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IAACN Symposium Review Part II

1271 HIGH STREET, AUBURN, CA 95603 • PHONE (530) 823-7092 • ORDER LINE (800) 359-6091
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IAACN CONFERENCE

This newsletter is a continuation of my review of the annual meeting of the International and American Associations of Clinical Nutritionists. This issue focuses on the highly significant discussion on vitamin D by John Cannell, M.D. Dr. Cannell single-handedly formed the Vitamin D Council which has popularized the serious problem of vitamin D deficiency in our society. I have included many of Dr. Cannell's observations with a few of my own observations about the importance of the vitamin.

Dr. Cannell's awareness of the importance of vitamin D was initiated by the very simple realization that

when you sunbathe for a short period of time you make about 20,000 IU of vitamin D. This is 50 times more vitamin D than in a multivitamin, 200 times more than in a glass of milk, and 100 times more than the government says you need.

Dr. Cannell believes that the optimal dose of vitamin D for healthy young men may be as high as 3,000-5,000 IU a day. Most people today obtain a daily dose of less than 2,000 IU from diet and light exposure.

Vitamin D is essential for proper calcium utilization. Dr. Cannell believes that we do not need more than 800 mg of calcium intake a day if our vitamin D is adequate.

SEASON, LONGITUDE, ALTITUDE

Dr. Cannell began with the observation that deficiencies of vitamin D or exposure to sunlight are probably involved with any disease that varies with seasons, becoming more common in the winter or early spring. Thus vitamin D probably plays a role in increased susceptibility to cold and flu viruses.

Longitudinal differences in the incidence of disease would also be associated with vitamin D. Multiple sclerosis, heart disease, and diabetes become more common the further north one travels. Vitamin D probably plays a role.

Finally, if differences in altitude

influence the incidence of disease vitamin D is probably involved. Vitamin D is more easily formed in the skin at higher altitudes.

Vitamin D is formed when UV B radiation comes in contact with the skin. These are the rays that cause sunburn. Unfortunately, this bandwidth of solar radiation is easily blocked by air pollution, ozone, and water vapor.

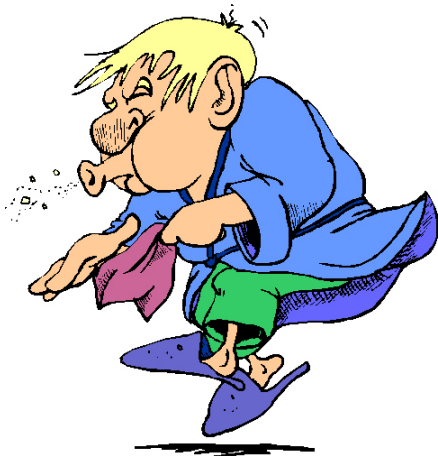
Many people are so afraid of sunburn and the skin cancer which is associated with it that they always put on suntan lotion when going outdoors. Burning does increase the risk of skin cancer. The untold story is that many types of cancer are greatly reduced with sun exposure.

BENEFITS OF VITAMIN D

HEART

Deficiency of vitamin D has been associated with congestive heart failure and increased risk of heart attack. Even small amounts of vitamin D supplementation (800 IU) have been shown to lower blood pressure.





BLOOD SUGAR

Considerable research links vitamin D deficiency to blood sugar abnormalities. The vitamin improves insulin sensitivity and lowers blood sugar in diabetics. Doubling blood levels of vitamin D can be as effective as many medications in lowering blood sugar. Dr. Cannell observed that blood sugar and the incidence of type 2 (or adult onset) diabetes are inversely proportional to blood vitamin D levels.

BONES AND TEETH

Vitamin D is absolutely essential for healthy bones and teeth. Lack of the vitamin contributes not only to osteoporosis, but also has been shown to speed the onslaught of osteoarthritis. Dr. Cannell suggested that both periodontal disease and tooth decay are contributed to by deficiency of vitamin D.

AUTOIMMUNITY

Vitamin D is important for the normal development of immune cells. Deficiency increases the tendency of immune cells to engage in autoimmune activity. Thus lack of the vitamin increases the likelihood of developing multiple sclerosis and type I or juvenile diabetes.

One study of 10 MS patients found that 5,000 IU of vitamin D from Cod Liver Oil along with calcium and magnesium reduced exacerbations of the condition and had no adverse

side effects.

A study of 10,000 infants and children showed that supplementation with vitamin D reduced type I diabetes by 80%.

Other autoimmune conditions which appear to be associated with vitamin D deficiency include Grave's disease, ankylosing spondylitis, lupus, and rheumatoid arthritis.

MOOD DISORDERS

Supplementation with vitamin D has been shown to significantly improve mood of those with seasonal affective disorder (SAD) within a week. These results were achieved with relatively modest doses of 400 or 800 IU per day. Vitamin D increases the activity of a rate limiting enzyme involved in the production of mood elevating neurotransmitters (tyrosine hydroxylase).

SEIZURES

Seizures can be a clue of vitamin D deficiency. Supplementation with vitamin D has been shown to reduce seizure frequency much more than a placebo.

HEADACHE, BACKACHE, AND PAIN DISORDERS

Vitamin D has also been shown to reduce severity, frequency, and duration of headaches associated with the menstrual cycle.

Vitamin D deficiency has been associated with other types of pain as well. It is very common in those who suffer with fibromyalgia and low back pain. A low back pain study found that generous supplementation with vitamin D improved almost all patients after three months.

POLYCYSTIC OVARY

Supplementation with calcium and vitamin D has been shown to normalize women with polycystic ovary disease. It appears that these two nutrients are essential for normal ovulation.

CANCER

Those exposed to sunlight or who obtain adequate vitamin D appear to have lower incidence of virtually every type of cancer except for skin cancer. Dr. Cannell suggested that calcitriol (vitamin D3) "is perhaps the most potent anti-cancer agent known to man." He said that it can cause cancer cells to commit suicide (apoptosis), promote differentiation or specialization of cells which makes them less malignant, inhibit creation of a blood supply for cancer cells, and inhibit the spread or metastasis of cancer.

Vitamin D lowers PSA in prostate cancer. Breast cancer is five times more common in those with the lowest blood vitamin D levels. Raising blood levels of vitamin D above 33 ng/ml reduced colon cancer risk by 80%.

VITAMIN D, COLD AND FLU

Linus Pauling wrote a famous book entitled *Vitamin C, the Common Cold and the Flu*. Pauling's work may be partially overshadowed by one of Dr. Cannell's observations. One of the most exciting topics he discussed was the ability of vitamin D to up-regulate the activity of what are called antimicrobial peptides.

Dr. Cannell worked as a psychiatrist at a psychiatric hospital. He had the patients under his care on vitamin D supplementation because





they evidenced a tendency to develop deficiency due to their confinement indoors.

In April of 2005 a flu epidemic began in the hospital and afflicted those all around Cannell's ward--to the right, left, and across the hall. Cannell's wards even mixed with the sick patients, yet not one developed fever and debilitating muscle aches.

In July of 2005 an article by Adrian Gombart in the *FASEB Journal* offered a credible explanation for the resistance to the flu virus observed by Cannell. The journal article demonstrated that a powerful antimicrobial peptide called cathelicidin is activated by vitamin D.

Human beings have only one cathelicidin antimicrobial peptide which helps the body ward off bacteria, viruses, and fungi. Domesticated animals like cows, pigs, and horses have several.

Cathelicidin is one of the munitions stored up in white blood cells. It is used to punch holes in the external membranes of microbes causing their innards to spill out. Cathelicidin is one of the immune system's most potent and effective weapons against microbial invasion and its production in the body is triggered by vitamin D. In the words of John White of McGill University in Montreal who made the vitamin D and cathelicidin connection, "When the researchers administered 1,25-D to a

variety of cells...the gene for making cathelicidin 'went boom! Its induction was very, very strong.'" Another researcher, Adrian Gombart of the University of California, commented that "nothing turned on the cathelicidin gene to any degree except vitamin D. And it really turned that gene on--just cranked it up. I was completely surprised."

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Raloff, Janet, The antibiotic vitamin, *Science News*, November 11, 2006, Vol. 170, 312, 317.

COD LIVER OIL

Cod Liver Oil may be an ideal means of stimulating antimicrobial peptides. It is a rich source of both vitamin D and vitamin A. Cathelicidin is activated not only by vitamin D, but also to a lesser extent by vitamin A, and by the presence of microbes. Two GNLD Cod Liver Oil tablets contain 540 IU of vitamin D and 5,000 IU of vitamin A.

Another advantage of Cod Liver Oil is that it also naturally contains omega-3 oils and vitamin K which helps build healthy bones.

During the winter months as colds and flu begin to proliferate keep a bottle of Cod Liver Oil next to the vitamin C to ward off the infectious scourges of the winter months.

From September through May vitamin D formation in the skin is inadequate even with sun exposure above 30 degrees north latitude which includes virtually all of the United States. Cod Liver Oil is the best and safest means of supplementing with vitamin D. You should also be aware of the fact that GNLD has a Chelated Cal-Mag with vitamin D. Use of this form of calcium in the wintertime is an excellent way to ob-

tain a vitamin D boost.

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Johansson, S, Melhus, H., Vitamin A antagonizes calcium response to vitamin D in man, *J. Bone Miner Res*, 2001 Oct;16(10):1899-1905.

MEASURING VITAMIN D

Vitamin D is a powerful nutrient which functions as both a vitamin and a hormone. Both excess and deficiency can have serious repercussions.

Testing for vitamin D status is available, although it can be confusing. The test for the active form of vitamin D is 25(OH)D or 25-hydroxyvitamin D and not 1,25(OH)D.

The typical norms for vitamin D have been based on the averages of a vitamin D deficient population and normal levels are not optimal. Dr. Cannell suggests that the testing should be interpreted as follows according to the most recent investigations on the vitamin:

- Less than 20 ng/mL (50 nmol/L)
 - Outright deficiency
- 20-40 ng/mL (50-100 nmol/L)
 - Insufficiency
- 40-65 ng/mL (100-160 nmol/L)
 - Proposed optimal range
- Over 80 ng/ml (200 nmol/L)
 - Excess Vitamin D, Risk of Toxicity

VITAMIN D TOXICITY

It is virtually impossible to devel-

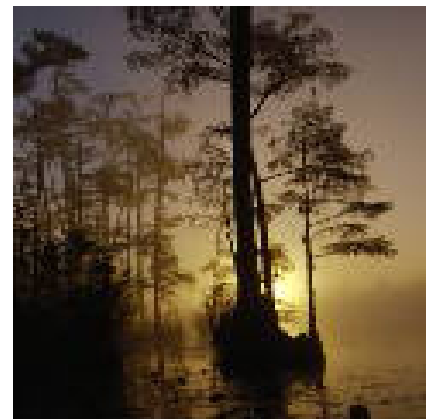
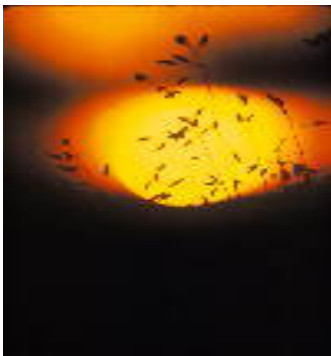




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op vitamin D toxicity from sun exposure. The same UVB that creates vitamin D in the skin also begins to degrade it. A steady state is reached which prevents toxicity. This safety mechanism is bypassed when vitamin D is taken orally.

Those with sarcoidosis should not supplement with vitamin D. They are hypersensitive to the vitamin. Some other diseases can also cause vitamin D hypersensitivity.

The most important paper on vitamin D in the last 30 years was written by Reinhold Vieth who argues that the threshold of toxicity for vitamin D is an intake of over 10,000 IU. He theorizes that 5,000 IU should be a safe range of oral supplementation. Dr Cannell supplements with 4,000 IU of vitamin D3 to maintain himself in the optimal range of 40-60 ng/ml.

Vitamin D toxicity can be serious and even lethal so excesses should be avoided. The government considers 2,000 IU the safe upper limit for vitamin D supplementation. Suggesting someone take a greater amount could put one on tenuous legal ground.

Dr. Cannell does not believe that 2,000 IU will bring everyone into the optimal range. This is particularly true of those with dark skin as they can have much greater difficulty obtaining adequate vitamin D due to the fact that dark skin inhibits vitamin D synthesis from sunlight. In one study the blood of African-American participants produced only 63% of the cathelicidin of blood from whites in response to tuberculosis bacteria until vitamin D was added to the blood.

Synthetic vitamin D2 which is often added to foods such as milk may have even greater risk of toxicity than the natural form of the vitamin (D3). Vitamin D2 is not only much less effective than vitamin D3, but it also breaks down into unique metabolites which may increase the risk of toxicity. Many of the toxicity observations on vitamin D are based

on studies with vitamin D2.

Vasquez, Alex, et al, The clinical importance of vitamin D (cholecalciferol): A paradigm shift with implications for all healthcare providers, *Alternative Therapies*, Sept/Oct 2004, Vol. 10, No. 5, 32.

Raloff, Janet, The antibiotic vitamin, *Science News*, November 11, 2006, Vol. 170, 312, 317.

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