

8. Medical supplements of calcium and vitamin D, when to take and how much?

Medical supplements of calcium and vitamin D should be given judiciously in safe amounts after careful consideration in light of the following reported medical observations:

- There is a high incidence of Osteoporosis in the USA and Northern Europe, where Vitamin D levels are lower for several months of the year due to lack of Sunlight. Food intake of calcium in these countries is twice as high as in South Asia (India). That sends a powerful public health message that high-dose calcium supplements without vitamin D do not help.
- High-dose calcium supplements, especially carbonate preparations of 1000 to 15000 mg/ day are irritating to the stomach and cause constipation. Digestive problems are a big reason why most people cannot take these calcium carbonate supplements long-term and quit in few weeks. Calcium supplements in high doses also increase the risk of heart attack by causing calcium deposits in the heart blood vessels. Additionally, these high-dose supplements can increase the risk of kidney stones.
- Vitamin D3 supplements in a dose of greater than 1000 units/ day are unnecessary and can lead to Vitamin D toxicity. Vitamin D blood levels greater than 70-100ng/ml can present as:

Nausea/ Vomiting, Dizziness

Confusion, Lethargy

Increased thirst and urination

- Extensive medical research suggests that calcium and vitamin D supplements increase bone density but may not prevent fractures. When given in high doses, these supplements carry the risk of side effects as outlined above.
- Vitamin D has several beneficial effects on the body, and normal vitamin D levels improve vitality, boost immunity, protect against many chronic

diseases by maintaining cellular health. In this respect, Vitamin D is considered a hormone and not merely a vitamin.

Calcium and vitamin D supplements should be prescribed in reasonable amounts while enhancing natural intake, as suggested in the following guidelines.

The guidelines for the safe Calcium and Vitamin supplementation

Whether the diagnosis is Osteopenia or Osteoporosis, the first step is patient education to enhance the natural intake of calcium, and Vitamin D. Adopt calcium-rich natural foods and sun exposure at least 3-4 times per week for 30-60 mins based on the color of the skin as outlined above.

Vitamin D supplements—First and foremost, Vitamin D testing for the blood levels is required only when medically indicated, such as:

- History of muscle weakness and bone pains
- Indoor lifestyle with no exposure to Sunlight
- Patients with digestive disorders
- Patients with kidney disease (kidney disease can lead to low vitamin D)
- Older age with Obesity, Type 2 Diabetes

Vitamin D blood levels lower than 12ng/ml require medical supplements. Daily supplementation with 800-1000 units of Vitamin D3 is a safe option compared to intermittent high-dose therapy. High- 10,000 units weekly or 60,000 units monthly. The higher doses of Vitamin D3 (4-5000 units/day) should be given only for few weeks under close medical supervision with Vitamin D blood level monitoring. Aim for blood levels within 30-50 ng/ml. Levels higher than 70 ng/ ml should alert the physician to discontinue high-dose supplements.

Giving very high amounts of 60,000 units intermittently every month increases the risks of falls in the elderly. The falls are more likely during the high peaks in blood levels of Vitamin D. High-dose vitamin D therapy can also increase calcium levels in the body, with an increased risk for kidney stones.

The Vitamin D supplements available in the market are D2 plant-based- vegan) or D3 (animal-based or plant-based). Between the two preparations, D3 is preferable as it is more effective in raising the blood level of Vitamin D.

Good sources of Vitamin D supplements:

Plant Source of Vitamin D2 supplements- Mushrooms and Yeast

Animal Source of Vitamin D3 Supplements – Lamb lanolin from lamb wool

Plant source of Vitamin D3- Algae and lichen extracted Vitamin D3 suspended in olive oil or extra virgin coconut oil. The oil as a suspension vehicle is ideal because Vitamin D is a fat-soluble vitamin and oil fat promotes the absorption improving its bioavailability.

Calcium Supplements- Advocacy for high dose calcium supplements of 1000-1500 mg was started almost a decade ago by the National Institute of Health (NIH), USA. The current research does not support such high-dose calcium supplements for the reasons outlined above. Recommendations are that individuals get their calcium primarily from their diet rather than calcium supplements. The calcium supplements should be given to patients with insufficient dietary intake, particularly if they have Osteoporosis. When required, calcium supplements should be prescribed in much smaller doses of 500 mg/day in conjunction with 800-1000 units of vitamin D3 to optimize bone health. The smaller amounts of calcium and vitamin D3 are safe and better tolerated.

The calcium preparation in the supplement does matter significantly. Intestinal absorption of calcium citrate is 25% better than calcium carbonate. Calcium citrate has the additional benefit that it can be taken on an empty stomach. On the other hand, calcium carbonate is dependent on stomach acidity for its absorption, so it has to be taken with food. Additionally, calcium carbonate takes a longer time to clear the stomach.

Keep in mind that acid reflux medications such as Nexium, Prilosec, etc., will interfere with the absorption of calcium by altering the acidity in the stomach.