



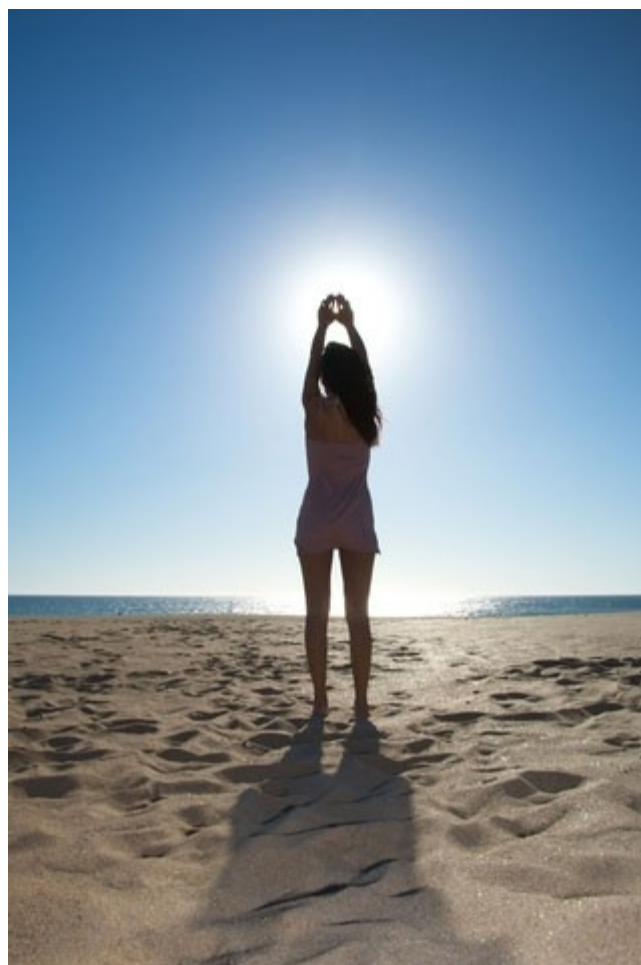
## Vitamin D: Values for Normal Are Exaggerated



Examining a patient’s blood for vitamin D levels has become common practice, with many millions of tests performed annually in the US. Based on the current standards of normal—30 ng/mL or greater—between 50 and 90 percent of adults and children are considered deficient in vitamin D.<sup>1-5</sup> Even people who are exposed to large amounts of sunlight do not meet the standards for sufficiency. For example, after a spring and summer in sunny California and a trip to Costa Rica this past July (2010) with hours spent intentionally sunbathing, Mary McDougall had a vitamin D test run in August of 2010. She failed, based on commonly reported standards, with a value of 29.6 ng/mL.

Many well-meaning doctors would have told her she was not in good health and in need of supplementation with vitamin D pills, perhaps for a lifetime.

Mary is not an unusual example of well-sunned people failing this commonly prescribed test. Similar results were found during a study of active young people living in Hawaii with an average sun exposure of 29 hours a week. Even with all that vitamin D-promoting solar radiation, 51 percent of the group failed to meet sufficiency levels of 30 ng/mL.<sup>6</sup> The highest reported level was 62 ng/mL and several people had values below 20 ng/mL. Another study of 495 women with an average age of 74 years, living in Hawaii, a geographical area with high environmental UV irradiance, found 44 percent of subjects had vitamin D values of less than 30 ng/mL, but none were below 10 ng/mL; and there was little evidence of seasonal variation of vitamin D levels.<sup>7</sup>



Commonly Reported Standards for Blood Vitamin D Levels:
25-hydroxy vitamin D, reported as ng/mL.
Definite Deficiency: 10 or less
Deficiency: 20 or less
Insufficiency: 20 to 29
Sufficiency: 30 to 80
Above recommended: 81 to 199
Toxic: above 200
Based on recent reviews, adequate, I believe, is 20 ng/mL or greater (see below).
To convert ng/mL to nmol/ml, multiply by 2.496.
<a href="#">Laboratory inaccuracies</a> have been reported to occur, so more than one reading should be requested before any drastic actions are taken, like accepting a lifetime of medication.

## Normal Values for Vitamin D Are Set Too High

Normal levels are determined by comparing the effects of various levels of vitamin D in the blood to parameters of bone health, such as the body's levels of parathyroid hormone (PTH), the ability of the intestine to absorb calcium, and a person's bone mineral density (BMD). Recent reviews of the scientific literature have come to the conclusion that the level set as normal (30 ng/mL or greater) is unsubstantiated and in need of revision. Consider these comprehensive reports:

A review paper titled "Vitamin D Insufficiency" by Clifford Rosen published in the January 20, 2011 issue of the *New England Journal of Medicine* found "...the IOM (Institute of Medicine) report, based on evidence from observational studies and recent randomized trials, suggests that a serum level of 20 ng per milliliter of 25-hydroxy- vitamin D would protect 97.5% of the population against adverse skeletal outcomes such as fractures and falls."<sup>5</sup>

An editorial in the January 2011 issue of the *American Journal of Clinical Nutrition* reviewed a series of studies of children and found that a vitamin D level above 12 ng/mL had no benefit on calcium absorption and above 20 ng/mL there was no evidence on improved bone health.<sup>8</sup>

[A recent United Kingdom consensus vitamin D position statement](#) indicates there is currently no standard definition of an optimal concentration of vitamin D, and that concentrations below 10 ng/mL should indicate deficiency.<sup>9</sup>

Widespread recommendations for testing vitamin D levels using a standard that is too high to achieve is another example of *disease mongering*—where healthy people are turned into patients. The net effect is these newfound patients now spend more money on doctors' visits, vitamin D tests, and supplements. My conclusion, based on the scientific research, is that normal should be considered 20 ng/mL or greater, a standard that most children and adults already meet. People failing to reach this acceptable level need to expose themselves to more sunshine.

## Sunlight Is the Source of Vitamin D

Vitamin D is a hormone that is naturally produced within the body with the help of the ultraviolet radiation from sunshine. Humans had their origin in lands near the equator and had darkly pigmented skin appropriate for a high intensity of solar radiation. As people migrated from equatorial zones to greater latitudes, north and south, the pigmentation of their skin decreased in order to allow more sunlight to penetrate for D synthesis. This adaptation allowed people to move to parts of the world as far north as Alaska, where sunlight is marginal even during the summer months.

Except for some oily fish swimming in the waters of higher latitudes, vitamin D does not naturally occur in our food supply. The exception of oily fish demonstrates how natural environments support their inhabitants—in this case fish eating provides the pre-formed hormone vitamin D to people (and polar bears) living with very little sunlight almost all year long.

Outside of the natural production of vitamin D by sunlight and that found in oily fish, the only other substantial sources of vitamin D come from supplements sold as pills or fortified foods. The most well known food to which synthetic vitamin D is added during production is cow's milk.

## Sunshine Is Essential for Good Health

Insufficient sunlight unquestionably results in two serious and related diseases: rickets and osteomalacia. Abundant sunshine exposure has also been associated with less risk of heart disease, common cancers, multiple sclerosis, and other medical conditions. A [review](#) published in the March 23, 2011 issue of the *New England Journal of Medicine* stated that, "For outcomes beyond bone health, however, including cancer, cardiovascular disease, diabetes, and autoimmune disorders, the evidence was found to be inconsistent and inconclusive as to causality."<sup>10</sup>

The association between low vitamin D and common diseases is most certainly due to the confounding factor of food. People living in sunny equatorial regions eat a starch-based diet whereas populations living at higher latitudes, where sunshine is less abundant, eat more animal foods, dairy and meat products. An unhealthy diet causes heart disease, cancers, multiple sclerosis and other chronic diseases of Westerners. However, this obvious conclusion should not diminish the importance of sunshine.

## How Much Sun Do You Need?

Overexposure to sunshine, resulting in skin damage, should be avoided. That said, when the entire body is exposed to enough solar radiation to cause the skin to become slightly pink (reddened)—an amount referred to as the *minimal erythemic dose* (MED)—then the exposed skin will release 10,000–20,000 IU of vitamin D into the circulation within 24 hours of exposure.<sup>11</sup> Vitamin D made in the skin lasts at least two to three times longer in the circulation compared to taking vitamin D as a supplement.<sup>12</sup> Therefore, the human body has a highly efficient capacity to make vitamin D with minimal sun exposure. Compare the effects of supplements in order to get some idea of the potency of sunlight to raise vitamin D levels in the blood: In general, for every 100 IU of vitamin D taken in, there is an increase of slightly less than 1 ng/mL in the serum level of 25-hydroxy-vitamin D.<sup>11</sup>

In practical terms, a person living in Boston who is not suntanned and is fair-skinned will receive their total body MED from just 10 to 12 minutes of midday, July, summer sun. A darker-skinned Asian Indian will require three times this exposure in order to receive their total body MED. Very darkly pigmented people, such as blacks, will require 5 to 10 times more solar radiation than a white person. Vitamin D made in the spring, summer, and fall months is efficiently stored in the body fat and supplies people's needs during winter months. The [next best choice](#) after natural sunlight would be to use artificial sunlight (sun beds, tanning booths).

I do not recommend taking vitamin D pill supplements (pills or liquids) for most people because they provide little benefit in terms of bone health and have concerning side effects.<sup>9</sup> The overall harmful effects caused by nutritional imbalances created by taking these pills are far from fully understood; however, there is sufficient evidence that taking vitamin D by mouth may increase your risk of heart disease, several forms of cancer, and kidney stones. In addition, recent studies have suggested levels of 25-hydroxy-vitamin D above 60 ng/mL are associated with an increased risk of pancreatic cancer, vascular calcification, and death from any cause.<sup>10</sup>

These days many people fail to get adequate sun because of their dark skin pigmentation, living in high latitudes, wearing clothes, and working indoors. My initial response to a failed vitamin D test is to not take vitamin supplements, but rather to get outside, get more naked, and get closer to the equator on vacations. I highly recommend a [Costa Rica McDougall Adventure trip](#) at least once a year for optimal sunshine and excellent food.

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