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## Are you vitamin D-ficient?

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Fort Lauderdale Ocean Rescue Lt. Jim McCrady spends 10-hour days patrolling the beach. Most people would worry that's too much sun. But to some, McCrady, 41, is soaking up critical ultra-violet rays. McCrady may be slightly pink at the end of his four-day work week, but there's one thing he's not suffering from: lack of vitamin D.

Many of us cannot say the same.

Vitamin D comes primarily from the sun, not food. It's best known for helping calcium build strong bones. But an exploding area of research is raising theories about vitamin D's vital role in staving off colon cancer, multiple sclerosis, diabetes and heart disease.

For years it was assumed people got enough D from fortified milk and everyday sun exposure. Not so. Today, even by conservative estimates, at least half of all Americans have insufficient levels of vitamin D. Among those most at risk: breast-fed infants, adults over 50 and people with darker complexions.

Researchers call it "an unrecognized epidemic," but its consequences could become apparent soon enough for this generation and its children.

"We're seeing [weaker bones] not only in women, but men, too. As they get older, more and more men are having fractures, and it's the men who have two or three greater chances of dying after a hip fracture than women," says Dr. Silvina Levis, director of the University of Miami Osteoporosis Center.

South Floridians -- despite living in a sun-drenched climate -- are not immune. A University of Miami study found men and women here are just as likely to be D-deficient as those who live in the North. Although 97 percent of the study's participants reported taking multi-vitamins, which contain some D, 39 percent were vitamin D deficient.

"Unless you're walking to your car in your bikini, you may not get enough sun," says UM's Levis, who co-authored the study, published in 2005 in *The Journal of Clinical Endocrinology & Metabolism*.

### MEDICAL DEBATE

How did it get to this point? Too many people have replaced fortified milk with soft drinks and juice. Too many are tethered to indoor lives, and when they spend time outside, they cover themselves -- and their children -- with sunscreen and clothing, for fear of skin cancer.

"Many dermatologists have thrown the baby out with the bath water," says Dr. James Dowd, a Michigan-based rheumatologist and author of *The Vitamin D Cure* (Wiley, \$24.95), published this year. "Their idea is 'No sun at all. Always cover up. Sun is evil.' That's an extreme message. We need enough sun to make vitamin D."

It can be daring for a doctor to prescribe even a short burst of sun without sunscreen, which can block D absorption if it has SPF 8 or higher. Just ask Dr. Michael Holick, who was asked to resign from the dermatology department at Boston University's medical school shortly after he published his 2004 book *The UV Advantage* (IBooks, \$19.95). Holick's book, which touts the health benefits of limited UV exposure, drew loud protests from dermatologists and the sunscreen industry.

Too much sun is indeed harmful. Evidence that ultraviolet radiation causes skin cancer is so strong the U.S. Department of Health and Human Services lists UV radiation as a known carcinogen. At current rates, one in five Americans will develop skin cancer.

"Under no circumstances should anyone be misled into thinking that natural sunlight or tanning beds are better sources of vitamin D than foods or nutritional supplements. The only thing they are proven to be better at is increasing your risk of developing skin cancer," says a statement by the American Academy of Dermatology.

While research clearly shows sunburns increase the risk of skin cancer, the evidence is less clear for short exposures to sunlight.

There is no one-size-fits all formula for determining how much sun provides enough vitamin D. Among the factors weighed: Skin color, age, how much skin is exposed, time of year, time of day, cloud cover, pollution and geographic location.

Most vitamin D experts advise that light-skinned people spend about 10 to 20 minutes exposing their arms and legs to the sun three

times a week. But people with darker skin need at least twice as much exposure because melanin acts as a UV filter.

The vitamin D sun connection goes back to early humans, who evolved near the equator and spent days outside, their skin absorbing ample amounts of vitamin D -- just like McCrady, the lifeguard.

"I'm not advocating tanning or sunburn," says Holick, who remains at Boston University Medical Center as director of the Bone Health Care Clinic. "We say, 'Go out there for five or 10 or 15 minutes. Make your vitamin D in your skin. Then put on your sunscreen with an SPF of 15 to prevent the effects of chronic excessive exposure to sunlight.'"

On its website, the National Institutes of Health makes a similar, cautious suggestion that "10 to 15 minutes of sun exposure at least two times per week to the face, arms, hands or back without sunscreen is usually sufficient to produce adequate vitamin D."

Dr. Barry Resnik, an Aventura dermatologist who screens the Marlins, says that unless someone is constantly applying sunscreen, even those who coat themselves before going outside should be able to get enough D.

"The effects of sunscreen wane the minute you put it on," Resnik says. "It's like driving a new car off the lot; it depreciates immediately."

## FOOD AS A SOURCE

Vitamin D puzzled scientists for years partly because it was initially misidentified as a true vitamin, something our bodies couldn't manufacture without getting it from food.

Foods high in vitamin D include oily fish like salmon, tuna and sardines, as well as egg yolks, beef liver, and shiitake mushrooms. Milk is fortified with it, as are some cereals and orange juice.

It would take an enormous appetite to get enough D from diet alone. To rack up at least 1,000 units of vitamin D, a daily intake advocated by many D experts, a person would have to eat 25 cups of fortified corn flakes or drink a little over 10 cups of fortified milk each day.

Once we consume vitamin D or produce it in our skin, it undergoes two transformations -- first in the liver and then in the kidney -- to become an active hormone the body uses. When a body is deficient in D, it's unable to properly control calcium and phosphate levels, leading to weak and soft bones.

## WHO'S AT RISK?

Blacks and Hispanics with darker skin are more susceptible to D deficiency because it takes two to five times longer for them to absorb D from the sun.

Also vulnerable: Adults older than 50 because as we age, the human body can't synthesize vitamin D efficiently and the kidneys are less able to convert D to its active hormone form. Infants who are exclusively breastfed also are at risk because D requirements cannot be met by breast milk alone.

Lifestyles play an important factor, too. Anyone who spends most of their time indoors and does not take vitamin D supplements is considered to be at risk. Even clothes can make a difference. (A study in Kuwait found that veiled women had lower D concentrations.)

Most doctors agree that everyone, unless they spend most of their day outdoors, should take vitamin D as an oral supplement. They just don't know how much.

The Institute of Medicine, the national group that recommends daily allowances for vitamins and minerals, sets a daily intake of 200 IU (international units) for infants, children and adults through age 50, a dose of 400 for ages 51 to 70, and 600 units a day after 70. The safe upper limit for adults is set at 2,000 units per day.

The institute's Food and Nutrition Board expects to form an expert panel by this fall to start work on new recommendations, which should be issued in 2010, says Linda Meyers, the board's director.

Some groups aren't waiting. Citing evidence that links vitamin D with up to 77 percent lower risk of breast, prostate and colorectal cancers, the Cancer Recovery Foundation recommended last year that all adults take 1,000 units of vitamin D daily. The National Osteoporosis Foundation recommends that adults 50 and under get 400 to 800 units daily and that adults 50 and over get 800 to 1,000.

Holick, author of *The UV Advantage*, says that in addition to seeking the sun for at least 30 minutes two or three times a week, he takes a multi-vitamin, plus a D supplement for 1,400 IU a day.

Vitamin D experts recommend an over-the-counter D supplement because a multi-vitamin generally has only 400 units of vitamin D. And simply taking extra multi-vitamins is dangerous, given the toxicity of high levels of vitamin A.

"Up to 2,000 is quite acceptable for adults, but at the conference I just attended, the researchers at coffee all admitted they were taking

4,000," says Dr. Laura Tosi, director of bone health at the Children's National Medical Center in Washington.

### **LOOKING FOR PROOF**

Preliminary research indicates vitamin D deficiency plays a role in causing 17 varieties of cancer, as well as heart disease, stroke, hypertension, autoimmune diseases, diabetes, depression, chronic pain, osteoarthritis and muscle weakness.

This doesn't mean vitamin D deficiency is the only cause of these diseases, or that people will not get them if they take vitamin D. And skeptics are quick to point out that much-touted nutrients in the past have often failed to live up to the initial hype. Drawing conclusions about the benefits of D are difficult because studies have used different methods to measure D in the blood and there is no agreement on what constitutes a low level.

"That's not to say it's not interesting and exciting, but whether it's as solid as the enthusiasts would like you to believe, that's another story," says Mary Frances Picciano, senior nutrition research scientist with the Office of Dietary Supplements.

"The advice I would give is that if people want to take a dietary supplement, they should get their blood tested to see if it's necessary."

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