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# The role that Vitamin D has in Cancer Prevention

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Everyone knows vitamin D as the vitamin important for bone health and for preventing rickets in children, but we are now recognizing that the major source of vitamin D is coming from the sun, so by definition vitamin D is really a hormone. Once you make vitamin D in your skin or ingest it from your diet, it goes to your liver, is converted to 25-hydroxy- vitamin D is known as Calcidiol, and then to the kidneys to the active form, 1,25-dihydroxy-vitamin D, also known as calcitriol.

We are now also recognizing that many cells in the body, separate from the kidneys, can activate vitamin D and there is mounting evidence that function of vitamin D is to help regulate cellular growth. There are several studies that have related higher blood levels of 25-hydroxy-vitamin D and reduced risk of many deadly cancers including colon, breast, and prostate cancer to name a few.

What do we know about how much vitamin D we require for optimal health including reducing the risk of cancers?

We should really ask the question ‘what was our hunter, gatherer forefathers doing?’ They were always exposed to sunlight. What were their likely levels? How much vitamin D would you require to attain those levels?

One of the insights was done several years ago where a study was performed on Maasai herders that live in Kenya at the equator. Even though they have extremely dark skin, Mother Nature still has the ability to make some vitamin D in their skin. Their blood levels were measured and it was determined that their 25-hydroxy-vitamin D levels were around 40–50 nanograms per milliliter. To acquire to that level, adults would need to take 3,000–5,000 units of vitamin D per day. There continues to be association data saying that the higher your 25-hydroxy-vitamin D levels are, the lower your risk for colorectal cancer.

The earliest study was done by the Garland brothers back in the 1990s when they were relating latitude and colon cancer and then did a prospective study on vitamin D status and the risk of colon cancer.

could potentially reduce your risk of colon cancer by as much as 50%. Other studies have suggested that improving your vitamin D status would have the benefit of reducing colorectal cancer by about 25%–50%, depending on the study.

Epidemiological studies have found that people who live near the equator, where exposure to sunlight produces more vitamin D, have lower incidence and death rates from certain cancers.

In culturing of cancer cells *in vitro* cells in the lab and in mouse models, vitamin D has also been found to slow cancer progression. The Vitamin D and Omega-3 Trial (VITAL), which concluded in 2018, found that vitamin D did not reduce the overall incidence of cancer, but hinted at a decreased risk of cancer deaths.

Now, in a secondary analysis of VITAL, a team led by investigators at Brigham and Women's Hospital has narrowed in on the connection between taking vitamin D supplements and the risk of metastatic or fatal cancer. The team reports that vitamin D was associated with an overall 17 percent risk reduction for advanced cancer. When the team looked at only participants with a normal body mass index (BMI), they found a 38 percent risk reduction, suggesting that body mass may influence the relationship between vitamin D and decreased risk of advanced cancer.

"These findings suggest that vitamin D may reduce the risk of developing advanced cancers," said a primary care physician and epidemiologist in the

They concluded two things. The first is that the higher latitude that you live, the higher your risk for colorectal cancer. They also concluded that taking 1,000 units of vitamin D a day

Brigham's Division of Preventive Medicine.

"Vitamin D is a supplement that's readily available, cheap, and has been used and studied for decades.

Our findings, especially the strong risk reduction seen in individuals with normal weight, provide new information about the relationship between vitamin D and advanced cancer."

The VITAL study was a rigorous, placebo-controlled study that took place over a span of more than five years. The VITAL study population included men who were 50 or older and women 55 or older who did not have cancer when the trial began.

When you look at that study carefully, most of the subjects were not vitamin D deficient. If they are vitamin D sufficient already, and getting some additional vitamin D, it is not clear that you would be able to see a significant benefit. It is also true that these types of cancers probably take more than a few years to develop, so introducing vitamin D for 5 years may not be a long enough time to see benefits. That is all the more reason why I encourage my family and my patients that they should always be vigilant about their vitamin D status and take an adequate amount of vitamin D from birth until death.

There continue to be small studies that have concluded that there may or may not be any benefit. Again, you have to look at how these trials are designed and what their outcome measures are. It is still not

clear that maintaining a blood level that we would consider to be in a healthy range for 25-hydroxy-vitamin D of 40–60 nanograms per milliliter as recommended by the Endocrine Society does have that have reviewed, I think overall, the data is suggestive that it does help reduce the risk of deadly cancers.

**Selected References**


1. Institute of Medicine Committee to Review Dietary Reference Intakes for Vitamin D and Calcium. *Dietary Reference Intakes for Calcium and Vitamin D*. Washington, DC: National Academies Press; 2011.


additional health benefit of reducing the risk of many deadly cancers. From my perspective, based on all of the information that I


2. https://www.brighamandwomens.org/
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