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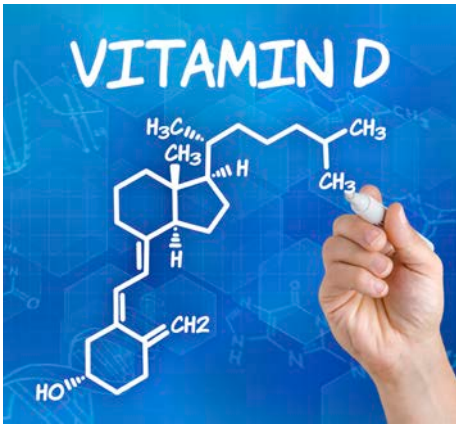
MOLECULES&HEALTH
Healing Through Modern Science · A Publication by Small Molecule Technologies, Inc.

D-Fend your Health

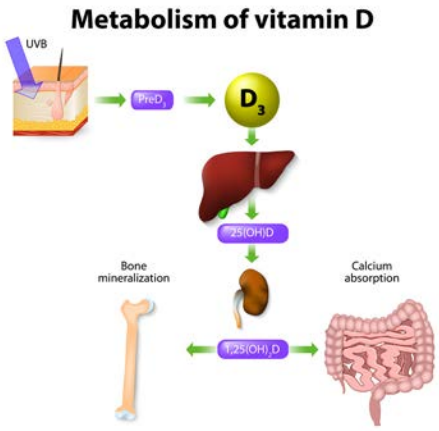
There's something about being outside on a bright sunny day that just makes people feel good. We tend to feel more energized, we don't get sick as much, and we might even smile a little bit more. Research is showing that a nice sunny day may do even more for our health, especially when it comes to preventing age-related diseases – all because of a compound we call Vitamin D.



There has been an ever-growing interest in the effects of Vitamin D on total body health for several decades now, and current research continues to confirm the importance of this vital molecule. So far, Vitamin D deficiency has been implicated in virtually all diseases including heart disease, diabetes, cancer, mood disorders, poor immune function, and osteoporosis.[1–7] Recently published research has also confirmed that the level of Vitamin D in a person's blood can significantly increase or decrease their risk of developing both dementia and Alzheimer's disease, and Vitamin D may play an important role in repairing damaged neurons in people with multiple sclerosis.[8,9]

What Makes Vitamin D So Important?

One reason Vitamin D status influences so many diseases is that it is not a typical vitamin – in fact, Vitamin D is a hormone synthesized naturally by your skin when it is exposed to sunlight.[6] When scientists wanted to know which organs required the most Vitamin D, they investigated which organs had the most receptors for Vitamin D. What they discovered was that virtually all organ systems in the body had relatively high concentrations of Vitamin D Receptors (VDRs), meaning it was important for all of them![10] More importantly, these VDRs were located on the nucleus of the cell where all of your genetic material (DNA) is stored.[10] It turns out that VDRs are genetic transcription factors, meaning that Vitamin D is actually capable of changing how your body expresses certain genes.[10] This helps to explain the major role it plays in so many disease states.



Why You Might Be Deficient in Vitamin D

The most significant source of

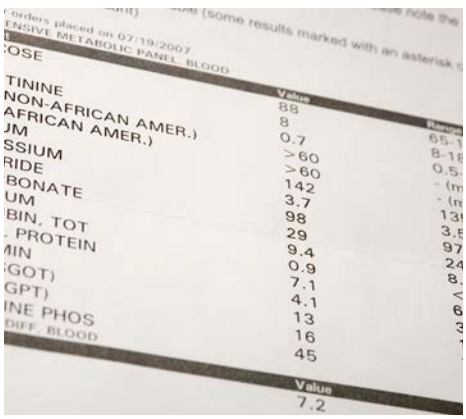
Vitamin D comes from production in skin when it is exposed to sunlight, specifically UVB light (not UVA).[6] Unfortunately, we know that excessive exposure to sunlight can also lead to deadly skin cancers like melanoma, so many of us try to avoid direct sunlight by staying indoors, wearing protective clothing, or by using sunscreens.[11] While these are effective methods to prevent skin cancer, they are also effective at decreasing the amount of active Vitamin D in your body. People with darker skin tones will require more sunlight than those with light complexions to produce the same amount of Vitamin D. Additionally, as you move further away from the equator, less Vitamin D producing sunlight reaches your skin, so you only produce Vitamin D during a few peak hours between 10:00 AM – 3:00 PM during the summer months.

There is also a phenomena called "Vitamin D Winter" that refers to the complete loss of Vitamin D producing sunlight during winter months as you get further from the equator. The angle of the sunlight in winter months creates a situation where it has to pass through more of the atmosphere before reaching your skin and this filters out all of the UVB light necessary for producing Vitamin D.[12,13] Never mind the fact that the days are shorter and people typically are bundled up in cold-weather clothes, but even if you were getting sunlight on your skin it would be incapable of producing Vitamin D.[4,14,12]

If you are not getting Vitamin D from sunlight, your other sources are limited to dietary sources like cold water fish (salmon/tuna), dairy, eggs, mushrooms, liver, fortified foods, or dietary supplements. Plant sources and some supplements contain Vitamin D2 (ergocalciferol) which is less potent than the preferred form, Vitamin D3 (cholecalciferol).[15] An important note is that a single serving of Vitamin D fortified whole milk only contains about 100 IU of Vitamin D3 per 8 oz. serving, so to get 1,000 IU of Vitamin D from milk you would have to drink 10 servings containing 1,500 calories and 46 grams of saturated fat. This is obviously not a healthy way of obtaining Vitamin D and it is not a recommended method of boosting your daily intake.

Are You Deficient?

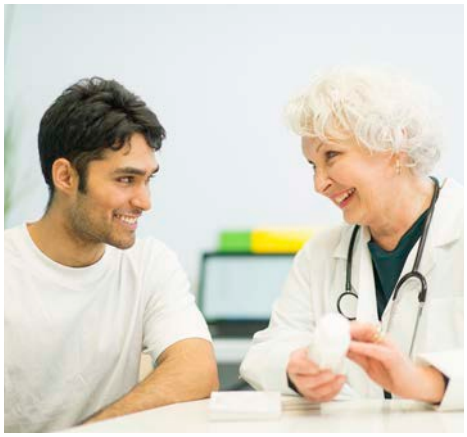
The only way to know for sure if you have a deficiency is with a blood test. Current medical practices define Vitamin D deficiency as blood levels lower than 30-32 nmol/L, based on studies of bone density and development of osteoporosis.16 Based of this cutoff point, an estimated 55 – 80% of people in the United States are considered deficient.[16,17] However, there is a growing body of evidence that the cutoff level for deficiency should be raised closer to 50 nmol/L or even higher, which would put over 95% of the U.S. population into the deficient category.[16,17] The research on Vitamin D's effects on dementia and Alzheimer's disease showed that people with blood levels between 25 – 50 nmol/L were 53% more likely to develop dementia and 70% more likely to develop Alzheimer's disease, compared to those with levels above 50 nmol/L.8 People that had severe deficiency, defined as levels below 25



nmol/L, were 125% more likely to develop dementia and 120% more likely to develop Alzheimer's disease. If your doctor tests your Vitamin D levels, be sure to ask what blood level they consider as the cutoff for deficiency and how they determined that level.

Supplementing Vitamin D

While it is extremely rare, it is possible to get too much vitamin D from supplements which can result in too much calcium in the blood (hypercalcemia). For this reason, it is important to work with your healthcare provider and monitor your blood levels while supplementing Vitamin D to find the dose that works for you. Most people will require a minimum of 2,000 IU daily to get their blood levels above 50 nmol/L, however you should only exceed that dose



under supervision of a healthcare provider.

Note: Recent studies revealed that the current recommended dietary allowance (RDA) of 400 IU per day was based on flawed research with a statistical miscalculation that underestimated the RDA by as much as ten-fold.[18]

At Small Molecule Technologies, we know the importance of Vitamin D3 in total body health and include it in several of our products to help you maintain healthy blood levels and promote optimum health. Give your Vitamin D levels a boost today by taking Small Molecule Technologies:

MultiVitamin	1050 IU/day
D3+ Magnesium	750 IU/day
Joint Health	600 IU/day
Energy Support	600 IU/day
Mood Support	600 IU/day
Brain Health	600 IU/day
Sleep Support	600 IU/day

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About the author: Kyle Hilsabeck, PharmD., is the Vice President of Pharmaceutical Affairs at McCord Holdings and licensed by the Iowa Board of Pharmacy. He completed bachelors degrees in biology and biochemistry at Wartburg College before earning his Doctorate of Pharmacy from the University of Iowa College of Pharmacy. Upon graduation, he completed a community pharmacy practice residency through the University of Iowa where he focused primarily on nutritional aspects of care including the use of vitamin, mineral, and herbal supplements. He has taught courses for the University of Iowa College of Pharmacy on vitamins, minerals, herbs, and nutritional supplements and given many presentations on the subject as well. He has a passion for improving patient care specifically with regards to the safety and quality of the nutritional supplements and health information people use.