

# Vitamin D—One of the Simplest Solutions to Wide-Ranging Health Problems

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By Dr. Mercola

Vitamin D deficiency is a pandemic in the United States, but many Americans, including physicians, are not aware that they may be lacking this important nutrient.

Despite its name, vitamin D is not a regular vitamin. It's actually a steroid hormone that you get primarily from either sun exposure or supplementation, and its ability to influence genetic expression that produces many of its wide-ranging health benefits.

Researchers have pointed out that increasing levels of vitamin D3 among the general population could prevent chronic diseases that claim nearly one million lives throughout the world each year. Incidence of several types of [cancer](#) could also be slashed in half.

Vitamin D also fights infections, including colds and the flu, as it regulates the expression of genes that influence your immune system to attack and destroy bacteria and viruses.

In this interview, one of the leading vitamin D researchers, Dr. Michael Holick, expounds on these and many other health benefits of vitamin D. He's both an MD and a PhD, and wrote the book, *The Vitamin D Solution*.

Since the early 2000's, scientific investigations into the effects of vitamin D have ballooned. By the end of 2012, there were nearly 34,000 of them. Dr. Holick is one of those who has really helped advance our understanding of the massive importance of vitamin D—far beyond its influence on bone metabolism.

*"I've been doing vitamin D research for more than 40 years," he says. "As a graduate student for my master's degree, I was responsible for identifying the major circulating form of vitamin D, 25-hydroxyvitamin D that doctors typically measure now for vitamin D status in their patients. For my Ph.D.,*

*I identified the active form of vitamin D [1,25-dihydroxyvitamin D] while working at Dr. DeLuca's laboratory."*

## Are You Vitamin D Deficient?

Before the year 2000, very few doctors ever considered the possibility that you might be vitamin D deficient. But as the technology to measure vitamin D became inexpensive and widely available, more and more studies were done, and it became increasingly clear that vitamin D deficiency was absolutely *rampant*. For example:

- The Centers for Disease Control and Prevention (CDC) reported that 32 percent of children and adults throughout the US were vitamin D deficient
- The National Health and Nutrition Examination Survey found that 50 percent of children aged one to five years old, and 70 percent of children between the ages of six to 11, are deficient or insufficient in vitamin D
- Researchers such as Dr. Holick estimate that 50 percent of the general population is at risk of vitamin D deficiency and insufficiency

I've often said that when it comes to vitamin D, you don't want to be in the "average" or "normal" range, you want to be in the "optimal" range. The reason for this is that as the years have gone by, researchers have progressively moved that 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. For treatment of chronic disease such as cancer, recommendations go even a bit higher than that. As Dr. Holick explains:

*"The Institute of Medicine, including the Endocrine Society, recommends at least 20 for bone health. But there's this area between about 21 and 30 that we consider to be an insufficient level. Most experts agree that if you're above 30 nanograms per milliliter, this is a healthy level."*

*Because of its variability in the assay, the recommendation from the Endocrine Society Clinical Practice Guidelines that looked at all the literature and made recommendations for prevention and treatment of vitamin D deficiency for doctors is 40 to 60 nanograms per milliliter...*

*[GrassrootsHealth](#) has also been looking at this issue and also recommends 40 to 60 nanograms per milliliter as the ideal level."*

*... A study was done in Maasai warriors who are outside every day. That really gives us an insight where we should all be with our blood levels of 25-hydroxy D. They were found to be around 50 nanograms per milliliter."*

## 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

[Sources](#)

## Dosing Recommendations if You Need to Take a Vitamin D Supplement

If your circumstances don't allow you to access the sun or a safe tanning bed, then you really only have one option if you want to raise your vitamin D, and that is to take a vitamin D supplement. Here too recommendations vary, and there are no hard and fast rules. While Dr. Holick disagrees with my recommendation to regularly test your levels in order to assess proper dosage due to the cost involved, I feel this really is your best bet. You want to make sure you're staying within the therapeutic range of 50-70 ng/ml year-round, so regardless of general guidelines, you may need to increase or decrease your dosage based on your personal requirements.

The Society Clinical Practice Guidelines Committee recommends the following dosages. Keep in mind that these guidelines are thought to allow most people to reach a vitamin D level of 30 ng/ml, which many still consider suboptimal for disease prevention.

- Neonates: 400 to 1,000 IU's per day
- Children one year of age and above: 600 to 1,000 IU's per day
- Adults: 1,500 to 2,000 IU's per day

Grassroots Health offers 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 IU's of vitamin D per pound of body weight could be used as an estimate for your ideal dose.

*"I treat my patients, on average, with 3,000 units of vitamin D a day," Dr. Holick says. "It's been very effective. I've published a paper that over a six-year period of time, most of my patients on a 3,000-unit equivalent a day has between 40 and 60 nanograms per milliliter and there is no toxicity."*

*If you're obese, you need two to three times more vitamin D... But for my patients who are at a normal weight, usually 3,000 to 4,000 units a day is adequate to maintain a healthy blood level of 25-hydroxyvitamin D. I personally take 3,000 units a day. My blood level, on average, is about 55 nanograms per milliliter."*

According to Dr. Holick, it makes no difference if you take your vitamin D daily or weekly, or even monthly. Personally, I'd recommend taking it daily. That way, if you miss a day or two, it's not quite as bad as missing an entire week. That said, it is fat soluble, so a lot of it enters your body fat and is slowly released from there. So if you miss a day, you can take double the dose the next day.

## Vitamin D is Critical for Health, Beginning in Utero and Onward

From my perspective, vitamin D deficiency appears to have the greatest impact on cancer rates. At present, the US [cancer mortality](#) rate is equivalent to eight to 10 airplanes crashing each and every single day. Optimizing vitamin D rates across the general population could reduce that by about 50 percent. And it's virtually free—at least if you opt for sun exposure.

As mentioned by Dr. Holick, one of the Nurses' Health Studies showed that nurses who had the highest blood levels of 25-hydroxyvitamin D, averaging about 50 ng/ml, reduced their risk of developing breast cancer by as much as 50 percent. Similarly, a Canadian study done by Dr. Knight showed that women who reported having the *most* sun exposure as a teenager and young adult had almost a 70 percent reduced risk of developing breast cancer. It's just insane not to take advantage of this prevention strategy.

*"I agree 100 percent," Dr. Holick says. "I usually recommend that vitamin D is critically important from birth until death. Just to give you a couple of examples: during pregnancy, we're now realizing that vitamin D deficiency is a major issue for the developing fetus. Pre-eclampsia, the most serious complication of pregnancy, is associated with vitamin D deficiency. Vitamin D is critically important for muscle function, which, of course, is important for birthing action. We showed a 400 percent reduced risk of women requiring a C-section if they simply were vitamin D sufficient at the time they gave birth.*

*We're now beginning to realize that in-utero vitamin D deficiency is more likely that the young children are going to have asthma and wheezing disorders. We're also now realizing that children who are vitamin D deficient are more likely to develop type 1 diabetes, multiple sclerosis later in life, rheumatoid arthritis, and Crohn's disease.*

*Studies have shown that if you improve your vitamin D status, it reduces risk of colorectal cancer, prostate cancer, and a whole host of other deadly cancers by 30 to 50 percent. You're correct. Cancer is a big deal. You need to realize that vitamin D is playing a very important role in helping to maintain cell growth and to help fight cancer when a cancer cell is developing in your body."*

## **Other Health Areas Where Optimizing Vitamin D Levels Could Save Both Lives and Dollars**

In addition to the health benefits already mentioned above, optimizing your vitamin D levels can help protect against:

- **Cardiovascular disease.** Vitamin D is very important for reducing hypertension, atherosclerotic heart disease, heart attack, and stroke. According to Dr. Holick, one study showed that vitamin D deficiency increased the risk of heart attack by 50 percent. What's worse, if you have a heart attack and you're vitamin D deficient, your risk of dying from that heart attack creeps up to 100 percent!
- **Autoimmune diseases.** Vitamin D is a potent immune modulator, making it very important for the prevention of autoimmune diseases, like MS and inflammatory bowel disease.
- **Infections, including influenza.** It also helps you fight infections of all kinds. A study done in Japan, for example, showed that schoolchildren taking 1,200 units of vitamin D per day during the winter time reduced their risk of getting influenza A infection by about 40 percent. I believe it's far more prudent, safer, less expensive, and most importantly, far more effective to optimize your vitamin D levels than to get vaccinated against the flu. According to Dr. Holick:

*“I think you’re right. We know that the immune cells use vitamin D and that they activate vitamin D. There’s good evidence that it will help kill tuberculosis bacteria, for example, if you have adequate vitamin D on board... We think that the immune system is primed with vitamin D in order to help fight infections.”*

- **DNA repair and metabolic processes.** One of Dr. Holick’s studies showed that healthy volunteers taking 2,000 IU’s of vitamin D per day for a few months upregulated 291 different genes that control up to 80 different metabolic processes; from improving DNA repair to having effect on autoxidation (oxidation that occurs in the presence of oxygen and /or UV radiation, which has implications for aging and cancer, for example), boosting the immune system, and many other biological processes.

## **Tired and Achy? You May Simply Be Vitamin D Deficient...**

Feeling tired and achy is a frequent wintertime complaint. According to Dr. Holick, many who see their doctor for such signs end up being misdiagnosed as having fibromyalgia or chronic fatigue syndrome.

*“Many of these symptoms are classic signs of vitamin D deficiency osteomalacia, which is different from the vitamin D deficiency that causes osteoporosis in adults,” he says. “What’s happening is that the vitamin D deficiency causes a defect in putting calcium into the collagen matrix into your skeleton. As a result, you have throbbing, aching bone pain.”*

The remedy is a combination of [vitamin D and calcium](#), which go hand in hand when it comes to bone health. Ideally, you’d want to get your calcium from your diet. If not, Dr. Holick recommends taking about 500 milligrams (mg) twice per day with your meals (for a total of 1,000 mg/day). Magnesium is another important element and should be taken in equal amounts. According to Dr. Holick, elderly muscle weakness is another classic symptom associated with vitamin D deficiency.

*“Many of my patients do incredibly well by just simply correcting their calcium and vitamin D deficiency,” he says.*

## **More information**

Dr. Holick’s book, *The Vitamin D Solution*, which was published in 2010, provides a broad overview of all the health benefits of vitamin D. It also answers many common questions raised by patients, such as, “Will taking a vitamin D supplement worsen my kidney stones?” (The answer: No, it won’t.)