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Add Sunshine To Your Day

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Perhaps you are already familiar with a healthy body's key nutrient — vitamin D3. It is arguably the most important essential nutrient, working to keep your bones strong and inflammation in check while reducing your risk of developing chronic disease or improving disease outcomes. Vitamin D3 tends to be the one supplement doctors strongly suggest their patients take. In fact, most oncologists will tell you they take it as part of their own cancer prevention strategy and while there are a variety of ways to obtain this essential hormone, the most simply effective way is free for the taking — the sun.

Most likely you have never thought about photosynthesis outside its role in helping plants create food from carbon dioxide and water, so you might be surprised to discover that humans also use photosynthesis to create Vitamin D, which begins when your skin is exposed to the sun's ultraviolet radiation (UVB). A form of cholesterol found in your skin called 7dehydrocholesterol absorbs UVB and converts it to cholecalciferol, a pre-vitamin form of vitamin D. That pre-vitamin travels through your blood stream to the liver where it begins to be metabolized and turned into 25hydroxy vitamin D. Then, it moves to the kidneys where it is converted into 1,25-dihydroxy vitamin D, the form your body can use. More simply put, the whole process begins

when the unprotected skin on your arms, legs, back and face is exposed to the sun for as little as 10 minutes for fair-skinned people and up to two hours for dark-skinned people. Do that three times each week between the hours of 10:00 am – 3:00 pm and you will be good to go. Because vitamin D is fat soluble, your body will store it for extended periods of time, and if you follow that simple program between the months of April and September in the northern reaches of the globe, you will have stored enough Vitamin D3 to get you through those long winters. If you live in a warmer climate, do the same. You cannot store too much of this vitamin.

The Discovery of Vitamin D

The use of vitamin D as a supplement dates back at least 750 million years before land animals roamed the earth. According to the Boston University Medical Center,¹ phytoplankton in the oceans were the first creatures to convert the UVB penetrating the water column into vitamin D2, which they used as a natural form of sunscreen. Once concentrated in their bodies, they also used it to balance out cellular calcium. As Vitamin D made its way up the food chain, the ocean's high calcium environment supported a diversity of sea life. However once animals moved onto land, calcium was harder to obtain and that is the point at which land animals developed the ability to "photosynthesize" vitamin



D. Humans did quite well until the industrialization of northern Europe by the 16th century when cities crowded with tall buildings blocked out the sun's rays precipitating the development of a devastating bone disease called rickets — a softening of the bone. In 1889, scientists began looking at the impact of vitamin D deficiency on our overall health and the significant role it played in various skin diseases including lupus vulgaris. Their discoveries led to the promotion of sunbathing as the premier way to absorb this essential nutrient and heal the skin.

disorders, including a weakened immune system, seasonal depression, autoimmune diseases, cancer, viral infections and dementia.

A 2014 study showed people with extremely low blood levels of vitamin D3 were more than two times as likely to develop Alzheimer's or other types of dementia. Disheartened? Do not be. A little time in the sun can reap huge benefits, protecting you from cardiovascular disease, hypertension, psoriasis, autoimmune diseases including MS, diabetes,

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In 1919, scientist Edward Mellanby observed that rickets also had a connection to vitamin D deficiency. He noted that the debilitating condition was only found in city dwellers, not those living in the country. To address the lack of sun exposure, it was in Wisconsin in 1929 that the invention of fortifying milk was developed by Harry Steenbock at the University of Wisconsin-Madison, and by 1932, milk fortified with the purified form of vitamin D all but eliminated rickets. While fortified foods such as milk, cereal and orange juice are available, the sun or whole food sources offer many more health benefits. Processing such as fortification decreases the nutritional value of farm fresh foods, which are abundant in vitamins, minerals, antioxidants and other nutrients that act synergistically to maintain optimal health.

Not Enough Vitamin D3?

Modern day research continues to build on our understanding of the benefits of vitamin D3 with a 2010 study² that found 41% of Americans deficient. Symptoms including fatigue, muscle pain, weakness, weight gain, poor concentration, restless sleep, eczema and headaches went mostly ignored. Long-term vitamin D3 deficiency can cause a host of

rheumatoid arthritis, reduced incidence of bone fractures and cancer.

In 2018, PLoS ONE³ published a study that states women with the highest levels of Vitamin D3 had an 80% lower risk of breast cancer due to its ability to promote normal mammary-cell development, while inhibiting the reproduction of and encouraging the death of cancer cells. A study published in 2017 by the National Institutes of Health⁴ found breast cancer survival rates increased with the higher levels of vitamin D. Finally, Harvard University's VITAL Study⁵ is currently working to define the role of vitamin D3 in preventing cancer.

Vitamin D deficiency has also been implicated as a risk factor for infertility by possibly causing women to ovulate less, which decreases the chance that eggs will implant in the womb. Vitamin D receptors are found in the ovaries, placenta, lining of the uterus, testicles and pituitary gland, and appear to control the genes involved in making estrogen while impacting the genes that help with implantation.

Wisconsin Obstetrician-Gynecologist Joi Davis says, "I do a lot of testing and pick up a lot of vitamin D3 deficiency among my patients. I've noted that if



vitamin D is too low, endometriosis is more prevalent. Also, my patients that don't drink milk are generally low in D3, suffering with fatigue, seasonal depression, and muscle aches, but will dramatically improve when they start drinking fortified milk."

Davis reflects on her IVF patients who do better if D3 is optimized, "If levels are low, a woman's egg supply is likely low, meaning there are fewer eggs in the ovaries, resulting in a decreased chance of pregnancy."

Vitamin D3 Supplements

This is where the case for vitamin D gets a little more complicated. In lieu of the sun, supplements can bring your D3 levels up to normal, improving your metabolism by influencing more than 200 genes that reduce inflammation and prevent and treat chronic disease. When using vitamin D as a supplement, however, the form is important. Look for D3 (cholecalciferol), which is more easily absorbed by our bodies than D2 (ergocalciferol). If you need to correct a deficiency, you can take as much as 5000 IU, but it is best to have your health practitioner check your levels and guide your dosing rather than self-treating. Once you are up to proper levels, maintenance doses are somewhere in the range of 1,000-2,000 IU, and according to recent studies, Vitamin D3 absorption may be higher when taken in the evening.

Dosing Vitamin D3 Supplements

When it comes to natural sources, you really cannot get too much vitamin D since your body stops producing it when it has enough stored, but supplementation can be slightly risky. According to Mayo Clinic,⁶ vitamin D toxicity or hypervitaminosis D is caused by taking mega doses of D supplements over a long period of time, resulting in the potential for a build-up of calcium in your blood, which can decrease appetite, cause nausea and vomiting, muscle weakness, frequent urination and kidney problems. However, an overdose is quite rare having been identified with doses of 40,000 IU or more, which is stratospherically above the recommended daily allowance. That said, vitamin D toxicity is more likely to occur in people who are taking a thiazide

diuretic or have health problems such as kidney or liver conditions. The bottom line is you should always consult your medical practitioner when using supplements.

What About Skin Cancer?


To get your vitamin D for free, you will have to expose your skin to ultraviolet radiation, but what about the risk of developing skin cancer from sun exposure? Sunscreen does interfere with your vitamin D absorption, but not using it can significantly increase your risk of melanoma. As with everything, it is all about balance. UVA penetrates through glass and permanently ages skin, while UVB burns it. Too much of either can cause skin cancer, so look for a broad-spectrum sunscreen that protects against both, remembering that SPF only measures how well you are protected against UVB radiation.

When it comes to water resistant sunscreens, it is important to reapply often. Mayo Clinic points out that "water resistant" means your skin is protected for up to 40 minutes while swimming or sweating, and "very water resistant" provides up to 80 minutes of protection. There are also stark differences in the ingredients and their health impacts on us. Remember that whatever you choose, use water resistant, broad-spectrum sunscreen with SPF 30 or higher.

Sunscreen:

1. Apply generous amounts to dry skin 15 minutes before going outside.
2. Use on all skin surfaces exposed to the sun including lips and ears.
3. Reapply every two hours and immediately after swimming or heavy sweating even if the product is water resistant.
4. Sand, water and snow reflect sunlight, making it more important to use sunscreen in those environs
5. Since UV light passes through clouds use sunscreen even when it is cloudy.



6. Children as young as six months can use sunscreen but keep all children in the shade as much as possible.
7. Use sunscreen year-round.
8. Your best defense against skin cancer is a combination of shade, sunscreen and clothing.
(Source: Mayo Clinic) 



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