Vitamin D: The Sunshine of Your Life?

Reader's Summary:

1. **Are dermatologists right about the sun being bad for us all the time?**
2. **Why is sunlight so vilified by some physicians?**
3. **What does Vitamin D really do for us and our immunity?**
4. **What diseases does it play a major role in humans? What help does it give?**
5. **What other conditions might optimizing your vitamin D levels help?**

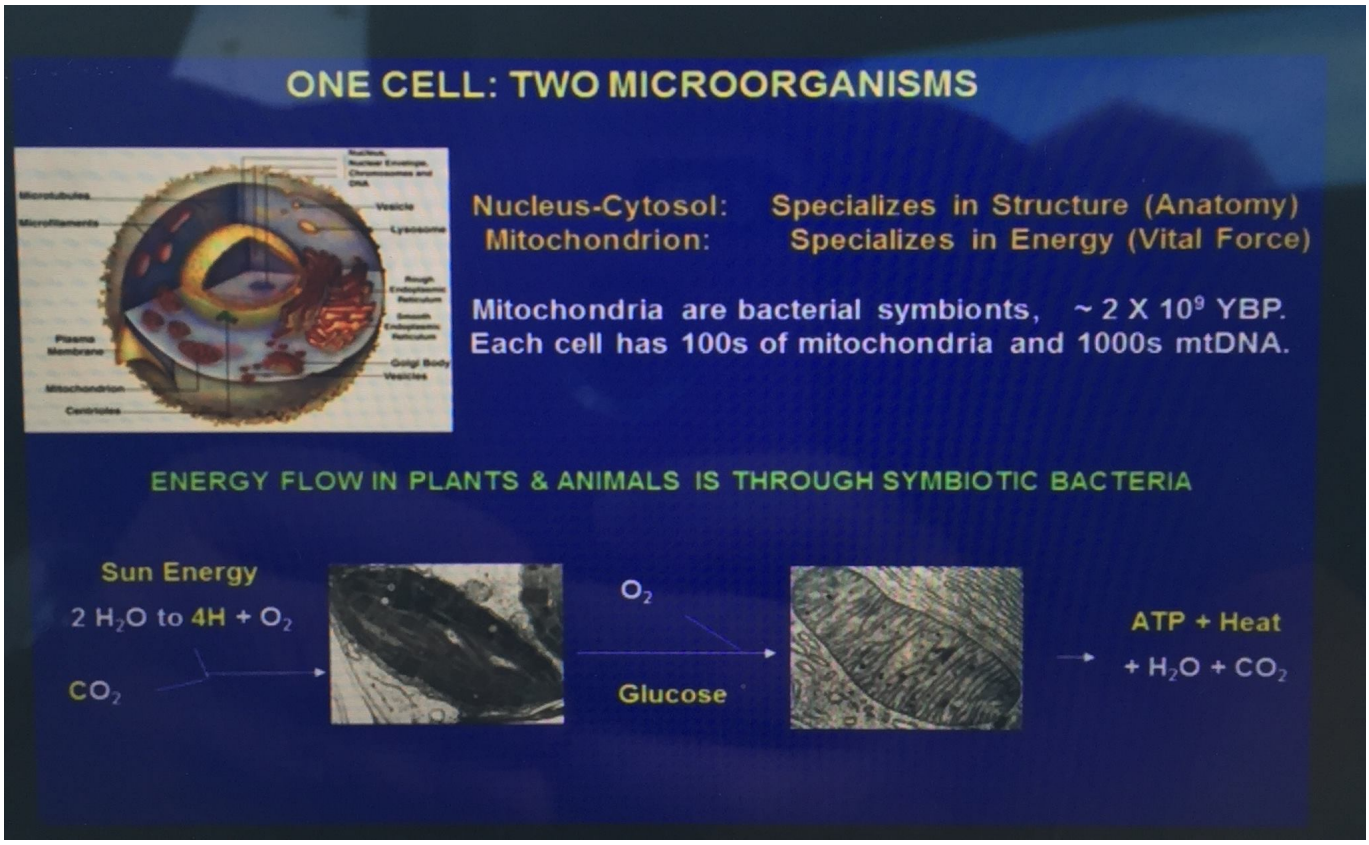
I was in a lounge watching the news last week and overheard a group of dermatologists talking about the new FDA rules for sunblocks that will go into effect in January 2012. There was unanimous agreement among them all that sunlight was the source of everything that was bad in their world. One of the doctors said to another, "No human should be out in the sun; they should just take vitamin D3 from the drugstore instead of getting it from the sun." It was at that point I knew this was going to make a blog post about this. Apparently, we've forgotten that photosynthesis supports most of the food chain on this planet. And we are the mammal with an energy hog in our heads that needs energy. Since our skin is derived from neuro-ectoderm and we, too, use photosynthesis to make Vitamin D for our protection from poor electron dense foods in summer. Maybe we should re-think our position on Vitamin D?

The next time a dermatologist tells you the sun is bad for you should tell them about this study: The further you are away from the equator, where the sun is strongest, skin cancer rates are HIGHER. Hyperlink to study.

It is beyond me why the sun is so vilified. We could not have evolved past single cells organisms without it. We all learned

that simple fact in school. But now with our advanced degrees and plaques on our wall, are we going to blame all skin diseases all on the sun? I decided to add pieces to the immunity levee in the QUILT because of this conversation. And before we start, let me be clear: In my opinion, it is better to get Vitamin D3 from natural sources before a supplement, but there is a catch to this pearl of wisdom. First, review this link on natural Vitamin D production.

If your O6/O3 ratio is suboptimal, your epidermis is more at risk for cancers caused by UV light, so using sunblock and supplemental Vitamin D3 makes some sense in this case. The problem I have encountered is few people know what their true O6/O3 ratio is! In the dermatology literature, recent studies point out that melanoma is now more common in people who use sunscreens! I think this is likely true, but not because the sun is so bad; I think it has more to do with not getting enough sun because we wear clothes today, and we eat the wrong foods at the wrong time of the year. Our modern lifestyle dehydrates us chronically, and causes us to lose both Vitamin D and magnesium. This is our greatest risk factor for skin cancer in my opinion. Australia is the classic example of this risk factor today. Anyone who is struggling to get their Vitamin D levels higher likely has a co-morbid magnesium deficiency due to a lack of water from poor mitochondrial function. People forget that one of the main by products of mitochondrial production is water.



They also may have an environment loaded with non native EMF and blue light. Magnesium is hydrophilic and without water, we lose Magnesium (Mg). There are 3 metabolic transactions from Cholesterol (Cholecalciferol) that occur under the skins surface where our “storage version” of Vitamin D (Calcidiol) is made and gets transformed in our kidneys and liver to the “active version” of Vitamin D (Calcitriol) in the liver. All 3 reactions require Mg as a cofactor. Mg however need the mitochondria to make cell water int he cell to work properly. If the mitochondria do not make water, taking a Mg supplement is a waste of time and resources. It is physiologically impossible to have a 25(OH) blood test (“Storage-D”) to be less than 35 ng/dl and a Magnesium RBC level to be above 6.5mg/dL because of the negative feedback tied to calcium levels. This is why Magnesium and Vitamin D deficits walk together, and why they are associated with cancers. Magnesium is also a co factor for telomerase that controls our telomere lengths. I also think it is because the humans who get this melanoma and use sunscreens are high risk because of their underlying and undiagnosed poor O6/O3 ratio and a large side

of carbohydrates that cause dehydration initially.

Vitamin D: The Immunity Steroid

In medical school, I learned that Vitamin D was a hormone that was important in bone metabolism and that is where it really ended until I began to read about Vitamin D3 five years ago in all that research that has uncovered it does for our cells. The major effect is that it modulates the immune system as its receptor is found on T helper cells (regulator cells), the same cells that the HIV infection wipes out in AIDS victims. So if your Vitamin D levels are low, they turn off the epigenetic switches on genes that turns on the immune system protector cells and keeps us free of diseases from viruses, bacteria and fungal infections. In fact, since I got my level checked 5 years ago, I have not been seriously ill.

DISEASES ASSOCIATED WITH LOW VITAMIN D LEVELS: (below 30 ng/ml on a Vitamin D 25 (OH) test

- Rickets and osteomalacia and psoriasis
- Hypocalcemia
- Seizures, muscle tetanus and heart failure in the newly born
- Osteoporosis and Osteopenia
- Cancer of all types
- Heart disease (the number killer of men and women)
- High blood pressure development
- Obesity from all causes
- Osteo and Rheumatoid Arthritis
- Mental illness of all types
- Chronic pain centrally or peripherally mediated
- Muscular weakness
- Radiation poisoning
- Diabetes…..especially metabolic syndrome and T2D development
- Multiple sclerosis and most autoimmune diseases

Take a look at this PDF on Vitamin D to see just how off the current IOM recommendations are in medicine. It is eye opening to say the least.

What does Vitamin D do—and what should you know about Vitamin D?

1. **Facilitates increased intestinal absorption of phosphorus and calcium** as well as suppression of parathyroid hormone secretion to increase our plasma calcium concentrations. It, however, does not dictate or direct where this calcium will be deposited in our bodies. There is also not a strong negative feedback control loop within the gut for Vitamin D.
2. **Levels above 50 ng/ml are associated with increased adiponectin levels and low leptin levels**. High adiponectin and low leptin levels means you are less likely to be obese. So higher vitamin D levels can help us trim our fat stores and offset the effect of seasonal carbohydrates in causing weight gain. By decreasing fat levels, we can avoid the initial steps that lead to insulin resistance and eventually develop Type 2 Diabetes.
3. **It’s a natural antibiotic that assists WBCs in clearing infections.** It does this by stimulating immune cells to make a protein called cathelicidin in our skin. This does not happen well in our gut, but works like a charm in our skin with UV and IR exposure. This protein is found on T cells within our skin, macrophages, neutrophils, and on our epithelial cells in our guts and respiratory system. It actually helps defend us from viruses and bacteria all the time when its optimized. In our gut linings, it also activates the T regulator cells to protect the intestinal lining and the GALT that lies right behind the brush border. The light required for this activation may come from the prokaryotes in our gut

microbiome who naturally release large amounts of light. Our enterocytes have to contain DHA in their cell membranes to decipher the signal properly. It now appears that low vitamin D status in the gut maybe a huge risk factor for the development of HIV general infection. Another major immune affect of Vitamin D is that is has the ability to block intracellular signals of NF Kappa beta and of TNF alpha. Both of these chemicals are part of the machinery that causes upregulation of the stressful cellular response mechanisms in many pathologic diseases like cancer, autoimmunity and in obesity.

4. **It's a direct inhibitor of the hormone renin in our kidneys** and helps protect us from developing systemic systolic blood pressure elevation. It also protects the kidney directly from high levels of uric acid production that come from end stage fructose metabolism.
5. **A single nucleotide polymorphism (SNP) has been linked to the development of early heart disease.** This SNP is on the C allele of SNP # rs4646536 and is being studied in the NIH VITAL trial currently ongoing. This is a second mechanism to prevent heart disease but a more common one will be discussed below.
6. When the skin makes Vitamin D3 naturally, usually 10-20,000 IU are made locally in the skin. The excess Vitamin D3 is then broken down to its degradation products, which have been shown to inhibit the development of psoriasis in studies. These degradation products prevent the proliferation of the lower levels of the skin from reproducing at a faster rate than normal. **This is the pathology found in psoriasis.** The lower epidermis is known to grow 25-40 times faster and the skin gets a large red plaque on its surface as a result. This is why light therapy is so effective in treating psoriasis. It's kind of ironic that dermatologists don't look at the pathological causes of this disease. Here, sunlight is curative because it

stimulates Vitamin D3 production to make excess Vitamin D3 to make degradation products. **Anyone with psoriasis should have their Vitamin D levels checked and optimized before they do anything else.** Most have extremely low levels and they tend to be obese and have higher cancer rates across the board.

7. **In autoimmune diseases, we need to advocate for much higher levels of Vitamin D from sunshine**. Why? In order for circulating vitamin D to perform its functions, it must first activate the vitamin D receptor (VDR). The gut is broken down in those with AI's due to an altered microbiome. They also tend to be DHA depleted. The problem is that many people with autoimmune disease have a genetic polymorphism that affects the expression and activation of the VDR and thus, reduces the biologic activity of vitamin D within the skin and gut. Studies have shown that a significant number of patients with autoimmune diseases have several VDR polymorphisms. There are over 25 variants of VDR polymorphisms now known and the list grows monthly. If you have a VDR problem, you require much higher circulating levels of Vitamin D from sunlight to bind to these defective receptors. As we have mentioned in multiple previous blogs, a leaky gut predisposes to the development of autoimmunity. Fundamentally the leaky gut maybe due to a lack of bacteria leaking UV and IR light to our enterocytes to activate the innate immune system and the VDR. Moreover, optimal Vitamin D levels are also linked to "tighter junctions" between the enterocytes of our intestinal lining making our guts "less leaky." If the gut is less leaky, our immune system is stronger because it does not have to be activated constantly to protect the rest of the body. We have also seen above that vitamin D levels play a huge role in our immune surveillance in our GI tracts. It appears to be critical to push your levels to much higher plasma levels in these cases. I strongly recommend talking this over with

your doctor. *The fears of Vitamin toxicity from sunlight are very overblown in my estimation and the risk of too low a level for disease propagation is far too common and risky for your health.* **There is a concern about oral vitamin D supplementation in case where non native EMF predominates.** There is now very recent evidence out from Dr. Hector DeLuca about MS and autoimmune encephalitis. Dr. DeLuca believes that the degradation products of vitamin D3 and/or some byproducts of solar radiation confer health to us in some fashion. He says vitamin D3 degradation and sunlight is somehow active against a range of autoimmune illnesses. In his latest work, that "something" he is studying is active against an experimental model of multiple sclerosis. I have always felt that MS, ALS and Guillian Barre are tied in some fashion to vitamin D metabolism and a loss of light. It appears Dr. DeLuca believes this as well.

8. **Vitamin D is a fat soluble molecule. It means you should take it with fat for absorption.** But it also means that some people will not absorb it well at all. Who? Those with a leaky gut, who have people with IBD, Crohn's, Ulcerative colitis, liver disease, those without a gallbladder, and those on a low fat diet that 99{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} of nutritionists and dietitians recommend. If your are a reader of this blog, you know I don't advocate that stance at all.Who else has to worry? Those who are on NSAIDs, steroids longer than a two weeks, those on blood thinners or anticoagulants, those on reflux medicines and antacids, and synthetic hormones like birth control pills. Are you starting to understand now why we have an epidemic of hypo vitaminosis of vitamin D?
9. Can you have a normal plasma D level and still have low vitamin D activity? Yes you can, and it is probably the biggest silent epidemic out there today. I most commonly see this in obese folks with hypothyroidism.

90{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} of the cases of hypothyroidism in the USA are cause by Hashimoto's disease. This disease is an autoimmune disease and these patients universally have defective VDR receptors. That means they need very high levels of blood Vitamin D levels from sunlight and optimization of their thyroid function to get results. Often, many obese people get stuck not losing weight because their doctors are fooled into thinking their thyroid and Vitamin D levels are fine. Most of the time, the levels are sub therapeutic and patients find amazing results when their plasma levels are pushed a bit by the clinician. The problem is most MD's are afraid to advocate for the sun's light. This is an area where you need to speak to your doctor. I often see this in post op cancer patients, too, under extreme stress. Patients with high cortisol levels suffer the same fate.

10. **Age will decrease your skin's ability to make vitamin D3 from sunlight and cholesterol.** As we go from age 20 to 60, we lose that ability by a four-fold magnitude. The darker our skin, the worse the conversion. So as we age, we need more sun or supplementation, not less of either. This is why so many older people see a higher incidence of neolithic diseases as well.
11. **Humans have a Vitamin D savings bank in our body**. It is supported by a good protein diet and a leads to a better Vitamin D level. An Epi-paleo diet is an optimal choice for this bank account. It works by making a protein called Vitamin D binding protein (DBP). It acts like albumin does in the blood. The vitamin D-binding protein (DBP) is a highly specific carrier for vitamin D and all of its metabolites found in the plasma. This allows us to store vast amounts of Vitamin D. Why do we need that from an evolutionary standpoint? Vitamin D synthesis from cholesterol by the sunlight is thus maintained within physiological limits estimated to be 0.01 to 2.5 mg of cholecalciferol per day. 2.5 mg per day translates

to 100,000 IU per day! If we are protein deficient, we do not have this ability and our stores are low in low light levels. It not only protects our Vitamin D stores, but **it also prevents the toxic effects of a high vitamin D level in the blood**. Humans start to store Vitamin D3 when Vitamin 25(OH)D level is above 40 ng/ml.The interesting finding is that it is only around a level of 60 ng/ml that the stores are sufficient to see us through a winter with a resultant optimal D level. This is why dietary composition is critical for immunity the further one gets from the equator. Seafood is on of the few foods high in Vitamin D levels. At the equator there are no foods with Vitamin D because the tropical sun provides all we need. This information also shows why flu season peaks in winter months in epidemiological studies. It also helps explain why those who are chronically ill or have serious diseases like cancer have very weakened immune systems. This is why cancer patients have higher risks for developing multiple neolithic diseases as they age. Peripheral neuropathy and pain is one such example. Those with low HDL levels or frank liver disease tend to make the lowest amounts of DBP. The liver is our organ that really is a solar organ that mimics photosynthesis. Liver disease or low HDL states are seen in hepatitis cases and in patients with metabolic syndrome as well. It also explains why other neolithic diseases afflict those people and why they all seemingly have low vitamin D levels, too. This is why we see an epidemic in the USA today. Before, we never looked for it, but now we are beginning to understand just how vital Vitamin D is for immunity and health.

12. In 2007, **Richards found that higher vitamin D levels are also associated with longer telomere lengths.** This means that optimal vitamin D levels reduce our cellular aging risk, reduce utilization of our stem cells, and decrease the leakiness of our mitochondria which drive the action

of the telomerase enzyme that dictates telomere length. So it makes sense if your D level is low, your telomeres will be shortened and this, too, will put you at heightened risk for neolithic disease. All cellular systems seem to point to disease and increased aging with lower vitamin D levels. ***Aging is also associated with calcium efflux in mitochondria.*** This is among one of the most congruent findings I have seen in biology since I began to review the biochemistry and literature in this area.

13. **When you optimize your vitamin D3 with sunlight, you will notice your HDL will rise 10-30{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} in the first year.** I look at low HDL as a cause of low redox and poor solar exposure. This signifies that the liver is doing a better job of "skimming" the portal circulation for endotoxins. This is the major mechanism that Vitamin D protects the heart, in my view. We all hear from doctors that a high HDL protects the heart. This is how: It makes the liver a master of defense for the nervous system. It also protects the brain from endotoxin assault form the gut, it reduces all causes of mental illness and it is a main defense in the brain gut axis. Read my VAP blog here to freshen up on this physiology. Higher levels of VDR activation means less hypoxia in the brain and better mitochondrial density and function in the brain and heart. This increases the magnetic sense within mitochondria by increasing electron tunneling on the inner mitochondrial membrane.
14. Regarding cancer and Vitamin D3: The gene that codes for E-cadherin can be ***epigenetically silenced*** via promoter hypermethylation. This explains why Vitamin D3 cannot "prevent" or "cure" all cancers, since the E-caherin gene is under the direct regulation of Vitamin D3. Many people do not understand this on off switch with regards to cancer.

SUMMARY:

So, I think I have just skimmed the surface here why Vitamin D does a ton more than I learned in medical school 20 years ago. I keep reading about it because we are finding out new things it does daily in organs like the brain and nerves. Consider this: the ApoE4 allele is the allele that conferred the ability of humans to leave Africa and evolve and live in lower levels of solar radiation, yet still capture enough Vitamin D to survive. This allele is associated with other diseases these days, but it was ideally matched for humans who needed to migrate north and south from the equator for many reasons.

It is also vitally important to our immunity and defense. New studies in 2009 showed that that **Vitamin D also decreases the risk of breast cancer in women when their levels were over 50 ng/ml.** I have a sense this increase must come from sunlight and not a supplement. This has huge implications for all women and all oncologists in my view.

Here is another interesting finding on vitamin D in 2008: it also improves athletic performance. You don't believe it? Consider this: The 2010, Chicago Blackhawks became the first team to have their Vitamin D levels maintained all season long via diet and supplementation—and they won the Stanley Cup. You might be inclined to say they had the best team and maybe that is why the won. But a closer look at the data showed something more interesting: they had the fewest injuries and games missed due to illness in the entire league—by a large margin. They changed their protocol because one of their player's wives saw a physician by chance who knew about this finding and shared it with the team trainer and they implemented it. That news spread to many other major professional franchises and several implemented changes to their off-season regimens. Two of those teams were the NFL's Green Bay Packers and the Pittsburg Steelers. By the way, both of them played in the

Super bowl the same year (Feb 2011), and they both optimized their Vitamin D levels. Coincidence? Maybe it is. But I will let you decide how to use this information best.

I hope you discuss this information with your doctor and decide on a new healthy course. Your health depends upon it.

Cites

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