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IN DEPTH

Health

Vitamin D: Boning up on the sunshine vitamin

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[CBC News](#)



(Andrew Vaughan/Canadian Press)

Imagine incorporating an inexpensive, single supplement into your life that forces you to get a little sunshine and promises to strengthen your bones, thwart different forms of cancer, stave off multiple sclerosis and autoimmune disorders and fight infections.

New research into the preventive benefits of vitamin D has raised hopes that the sunshine vitamin, which is produced naturally in the body through exposure to the sun's ultraviolet rays, could extend and improve people's lives.

How much vitamin D do I need?

The Canadian Cancer Society recommends Canadians take in 1,000 IU of vitamin D every day. During the spring and summer, that can be accomplished through normal daily exposure to the sun. In the fall and winter months, a vitamin D supplement may be necessary.

In September 2007, an analysis of 18 randomized controlled trials involving people over the age of 50 found that people who took at least 500 international units (IU) of vitamin D daily had a seven per cent lower risk of death compared with those given a placebo.

Lead researcher Dr. Philippe Autier said it was not clear how the supplements lowered risks of mortality, but he suggested that vitamin D may block cancer cell proliferation or improve blood vessel and immune system functions. The study, published in the Archives of Internal Medicine, reviewed research involving 57,311 participants.

The findings are part of a growing body of research regarding vitamin D's benefits. In June 2007, the Canadian Cancer Society said that based on current research adults should consider increasing their daily dosage of vitamin D. The society said Canadians should now consume 1,000 IU of vitamin D daily during the fall and winter months, in consultation with a health-care provider.

The society noted, however, that more research on appropriate dosage levels is needed and said it would update its recommendations as new studies are released.

In making its recommendations, the society referred to research including a study published in the June 2007 issue of the *American Journal of Clinical Nutrition*. Researchers at Creighton University School of Medicine in Omaha found a 60 to 77 per cent decrease in cancer rates in postmenopausal women who took a daily dose of 1,100 IU of vitamin D combined with calcium over women who were given a placebo or calcium alone. The double-blind clinical study, conducted over four years, tested healthy women over the age of 55 living in rural Nebraska. Critics of the study cautioned that a larger study would have yielded more reliable and conclusive results.

But Reinhold Vieth, a nutritional scientist at the University of Toronto, said the study is the last piece of evidence for which many in the field have been waiting. Vieth said that many cells in the body use vitamin D to produce a signaling molecule that allows the cells to communicate with each other.

"Those signals do things like helping cells to differentiate to recognize what kind of cell they should be becoming or they can signal cells to stop proliferating and those are good things in terms of cancer, you want differentiation so they become good well-behaved cells and you don't want them to keep replicating all the time," he said.

Other researchers have begun studying how the sunshine vitamin affects other forms of cancer.



Tourists soak up the sun while walking along Patong Beach in Phuket, Thailand, in December 2005. Recent studies indicate that vitamin D, which is produced naturally in the body through exposure to the sun's ultraviolet rays, can extend and improve people's lives. (David Longstreath/Associated Press) Researchers at the University of California, San Diego, suggested in the March 2007 issue of the *American Journal of Preventive Medicine* that taking 2,000 IU of vitamin D daily along with 10 to 15 minutes in the sun and a healthy diet could reduce the incidence of colorectal cancer by two-thirds. The same authors found that breast cancer rates were 50 per cent lower in people with high levels of vitamin D in their blood, and suggested that the average person could maintain those levels by taking 2,000 IU of vitamin D daily and spending 10 to 15 minutes in the sun.

Similarly, a December 2006 study in more than seven million people found that white members of the U.S. military who had high blood levels of vitamin D were 62 per cent less likely to develop multiple sclerosis than those with the lowest levels of the vitamin. Researchers noted the findings were still too preliminary to suggest that a lack of vitamin D could trigger the nerve disorder.

A study published in the *Archives of Internal Medicine* on May 28, 2007, suggested that women who consume higher amounts of calcium and vitamin D may have a lower risk of developing breast cancer before menopause. The study followed more than 31,000 women aged 45 and older for 10 years. It found that intake of calcium and vitamin D was moderately associated with a lower risk of breast cancer before — but not after — menopause.

Yet another study — released on May 15, 2008 — found that women with low levels of vitamin D may have a poorer prognosis than those with sufficient vitamin D. The study by Toronto researchers also found

that women with too little of the vitamin had a greater chance of recurrence and lower overall survival rates than those with healthier amounts.

The study involved 512 women, aged 35 to 69, who were diagnosed with breast cancer between 1989 and 1996. Their health was followed until 2007, on average for almost 12 years. The researchers found that 37.5 per cent of the patients were vitamin D deficient and 38.5 per cent had levels that were considered insufficient for good bone health. Only 24 per cent had sufficient levels of vitamin D in their blood.

The researchers say their study shows there is an association between vitamin D levels and breast cancer outcome. They say it's too early to tell whether vitamin D deficiency can cause the disease.

But less than two weeks later, another study suggested the cancer-fighting properties of vitamin D may be not be universal. The [study](#), published in the Journal of the National Cancer Institute, found that a higher level of vitamin D in men is not associated with a lower risk of developing prostate cancer. And in some cases, it may be linked to a higher risk of developing a more aggressive form of the disease.

Meanwhile, a study published in the June 9, 2008 issue of the [Archives of Internal Medicine](#) found that men with low levels of vitamin D may have an increased risk of heart attack. The study followed the medical records and blood samples of 454 men who had non-fatal heart attacks or fatal heart disease from January 1993 and January 2004. They compared the data from those men with records and blood samples of 900 living men who had no history of cardiovascular disease. The researchers also recorded diet and lifestyle factors.

The researchers found that after adjusting for several factors — including family history of heart trouble, body mass index, alcohol consumption, physical activity and hypertension — men with low levels of vitamin D (less than 15 nanograms per millilitre of blood) had a higher risk for developing heart disease than men with sufficient levels of vitamin D (30 nanograms per millilitre of blood or more).

Dr. John Cannell, the executive director of the U.S. Vitamin D Council, in 2006 published a study in the Journal of Epidemiology and Infection suggesting among other things that children who are exposed regularly to sunlight are less likely to catch colds and respiratory infections. A separate 2006 study published in the journal Science suggested that Vitamin D might boost the body's production of naturally occurring antibiotics.

Bolstered by the benefits the sunshine vitamin offers, public health officials are encouraging people to include vitamin D in their diets as researchers continue to investigate how it helps the body.

What is vitamin D?

Vitamin D helps the body absorb calcium thereby making bones stronger. Certain foods such as cow's milk and margarine are fortified with vitamin D and inexpensive supplements can help boost the body's vitamin D levels.

A deficiency in children can trigger rickets, a bone disease that leaves children with soft bones and skeletal deformities. As breast milk doesn't contain sufficient levels of vitamin D, public health officials recommend that infants who are exclusively breastfed should take a supplement to prevent vitamin D deficiency.

In adults, low levels of vitamin D can cause osteoporosis, a disease that decreases bone mass and bone tissue, putting patients at risk of fractures. People with darker skin tones are also often advised to take a supplement as they have more difficulty generating natural vitamin D from the sun's ultraviolet rays.

As well, patients with a reduced ability to absorb dietary fat, including people suffering from Crohn's disease, cystic fibrosis or liver disease, often have low vitamin D levels.

For Canadians who suffer through long grey winters, maintaining adequate levels of vitamin D can be

difficult. From October through March in many cities across the country, the sun's rays are not strong enough to synthesize the vitamin naturally. Moreover the skin's ability to produce the vitamin drops with age, putting men and women over the age of 50 at particular risk.

To that end, Health Canada spotlighted the benefits of vitamin D when it released the new edition of the Canada Food Guide in February 2007. The guide says that boosting levels of vitamin D will improve muscle strength and reduce fracture and falling rates.

Source: *B.C. Ministry of Health*

Food	Serving	Vitamin D
Milk	1 cup	100 IU
Fortified rice or soy beverage	1 cup	100 IU
Fortified margarine	2 tsp	53 IU
Salmon canned, pink	3 oz	530 IU
Tuna canned, light	3 oz	200 IU

Fortified foods and a dose of sunshine

The Canada Food Guide says men and women over the age of 50 are advised to consume three servings of milk and alternatives along with a supplement equal to 10 micrograms or 400 IU of Vitamin D every day. One cup of milk has 100 IU of vitamin D. All other age groups are encouraged to have two cups of milk to ensure adequate vitamin-D levels.

Some companies have fortified their products with vitamin D but Health Canada notes that fatty fish and egg yolks are the only natural food sources.

Isabelle Neiderer, the director of nutrition for the Dairy Farmers of Canada, said her group met with Health Canada officials earlier this year to discuss the possibility of fortifying cheese and yogurt with vitamin D.

"We feel, considering the large scientific evidence that we see at the moment ... that it would be a good thing that other milk products could be fortified as well," she said.

In the United States, vitamin D can be added to cheese and yogurt products.

While exposure to sun may be the best way to boost vitamin D levels, this doesn't necessarily give sun lovers licence to tan. While being mindful of the threat of skin cancer, people should calculate how much time they spend in the sun depending on location, cloud cover, skin type, age and the amount of pollution in the area. Generally, doctors recommend that 10 to 15 minutes outdoors without sunscreen at least twice a week is adequate.

The Canadian Cancer Society, though, does not recommend that people rely solely on increasing their exposure to the sun to boost their levels of vitamin D. The society points out that there are other sources of vitamin D, including vitamin supplements, oily fish and fortified foods.

It also warns that — for some people — increasing exposure to the sun by even a few minutes a day could increase the risk of skin cancer. The society recommends that people consider a balance of vitamin D supplements and small amounts of sun exposure to maintain proper levels of the vitamin while keeping risks of skin cancer to a minimum.

But a study by scientists at the U.S. Department of Energy's Brookhaven National Laboratory that was published in National Academy of Sciences on Jan. 7, 2008, suggested that increasing sun exposure can be good — for some people.

The study concludes that the benefits of moderately increased exposure to the sun's rays may outweigh the

risks of developing skin cancer. The benefits include the body's increased production of vitamin D, which can help reduce the risk of death from other forms of cancer.

The study's authors note that the most dangerous form of skin cancer is melanoma, which is triggered by exposure to UVA (the long ultra violet wavelengths of the sun) and visible light. Exposure to UVB (the short wavelengths produced by the sun) trigger the body's production of vitamin D. The authors suggest that sunscreens could be reformulated to block UVA rays while allowing more UVB rays through.

As researchers continue to explore how the vitamin helps the body, Health Canada warns overenthusiastic consumers that exceptionally high levels can be damaging. The U.S.-based Institute of Medicine of the National Academies has set 2,000 IU of vitamin D as the daily maximum tolerable amount. Health Canada warns exceeding this limit could lead to an overdose that can cause kidney stones as well as damage to the heart, lungs and blood vessels.

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