



VITAMIN D

Scientific Names: *cholecalciferol, ergocalciferol*

Common Names: *vitamin D3, vitamin D2*

Effectiveness: Currently recommended to reduce risk of osteoporosis, especially if taking corticosteroids (such as prednisone).

Safety: Generally well tolerated if taken orally and within recommended doses.

What is vitamin D?

- Vitamin D is a fat-soluble vitamin naturally produced in the body. It is produced in the skin in an inactivated form (precursor) when the skin is exposed to sunlight. The produced vitamin D precursor is called vitamin D3 (cholecalciferol). It is then changed (metabolized) in the liver and the kidney to the active form (calcitriol).
- Vitamin D2 (ergocalciferol) is mainly derived from plant sources. It can also be found in egg yolk; fatty fish such as salmon, tuna, and sardines; and fortified foods.
- Over the counter vitamin D supplements contain vitamin D3. Vitamin D2 is a prescription only product (alfacalcidol) in Canada.

What is the recommended dose?

- The Health Canada recommendations for daily vitamin D intake for adults with minimal sun exposure range between 600 to 800 units.
- The Dietitians of Canada also provide an easy-to-read list of common foods that are rich in vitamin D.
- On a sunny day, your body generally produces enough vitamin D with only a few minutes of sun exposure to an area of the skin equivalent to your face, arms, and hands.
- However, you should still wear sunscreen and avoid prolonged UV exposure, especially tanning beds, due to the increased risk of skin cancers.

What it is it used for in people with rheumatic conditions?

- Bone loss is a natural aging process. Patients with rheumatic conditions may experience faster bone loss leading to bone weakness (osteoporosis) and fractures.
- Some medications used in rheumatic conditions such as prednisone and methotrexate can further reduce the strength of bones. Use of glucocorticosteroids is associated with reduction in vitamin D levels.
- Adequate vitamin D is therefore recommended to maintain healthy bone density.

How is it thought to work?

- Vitamin D is important to regulate absorption of calcium from the digestive system.
- Vitamin D also regulates the minerals calcium and phosphorus in the body (by impacting the production of parathyroid hormone). Vitamin D has an important role in maintaining proper bone structure.

Does it Work? What the Science Says:

Not taking glucocorticosteroid: 600 – 800 units / day

- Health Canada currently recommends 600 units of vitamin D in healthy adults younger than 70 years of age and 800 units for adults over 70.
- Studies have demonstrated that vitamin D given together with calcium reduces the risk of osteoporosis, fractures, and bone mineral density loss, especially in postmenopausal women.
- Taking vitamin D supplement is recommended, especially if sun exposure is minimal.

Taking glucocorticosteroid: 800 – 1000 units / day

- American College of Rheumatology recommends 800 – 1,000 units of vitamin D3 / day in patients taking corticosteroids.
- Studies suggest that vitamin D supplements, together with calcium, modestly reduce loss of bone mineral density in patients taking corticosteroids.
- However, only alfacalcidol, an active vitamin D analogue and prescription only product, is demonstrated to reduce risk of vertebral fractures. Some studies also suggest that alfacalcidol may be more effective than vitamin D3 in preserving bone mineral density
- Taking vitamin D supplements while on corticosteroid therapy is recommended, especially if sun exposure is minimal.

- Alfacalcidol may provide more benefit than vitamin D3 or D2, but is associated with higher risk of adverse effects and greater cost.

Osteoporosis: 800 – 2000 units / day

- Osteoporosis Canada recommends calcium and vitamin D (from diet or supplement) as adjunct to osteoporosis treatment.
- It is recommended adults with osteoporosis supplement with 800 – 2000 units of vitamin D3.
- Calcium and vitamin D should not be used as the sole treatment of osteoporosis.
- Some people (with conditions affecting vitamin D absorption or with low vitamin D level) may require supplementation of > 1000 units / day

What are possible side effects and what can I do about them?

- Vitamin D supplements are generally well tolerated when used orally. The upper tolerable limit of vitamin D3, from all sources, in adults is 4000 units.
- Taking excess vitamin D may cause high blood calcium (hypercalcemia), which increases the risk of kidney dysfunction, kidney stones, osteoporosis, seizures, and hardening of blood vessels due to calcium deposits.

Interactions

With drugs:

- High blood calcium (hypercalcemia) caused by high dose of vitamin D intake may reduce the efficacy of some calcium channel blockers such as diltiazem (Cardizem®), Tiazac®) and verapamil (Isoptin®); this effect can also increase risk of digoxin (Lanoxin®) toxicity.
- Adult patients taking these drugs should be cautious not to exceed vitamin D3 2000 units per day.

Other diseases:

- In patients at increased risk of high blood calcium (hypercalcemia) vitamin D supplementation should be used with caution and under medical supervision only. Examples of increased risk would include patients with renal failure or hyperparathyroidism.

For more information about vitamin D consult your physician and pharmacist.