

Addressing the Vitamin D Debate: Make screening for vitamin D deficiency an integral part of every patient assessment by Grace Keenan, MD

What role does vitamin D play in health and longevity? This important and hotly debated question continues to surface in the wake of M.F. Holick's lifetime studies on vitamin D deficiency.

Aside from its well known role in osteoporosis,¹ vitamin D also has been linked with diseases such as cancer and diabetes.¹ Therefore, many experts are touting the life-giving benefits of this vitamin and calling for increased recommended daily allowances.

These findings indicate the importance of regular screening for vitamin D deficiency. With supplementation, we can help keep our patients healthy, beyond just their bones.

Lab Recommendations: According to commonly accepted standards, a normal vitamin D test result is 30 ng/mL or above. Insufficiency occurs just under 30 ng/ml, while deficiency is labeled under 20 ng/mL. A more updated recommendation, however, is extrapolated from a study by Shinchuk,² who recommends that a healthy serum level should range from 30 ng/mL to 60 ng/ml.

In our practice, we aim for much higher lab values, from 60 ng/ml to 100 ng/ml. This is because research shows decreased incidences of cancers and other diseases with higher levels of vitamin D. Holick recommends a minimum concentration of 25(OH)D of 50 nmol/L. For maximum bone health and for preventing many chronic diseases, he recommends a 25(OH)D concentration of 78 nmol/l to 100 nmol/l, which is where we think each of our patients should be.³ Studies show that lower levels of 25(OH)D correlate with disease. For example, the *New England Journal of Medicine*⁴ showed a 25-OH Vitamin D level of 30 ng/ml or less resulted in a significant decrease in intestinal calcium absorption⁴ and elevated parathyroid hormone levels.⁵⁻⁷ Multiple studies also link low levels of 25 OH vitamin D (below 20 ng/ml) to a 30 percent to 50 percent increased incidence and mortality to colon, pancreas, lymphoma, ovary and breast cancers.⁸⁻¹² Several health endpoints require levels of 80 nmol/l or higher. To achieve an appreciable difference in serum levels, patients generally need 1,000 IU/day to 2,000 IU/day of supplemental cholecalciferol.¹³

Justification for Supplementation: Still, the Institute of Medicine only recommends that patients take 200 IU of Vitamin D per day. For patients ages 51 to 70, the organization recommends more, suggesting 400 IU per day. For those over 70, it indicates 600 IU per day.¹ However, many studies show that higher levels of supplementation will yield more health benefits. For example, women who took 400 IU per day of Vitamin D₃ diminished their incidence of multiple sclerosis by 42 percent.¹⁴ Similar reductions were observed in rheumatoid arthritis¹⁵ and osteoarthritis.¹⁶ In addition, studies noted an 80 percent reduction in the incidence of type 1 diabetes with vitamin D supplementation,¹⁷ and a 33 percent reduction in type 2 diabetes.¹⁸ There's more as well. Congestive heart failure, elevated C reactive protein, schizophrenia, depression and respiratory wheezing all have been linked to vitamin D deficiency.¹ It's important to consider that organs throughout the body have vitamin D receptors, including the brain, prostate, breast, colon and cells involved in immunity and genetic regulation.¹ Vitamin D receptors exist in skeletal muscle, explaining one of the most common symptoms of vitamin D deficiency: muscle weakness and soreness.

One study, for example, identified that up to 93 percent¹⁹ of patients presenting in the emergency room with muscle aches and bone pain were deficient in vitamin D. Supporting this theory, studies also link vitamin D deficiency with muscle weakness and falls. This may be why a meta-analysis of five randomized studies, representing 1,237 participants, found that 800 IU per day of Vitamin D₃ supplementation significantly reduced the risks of falls by 22 percent.²⁰

Practical Matters: Given the relationship of vitamin D deficiency with so many illnesses, many experts are suggesting routinely measuring 25 OH vitamin D. Current estimates show that 40 percent to 100 percent of U.S. and European elderly not living in nursing homes are deficient in vitamin D.^{5-7,20-30} Moreover, 52 percent of Hispanic and black adolescents and 48 percent of white pre-adolescent girls in Maine³¹ have levels below 20 ng/ml.

These statistics have caused me to routinely order vitamin D tests on annual exams, especially in patients presenting with the diagnoses linked to the deficiency. For example, muscle aches and pains are most commonly associated with vitamin D deficiency, but these are often misdiagnosed as chronic fatigue syndrome or fibromyalgia. This deficiency may be even more pronounced for those who live at higher latitudes, since they're not exposed to the sun often enough. Vitamin D deficiency occurs more often among people living in the New England states, especially in winter.

For patients with nominally low levels (in the 45 ng/ml to 60 ng/ml range), I may recommend sources of vitamin D through food, including oily fish (salmon and mackerel) or other oils three times per week. We also recommend six to eight glasses of vitamin D-fortified milk daily or vitamin D3 supplementation (probably in excess of 2,000 IU per day). Note that 3.5 ounces of wild salmon contains 600 to 1,000 IU of vitamin D3 and the same portion of farm raised salmon contains 100 to 250 IU vitamin D3.¹

Very few foods in nature contain vitamin D. However, the flesh of fish (such as salmon, tuna and mackerel) and fish liver oils are among the best sources. For example, almost all of the U.S. milk supply is fortified with 100 IU/cup of vitamin D (25 percent of the Daily Value or 50 percent of the AI level for people ages 14 to 50). Other dairy products made from milk, such as cheese and ice cream, generally are not fortified. Ready-to-eat breakfast cereals often contain added vitamin D, as do some brands of orange juice, yogurt and margarine.³² Obviously, high dose supplementation is the most effective way to get this vitamin. I prescribe vitamin D3 2000 IU per day for patients with levels from 40 ng/ml to 60 ng/ml. If levels are under 40 ng/ml, I prescribe 5,000 IU vitamin D3 daily. When we replace vitamin D in this manner, the risk of toxicity (levels greater than 150 ng per ml) is unlikely.³³⁻³⁸ In fact, studies show 10,000 IU vitamin D3 has no associated toxicity.³⁶

Although a 50,000 IU dose of D2 is available by prescription, I am reluctant to prescribe this to patients. These doses are not found anywhere in nature, and we don't know how the body receives such excessive amounts. There is also a prescription, known as Drisdol (D2), which is 8,000 IU/ml.

I prefer, instead, to prescribe Vitamin D3, which is the primary form of dietary vitamin D, in a 2,000 IU or 5,000 IU capsule per day dosage. D2 is a secondary form of vitamin D, which is derived from the yeast and plant sterol precursor, ergosterol. Both calciferols appear to be absorbed with equal efficiency, but vitamin D2 may be less potent and may have a different toxicological profile. We monitor as serum levels rise slowly, checking plasma levels after six months, aiming for serum levels greater than 60 ng/ml.

As patients continue to be more proactive in maintaining their health and as the mainstream medical literature continues to espouse the benefits of vitamin D, medical providers should consider monitoring vitamin D levels. This is why we routinely evaluate 25 OH vitamin D in our assessment. We feel strongly that the so-called sunshine vitamin may, in fact, allow patients to live longer and healthier lives.

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Grace Keenan, MD, has been in private practice in Sterling, Va., since 1988. Certified by the American Board of Internal Medicine, Dr. Keenan is a clinical assistant professor at Georgetown University's department of medicine and an affiliate faculty member at George Mason University.

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