

**Record: 1**

- Title:** Risk assessment for vitamin D.
- Authors:** Hathcock JN; Shao A; Vieth R; Heaney R
- Author Address:** Council for Responsible Nutrition, Washington, DC 20036-5114, USA.  
jhathcock@crnusa.org
- Source:** The American Journal Of Clinical Nutrition [Am J Clin Nutr] 2007 Jan; Vol. 85 (1), pp. 6-18.
- Publication Type:** Journal Article; Meta-Analysis; Review
- Language:** English
- Journal Information:** *Country of Publication:* United States *NLM ID:* 0376027 *Publication Model:* Print *Cited Medium:* Print *ISSN:* 0002-9165 (Print) *Linking ISSN:* 00029165 *NLM ISO Abbreviation:* Am. J. Clin. Nutr. *Subsets:* Core Clinical (AIM); MEDLINE
- MeSH Terms:** Nutrition Policy\*  
Vitamin D\*/administration & dosage  
Vitamin D\*/adverse effects  
Bone Density Conservation Agents/\*administration & dosage  
Bone and Bones/\*metabolism  
Vitamin D Deficiency/\*prevention & control  
Bone Density Conservation Agents/adverse effects; Dietary Supplements; Evidence-Based Medicine; Female; Food, Fortified; Humans; Hypercalcemia/chemically induced; Hypercalcemia/prevention & control; Male; Maximum Tolerated Dose; No-Observed-Adverse-Effect Level; Nutritional Requirements; Risk Assessment; United States; Vitamin D Deficiency/complications; Vitamins/administration & dosage; Vitamins/adverse effects
- Abstract:** The objective of this review was to apply the risk assessment methodology used by the Food and Nutrition Board (FNB) to derive a revised safe Tolerable Upper Intake Level (UL) for vitamin D. New data continue to emerge regarding the health benefits of vitamin D beyond its role in bone. The intakes associated with those benefits suggest a need for levels of supplementation, food fortification, or both that are higher than current levels. A prevailing concern exists, however, regarding the potential for toxicity related to excessive vitamin D intakes. The UL established by the FNB for vitamin D (50 microg, or 2000 IU) is not based on current evidence and is viewed by many as being too restrictive, thus curtailing research, commercial development, and optimization of nutritional policy. Human

clinical trial data published subsequent to the establishment of the FNB vitamin D UL published in 1997 support a significantly higher UL. We present a risk assessment based on relevant, well-designed human clinical trials of vitamin D. Collectively, the absence of toxicity in trials conducted in healthy adults that used vitamin D dose  $\geq$  250 microg/d (10,000 IU vitamin D<sub>3</sub>) supports the confident selection of this value as the UL.

**Number of** 99  
**References:**  
**Substance** 0 (Bone Density Conservation Agents)  
**Nomenclature:** 0 (Vitamins)  
1406-16-2 (Vitamin D)  
**Entry Dates:** *Date Created: 20070108 Date Completed: 20070215*  
**Update Code:** 20101124  
**PMID:** 17209171  
**Database:** MEDLINE

**Record: 1**

- Title:** Comparisons of estimated economic burdens due to insufficient solar ultraviolet irradiance and vitamin D and excess solar UV irradiance for the United States.
- Authors:** Grant WB; Garland CF; Holick MF
- Author Address:** Sunlight, Nutrition and Health Research Center (SUNARC), 2107 Van Ness Avenue, Suite 403B, San Francisco, CA 94109-2529, USA. wgrant@sunarc.org
- Source:** Photochemistry And Photobiology [Photochem Photobiol] 2005 Nov-Dec; Vol. 81 (6), pp. 1276-86.
- Publication Type:** Comparative Study; Journal Article; Research Support, N.I.H., Extramural; Research Support, Non-U.S. Gov't
- Language:** English
- Journal Information:** *Country of Publication:* United States *NLM ID:* 0376425 *Publication Model:* Print *Cited Medium:* Print *ISSN:* 0031-8655 (Print) *Linking ISSN:* 00318655 *NLM ISO Abbreviation:* Photochem. Photobiol. *Subsets:* MEDLINE
- MeSH Terms:** Cost of Illness\*  
Health Expenditures\*  
Ultraviolet Rays\*/adverse effects  
Vitamin D/\*physiology  
Cataract/economics; Dietary Supplements; Great Britain; Humans; Keratosis/economics; Melanoma/economics; Melanoma/etiology; Multiple Sclerosis/economics; Neoplasms/economics; Neoplasms/etiology; Osteoporosis/economics; Risk Reduction Behavior; Skin Neoplasms/economics; Skin Neoplasms/etiology; Sunlight; United States; Vitamin D/pharmacology
- Abstract:** Vitamin D sufficiency is required for optimal health, and solar ultraviolet B (UVB) irradiance is an important source of vitamin D. UVB and/or vitamin D have been found in observational studies to be associated with reduced risk for over a dozen forms of cancer, multiple sclerosis, osteoporotic fractures, and several other diseases. On the other hand, excess UV irradiance is associated with adverse health outcomes such as cataracts, melanoma, and nonmelanoma skin cancer. Ecologic analyses are used to estimate the fraction of cancer mortality, multiple sclerosis prevalence, and cataract formation that can be prevented or delayed. Estimates from the literature are used for other diseases attributed to excess UV irradiation, additional cancer estimates, and osteoporotic fractures. These results are used to estimate the economic burdens of insufficient UVB irradiation and vitamin D insufficiency as well as excess UV irradiation in the United States for these diseases and conditions. We estimate that 50,000-63,000 individuals in the United States and 19,000-25,000 in the UK die prematurely from cancer annually due to insufficient vitamin D. The U.S. economic burden due to vitamin D insufficiency from inadequate exposure to solar UVB irradiance, diet, and supplements was estimated at \$40-56 billion in 2004, whereas the economic burden for excess UV irradiance was estimated at \$6-7 billion. These results suggest that increased vitamin D through UVB irradiance, fortification of food, and supplementation could reduce the health care burden in the United States, UK, and elsewhere. Further research is required to confirm these estimates.
- Grant Information:** AR3696312 United States AR NIAMS NIH HHS; M01RR00533 United States RR NCRR NIH HHS
- Substance Nomenclature:** 1406-16-2 (Vitamin D)
- Entry Dates:** *Date Created:* 20051215 *Date Completed:* 20060609 *Latest Revision:* 20071114

**Record: 1**

**Title:** An estimate of the economic burden and premature deaths due to vitamin D deficiency in Canada.

**Authors:** Grant WB; Schwalfenberg GK; Genuis SJ; Whiting SJ

**Author Address:** Sunlight, Nutrition, and Health Research Center (SUNARC), San Francisco, CA 94164-1603, USA.  
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**Source:** Molecular Nutrition & Food Research [Mol Nutr Food Res] 2010 Aug; Vol. 54 (8), pp. 1172-81.

**Publication Type:** Journal Article; Research Support, Non-U.S. Gov't; Review

**Language:** English

**Journal Information:** *Country of Publication:* Germany *NLM ID:* 101231818 *Publication Model:* Print Cited Medium: Internet *ISSN:* 1613-4133 (Electronic) *Linking ISSN:* 16134125 *NLM ISO Abbreviation:* Mol Nutr Food Res *Subsets:* MEDLINE

**MeSH Terms:** Health Care Costs\*  
Mortality\*  
Vitamin D/\*administration & dosage  
Vitamin D/\*physiology  
Vitamin D Deficiency/\*economics  
Vitamin D Deficiency/\*physiopathology  
25-Hydroxyvitamin D  
2/blood; Adult; Calcifediol/blood; Canada/epidemiology; Child; Female; Humans; Infant; Male; Nutrition Policy; Pregnancy; Vitamin D Deficiency/epidemiology; Vitamin D Deficiency/prevention & control

**Abstract:** The objective of this work is to estimate the economic burden and premature death rate in Canada attributable to low serum 25-hydroxyvitamin D (25(OH)D) levels. Vitamin D deficiency has been linked to many diseases and conditions in addition to bone diseases, including many types of cancer, several bacterial and viral infections, autoimmune diseases, cardiovascular diseases, and adverse pregnancy outcomes. Canadians have mean serum 25(OH)D levels averaging 67 nmol/L. The journal literature was searched for papers reporting dose-response relationships for vitamin D indices and disease outcomes. The types of studies useful in this regard include randomized controlled trials, observational, cross-sectional, and ecological studies, and meta-analyses. The mortality rates for 2005 were obtained from Statistics Canada. The economic burden data were obtained from Health Canada. The estimated benefits in disease reduction were based on increasing the mean serum 25(OH)D level to 105 nmol/L. It is estimated that the death rate could fall by 37,000 deaths (22,300-52,300 deaths), representing 16.1% (9.7-22.7%) of annual deaths and the economic burden by 6.9% (3.8-10.0%) or \$14.4 billion (\$8.0 billion-\$20.1 billion) less the cost of the program. It is recommended that Canadian health policy leaders consider measures to increase serum 25(OH)D levels for all Canadians.

**Substance** 1406-16-2 (Vitamin D)  
**Nomenclature:** 19356-17-3 (Calcifediol)  
21343-40-8 (25-Hydroxyvitamin D 2)

**Entry Dates:** *Date Created:* 20100810 *Date Completed:* 20101130

**Update Code:** 20101209

**PMID:** 20352622

**Database:** MEDLINE

## Take Magnesium AND Vitamin D To Avoid Vitamin D Side Effects

If you are taking Vitamin D, it's important that you understand the **Magnesium and Vitamin D** connection in order to avoid vitamin d side effects and to maximize absorption.

Nutrients don't work alone, and when it comes to taking vitamin d, it's important that you take magnesium and vitamin d together and not JUST vitamin d alone in large doses as this can lead to what people **BELIEVE** are vitamin d side effects, but are really just magnesium deficiency symptoms that have been induced because of how vitamin d 'uses up' magnesium in its conversion to its 'active form' in the bloodstream from supplements and sunlight.

This is a **BIG** problem because as more and more people, and their doctors, begin to realize the amazing health benefits that Vitamin D has to offer and to understand the seriousness of the long term Symptoms of Vitamin D Deficiency, more people are taking vitamin d with the effect of there being an increase in people having these so called 'vitamin d side effects'.

But what is **Not** being addressed by health care practitioners, however, is that many of these 'Vitamin D Side Effects' are not problems with the vitamin d, but are problems with not getting enough magnesium! There would be a significant reduction in problems with taking vitamin d if only people would take magnesium and vitamin d were taken **TOGETHER**.

Part of this problem is that nearly as many people have undiagnosed magnesium deficiencies as do people with vitamin d deficiencies. And unfortunately, blood Magnesium Levels are virtually worthless and can't tell you if you really are magnesium deficient!

In fact, Signs of Magnesium Deficiency are SO prevalent that Dr. Carolyn Dean calls this problem an 'Epidemic'. And if you have even a **MILD** unrecognized magnesium deficiency, your Signs of Magnesium Deficiency are going to be amplified greatly when vitamin d is taken- particularly in the large doses commonly used for vitamin d deficiency treatment. And this is creating some uncomfortable Side Effects of Vitamin D that are actually **NOT** problems with taking vitamin d itself, but symptoms of an induced magnesium deficiency!

Some of the problems being experienced by those taking vitamin D are: • Headaches

- Insomnia
- Jitteriness
- Muscle Cramps
- Anxiety
- Heart Palpitations
- Constipation

All of which are exactly the same as Signs of Magnesium Deficiency!! While certainly there are always going to be those who simply can't tolerate taking Vitamin D Supplements for one reason or another, the good news is that the vast majority of these problems can be

cleared up or easily prevented by being sure to take magnesium, in a dosage that is outlined on the [Magnesium Dosage](#) page, along with your vitamin d. This is equally true of those who get their vitamin d from the sun as well.

### **Vitamin D Absorption Problems** **How Magnesium and Vitamin D Work Together**

Since magnesium is required for the conversion of vitamin d into its active form, it's also true that taking vitamin d may not raise [Vitamin D Blood Levels](#) in those who are magnesium deficient!! Be sure that you read this again and understand this magnesium and vitamin d interrelationship:

- Magnesium is 'Used Up' when Vitamin D is converted into its active form in the blood
- Magnesium is 'Required' to convert Vitamin D into its active form in the blood

It works **BOTH ways**. Magnesium is not JUST depleted, but you won't convert vitamin d unless you have enough magnesium in order to allow vitamin d to **BE** converted!! In many cases where large doses of vitamin d are taken but the vitamin d level does not come up, both the person deficient and their doctor believe that they are having Vitamin D Absorption problems. This ends up causing:

- 1) A lot of fear that an underlying serious medical problem exists
- 2) Unnecessarily high dosages of Vitamin D are often taken causing worsening of the magnesium deficiency
- 3) Thousands and sometimes tens of thousands of dollars are spent in unnecessary medical testing to find the 'absorption' problem
- 4) The underlying magnesium deficiency is often never found and addressed because testing for magnesium levels is not a useful test to determine need for that nutrient

Unlike drugs, nutrients are 'synergistic' and interconnected with each other. Especially in the case of *Magnesium and Vitamin D* it's EXTREMELY important that you take magnesium if you are taking vitamin d on a regular basis.