Vitamin D3 Health Benefits Compilation

By Lita Lee, Ph.D.
May 2008

Natural Vitamin D3 (cholecalciferol) vs Synthetic Vitamin D2 (ergocalciferol)

Vitamin D3 is the healthy kind your body makes when exposed to sunshine. The toxic kind, D2, is made from ergosterol, a fungal steroid. It is the form of vitamin D used in prescriptions in North America. Syntheic vitamin D2 was first produced in the 1920s through ultraviolet exposure of foods. The process was patented and licensed to drug companies for use in prescription vitamins. The vitamin D that is added to milk is not D3 but the highly inferior vitamin D2. (Dr. Ray Peat).

Optimizing your sun exposure and levels of vitamin D3 may be one of the most important physical steps you can take in support of your long-term health. When you get your vitamin D from appropriate sun exposure your body can indeed self-regulate and greatly reduce vitamin D production if you don't need it, which makes it very difficult to overdose on vitamin D from sun exposure.

Ultraviolet-B Is What Generates Vitamin D in Your Skin. UV light is divided into 3 bands, or wavelength ranges, which are referred to as UV-A, UV-B and UV-C. UV-B is sometimes called the "burning ray." It's the primary cause of sunburn caused by overexposure to sunlight. However, UV-B sunlight produces vitamin D on the skin. The amount produced depends on exposure time, latitude and altitude of location, amount of skin surface exposed, skin pigmentation and season. UV-B also stimulates the production of MSH, an important hormone in weight loss, energy production, and in giving you that wonderful tanned appearance.

However, UV-B does not penetrate very deeply into your skin. The darker the pigmentation or more tanned your skin, the less UV-B penetrates. Window glass allows only 5 percent of the UV-B light range that produces D to get into your home or auto.

The timing of your sun exposure is also a major factor. Sun exposure must take place when UV-B is present. The actual dosing of your sun exposure is quite complex, since it involves knowing the amount of UV-B and one's skin color.

This doesn't sound very complex, but the amount of UV-B is not a constant. It is a major variable and is influenced by a number of factors:

- Latitude -- the further north you are the less there is
- Time of Year -- virtually none available in winter in continental U.S.
- Clouds -- can block UV-B
- Pollution -- smog and ozone can block UV-B
- Altitude -- the higher up you are the more UV-B reaches you

Source: www.Mercola.com

Exposure to sunlight supplies us the majority of our vitamin D our bodies require. Darkly pigmented skinned people are the exception because they require 10 to 15 times exposure to the sun to get the same effect as lighter skinned people. A high number of vitamin D deficiency cases have been found in infants who are solely breastfed from adults who have darker skin or lower exposure to the sun.

For those people who don’t get adequate amounts of sunlight, experts recommend a minimum of 1,000 - 4000 IU of vitamin D3 to maintain healthy levels in their blood.

Signs and symptoms of Vitamin D Deficiency

Bone Health

Vitamin D3 is clearly associated with stronger bones and preventing osteoporosis. Vitamin D3 -- and therefore exposure to sunlight -- is essential for maximizing your bone health, and for preventing and treating a variety of bone diseases. But vitamin D deficiency is pandemic, and can cause osteopenia, osteoporosis and osteomalacia. Unlike osteoporosis, osteomalacia causes aching bone pain, and is often misdiagnosed as fibromyalgia, chronic pain syndrome or even depression. Says Dr. James Dowd, associate professor of medicine at Michigan State University and author of *The Vitamin D Cure*: "Bone pain, muscle pain, joint pain [are all signs]," he says. "[The pain] typically moves around—one day it's your back that bothers you, a week later it's your shoulders and the next day it is your feet and hands."

Absorption of calcium and phosphorus

Vitamin D3 enhances your intestinal absorption of calcium and phosphorus which helps explain why this vitamin promotes bone health.. The major source of vitamin D3 is exposure of your skin to sunlight, since very few foods naturally contain vitamin D3 or are fortified with vitamin D3 (most foods are fortified with the less effective synthetic vitamin D2).

Muscle weakness

Vitamin D deficiency also causes muscle weakness, which can increase your risk of falls and fractures.

Fatigue

Dr. James Dowd says that fatigue can be quite severe. In fact, those diagnosed with chronic fatigue syndrome may also suffer from lack of vitamin D, he says.

Difficulty controlling weight

Vitamin D plays a role in regulating weight, and Dr. Dowd says a deficiency may make it difficult to keep your weight in check.

Cancer

http://articles.mercola.com/sites/articles/archive/2007/08/24/lack-of-sunshine-causes-600-000-cancers-a-year.aspx

There is compelling research indicating that "Optimizing your vitamin D levels could help you to prevent many cancers, including pancreatic, lung, breast, ovarian, prostate, and colon cancers." A recent study by William B. Grant, Ph.D. (www.sunarc.org) links UVB as protective to a total of 16 types of cancer, primarily epithelial (pertaining to the surface) cancers of the digestive and reproductive systems [Grant, submitted]. Six types of cancer (breast, colon, endometrial, esophageal, ovarian, and non-Hodgkin's lymphoma) were inversely correlated to solar UVB radiation and rural residence in combination. This result suggests that living in an urban environment is associated with reduced UVB exposure compared to living in a rural environment.

Heart disease

http://articles.mercola.com/sites/articles/archive/2005/12/13/how-vitamin-d-protects-your-heart.aspx This research indicates that vitamin D production through sunlight exposure helps to fight heart disease by increasing the body's natural anti-inflammatory cytokines; suppressing vascular calcification and inhibiting

vascular smooth muscle growth. A study of patients with congestive heart failure found elevated levels of TNF, another marker of inflammation.

Anti-inflammatory properties

Contributed by John Jacob Cannell, MD, executive director of The Vitamin D Council (http://www.vitamindcouncil.org/)

Researchers in Belgium appear to be the first to show that natural vitamin D (cholecalciferol) lowers C - reactive protein (CRP), a measure of inflammation in the body, in critically ill patients. CRP is elevated when there is inflammation going on somewhere in the body, and chronic inflammation is a risk factor for a number of conditions including coronary heart disease (CHD) and diabetes. Numerous studies have shown that vitamin D lowers inflammation and that vitamin D deficiency is associated with increased inflammation. Vitamin D is the pivotal feedstock for a hormone that protects muscle, and inhibits autoimmune disorders from multiple sclerosis and lupus to inflammatory bowel disease.

Multiple sclerosis

Seminars in Neurology 2008; 28: 017-028; www.Mercola.com

Although the risk of multiple sclerosis (MS) is often blamed on genetics, there are significant geographic variations in MS frequency, which suggests strong environmental factors may be at play. Sunlight exposure has been linked to a reduced risk of MS, and vitamin D deficiency (caused by a lack of sun exposure) has been suggested as a cause of MS. MS is rare in Asia, the tropics and the sub-tropics, and strong correlations exist between MS, location, and duration and intensity of sunlight.

A review of epidemiological studies found a protective role of vitamin D for MS. Meanwhile, animal studies have found that an injection of vitamin D3 can prevent experimental autoimmune encephalomyelitis (EAE), which is an animal model of MS. Vitamin D deficiency accelerated the onset of EAE in animals. The researchers concluded that vitamin D supplementation, at levels higher than are currently recommended by the Institute of Medicine, may help to reduce the risk of MS. Other environmental factors that may also increase the risk of MS include infection with the Epstein-Barr virus and cigarette smoking.

Review on Vitamin D American Journal of Clinical Nutrition March, 2004;79(3):362-371

Findings from a review on vitamin D showed the various health benefits provided by vitamin D and the consequences of vitamin D deficiency. Without vitamin D, the small intestine would only be able to absorb 10 percent to 15 percent of our dietary calcium intake, which could lead to osteoporosis. Other health consequences of vitamin D deficiency include: common cancers, multiple sclerosis, high blood pressure, psoriasis, type I diabetes and rheumatoid arthritis.

Vitamin D and Mental Illneses

Here is an abstract from "Vitamin D and Mental Illness," John Jacob Cannell, MD, September 7, 2003, Executive Director, Vitamin D Council, 9100 San Gregorio Road, Atascadero, CA 93422, Phone: 805 462-8129, Fax: 805 462-8836, E-mail: jcannell@charter.net, Web: cholecalciferol-council.com

We propose vitamin D plays a role in mental illness based on the following five reasons: a) epidemiological evidence shows an association between reduced sun exposure and mental illness, b) mental illness is associated with low 25-hydroxyvitamin D (25(OH)D) levels, c) mental illness shows a significant comorbidity with illnesses thought to be associated with vitamin D deficiency, d) theoretical models (in-vitro or animal evidence) exist to explain how vitamin D deficiency may play a causative role in mental illness and e) two small studies indicate vitamin D improves mental illness.

Epidemiological evidence that mental illness has increased as humans have migrated out of the sun followed by additional epidemiological evidence that associates vitamin D deficiency with mental illness.

Vitamin D has a significant biochemistry in the brain. Nuclear receptors for vitamin D exist in the brain and vitamin D is involved in the biosynthesis of neurotrophic factors, synthesis of nitric oxide synthase and increased glutathione levels, all suggesting an important role for vitamin D in brain function. Animal data indicates that tyrosine hydroxylase, the rate-limiting enzyme for all the brain's monamines, is increased by vitamin D. Rats born to severely vitamin D deficient dams (mothers) have profound brain abnormalities.

Fear of vitamin D toxicity is unwarranted but rampant in the medical profession. Because vitamin D deficiencies are so widespread in the western world, psychiatrists should suspect the deficiency, especially in people of color, the aged and those who avoid the sun. Serum 25(OH)D levels should be obtained when deficiency is suspected. Judicial exposure to sunlight, oral vitamin D, or both, aimed at restoring circulating levels of 25(OH)D between 35 and 55 ng/ml is the treatment of choice for vitamin D deficiency in mentally ill patients. Cholecalciferol (Vitamin D3) is the preferred oral preparation of vitamin D.

Supplemental Vitamin D3 – how much is safe? (www.Mercola.com)

Adequate vitamin D levels can be sustained by getting sensible sun exposure or ingesting at least 1000 – 4000 IU of vitamin D3 daily. For those with sensitive intestines (from allergens in vitamin)), Dr. Ray Peat recommends using 6000 iu on the skin. If you aren't sure of how much Vitamin D you need, it's best to have your blood checked for optimum Vitamin D levels. It is important to understand that most of us get 10,000 units on a sunny summer day if we have significant exposure.

The requirements for vitamin D are far closer to 10 times the current RDA of 400 units, or 4,000 units. If you only took the RDA of 400 units of vitamin D and avoided the sun you can be virtually guaranteed you would be vitamin D deficient, just like over 85 percent of the country currently is.

Most people have far too little vitamin D in their blood. Over 85 percent of people have levels below 32, which is considered deficient, but it is possible to overdose on vitamin D. In my practice we don't like to see patient levels go much above 50, but 55 is probably a perfect level and anything above 60 is likely to be toxic. If you wish to take high doses (over 4000 iu) of vitamin D, it is important to have your blood levels tested. Patients routinely take 10,000 units a day or more of vitamin D safely as long as their blood levels are monitored.

Recommended reading: Dr. John Cannell's excellent Vitamin D Newsletter at
http://www.vitamindcouncil.org/

Vitamin D blood tests

http://articles.mercola.com/sites/articles/archive/2002/02/23/vitamin-d-deficiency-part-one.aspx

There are two vitamin D tests -- 1,25(OH)D and 25(OH)D. 25(OH)D is the better marker of overall D status. It is this marker that is most strongly associated with overall health. The correct test is 25(OH)D, also called 25-hydroxyvitamin D.

There is a big difference between normal and optimal. The goal is to be optimally healthy. Some experts may disagree with the following healthy ranges, but they are taken from healthy people from the tropical or subtropical parts of the world where they are receiving healthy sun exposures. It seems more than reasonable to assume that these values are in fact reflective of an optimal human requirement.

Dr. Michael Hollick is one of the top vitamin D researchers in the world and he has been advocating higher reference ranges, though not as high as the ones suggested here. (Holick MF. Calcium and Vitamin D. Diagnostics and Therapeutics. Clin Lab Med. 2000 Sept, 20(3):569-90)

Optimal **25-hydroxyvitamin D values are:**	**Normal 25-hydroxyvitamin D lab values are:**
45-50 ng/ml or 115-128 nmol/l	**20-56 ng/ml 50-140 nmol/l**
Your vitamin D level should NEVER be below 32 ng/ml. Any levels below 20 ng/ml are considered serious deficiency states and will increase your risk of breast and prostate cancer and autoimmune diseases like MS and rheumatoid arthritis.	

Many commercial labs are using the older dated reference ranges. The above values are the newest ones from the clinical research. There are a number of different companies that have FDA approval to perform vitamin D testing. Quest Labs is the largest commercial lab in the US and they use DiaSorin to measure 25 hydroxy D levels. However, many other commercial labs don't. Your test results will not be accurate and you can not use the values in the table above unless the D is measured with a DiaSorin assay.

Sources of Vitamin D3

Supplements: A daily multivitamin has about 400 units of vitamin D, but Dr. Dowd says you still need to take a straight vitamin D 3 supplement on top of the multivitamin to reach normal levels. "Your average [100- to 200-] pound person is going to require probably between 2,000 and 4,000 units of vitamin D a day," he says. My favorite brand of Vitamin D3 is from Carlson and I have available a 2000 i.u. capsule from Lanolin (Sheep Wool). Carlson also has Vitamin D3 derived from fish oil.

Sun exposure: Eating lunch outdoors when possible or going for walk during a break to get sun exposure will help you achieve normal vitamin D levels, Dr. Dowd says. "Increase your sun exposure at midday between spring blossoms and fall colors," he says.

Eat vitamin D-rich foods: Very few foods in nature contain vitamin D. Fish, such as salmon and tuna are among the best sources. Small amounts of vitamin D are found in beef liver, cheese, and egg yolks. Vitamin D in these foods is primarily in the form of vitamin D_3 (cholecalciferol) and its metabolite $25(OH)D_3$. Dr. Dowd says that green, leafy vegetables and sun-dried produce such as peppers and tomatoes are excellent sources of vitamin D.

Vitamin D Deficiency Widespread in U.S. Children

by Mike Adams, the Health Ranger, NaturalNews Editor

NaturalNews.com , August 8, 2009

It's official: Vitamin D deficiency is so widespread in U.S. children that it poses a huge threat to the future health of an entire generation. A new study published in the journal *Pediatrics* paints a disturbing picture of vitamin D deficiency across the population of children aged 1 through 21. Three-fourths of young African American children, for example, are deficient in vitamin D. Much the same pattern holds true for Mexican American children. Even white kids, with their fairer skin and greater vitamin D production, hit the charts with 50% - 60% deficiency, depending on the age group.

"It's astounding," said Michal L. Melamed of the Albert Einstein College of Medicine in New York, in a Washington Post report (source below). "At first, we couldn't believe the numbers. I think it's very worrisome."

But why are American kids so deficient in vitamin D in the first place?

Sunlight deficiency is now at epidemic levels

The answer, of course, is because kids are *sunlight deficient*. And that's due to a few reasons: First, too many kids today spend most of their hours in front of computers, televisions or gaming consoles. The live almost like vampires, staying awake all night, sleeping during the day, living off the flesh of other creatures (beef jerky and hamburgers...).

Many of their parents, too, are part of the problem. Today's moms seem terrified that their kids might actually experience "the outdoors" for more than a few moments. They wait with air-conditioned cars at the school bus stops, then hustle their kids into pre-cooled cars to drive the quarter mile back to their artificially air-conditioned homes. Sunlight almost never touches these kids (they might turn to dust).

The sunscreen industry also shares some blame in all this, as it thrives on the silly idea that sunlight is bad for children and that all kids need to be smothered in sunscreen lotions before venturing outdoors. (Of course, they never admit their own sunscreen products are filled with cancer-causing chemicals in the first place...)

Meanwhile, we spend hundreds of billions of dollars treating diseases that can be *cured* with vitamin D. Cancer is one of them. Most cancer tumors simply cannot grow in the presence of vitamin D. You show me someone on chemotherapy, and I'll show you someone who's deficient in vitamin D.

Sources for this story include:
WashingtonPost.com
http://www.washingtonpost.com/wp-dy...

The ZRT Laboratory At Home Test for Vitamin D3

How much vitamin D do you need? Most adults need 5,000 IU per day of vitamin D in the winter. Children need about 1,000 IU per every 25 pounds of body weight. However, many people will still be deficient at these doses so after taking the vitamin D for three months, get tested. You can save yourself concerns about how much vitamin D you need plus some money by testing your vitamin D levels in the privacy of your home. ZRT is accurate, has correlated their test with Diasorin RIA, and only charges $65.00 if you order through the Vitamin D Council. Please read the page below before doing anything, including emailing me with a question already answered on the page below!

http://www.vitamindcouncil.org/health/deficiency/
am-i-vitamin-d-deficient.shtml

John Cannell, M.D., 9100 San Gregorio Road, Atascadero, CA 93422, Vitamin D Council

Information on the ZRT At Home Test for Vitamin D3
http://www.zrtlab.com/Page.aspx?nid=12&
action=view&category=14&partner=VitaminD%20Council

25-hydroxy-vitamin D or 25(OH)D is the circulating form of vitamin D and routinely used to diagnose vitamin D deficiency. The Vitamin D Council recommends 25(OH)D levels be between 50 and 80 ng/mL, year around. These levels assure vitamin D metabolism is normalized. Furthermore, levels of 50-80 ng/mL are “natural” levels, that is, levels normally achieved by people who work in the sun.

Low vitamin D levels have been associated with most of the diseases of civilization but only a few controlled trials show vitamin D prevents disease. Controlled trials showing vitamin D treats diseases are even rarer. Many such studies are currently being conducted to see if vitamin D really does prevent or help treat disease. While you wait for the studies to be finished, what 25(OH)D level do you want to have while you wait, a natural 25(OH)D level, one humans had when they worked in the fresh air and sunshine, or a level that is the result of a civilized indoor lifestyle?

Disclaimers

California disclaimers regarding testing do not apply to orders through the Vitamin D Council as the Vitamin D Council is a non-profit organization whose executive president, John Cannell, M.D. will be responsible for ordering testing for 25-hydroxyvitamin D. However, by ordering this test, I agree that I have not entered into a doctor-patient relationship with Dr. Cannell; that is, I understand that Dr. Cannell is not my doctor. I also understand that the vitamin D kit I am buying will report my 25-hydroxy-vitamin D level back to me, but what actions I do or do not take after getting the results back is up to me and my doctor, not Dr. Cannell or the Vitamin D Council.

New York State health law prohibits the testing of specimens collected in or mailed from New York and prohibits the transmission of data from our laboratory to NY physicians or residents. Therefore, we are unable to process such orders at this time.

The Vitamin D Council and Dr. Cannell have partnered with ZRT Laboratory to offer selected products to you at a discount. At this time, Vitamin D Council discounts apply to the following products:

Add to Cart
View Cart

Vitamin D Kit $ 65.00
For detection of vitamin D deficiency and monitoring of supplemented levels. Test in blood spot measures total 25(OH)D, the best single measure of overall vitamin D status. Kit contains one test.

Add to Cart
View Cart

Vitamin D Multi-Test Kit, four tests $ 220.00
Save money on testing your family or on retesting yourself after various amounts of vitamin D supplementation. Kit contains four tests.

Vitamin D3 caps, 2000 iu available from http://www.litalee.com/SFP_shopexd.asp?id=391
Vitamin D3 drops, one drop = 1000 iu http://www.litalee.com/SFP_shopexd.asp?id=404

Vitamin D3 and Pregnancy

The Vitamin D Newsletter

Dr. John Cannell, M.D.

June, 2009

This is a periodic newsletter from the Vitamin D Council, a non-profit trying to end the epidemic of vitamin D deficiency. If you are not subscribed, you can do so on the website.

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In the last 3 years, an increasing amount of research suggests that some of the damage done by Vitamin D deficiency is done in-utero, while the fetus is developing. Much of that damage may be permanent, that is, it can not be fully reversed by taking Vitamin D after birth. This research indicates Vitamin D deficiency during pregnancy endangers the mother's life and health, and is the origin for a host of future perils for the child, especially for the child's brain and immune system. Some of the damage done by maternal Vitamin D deficiency may not show up for 30 years. Let's start with the mother.

Incidence of Gestational Vitamin D Deficiency:

Dr. Joyce Lee and her colleagues at the University of Michigan studied 40 pregnant women, the majority taking prenatal vitamins. Only two had levels of >50 ng/ml and only three had levels > 40 ng/ml. That is, 37 of 40 pregnant women had levels below 40 ng/ml and the majority had levels below 20 ng/ml. More than 25% had levels below 10 ng/ml.

Lee JM, Smith JR, Philipp BL, Chen TC, Mathieu J, Holick MF. Vitamin D deficiency in a healthy group of mothers and newborn infants. Clin Pediatr (Phila). 2007 Jan;46(1):42-4.

Dr. Lisa Bodnar, a prolific Vitamin D researcher, and her colleagues at the University of Pittsburg studied 400 pregnant Pennsylvania women; 63% had levels below 30 ng/ml and 44% of the black women in the study had levels below 15 ng/ml. Prenatal vitamins had little effect on the incidence of deficiency.

Bodnar LM, Simhan HN, Powers RW, Frank MP, Cooperstein E, Roberts JM. High prevalence of vitamin D insufficiency in black and white pregnant women residing in the northern United States and their neonates. J Nutr. 2007 Feb;137(2):447-52.

Dr. Dijkstra and colleagues studied 70 pregnant women in the Netherlands, none had levels above 40 ng/ml and 50% had levels below 10 ng/ml. Again, prenatal vitamins appeared to have little effect on 25(OH)D levels, as you might expect since prenatal vitamins only contain 400 IU of Vitamin D.

Dijkstra SH, van Beek A, Janssen JW, de Vleeschouwer LH, Huysman WA, van den Akker EL. High prevalence of vitamin D deficiency in newborns of high-risk mothers. Arch Dis Child Fetal Neonatal Ed. 2007 Apr 25.

Thus, more than 95% of pregnant women have 25(OH)D levels below 50 ng/ml, the level that may indicate chronic substrate starvation, that is, they are using up any Vitamin D they have very quickly and do not have enough to store for future use. Pretty scary.

Effects on the Mother:

Caesarean section:

The rate of Caesarean section in American women has increased from 5% in 1970 to 30% today. Dr. Anne Merewood and her colleagues at Boston University School of Medicine found women with levels below 15 ng/ml were four times more likely to have a Cesarean section than were women with higher levels. Among the few women with levels above 50 ng/ml, the Caesarean section rate was the same as it was in 1970, about 5%.

Merewood A, Mehta SD, Chen TC, Bauchner H, Holick MF. Association between vitamin D deficiency and primary cesarean section. J Clin Endocrinol Metab. 2009 Mar;94(3):940-5.

Preeclampsia:

Preeclampsia is a common obstetrical condition in which hypertension is combined with excess protein in the urine. It greatly increases the risk of the mother developing eclampsia and then dying from a stroke. Dr. Lisa Bodnar and her colleagues found women with 25(OH)D levels less than 15 ng/ml had a five-fold (5 fold) increase in the risk of preeclampsia.

Bodnar LM, Catov JM, Simhan HN, Holick MF, Powers RW, Roberts JM. Maternal vitamin D deficiency increases the risk of preeclampsia. J Clin Endocrinol Metab. 2007 Sep;92(9):3517-22.

Gestational Diabetes:

Diabetes during pregnancy affects about 5% of all pregnant women, is increasing in incidence, and may have deleterious effects on the fetus. Dr. Cuilin Zhang and colleagues at the NIH found women with low 25(OH)D levels were almost 3 times more likely to develop diabetes during pregnancy.

Zhang C, Qiu C, Hu FB, David RM, van Dam RM, Bralley A, Williams MA. Maternal plasma 25-hydroxyvitamin D concentrations and the risk for gestational diabetes mellitus. PLoS ONE. 2008;3(11):e3753.

Bacterial Vaginitis:

Dr. Lisa Bodnar and her colleagues found pregnant women with the lowest 25(OH)D level are almost twice as likely to get a bacterial vaginal infection during their pregnancy.

Bodnar LM, Krohn MA, Simhan HN. Maternal Vitamin D Deficiency Is Associated with Bacterial Vaginosis in the First Trimester of Pregnancy. J Nutr. 2009 Apr 8.

Effects on the child:

Before we talk about maternal Vitamin deficiency's effect on the fetus, remember that children need lots of Vitamin D. In fact, seventeen experts, many world-class experts, recently recommended:

"Until we have better information on doses of vitamin D that will reliably provide adequate blood levels of 25(OH)D without toxicity, treatment of vitamin D deficiency in otherwise healthy children should be individualized according to the numerous factors that affect 25(OH)D levels, such as body weight, percent body fat, skin melanin, latitude, season of the year, and sun exposure. The doses of sunshine or oral vitamin D3 used in healthy children should be designed to maintain 25(OH)D levels above 50 ng/mL. As a rule, in the absence of significant sun exposure, we believe that most healthy children need about 1,000 IU of vitamin D3 daily per 11 kg (25 lb) of body weight to obtain levels greater than 50 ng/mL. Some will need more, and others less. In our opinion, children with chronic illnesses such as autism, diabetes, and/or frequent infections should be supplemented with higher doses of sunshine or vitamin D3, doses adequate to maintain their 25(OH)D levels in the mid-normal of the reference range (65 ng/mL) — and should be so supplemented year round (p. 868)."

That's right. Healthy children need about 1,000 IU per 25 pounds of body weight and their 25(OH)D levels should be >50 ng/ml, year round.

Cannell JJ, Vieth R, Willett W, Zasloff M, Hathcock JN, White JH, Tanumihardjo SA, Larson-Meyer DE, Bischoff-Ferrari HA, Lamberg-Allardt CJ, Lappe JM, Norman AW, Zittermann A, Whiting SJ, Grant WB, Hollis BW, Giovannucci E. Cod liver oil, vitamin A toxicity, frequent respiratory infections, and the vitamin D deficiency epidemic. Ann Otol Rhinol Laryngol. 2008 Nov;117(11):864-70.

What about fetuses, what happens to them later in life if their mother is deficient? Eight years before the above recommendations, Professor John McGrath of the Queensland Centre for Mental Health Research theorized that maternal Vitamin D deficiency adversely “imprinted” the fetus, making infants more liable for a host of adult disorders. Research since that time has supported McGrath’s theory. Consider, for a minute, what it must be like for John McGrath, to know that maternal Vitamin D deficiency is causing such widespread devastation, to know it could be so easily treated, but to also know he must wait the decades that will be required to deal with the problem.

McGrath J. Does 'imprinting' with low prenatal vitamin D contribute to the risk of various adult disorders? Med Hypotheses. 2001 Mar;56(3):367-71.

Schizophrenia:

Dr. Dennis Kinney and his colleagues at Harvard published a fascinating paper last month on the role of maternal Vitamin D deficiency in the development of schizophrenia, in support of Dr. McGrath's theory. As they point out, the role of inadequate Vitamin D during brain development appears to "overwhelm" other effects, explaining why schizophrenia has so many of the footprints of a maternal Vitamin D deficiency disorder, such as strong latitudinal variation, excess winter births, and skin color.

Kinney DK, Teixeira P, Hsu D, Napoleon SC, Crowley DJ, Miller A, Hyman W, Huang E. Relation of schizophrenia prevalence to latitude, climate, fish consumption, infant mortality, and skin color: a role for prenatal vitamin d deficiency and infections? Schizophr Bull. 2009 May;35(3):582-95.

Autism:

I'll say not more other than to point out Scientific American ran a lengthy article last month on my autism theory but the editors insisted that the author not cite me or my paper, because I'm "not a scientist."

What If Vitamin D Deficiency Is a Cause of Autism?

Mental Retardation:

The only evidence that Vitamin D deficiency is a common cause of mental retardation is from researchers at the CDC who found mild mental retardation is twice as common among African Americans as whites and the politically correct explanation – socioeconomic factors – cannot explain it. If latitudinal studies of mild mental retardation exist, I am unable to locate them.

Yeargin-Allsopp M, Drews CD, Decoufle P, Murphy CC. Mild mental retardation in black and white children in metropolitan Atlanta: a case-control study. Am J Public Health 1995;85(3):324–8.

Drews CD, Yeargin-Allsopp M, Decoufle P, Murphy CC. Variation in the influence of selected sociodemographic risk factors for mental retardation. Am J Public Health 1995;85(3):329–34.

Of course, you are a racist if you believe these studies. In fact, a number of writers have told me their editors will not allow writers to discuss these studies in their stories. I'm glad these studies were conducted by researchers at the CDC although I worry about their political longevity at the CDC after reporting such findings.

I'll mention one other fact, at my peril, and that is the fact that a very smart man, President Barack Obama, was born in the late summer (August) and has a brain that developed in a womb covered in white skin, during the spring and summer, in the subtropics (Latitude 21 degrees North), during an age before sun-avoidance was the mantra (1961). Make what you want to of that fact. My point is that whites living at temperate latitudes may have a huge developmental advantage over blacks, an advantage that begins immediately after conception, an advantage that has nothing to do with innate genetic ability and everything to do with environment.

Newborn Lower Respiratory Tract Infection:

Newborn babies are vulnerable to infections in their lungs and women with the lowest 25(OH)D level during pregnancy were much more likely to have their newborn in the ICU being treated for lower respiratory tract infections. Drs. Walker and Modlin at UCLA recently presented reasons why viral pneumonia is probably only one of many pediatric Vitamin D deficient infections.

Karatekin G, Kaya A, Salihoğlu O, Balci H, Nuhoğlu A. Association of subclinical vitamin D deficiency in newborns with acute lower respiratory infection and their mothers. Eur J Clin Nutr. 2009 Apr;63(4):473-7.

Walker VP, Modlin RL. The Vitamin D Connection to Pediatric Infections and Immune Function. Pediatr Res. 2009 Jan 28.

Birth weight:

While conflicting results exist on the effects of maternal Vitamin D deficiency and birth weight, the majority of the studies find an effect. Furthermore, the studies are comparing women who have virtually no intake to women who have minuscule intakes. For example, women who ingested around 600 IU per day were more likely to have normal weight babies compared to women whose intake was less than 300 IU per day. One can only wonder what would happen if pregnant women had adequate intakes? Drs. Scholl and Chen, at the Department of Obstetrics at the University of Medicine and Dentistry of New Jersey, concluded pregnant women need 6,000 IU/day, not the 400 IU/day contained in prenatal vitamins.

Scholl TO, Chen X. Vitamin D intake during pregnancy: association with maternal characteristics and infant birth weight. Early Hum Dev. 2009 Apr;85(4):231-4.

Diabetes:

My old nemesis, cod liver oil, when given during pregnancy, resulted in children who were three times less likely to develop juvenile diabetes before the age of 15. Of course this was back when cod liver oil had meaningful amounts of Vitamin D (these Norwegian mothers were taking cod liver oil in the 1980s).

Stene LC, Ulriksen J, Magnus P, Joner G. Use of cod liver oil during pregnancy associated with lower risk of Type I diabetes in the offspring. Diabetologia. 2000 Sep;43(9):1093-8.

Seizures:

Newborns frequently have seizures and those seizures are almost always due to low blood calcium. This problem is so common that many newborns are given a prophylactic injection of calcium. In 1978, researchers found such hypocalcemia can easily be prevented by giving Vitamin D. Sadly, standard treatment remains, not Vitamin D, but calcium and an analogue of activated Vitamin D; such analogues do not correct Vitamin D deficiency. The fact this was known in 1978, and routinely ignored by obstetricians since then, should give you pause. Do not think science will solve the Vitamin D problem. Science simply points the way, activists must change the practice.

Fleischman AR, Rosen JF, Nathenson G. 25-Hydroxycholecalciferol for early neonatal hypocalcemia. Occurrence in premature newborns. Am J Dis Child. 1978 Oct;132(10):973-7.

Heart Failure:

Idiopathic infant heart failure is often fatal. Of course, idiopathic to whom: the idiot cardiologists who do not recognize severe infantile Vitamin D deficiency. Luckily, for 16 infants, Dr. Maiya, Dr. Burch and colleagues at the Great Ormand Street Hospital for Children, are not among those idiots.

Maiya S, Sullivan I, Allgrove J, Yates R, Malone M, Brain C, Archer N, Mok Q, Daubeney P, Tulloh R, Burch M. Hypocalcaemia and vitamin D deficiency: an important, but preventable, cause of life-threatening infant heart failure. Heart. 2008 May;94(5):581-4.

Weak bones:

Dr. Muhammad Javaid and colleagues at the University of Southampton found that children of Vitamin D deficient mothers were much more likely to have weak bones 9 years later. Dr. Adrian Sayers and Jonathan Tobias of the University of Bristol recently found the same thing when they looked at maternal sun-exposure.

Javaid MK, Crozier SR, Harvey NC, Gale CR, Dennison EM, Boucher BJ, Arden NK, Godfrey KM, Cooper C; Princess Anne Hospital Study Group. Maternal vitamin D status during pregnancy and childhood bone mass at age 9 years: a longitudinal study. Lancet. 2006 Jan 7;367(9504):36-43.

Sayers A, Tobias JH. Estimated maternal ultraviolet B exposure levels in pregnancy influence skeletal development of the child. J Clin Endocrinol Metab. 2009 Mar;94(3):765-71.

Brain Tumors:

John McGrath's group discovered that children with astrocytomas and ependyomas (brain tumors you do not want your child to have) were more likely to be born in the winter.

Ko P, Eyles D, Burne T, Mackay-Sim A, McGrath JJ. Season of birth and risk of brain tumors in adults. Neurology. 2005 Apr 12;64(7):1317

Epilepsy:

Three studies have found that epileptic patients are much more likely to be born in the winter. Dr. Marco Procopio of the Priory Hospital Hove in Sussex has written all three. Here is his last one, which summarizes his first two.

Procopio M, Marriott PK, Davies RJ. Seasonality of birth in epilepsy: a Southern Hemisphere study. Seizure. 2006 Jan;15(1):17-21.

Craniotabes:

Craniotabes is softening of the skull bones that occur in 1/3 of "normal" newborns. Recent evidence indicates it is yet another sign and sequela of maternal vitamin D deficiency.

Yorifuji J, Yorifuji T, Tachibana K, Nagai S, Kawai M, Momoi T, Nagasaka H, Hatayama H, Nakahata T. Craniotabes in normal newborns: the earliest sign of subclinical vitamin D deficiency. J Clin Endocrinol Metab. 2008 May;93(5):1784-8.

Cavities:

Dr. Robert Schroth from the University of Manitoba reported that mothers of children who developed cavities at an early age had significantly lower vitamin D levels during pregnancy than those whose children were cavity-free.

Prenatal vitamin D linked to kids' dental health

Asthma:

The extant data here is conflicting. Two studies have found higher Vitamin D intakes during pregnancy decrease the risk of asthma in later childhood and one has found the opposite. The best review of the issue is by Drs. Augusto Litonjua and Scott Weiss, at Harvard, who conclude that the current epidemic of asthma among our children is related to both gestational and ongoing childhood vitamin D deficiency.

Litonjua AA, Weiss ST. Is vitamin D deficiency to blame for the asthma epidemic? J Allergy Clin Immunol. 2007 Nov;120(5):1031-5.

Furthermore, a very recent study by Dr. John Brehm and the same Harvard group found low Vitamin D levels in asthmatic children were associated with hospitalization, medication use, and disease severity.

Brehm JM, Celedón JC, Soto-Quiros ME, Avila L, Hunninghake GM, Forno E, Laskey D, Sylvia JS, Hollis BW, Weiss ST, Litonjua AA. Serum vitamin D levels and markers of severity of childhood asthma in Costa Rica. Am J Respir Crit Care Med. 2009 May 1;179(9):765-71.

In case you are wondering, black children are four times more likely than white children to be hospitalized or die from asthma.

Akinbami LJ, Schoendorf KC. Trends in childhood asthma: prevalence, health care utilization, and mortality. Pediatrics. 2002 Aug;110(2 Pt 1):315-22.

My experience, both at the hospital and via my readers, is that asthma improves, albeit sometimes slowly, when adequate doses of Vitamin D are taken. However, Vitamin D does not appear to be a cure, like it is in some other conditions. I suspect children with asthma have suffered both gestational and ongoing childhood Vitamin D deficiency that probably altered, perhaps permanently, their immune system.

The Vitamin D Council's Effort:

We recently ran a ¼ page announcement in OB/GYN News and the American Journal of Obstetrics and Gynecology (AJOG). Unfortunately, the editor of AJOG censored our announcement after its first month but we were able to get the full three month run in OB/GYN News. We also sent a very similar email to 18,000 obstetricians in the US. The total cost to the Council for this campaign was about $12,000.00.

The announcement simply pointed out that the American Academy of Pediatrics (AAP) recently recommended that all pregnant women have a 25(OH)D blood test because Vitamin D is important for normal fetal development (p. 1145):

"Given the growing evidence that adequate maternal vitamin D status is essential during pregnancy, not only for maternal well-being but also for fetal development, health care professionals who provide obstetric care should consider assessing maternal vitamin D status by measuring the 25-OH-D concentrations of pregnant women. On an individual basis, a mother should be supplemented with adequate amounts of vitamin D3 to ensure that her 25-OH-D levels are in a sufficient range (>32 ng/ml). The knowledge that prenatal vitamins containing 400 IU of vitamin D3 have little effect on circulating maternal 25-OH-D concentrations, especially during the winter months, should be imparted to all health care professionals."

Wagner CL, Greer FR; American Academy of Pediatrics Section on breastfeeding; American Academy of Pediatrics Committee on Nutrition. Prevention of rickets and vitamin D deficiency in infants, children, and adolescents. Pediatrics. 2008 Nov;122(5):1142-52.

As the AAP recommendation came from an official medical body, to medical malpractice attorneys it represents evidence of a "standard of care" for future lawsuits. We also reminded obstetricians that the statute of limitations on malpractice suits does not toll (begin) until the injured party recognizes the injury. That is, the parents of a 5-year-old child diagnosed with autism five years in the future may bring suit against that obstetrician for how the child was treated during his time in the uterus, citing the 2008 AAP's recommendation as a standard of care. Obstetricians are already burdened with numerous lawsuits, but they could decrease the number of suits significantly if they would just take the time to learn about Vitamin D.

Finally, we used our last $12,000 to produce and run the following TV announcement in the Washington, D.C. TV market.

http://www.vitamindcouncil.org/videos/vitamin-d-and-pregnancy.wmv

What can you do?

Most people want to do good – at least some good – in their lives. The endless pursuit of the God-almighty dollar, better clothes, better houses and better vacations than your neighbors eventually leaves a hole in your soul. Here is an opportunity to fill it.

If you don't feel that soul hole, try a meditation I learned at Esalen Institute in the 1980s and have practiced ever since. Lie on the floor and pretend you are dead in your grave. Feel the worms, smell the rot, sense the finality. Then, when you really feel dead, visualize your gravestone above. What does it say? "Here lies Robert; he had a big fancy house." "Here lies Vanessa; she wore beautiful clothes and had four face lifts." Here lies Michael; he made a billion dollars." Through this meditation, I realized I want my gravestone to say, "Here lies John, he did something good."

One good thing you can do is simply tell every pregnant woman and women thinking of getting pregnant that she needs to take more Vitamin D, a lot more. Pregnant women need a minimum of 5,000 IU per day and even that dose will not achieve 25(OH)D levels of >50 ng/ml in all women. Why not buy a few bottles of 5,000 IU capsules and hand out the bottles to your pregnant friends. You can get 250 capsules for 15 bucks. Forward this email to her. Show her our Pregnancy and Vitamin D public service announcement.

http://www.vitamindcouncil.org/videos/vitamin-d-and-pregnancy.wmv

If you want to do more, why not get a copy of our Pregnancy and Vitamin D public service announcement (email: webmaster@vitamindcouncil.org; the ad is not copyrighted) and then pay to run it on a TV station in your hometown. You can easily add a caption at the bottom saying this public service announcement is being sponsored by your company, combining a good deed with good business.

Alas, no glory will be yours, at least in this life. No woman will ever thank you for the schizophrenic child she never had, for the trips to the emergency room with a breathless child that she never made, for the repetitive moaning of the autistic child she never endured. Although, she may wonder why her pregnancy was so easy and why her infant is so healthy, alert, active and smart.

John Cannell, MD

Vitamin D Council

This is a periodic newsletter from the Vitamin D Council, a non-profit trying to end the epidemic of vitamin D deficiency. Please reproduce it, post it on Internet sites, and forward it to your friends. Remember, we are a non-profit and rely on your donations to publish our newsletter, maintain our website, and pursue our objectives. Send your tax-deductible contributions to:

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