



Vitamin D Deficiency

What is Vit D and what does it do?

- A fat-soluble vitamin
- Helps to absorb dietary Ca/Phos from intestines
- Suppresses release of PTH, which causes bone resorption
- Keeps Ca/Phos levels in blood normal

SYMPTOMS

- “Subclinical” Vitamin D deficiency – low Vit D level without signs/symptoms
- Nonspecific musculoskeletal pain or weakness

COMPLICATIONS

- decrease in blood calcium and phosphate levels
- Elevated parathyroid hormone (PTH) – accelerates bone resorption
- Reduced bone density
- Increased risk of falls, and possibly fractures

Any more complications?

Possibly!!

Research *SUGGESTS*:

Vitamin D can play a role in the prevention and treatment of many conditions.

These include Diabetes Type 1 and 2, HTN, cardiovascular disease, autoimmune disease (RA/MS), breast/colon/prostate cancer, cognitive impairment in older adults, asthma, impaired immunity.....

Sources of Vitamin D

- Made in the skin when exposed to UVB light
- Foods (20%)
- Supplements

Amount of sunlight varies depending upon:

- Age
- Skin color
- Season
- Latitude
- Sunscreen
- Extensive burns

Foods that contain Vit D

- Cod liver oil (1tbs = 1360 IU) **Caution re: high doses of Vit A
- Tuna/Mackerel/Salmon (3oz = 800 IU)
- Milk/orange juice/cereals/yogurt (8oz milk = 100 IU)
- Egg yolks
- Beef liver
- Mushrooms

Causes of Vit D Deficiency

- Inadequate intake of Vitamin D in diet
- Inadequate sun exposure
- Inability to process Vit D due to kidney or liver disease
- Diseases or surgeries that affect intestinal tract (celiac dz, Crohn's dz, cystic fibrosis, gastric bypass, peptic ulcer resection)
- Obesity

- DRUGS that induce the p-450 enzyme pathway: Dilantin, Phenobarbital, Tegretol, Theophylline, Rifampin

DIAGNOSIS

- Blood test called 25-hydroxyvitamin D, (25OHD) = calcidiol, the major circulating form of Vit D and the best estimate of Vit D sufficiency
- No consensus on optimal concentration!

DIAGNOSIS

- **NORMAL:** 25OHD 30-100 ng/mL
- **INSUFFICIENCY:** 20-30 ng/mL
- **DEFICIENCY:** <20 ng/mL

WHO NEEDS TESTING?

- Not recommended for everyone
- Home-bound or long-term care facility
- Medical conditions that increase risk
- Osteoporosis
- History of low-trauma fracture
- Low blood calcium or phosphate

TREATMENT

- Two commonly available supplements:

Vit D2 (ergocalciferol)

Vit D3 (cholecalciferol) – naturally occurring form, may raise levels more effectively

DOSING

- Depends on nature/severity of deficiency
- If level $<20\text{ng/mL}$, 50K IU once/wk for 8-12 wks, then 800-1000 IU daily thereafter
- If level $20\text{-}30\text{ng/mL}$, 800-1000 IU D3 daily, some need higher doses
- If normal, 600 IU daily (800 IU daily at age 70+)

How much is too much?

- Much controversy
- (2010) Institute of Medicine defined safe upper limit of for Vit D intake as 4000 IU/day.

SIDE EFFECTS

- Uncommon, but avoid taking multiple products that contain Vit D
- High blood calcium levels, kidney stones

What we know for sure...

