

## Vitamin D and Health

**Definition:** Fat soluble vitamin made from cholesterol in the skin in the presence of UVB light.

- Ergocalciferol (D2) - the usual form found in supplements
- Cholecalciferol (D3) - the preferred form of supplementation
- D3 is converted to calcidiol (25-OH-D) which may have steroid hormone activity.
- Calcidiol is converted to Calcitriol (1, 25-di-OH-D) the main active form of vitamin D.
- The small intestine, liver and kidney participate in converting vitamin D into its active forms.

**Testing:** The appropriate test for vitamin D status is 25-hydroxy vitamin D. Normal lab values are often too low. The ideal level is 45-50ng/ml or, in some views, higher.

### **Supplementation:**

- Consider giving 10,000-20,000 IU per day
- Daily Requirements of vitamin D3 are 3,000-5,000 IU/day once levels are brought to normal.
- Vitamin D is needed to load calcium into the blood and must be balanced with vitamin F, K, other fat-soluble vitamins, and EFA's that ionize and unload calcium into the tissues.

### **Sunlight Exposure:**

- Sun block prevents vitamin D production through the skin
- White skinned people can make five to ten times the amount of vitamin D as dark skinned people, so darker skinned individuals can be more deficient.
- UV light does not penetrate glass
- People living in more northern climates usually make no Vitamin D via the skin for 6 or more months of the year.

### **Cardiovascular Roles of Vitamin D:**

- Anti-inflammatory---vitamin D down regulates pro-inflammatory cytokines and up regulates anti-inflammatory cytokines. (*Cytokines are proteins that communicate cell to cell.*)
- Inhibits vascular calcification
- Decreases smooth muscle proliferation
- Anti-hypertensive

### **Other Functions of Vitamin D:**

- Prevention of many types of cancer
- Protection against autoimmune diseases including MS, RA and others
- Protection against Diabetes 1 & 2
- Needed for bone health
- Decreases muscle and joint pain
- Required for calcium absorption and metabolism
- Protects against neuro-degenerative diseases such as Alzheimer's
- Facilitates memory and cognition
- Mood support; a natural antidepressant