

Center for Integrative Medicine

Dietary Supplements: Vitamin D

Vitamin D has several forms and functions like a hormone in many different tissues and organs. Historically, our ancestors generated their own vitamin D through the skin's ability to use sunlight to transform cholesterol into vitamin D. As we moved indoors, wore clothing, and used sunscreen, we've obtained more of our vitamin D from fortified foods and supplements.

There are 3 major forms of vitamin D:

1. 25, Hydroxy (OH) vitamin D. This is the form that circulates in the blood and the one we test for in our clinic to check for suboptimal or deficient levels.
2. D2 ergocalciferol, made by plants. This is often the kind in supplements.
3. D3, cholecalciferol is the kind produced in our skin with the help of UV-B rays from the sun. This is the kind found in fish and fish products. In the summer, an adult in a bathing suit whose body is exposed to 10 – 15 minutes of full sunshine makes 10,000 – 20,000 IU of D3. Sunscreen reduces vitamin D production by 95%; darkly pigmented and obese people require 5 – 10 times longer exposure to generate similar amounts of vitamin D. In North America, the UV B levels are insufficient to produce Vitamin D during most winter months.

The skin, intestines, liver, kidneys, bones, and parathyroid glands are all important in vitamin D metabolism. Diseases in any of these organs and phenytoin, phenobarbital, and steroid medications can lower vitamin D. Most studies have found suboptimal Vitamin D levels in more than 50% of teens. Low levels are associated with fatigue and pain in the muscles and joints.

Vitamin D is important for:

- Healthy bones (preventing rickets in children and osteomalacia/osteoporosis in adults).
- Reducing the risk of falls in the elderly
- Reducing the risk of some auto-immune disorders such as type 1 diabetes, rheumatoid arthritis, and multiple sclerosis; promoting innate immunity to prevent viral, bacterial and TB infections
- Reducing the risk of heart attacks in adults
- Reducing the risk of depression
- Reducing the risk of prostate, colorectal, ovarian, and breast cancer
- Reducing all cause mortality

Good dietary sources of vitamin D include: cod liver oil, herring, sardines, oysters, and vitamin fortified dairy products and cereals. All vitamin D supplements tested by ConsumerLab in 2009 met their quality standards for having the amount of vitamin D listed on the label, and all products disintegrated properly. Products that also contain calcium and other vitamins or minerals may have more problems with contamination. Most multivitamins contain some vitamin D. See www.consumerlab.com for more details about supplement quality.

Safety: Although it is easy to get sunburned from too much sun, it is not possible to make too much vitamin D in our skin from sun exposure. Getting vitamin D from food is safe. Excessive intake of supplements can increase calcium to toxic levels in the blood, nausea, constipation, and weight loss, confusion and heart rhythm problems. Adults should avoid taking more than 10,000 IU daily unless a severe deficiency has been demonstrated. Seek assistance from a qualified health professional.

According to the 2008 guidelines from the American Academy of Pediatrics, the **minimum** daily intake for: Infants, children, and adolescents should be: 400 IU of vitamin D (cholecalciferol)

Women who are pregnant or nursing should ensure optimal Vitamin D intake, and breastfed infants should receive vitamin D supplements.

Formula fed infants who consume less than 1 quart daily of formula should also receive vitamin D supplements to ensure a minimum intake of 400 IU daily. NOTE: fortified milk contains 400 IU per quart.

We aim for minimum levels between 50 – 75 nmol/L. and less than 500 nmol/L. (1 nanogram/mL = 2.5 nmol/L) Many experts recommend substantially higher intakes and higher levels.

For additional information, see the US Office of Dietary Supplements Fact Sheet on Vitamin D.

www.wakehealth.edu/CIM - See Quick Link to Dietary Supplements