

## **Vitamin D is Called the Sunshine Vitamin for Good Reason**

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December 7, 2005

Vitamin D is not a vitamin but a hormone. It is unique in that it is made in the skin as a result of exposure to sunlight. Photosynthesis of vitamin D has been occurring on earth for more than 750 million years. Some of the earliest life forms that were exposed to sunlight for their energy requirement were also photosynthesizing vitamin D. Both children and adults have in the past depended on adequate sun exposure to satisfy their vitamin D requirement. It is well documented that at the turn of the last century upwards of 80% of children in the industrialized, polluted cities of northern Europe and northeastern United States suffered from the devastating consequences of vitamin D deficiency rickets. The skin has a large capacity to make vitamin D. Exposure of a person in a bathing suit to a minimal erythemal dose of sunlight, which is typically no more than 15-20 minutes on Cape Cod in June or July at noontime, is the equivalent to taking 20,000 IU of vitamin D orally. It is now well documented that in the absence of any sun exposure 1,000 IU of vitamin D<sub>3</sub> a day is necessary to maintain healthy levels of 25-hydroxyvitamin D in the circulation. An analysis of the NHANES III data has demonstrated that neither children nor adults are receiving an adequate amount of vitamin D from their diet or from supplements.

Is there any advantage to being exposed to sunlight to produce vitamin D rather than taking a pill that contains an adequate amount, i.e. 1,000 IU of vitamin D<sub>3</sub>? It is known that when exposed to sunlight the vitamin D that's made in the skin enters the dermal capillary bed, and essentially 100% is bound to the vitamin D binding protein. When vitamin D is ingested, it is incorporated into the chylomicrons and is transported through the lymphatic system, which in turn, is deposited into the venous system where it eventually is metabolized in the liver to 25-hydroxyvitamin D. As a result, no more than

60% of the vitamin D that is ingested is bound to the vitamin D binding protein, whereas the other 40% is mostly bound to lipoproteins. Thus the vitamin D that is made in the skin has a longer half-life in the circulation than it does when ingested from the diet or from a supplement. Furthermore, the vitamin D produced in the skin from sun exposure is free, unlike a vitamin D supplement. You can never become vitamin D intoxicated from sun exposure, but you can if you take too many vitamin D pills.

90-95% of most people's vitamin D requirement comes from casual exposure to sunlight. Why is there such a controversy about sensible sun exposure as a recommendation to satisfy our vitamin D requirement? The sun has been demonized, and as a result, most of the world's population has been brainwashed into thinking that any exposure to sunlight is bad medicine. This is unfortunate since there is essentially no substantiated scientific evidence to suggest that moderate sun exposure either significantly increases risk of squamous and basal cell carcinomas, and more importantly, the most deadly form of skin cancer; melanoma. There is no question that excessive exposure to sunlight and sun burning experiences significantly increase risk of both basal and squamous cell carcinoma. However, these cancers are often easily detected, and if detected early, are easily treated and often cured. Melanoma on the other hand, is a very aggressive and deadly form of skin cancer. However, most melanomas occur on the least sun exposed areas, and a recent meta analysis of 35 studies suggests that occupational exposure to sunlight decreases risk of developing melanoma.

Why not take advantage of sensible sun exposure? Not only do people feel better but they also will obtain their vitamin D requirement during the spring, summer and fall. It is possible to maintain adequate vitamin D stores by taking an adequate amount of vitamin D from a supplement. It is extremely unlikely that a person can get an adequate amount of vitamin D from their diet, however. The major issue of obtaining vitamin D from a pill is that the person has to remember to take the pill, and they have to be able to find a pill that contains the needed amount of vitamin D, i.e. 1,000 IU of vitamin D<sub>3</sub>. Most drug stores do not carry vitamin D supplements that satisfy the body's requirement.

There needs to be a reevaluation of the important role that sensible sun exposure has in providing vitamin D for the world population. Indeed in Australia and New Zealand where the incidence of skin cancer are the highest in the world, the New Zealand Bone and Mineral Society in collaboration with the Australian College of Dermatologists and Cancer Council of Australia have recommended that a balance is required between avoiding an increased risk of skin cancer and achieving enough UV radiation to maintain adequate vitamin D levels. I believe Charles Shultz said it the best in his Peanuts comic strip where Linus is sitting in the school yard, opens his lunch to find a note from his mother encouraging him to “make good friends, get good grades,” and she notes, “I hope that you are sitting in the sun, for a little sun is good as long as we don’t over do it. Perhaps 10 minutes a day this time of the year is about right.” He was right on target. Hopefully this message will be heard loud and clear, and this recommendation will be adopted worldwide.

Reference: Holick, M.F. Vitamin D: Importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis. *Am J Clin Nutr* 2004;79:362-371.