

# REVEALING THE GEM

## Vitamin D

Technically not a "vitamin," vitamin D is in a class by itself. Its metabolic product, calcitriol, is actually a secosteroid hormone that targets over 2000 genes (about 10% of the human genome) in the human body.

Current research has implicated vitamin D deficiency as a major factor in the pathology of at least 17 varieties of cancer as well as heart disease, stroke, hypertension, autoimmune diseases, diabetes, depression, chronic pain, osteoarthritis, osteoporosis, muscle weakness, muscle wasting, birth defects, periodontal disease, and more.

Vitamin D's influence on key biological functions vital to one's health and well-being mandates that vitamin D no longer be ignored by the health care industry nor by individuals striving to achieve and maintain a greater state of health.

### What is the storage form of vitamin D?

- 7 dehydro-cholesterol.
- Cholecalciferol.
- **Calcidiol or 25(OH)D.**
- Calcitriol or 1,25(OH)<sub>2</sub>D.

### What is the active form of vitamin D?

- 7 dehydro-cholesterol.
- Cholecalciferol or D<sub>3</sub>.
- Calcidiol or 25(OH) D<sub>3</sub>.
- **Calcitriol or 1,25(OH)<sub>2</sub> D<sub>3</sub>.**

## SUNSHINE AND YOUR HEALTH

- If well adults and adolescents regularly avoid sunlight exposure, research indicates a necessity to supplement with at least 5,000 units (IU) of vitamin D daily.
- To obtain this amount from milk, one would need to consume 50 glasses. With a multivitamin more than 10 tablets would be necessary. Neither is advisable.
- The skin produces approximately 10,000 IU vitamin D in response 20–30 minutes summer sun exposure— 50 times more than the US government's recommendation of 200 IU per day!

### How To Get Enough Vitamin D

- Regularly receive mid-day sun exposure in the late spring, summer, and early fall, exposing as much of the skin as possible (being careful to never burn).
- It's important to realize that vitamin D<sub>3</sub> is formed from exposure to UVB rays, whereas UVA radiation actually destroys vitamin D.
- This helps keep your body in balance; it's one of the protective mechanisms your body has to avoid overdosing on vitamin D when you're outside.

- However, when you're exposed to sunlight through windows -- in your office, your home or your car -- you get the UVA but virtually none of the beneficial UVB.
- The high rate of natural production of vitamin D3 cholecalciferol in the skin is the single most important fact every person should know about vitamin D—a fact that has profound implications for the natural human condition.

### **Could bathing remove vitamin D from your skin?**

YES!

- New evidence shows it takes up to 48 hours before you absorb the majority of the vitamin D that was generated by exposing your skin to the sun!
- Therefore, if you shower with soap, you will simply wash away much of the vitamin D3 your skin generated, and decrease the benefits of your sun exposure.
  - [www.triliumhealth.com](http://www.triliumhealth.com)
  - Helmer AC, Jensen CH. Vitamin D precursors removed from the skin by washing. *Studies Inst. Divi Thomae*, 1937, 1:207–216.

### **Does body weight have any bearing on vitamin D levels?**

- Obesity has been associated with lower levels of 25 (OH) D3.
- Theories:
  - Sequestration of fat,
  - Increased clearance by a larger body-fat pool,
  - Negative feedback from higher circulating 1,25 (OH)<sub>2</sub>D levels in obesity, and
  - Decreased sun exposure due to limited mobility or avoidance of outdoor activity.

### **What is our vitamin D tank?**

#### **What is the desirable level at which vitamin D should be maintained?**

Serum 25(OH) cholecalciferol

- In order to understand why you should keep your vitamin D tank full, you need to understand the steps in the metabolism of cholecalciferol.
- After your liver turns cholecalciferol into calcidiol, calcidiol follows one of two pathways.
  - The first pathway takes priority- in the kidneys-as your life literally depends on it
  - The second pathway- in the tissues-...
- However, if your tank is low, most of your calcidiol takes the first pathway.
- The first pathway leads to the kidney, where calcidiol is turned into calcitriol.
  - Calcitriol is a potent steroid hormone, in fact, it is the most potent steroid hormone in the human body and acts to turn your genes on and off.
  - They are always important to health, always needed to be handled with care, and are often quite potent.
- Calcitriol made by the kidney circulates in the blood to maintain your blood calcium levels. Calcium is vital to the function of the cells in the body, without enough calcitriol in the blood calcium levels will fall and illness will set in. Therefore, the first priority for calcidiol is to go to the kidney where it makes enough calcitriol to secrete into the blood in order to regulate serum calcium.

- If any calcidiol is left over—that is, if your tank is full and your kidneys are getting all the calcidiol they need to maintain serum calcium—then calcidiol is able to take another pathway, one that leads directly to the cells.
- This path is only now being fully understood and is causing excitement all around the world, especially concerning cancer. These are the autocrine (inside cell) and paracrine (around the cell) functions of the vitamin D system.
- These functions are crucial to understanding why you should keep your vitamin D tank full. If you only have a small amount of calcidiol in your blood, virtually all of it goes to your kidney, which then makes extra calcitriol to keep your serum calcium levels from falling. Almost no calcidiol gets to your tissues to make tissue calcitriol.

### **Are there factors that you need with vitamin D for it to be utilized efficiently in your body?**

Vitamin D has co-factors that the body needs in order to utilize vitamin D properly. They are:

- magnesium
  - zinc
  - vitamin K2
  - boron
  - genestein
  - a tiny amount of vitamin A
- Magnesium is the most important of these co-factors. In fact, it is common for rising vitamin D levels to exacerbate an underlying magnesium deficiency. If one is having problems supplementing with vitamin D, a magnesium deficiency could be the reason why.
  - All the enzymes that metabolize Vitamin D require Mg.

### **Types of Vitamin D**

- D2- plant origin Vitamin D
- D3- animal source Vitamin D

### **Is there a vitamin D3 of plant origin?**

YES!

- sun dried shiitake mushroom has the highest content of vitamin D of any plant food

### **Does sunscreen affect Vitamin D production?**

- YES! To a certain extent.

**DISCLAIMER:** This presentation is for education purposes. This is not meant to take the place of proper medical consult for diagnosis and management.