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## Vitamin D Deficiency: Common Cause of Many Ailments



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**The Institute of Medicine** brought experts together to explore the question of whether the RDA or recommended allowance, of vitamin D has been set too low. The occasion was the mounting evidence for this vitamin preventing common cancers, autoimmune diseases, diabetes, heart disease, and osteoporosis.

Furthermore, studies have shown that vitamin D deficiency is more common in the U.S. Because the typical symptoms of vitamin D deficiency—bone and muscle discomfort—can be misdiagnosed as fibromyalgia or chronic fatigue syndrome, according to Michael F. Holick, MD, PhD, of the Boston School of Medicine.

Dr. Holick has conducted a review of all vitamin D studies published in the December 2004 issue of the *Journal of Clinical Nutrition*. Vitamin D has become the focus of the moment, possibly because researchers are trying to raise the RDA again. And Dr. Holick's review, which was funded by the U.S. National Institutes of Health, supports the move.

For most Americans, sunlight provides the lion's share of our vitamin D requirements because we eat foods that naturally contain vitamin D, such as cod liver oil and oily fish (salmon, sardines, and mackerel). But many of us do not meet the minimum requirement of sun exposure. What's more, vitamin D deficiency is more prevalent among people living at higher latitudes, such as the New England States, especially in winter.

Dr. Holick and colleagues conducted a 2002 study at the Boston Medical Center, which found that, by winter, 32% of students and doctors, aged 18 to 29 years, were vitamin D deficient. Winter isn't the only time because, year-round, many people spend a lot of time indoors or slather themselves with sunscreen even when outside.

So it was not too surprising that another study conducted in Boston found a high degree of D deficiency (30%), Hispanic (42%) and black (84%) elderly people at the end of August. Another study found that home residents were vitamin D deficient.

Much of the sun avoidance and excessive sunscreen use is attributed to public education campaigns by dermatologists warning about skin cancers. It should be noted, however, that the most deadly form of melanoma, is unrelated to sun exposure, as the disease usually occurs in areas of the body not exposed to the sun.

Obesity is yet another cause of vitamin D deficiency, according to Dr. Holick, who found that even when dietary vitamin D intake and sun exposure are adequate, the vitamin becomes unavailable because it becomes sequestered in a large amount of body fat. Aging skin requires more sun exposure. A 70-year-old exposed to the same

sunlight as a 20-year-old will only make 25% of the vitamin D that the young person can make.

Breastfed infants are deficient in vitamin D because human milk is deficient in vitamin D. Dr. Holick offered this explanation for why deficiencies are widely overlooked: During the standard blood work-up, doctors tend to focus on the blood calcium levels, and if they are normal, doctors incorrectly assume their patients are getting enough D.

Why the seemingly sudden interest in vitamin D when intriguing research goes back over a half century? In 1949, a researcher published his observation that people who live at higher latitudes, such as New Hampshire, Vermont, and Massachusetts, had a higher incidence of cancer deaths, compared with people living in southern states, such as Texas, Georgia, and Alabama.



In a telephone interview, Dr. Holick was asked why other researchers didn't pick up on this study and was an interesting observation, but people didn't take epidemiology seriously," he answered. "Little attention was paid to it until the 1980s when other researchers reported that colon and breast cancer rates were higher for people living at higher latitudes in the U.S."

Even then, the finding was not taken seriously until researchers understood the mechanism for how vitamin D and prostate activate vitamin D and use it to regulate cell growth, which Dr. Holick explained as a process of "keeping cell growth in check and possibly preventing the cell from becoming autonomous and developing into an unregulated cancer cell."

After the paper explaining the mechanism was published in the British journal *The Lancet*, much more attention began to be paid to vitamin D. And after 1999, many more observational studies were published linking vitamin D deficiency and several chronic diseases. For example, there are higher rates of multiple sclerosis in people who live at higher latitudes; and another study showed vitamin D intake is inversely related to rheumatoid arthritis.

In a 2001 study published in *The Lancet*, children treated with 2,000 IU daily of vitamin D from their first year onward had an 80% decreased risk of developing type 1 diabetes throughout the next 20 years. And in the years since, several studies have been published indicating a link between schizophrenia and decreased exposure to sunlight. Dr. Holick's review states that animal studies have successfully shown that type 1 diabetes, rheumatoid arthritis, and multiple sclerosis can be prevented using mice prone to these diseases.

To Dr. Holick, who is an endocrinologist, it is clear from studies like these (and many more that go unmentioned in this article for lack of space) that vitamin D should no longer be thought of only as the nutrient necessary for the prevention of rickets in young children. He said that his work has been instrumental in the vitamin D field for several common foods, including milk products, bread, and orange juice.

In the telephone interview, Dr. Holick was asked whether an increase in the RDA for vitamin D was in fact the fact that the Institute of Medicine, a division of the National Academy of Science, recently held a meeting on the topic. "No, it usually takes 10 to 15 years to change an RDA," he answered. "A huge bureaucratic system in the meantime, he and other vitamin D researchers recommend a minimum of 1,000 IU vitamin D daily. If that increase, he explained, will maximize the absorption of calcium.

As for the risk of overdose, Dr. Holick said, "You'd have to take 10,000 to 20,000 IU daily to approach a toxic level of vitamin D. It's not that important? "Multivitamins usually have D2 which comes from yeast, but it's probably not as effective as D3," which, he believes is better and longer lasting.

Then there's the question of what constitutes an adequate amount of sunlight: "Five to ten minutes of direct sunlight on your arms and legs or the hands, arms and face two or three times a week," stated Dr. Holick, adding a warning about the right timing, "25% of the time that it would take to cause a light pinkness to the skin."

For More Information:

Read Dr. Holick's book, co-authored with Mark Jenkins and written for the general public, *The UV Advantage*.

York: Simon & Schuster/ ibooks, 2003).

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