
VITAMIN D Fact Sheet [G]

Bottom Line:

Vitamin D supplementation may be beneficial in depression, but reserve its use for those who have low vitamin D levels, and make sure patients take adequate doses, in the range of 1000–5000 IU daily.

FDA Indications:

None.

Off-Label Uses:

Depression.

Dosage Forms:

Supplied over the counter as vitamin D2 and D3, as tablets, capsules, and softgels in “international units” (IU) dosing. We recommend D3: 1000 IU, 2000 IU, 5000 IU, 10,000 IU.

Dosage Guidance:

Dosing guidelines vary. For depression, use 1000–5000 IU per day.

Monitoring: Periodic vitamin D [25(OH)D] levels.

Cost: \$

Side Effects:

- Most common: Well tolerated.
- Serious but rare: Vitamin D toxicity possible but very rare.
- Pregnancy/breastfeeding: Considered safe.

Mechanism, Pharmacokinetics, and Drug Interactions:

- Thought to play a role in brain plasticity, neuroimmunomodulation, and inflammation.
- Metabolized by liver and kidneys; $t_{1/2}$: 12–50 days (varies based on level, source, dose, obesity, and race).
- No known significant interactions.

Clinical Pearls:

- Sources of vitamin D include exposure to sunlight, dietary intake, and supplements.
- It's difficult to obtain sufficient daily needs from dietary intake alone. Two types of vitamin D are obtained from dietary sources: D2 (ergocalciferol) from plant sources such as mushrooms and soy milk and D3 (cholecalciferol) from animal sources such as raw fish, mackerel, smoked salmon). D3 is approximately three times stronger than D2.
- Majority of vitamin D is produced through conversion of 7-dehydrocholesterol via ultraviolet B, after penetration of sunlight on the skin, to vitamin D3.
- Vitamin D is metabolized in the liver to 25-hydroxyvitamin D or 25(OH)D and then in the kidneys to its active form calcitriol, or 1,25-dihydroxyvitamin D. There is no consensus about the optimal total 25(OH)D level, which may vary with the assay used. Many labs report 25(OH)D level of 30–60 ng/mL as normal range, 21–29 ng/mL as insufficiency, and ≤ 20 ng/mL as deficiency.
- Several meta-analyses have found no beneficial effects of vitamin D supplementation on depression. When studies were limited to depressed patients with both vitamin D insufficiency at baseline and adequate dosing of supplementation (>800 mg/day), statistically significant benefits were seen.
- Studies in anxiety, psychosis, and dementia have not shown positive results of supplementation.

Fun Fact:

A number of things affect your vitamin D status, including how far away you live from the equator, the air quality in your community, your skin color, and your use of sunscreen.