

Can too much vitamin D be harmful? Yes, it certainly can - though anything can be toxic in excess, even water. As one of the safest substances known to man, vitamin D toxicity is very rare. In fact, people are at far greater risk of [vitamin D deficiency](#) than they are of vitamin D toxicity.

What is vitamin D toxicity?

Vitamin D toxicity is a condition where blood serum concentrations of vitamin D's storage form, 25(OH)D or [calcidiol](#), become too high, causing adverse systemic effects.

How it happens



There is no risk of vitamin D toxicity due to sun exposure.

Because the body has a built in mechanism for preventing toxicity with vitamin D produced in the skin, there is no risk of vitamin D toxicity due to ultraviolet-B (UVB) exposure - whether from the Sun or a tanning bed.

Supplemental vitamin D bypasses this built-in protection and, if excessive amounts are consumed over a period of time, 25(OH)D blood levels can reach a point where toxicity is possible.

Toxic doses

What exactly constitutes a toxic dose of vitamin D has yet to be determined, though it is possible this amount may vary with the individual.

Published cases of toxicity, for which serum levels and dose are known, all involve intake of ≥ 40000 IU (1000 mcg) per day.¹ Two different cases involved intake of over 2,000,000 IU per day - both men survived.^{2 3}

Serum levels: upper limit and toxicity threshold

Upper limit for a substance is the amount up to which is considered safe and without risk of adverse effects in the majority of the population.

Toxicity threshold for a substance is the amount beyond which over-saturation occurs and symptoms of toxicity manifest.

These values for 25(OH)D are as follows:

- Toxicity threshold level - 200-250 ng/mL (500-750 nmol/L) [4](#) [5](#) [6](#) [7](#) [8](#)
- Upper limit - 100 ng/mL (250 nmol/L)

The large range between 25(OH)D's [upper limit](#) and its threshold value implies a degree of safety at serum levels up to 100 ng/mL (250 nmol/L), since concentrations twice this amount have yet to ever be associated with toxicity. [4](#)

In animal models, serum concentrations have reached as high as 400-700 ng/mL (1,000-1750 nmol/L) before toxic effects (severe [hypercalcemia](#)) were observed. [8](#) [9](#)

Symptoms: toxicity and overdose



blood [calcium](#).

Signs of vitamin D toxicity are high urine and

The first sign of vitamin D toxicity is hypercalcuria (excess [calcium](#) in the urine) followed by [hypercalcemia](#) (high blood [calcium](#)). The following symptoms may present:

- nausea
- vomiting
- poor appetite
- constipation (possibly alternating with diarrhea)
- weakness
- weight loss

- tingling sensations in the mouth
- confusion
- heart rhythm abnormalities

The immediate symptoms of vitamin D overdose are:

- abdominal cramps
- nausea
- vomiting

What to do if you think you are vitamin D toxic



Vitamin D is not toxic when used in the amounts Nature intended.

It is fairly difficult to become toxic using vitamin D3. If you think you may be toxic because you are having an adverse reaction to vitamin D but you have not been using excessive amounts like those described above, your symptoms could be due to reasons other than toxicity.

Test serum levels

First thing is to stop supplementation, then have your physician help you determine if you are toxic by testing your 25(OH)D levels. This is the same test used to determine vitamin D deficiency.

Rule out other possibilities

If results indicate levels lower than 200-250 ng/mL (500-750 nmol/L), you are most likely

not toxic. In this case, the reaction you experienced may be a result of:

1. An underlying [magnesium](#) deficiency. This is the most common reason for symptoms brought on by using vitamin D.
2. Vitamin D hypersensitivity due to pre-existing high blood [calcium](#) (hypercalcemia). Often mistaken for vitamin D toxicity, [hypercalcemia](#) is a rare condition usually caused by one of the following:
 - primary hyperparathyroidism (most common cause)
 - sarcoidosis
 - granulomatous TB
 - some cancers

If toxic, reduce serum levels

If the results show a serum 25(OH)D level of 200-250 ng/mL (500-750 nmol/L) or more, you could be toxic. The following measures should be taken until vitamin D levels return to normal:

1. avoidance of direct sunlight exposure
2. avoidance of foods and supplements containing vitamin D
3. restriction of [calcium](#) intake
4. drinking 8 glasses of water daily

Once 25(OH)D levels have normalized, sunlight exposure and/or vitamin D supplementation can be resumed, taking care not to overdo it.

In most cases, vitamin D toxicity can be corrected without lasting problems, provided the body has not remained in a hypercalcemic state for too long. [Hypercalcemia](#) has the potential to cause soft tissue calcification, resulting in deposits of [calcium](#) crystals in the heart, lungs, and/or kidneys. With prolonged [hypercalcemia](#), permanent damage is possible if calcification is severe enough.

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