

## **You Need Vitamin D**

Dangerously low vitamin D levels may be the next national epidemic--increasing the risk of heart disease, colon cancer, and prostate cancer. The solution? Catch some rays

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Frankly, I didn't really want to die at age 37.

That was the first thought I had three summers ago, when my dermatologist told me that the small pink lump on my left cheek was, in fact, skin cancer. He quickly went about assuring me that, despite the funeral dirge playing in my head, death wasn't really an option here. I had the mildest form of the disease, basal-cell carcinoma, which hardly ever causes long-term problems. What's more, removing it would be a simple slice-and-stitch procedure. And that's just what it was. In the end, the root canal I'd had 2 months earlier was probably more of a near-death experience.

That said, ever since that moment, I--like so many guys nowadays--have become far more conscious of protecting myself from the sun. I slather sunscreen on my fast-burning Irish skin and outfit myself in a series of grimy baseball caps (my fedora phase, thankfully, has passed). Having cheated death at age 37, I'm not about to let it win at age 47.

There's just one hitch: My attempts to save my skin may ultimately cost me my life. At least that's the warning a group of researchers is giving sun-phobics like myself. They're suggesting we've grown dangerously leery of the sun and, specifically, that we need more of the ultraviolet vitamin, vitamin D. As evidence, they point to an alarming number of people--particularly those living in the northern part of the United States, and those with dark skin--who are running close to "E" when it comes to D.

### **Sun Spotting**

In 2002, for example, a study of otherwise healthy 18- to 29-year-olds in Boston found that one-third had significantly low vitamin D levels by the end of the winter. A recent article in the journal *Nutrition Reviews*, which looked at five separate studies, concluded that "prevalence of vitamin D insufficiency is higher than anticipated in North America." Meanwhile, one noted expert on bone and calcium believes that the problem is even bigger than that. "I admittedly have a liberal standard," says Robert Heaney, M.D., of Creighton University in Nebraska, "but I estimate that as many as 80 percent of people in the United States don't get enough vitamin D."

Now, granted, "You need more vitamin D" sounds like what your grandmother might say if she were named Surgeon General (right after she proclaimed beets the national vegetable). But there's reason to pay attention, since researchers believe that a lack of D--a substance that helps our bodies use calcium and is crucial to bone strength--could be behind much of what ails us here at the dawn of the 21st century, including heart disease, colon cancer, and prostate cancer. Indeed, a 2002 study in the journal *Cancer* speculated

that vitamin D undernourishment may lead to more than 23,000 cancer deaths each year.

"I think this is a major unrecognized epidemic in the United States," says Michael Holick, M.D., a researcher at Boston University medical center and the most high-profile member of the vitamin D research community. "It affects children and adults of all ages, all races, and both sexes. It's very significant."

### **The Dividing Line**

The way God drew it up, getting enough vitamin D ought to be a cinch, since the process is as unconscious as breathing. When you're outside in the sunlight, UVB rays from the sun activate an enzyme in your skin. Presto, vitamin D is created and goes to work in your body.

Unfortunately, in practice several things can interfere with the process. First is geography. The farther you are from the equator, the less direct the sunlight is, and the weaker the UV rays become. Above 42° north, for example--picture a line stretching roughly from Boston to northern California--it's difficult for many people to produce vitamin D during the winter. African-Americans, Latinos, and others with dark skin are at a further disadvantage, since their pigmentation limits the UV light they can absorb and slows vitamin D synthesis.

The final obstacle in vitamin D production is, or at least can be, the environment--the cause of the last big vitamin D crisis, in the early 1900s. As the industrial revolution kicked into high gear, more people moved to the cities and hunkered down in dark, dank tenements; meanwhile, pollution from bustling factories clouded the skies. The result was far fewer UV rays touching people's skin, and a lot more vitamin D deficiency. "At the turn of the last century," says Dr. Holick, "more than 80 percent of the kids in Boston had rickets."

### **Moo Juice**

While fortifying milk with vitamin D eventually solved the rickets problem, it may have given us a false sense of security. Research has shown that our milk supply, for all the trust we put in it, is remarkably unreliable. A 1992 study published in the *New England Journal of Medicine* showed that, of 42 milk samples tested, 26 contained less than the 400 international units (IU) of vitamin D per quart listed on the label. Some of the skim milk tested contained no D at all. In 2001, Cornell University researchers analyzed 648 samples of milk sold in New York State and found that 46 percent were underfortified.

But even if milk came as advertised, it still might not cover our bodies' needs. While the current recommended daily intake is 200 IU for adults up to age 50, there's a growing consensus that we need five times that--1,000 IU--to keep our blood levels where they should be. (An editorial in the *New England Journal of Medicine* several years ago argued for just such an increase.) And that's nearly impossible to get solely through diet, particularly since cold-water fish is the only food naturally high in D. As Dr. Holick puts it, "You'd have to take a multivitamin, drink two glasses of milk, and eat salmon every

day just to begin to satisfy your vitamin D requirement."

### **Sundry Facts**

On a recent morning--a warm, sunny one, it's worth noting--I am sitting in Dr. Holick's office at BU medical center. Lean and wiry, with shaggy white hair and lively blue eyes, Dr. Holick has been studying vitamin D since he was a graduate student at the University of Wisconsin 30 years ago. Lately, he's also become one of the most controversial vitamin D researchers. Earlier this year, just prior to the publication of his new book, *The UV Advantage*, Dr. Holick was asked to resign from BU's dermatology department by the chairwoman, Barbara Gilchrest, M.D.

"She'd been e-mailing me for more than a year, saying her dermatologist friends had been questioning how I could be a professor of dermatology and suggest that people be exposed to some sunlight for their health," says Dr. Holick, who still holds several positions at the university. "Then, in February, she told me she would like me to resign. Which I did."

Dr. Gilchrest declined to be interviewed for this story, but when one newspaper asked what she thought of Dr. Holick's recommendations, she answered, "I read better things in ladies' magazines." Her criticism was echoed by the American Academy of Dermatology, which likened the advice to "smoking to combat anxiety." (Dr. Holick's critics also say that he accepts money from the indoor-tanning industry. He doesn't dispute the charge, but claims the amount is small and comes with no conditions.)

In a way, it's tough to blame dermatologists for their hard-line zeal. In 1980, roughly 400,000 cases of skin cancer were diagnosed in the United States; this year it will be more than a million. Little wonder that the U.S. government recently added UV radiation to the list of known human carcinogens.

Dr. Holick tells me he doesn't deny that skin cancer is a problem--in fact, he says that after a few minutes in the sun, people should cover up or use sunscreen. But he also believes that the zero-tolerance approach of many dermatologists could be just as dangerous.

Two large population-based studies seem to lend credence to his concern. A few years ago, a NASA physicist named William Grant, Ph.D., noticed that residents of New England were 1.7 to two times more likely to get prostate, colon, or breast cancer than those living in the Southwest. Intrigued, Grant began comparing the UV levels in 500 U.S. cities and counties with the rates of cancer in those areas.

"I found a correlation between lower UV levels and a higher incidence of 12 different types of cancer," says Grant, who launched the San Francisco-based Sunlight, Nutrition and Health Research Center to further study vitamin D. More recently, Grant redid his study (which was published in the journal *Cancer*), this time controlling for other cancer risk factors, such as smoking and alcohol intake. The new research, which hasn't yet been published, confirmed his findings.

A similar geographic link has been found between sun exposure and multiple sclerosis: Cases of MS in the United States increase the farther north you go. And a new U.K. study found that those with skin cancer have half the rate of MS of those without cancer. Grant says the link is inescapable. "I estimate that half of the 400,000 with MS in the United States would not have MS if they had the same UVB doses as those living in the southern states."

If vitamin D were on trial in a court of law, Grant's findings would be circumstantial evidence--compelling, but not enough to convict. A stronger case can be made for the connection between vitamin D and bone health. Not only does research show that low levels of D can increase your risk of osteoporosis by as much as 300 percent, but new research also is finding a link to unexplained bone pain. A study from the Riyadh Armed Forces Hospital in Saudi Arabia found that 80 percent of back-pain sufferers were light on vitamin D.

Less concrete--but more alarming--is exhibit B of D's relationship to cancer. Lab studies have shown that cancer cells have difficulty growing when D levels are normal; meanwhile, a study published last December in the *Journal of the American Medical Association* found that those with diets high in vitamin D were 40 percent less likely to develop potentially cancerous colon polyps.

Researchers have also discovered a link between vitamin D and heart health. Studies have shown that the farther you live from the equator, the higher your blood pressure is likely to be, and that people tend to have lower blood pressure during the summer, when UV rays are stronger. (The hormone that controls BP is regulated by vitamin D.) And a study last year in the *Journal of the American College of Cardiology* found that low vitamin D levels may be a factor in congestive heart failure.

### **Sun Rise, Sun Set**

Still, the idea of vitamin D as a possible panacea has some people, including many dermatologists, skeptical. James Spencer, M.D., director of dermatologic surgery at the Mount Sinai Medical Center in New York City, says Dr. Holick and his colleagues remind him of the late Linus Pauling, the Nobel Prize-winning researcher who became obsessed with the idea that vitamin C could ward off everything from colds to cancer. "Dr. Holick got religion on vitamin D the same way Dr. Pauling got it on vitamin C," says Dr. Spencer. "It's a very appealing notion: Just take this pill, or spend more time in the sun, and everything will be fine. But come on, is life ever that simple?"

Vitamin D researchers, ironically, argue that it's the dermatologists who are oversimplifying things. "A tendency we all have is to focus on the disease in our specialty," says Dr. Heaney. "The dermatologists have looked at the rise in melanoma and panicked. But they aren't looking at the whole human being."

Dermatologists have also exaggerated the actual risk that skin cancer poses, say D experts. They note that, while skin cancer is the most frequently diagnosed cancer in the

United States, more than 90 percent of cases are either basal-cell carcinoma or squamous-cell carcinoma. Both are relatively harmless if detected early. Granted, nearly 8,000 deaths per year from melanoma are not to be dismissed, but from a public-health standpoint, that makes skin cancer less of a problem than vitamin D deficiency is, says Bruce Hollis, Ph.D., a vitamin D researcher at the Medical University of South Carolina. "I tell my medical students that if I were going to have cancer, I'd rather have basal-cell carcinoma than breast cancer, colon cancer, or one of the other cancers linked to vitamin D deficiency."

### **Sunshine of My Life**

So in the end, are we simply left with a grim choice--either dying of too much sun (skin cancer) or too little (prostate cancer, MS)? Not necessarily. In the short term, those most at risk--African-Americans, people living in the northern part of the United States, the elderly--can get a blood test to see whether they have adequate levels of vitamin D. We can also be judicious about which parts of our bodies get exposed to the sun: Since basal- and squamous-cell cancers most often appear on the face and ears, Dr. Holick suggests protecting those areas with sunscreen, while still exposing your arms and legs.

Of course, the ultimate solution would be to find some way to get the vitamin D we need while limiting our exposure to the sun. And those possibilities exist--from broader, more reliable fortification of the food supply to more powerful D supplements. (Right now, most multivitamins contain just 400 IU, even though toxicity only becomes a concern at 10,000 IU and above.) Or perhaps there's some other way.

"I'm a fan of Stanley Kubrick and the film 2001: A Space Odyssey," Dr. Holick tells me as we sit in his office. "And in there, he has the astronauts being exposed to simulated sunlight to make vitamin D. I think that one day indoor lighting will be developed so you could actually be exposed to small amounts of UVB rays to get your vitamin D."

Vitamins from the lights? Maybe our future isn't as dark as it seems. But in the meantime, I've never been happier that I like salmon.