

## Cancer Researchers Determine Specific Amount of Vitamin D Needed to Cut Colon Cancer Risk in Half

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Taking 1,000 international units (IU) of vitamin D 3 daily appears to lower an individual's risk of developing colorectal cancer by 50 percent, according to an extensive literature review led by cancer prevention specialists at the Moores Cancer Center at the University of California, San Diego (UCSD) Medical Center. The researchers call for prompt public health action to increase intake of vitamin D 3 as an inexpensive, non-toxic prevention for a disease that claims 56,000 U.S. lives each year. "Studies over the last 25 years have shown that vitamin D is associated with preventing colon cancer, but we haven't known how much is needed to produce a benefit," said Edward D. Gorham, assistant adjunct professor of Family and Preventive Medicine at UCSD School of Medicine and a cancer epidemiologist affiliated with the Moores UCSD Cancer Center. "This paper establishes the target level of vitamin D that could reduce the incidence of colorectal cancer by half."

Gorham added that this review, an invited publication in the current issue of the peer-reviewed *Journal of Steroid Biochemistry and Molecular Biology*, does not prove a causal relationship and further studies need to be done.

"Interventional studies, or clinical trials, are needed to further define the relationship between vitamin D and colon cancer," he said, "but such studies could take more than 20 years to complete. Since the safety of daily intake of vitamin D 3 in the recommended range has been thoroughly assessed and confirmed by the National Academy of Sciences, and the benefits found so far in observational studies are considerable, expanded use of vitamin D as a public health measure should not be delayed."

In the paper, the authors conclude: "Intake of 1,000 IU/day of vitamin D, half the safe upper intake established by the National Academy of Sciences, was associated with 50 percent lower risk (of colorectal cancer)." They further write that individuals with vitamin D blood levels of 33 nanograms per milliliter, generated through modest sunlight exposure, also had a 50 percent lower incidence of colorectal cancer.

Approximately 145,000 new cases of colorectal cancer are diagnosed each year in the U.S. Results of this paper suggest that approximately 72,500 new cases and 28,000 deaths could be prevented with appropriate intake of vitamin D.

The findings are based upon an extensive systematic review of scientific papers on the relationship of blood serum levels or oral intake of vitamin D with risk of colorectal cancer published worldwide between January 1966 and December 2004. Forty four articles were identified; 18 articles met the study's criteria for inclusion. A majority (10) of the studies found that inadequate vitamin D status was significantly associated with higher risk of colorectal cancer. The other eight studies ranged from a borderline association to no association.

This complex analysis of virtually every scientific paper written on the subject, called a systematic review, paints a clearer picture than any single study and is recognized by scientists as an important tool for establishing a consensus of findings. For example, some studies, particularly those conducted in Scandinavian countries, did not find an effect.

"When we looked at the Scandinavian studies in the context of all of the studies, we realized there may be reasons specific to those countries that can explain the anomaly," Gorham said. "In Scandinavian countries, vitamin D comes largely from fish. Most of their fish is smoked, salted or preserved. These are carcinogenic, so the carcinogens could offset the benefit."

Gorham said that while this study looked at all forms of vitamin D - intake through diet or supplements, and photosynthesis through modest sun exposure - as a practical matter, the majority of people will most easily achieve the target levels by taking supplements.

"Many people are deficient in vitamin D. A glass of milk, for example, has only 100 IU. Other foods, such as orange juice, yogurt and cheese, are now beginning to be fortified, but you have to work fairly hard to reach 1,000 IU a day," he explained. "Sun exposure has its own concerns and limitations. We recommend no more than 15 minutes of exposure daily over 40 percent of the body, other than the face, which should be protected from the sun. Dark-skinned people, however, may need more exposure to produce adequate amounts of vitamin D, and some fair-skinned people shouldn't get any vitamin D from the sun. The easiest and most reliable way of getting the appropriate amount is from a daily supplement."

As an appendix to the research paper, the authors make nine recommendations for action, including that the federal government officially recommend intake of 1,000 IU per day of vitamin D for cancer prevention; that it establish a national research program to further explore the beneficial effects of vitamin D on a variety of cancers; and that it standardize vitamin D measurements and make that standard available to scientists throughout the world to streamline future research.

The researchers conducted a cost/benefit analysis of their recommendations and conclude with the following: "Preventing approximately half of colorectal cancer incidence by a program that would ensure vitamin D adequacy could save an estimated \$20 billion per year. Annual supplementation of all Americans with 1,000 IU per day of vitamin D 3 would cost approximately \$5 billion. Although further economic investigation would be desirable, a gross estimate of the annual return on investment, considering the cost of supplementation, would be \$15 billion per year, amounting to a nearly 40 percent per annum return on investment."

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