

The benefits of Vitamin D

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Types of Vitamin D

- D – steroid hormone precursor
- D2 – plant derived
- D3 – animal derived
- Calcitriol – The drug name for Vitamin D used in severe Vitamin D deficiency.

Vitamin D deficiency

- Rickets
- Osteomalacia
- RDA – 400 IU – used to prevent rickets
- Is this enough for wellness?

Risk factors for Vitamin D deficiency

- Exclusively breast fed infants
- Older adults
- Limited sun exposure
- Dark skin
- Liver and kidney disease
- Obesity
- Inflammatory bowel disease

Sources of Vitamin D

- Sunshine – 20 minutes full body exposure = 200 IU (sunburn = 100,000)
- Mushrooms
- Fish liver
- Eggs
- Tanning lamps
- Fortified foods – milk, cereals

Production of Vitamin D

- Produced in the skin in response to UV rays
- Determined by melanin content
- Melanin is a UV filter
- Converted to the active form in liver and kidneys

Factors interfering with Vitamin D production

- Cloud cover reduces production by 50%
- Smog reduces by 60%
- Blocked by sunscreen SPF 8 or higher
- Season
- Latitude

Absorption of Vitamin D

- Fat soluble vitamin
- Intestinal absorption best when taken with a fatty meal.
- Needs bile to be absorbed

What causes a Vitamin D deficiency?

- Lack of sunlight
- Dark skin
- Fat malabsorption
- Liver or Kidney disease

Common uses for Vitamin D

- Rickets
- Osteomalacia
- Osteoporosis

Less Commonly known uses for Vitamin D

- Cancer
- Auto-immune disease
- Alzheimer's disease
- Multiple Sclerosis
- Cardiovascular disease
- Proper immune system functioning

How does it function?

- Vitamin D receptor
- Located in the nucleus of the cell
- Turns cell regulating mechanisms on or off

Function of Vitamin D

- Increases absorption of Ca and Phos. in the intestine
- Increases Ca resorption in the kidneys
- Increases deposition of Ca in the bone long term
- Inhibits parathyroid secretion
- Inhibits the inflammatory response

Vitamin D and cancer

- Adequate Vitamin D leads to reduced
 - Colorectal cancer
 - Breast cancer
 - Prostate cancer
- Induces cell death in cancer cells
- Regulates cell growth, differentiation, and programmed cell death

Cancer statistics

- Inverse association between sun exposure, Vitamin D and risk of developing or surviving cancer
- 1,000 IU daily reduced
 - Colorectal cancer 50%
 - Breast and ovarian 30%
 - 77% fewer cancers overall
 - Pancreatic cancer 43%

Immune effects of Vitamin D

- Vitamin D receptors present in almost all immune cell types
- Increases phagocytosis
- Increases anti-tumor activity
- Increases natural production of anti-microbial compounds
- Modulates the immune response – enhancing and suppressing where needed

Cardiovascular disease & Vitamin D

- Deficiency associated with increased risk of high blood pressure
- 62% increased risk for a cardiovascular event with low Vitamin D levels
- Low Vitamin D associated with
 - High triglycerides
 - Impaired insulin metabolism

Vitamin D and aging

- Low Vitamin D associated with
 - Cancer, diabetes, hypertension
- Increased risk of age related disease
- Low Vitamin D increases the rate of cell division

Normal levels of D

- Normal range 20-80 ng/ml
- Healthy range 40-60 ng/ml
- Toxicity range 200 ng/ml

Vitamin D toxicity

- Has a half life of 20-29 days
- Maximum production via sunlight = 100,000 IU per day
- Safe upper limit is 10,000 IU per day
- Toxicity happens with dose over 40,000 IU per day
- Safe upper limit for children 2,000 IU per day