseases.

A 2023 systematic review and meta-analysis[18] found vitamin D3 supplementation reduced cancer mortality by 6% and when only studies involving daily vitamin D intake were analyzed, cancer mortality dropped by a significant 12%. According to the researchers:[19]

> *"From a biological perspective, it is plausible that a sufficient vitamin D status has an impact on cancer prognosis: by binding to the vitamin D receptor (VDR), the active hormone 1,25-dihydroxyvitamin D (1,25(OH)2D) influences signaling pathways that regulate cell proliferation, differentiation, and cell survival, and thus acts as an anti-proliferative agent in many tissues and can slow the growth of malignant cells."*

The study further revealed that daily vitamin D supplementation was particularly beneficial for people aged 70 and over, as well as those who took vitamin D daily and were later diagnosed with cancer. The data from a 2023 study[20] also indicate that vitamin D deficiency may increase your risk for dementia.

The researchers gathered data from 12,388 people from the National Alzheimer's Coordinating Center who were dementia-free and had an average age of 71. They explored the association between supplementation and the incidence of dementia by measuring exposure to vitamin D but not serum levels.

In other words, just taking a vitamin D supplement and raising the serum level an unknown amount had a positive effect on reducing risk. They found that across all formulations used, participants who were exposed to vitamin D had a "significantly longer dementia-free survival and lower dementia incidence rate than no exposure."[21]

What Are Optimal Levels of Vitamin D and How to Get There

In the early months of the **COVID-19 pandemic**, it was easy to find lies in the mainstream media about several drugs that had been effectively used in human medicine for several decades. Among the supplements that were vilified was vitamin D. Vitamin D is crucial

to the innate and adaptive immune responses,[22] so it's just common sense that it would be useful in an infectious disease.

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**. However, the only way to know your vitamin D level is to measure your serum levels, ideally twice a year.

But supplementing with just vitamin D is not enough, and it could backfire. As I've written before, magnesium and vitamin K2 are necessary to optimize your vitamin D supplementation. When you're not taking magnesium and K2, you could need up to 2.5 times more vitamin D to reach adequate levels.

However, a deficiency in vitamin K2 can lead to excessive calcification in your arteries when you're taking vitamin D. Magnesium is also a crucial part of the equation since it's necessary to activate vitamin D so your body can properly utilize it. You'll find more about the interactions between vitamins D, K2, B12, and magnesium in **Magnesium and K2 Optimize Your Vitamin D Supplementation**.

Sources and References

- [1, 6, 7, 8, 9, 10] EurekAlert! November 12, 2023
- [2, 12] Nutraingredients, November 13, 2023
- [3] ClinCalc, It's Time to Say Goodbye to Vitamin D2
- [4] Journal of Steroid Biochemistry and Molecular Biology, 2019;189
- [5] National Institutes of Health, Vitamin D, table 2 5% DTP
- [11] Nutrients, 2020; 12(2)
- [13, 15] Nutrients, 2023; 15(22)
- [14] European Journal of Endocrinology, 2010;162
- [16] Fertility and Sterility, 2022;118(6)
- [17] Annals of Internal Medicine, 2022 doi: 10.7326/M21-3324
- [18] Ageing Research Reviews, 2023; 87(101923) 4.1 summary of main findings
- [19] Ageing Research Reviews, 2023; 87(101923) 1.1 Rationale
- [20, 21] Diagnosis, Assessment and Disease Monitoring, 2023; doi: 10.1002/dad2.12404
- [22] Journal of Investigative Medicine, 2011 semicolon 59(6)