

KNOW “D” NUMBER



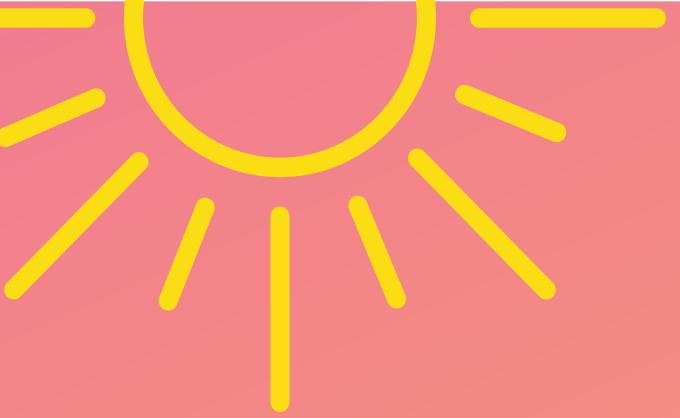
GrassrootsHealth
Nutrient
Research Institute

Moving Research Into Practice

Patient and Provider Guide
to Understanding
Vitamin D, Testing & Results

YOUR VITAMIN D
LEVEL

40
ng/ml



What is Vitamin D?

Vitamin D, which is both a nutrient and a hormone, is needed by virtually every cell in the body and is essential for hundreds of processes each and every day. It acts as a regulator of all cell types, tissues, and organs, and enhances the functioning of each system of the body to help keep us healthy.

Why do we need Vitamin D?

Every tissue in our bodies needs vitamin D and may be impaired if we do not get enough. In its most extreme forms, vitamin D deficiency results in rickets in children and osteomalacia (bone softening) in adults. Milder degrees of deficiency are now understood to be among the risk factors of a vast array of chronic diseases, including osteoporosis, impaired cognitive and immune function, various autoimmune diseases (such as diabetes and multiple sclerosis), several cancers (such as breast, colon, lung, lymphoma, and prostate), high blood pressure, pregnancy complications, and cardiovascular disease. The GrassrootsHealth panel of 48 Vitamin D scientists recommends a vitamin D blood level (measured as 25(OH)D) in the range of 40-60 ng/ml (100-150 nmol/L) for disease prevention.

Vitamin D deficiency has been linked to:

BRAIN

Depression & Anxiety, Schizophrenia, Alzheimer's Disease, ADHD & Autism

CIRCULATORY

High Blood Pressure, Peripheral Artery Disease, Coronary Heart Disease, Atrial Fibrillation

RESPIRATORY

Colds & Flu, Pneumonia & Acute Respiratory Distress Syndrome (ARDS), Asthma, Tuberculosis

MUSCLE

Neuromuscular Pain, Weakness, Injury

BONE

Rickets, Osteoporosis, Fracture

AUTO-IMMUNE

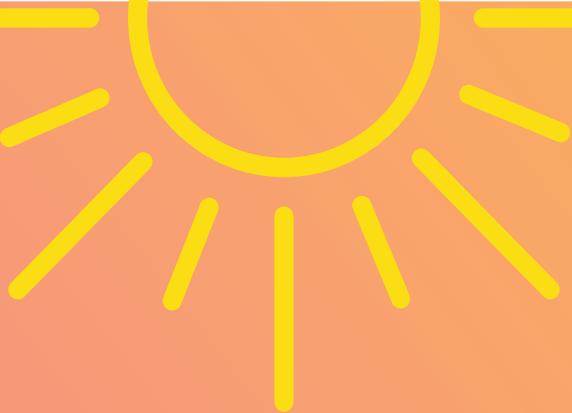
Diabetes, Crohn's Disease, Cancer, Multiple Sclerosis, Psoriasis

REPRODUCTIVE

Infertility, Preterm Birth & Prenatal Complications

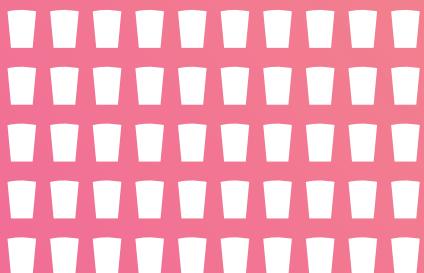


How do you get Vitamin D?



People obtain vitamin D from three sources: sun exposure, food sources, and supplements. In the past, humans achieved the optimal vitamin D blood level of 40-60 ng/ml (100-150 nmol/L) living a nomadic lifestyle. However, most modern humans are not able to reach optimal blood levels with the occasional sun exposure and food sources typical of modern day living without supplementation.

50



glasses of milk

OR

10



pieces of salmon

=

5000 IU

from a supplement source

Can Vitamin D deficiency also indicate a “Sunshine Deficiency”?

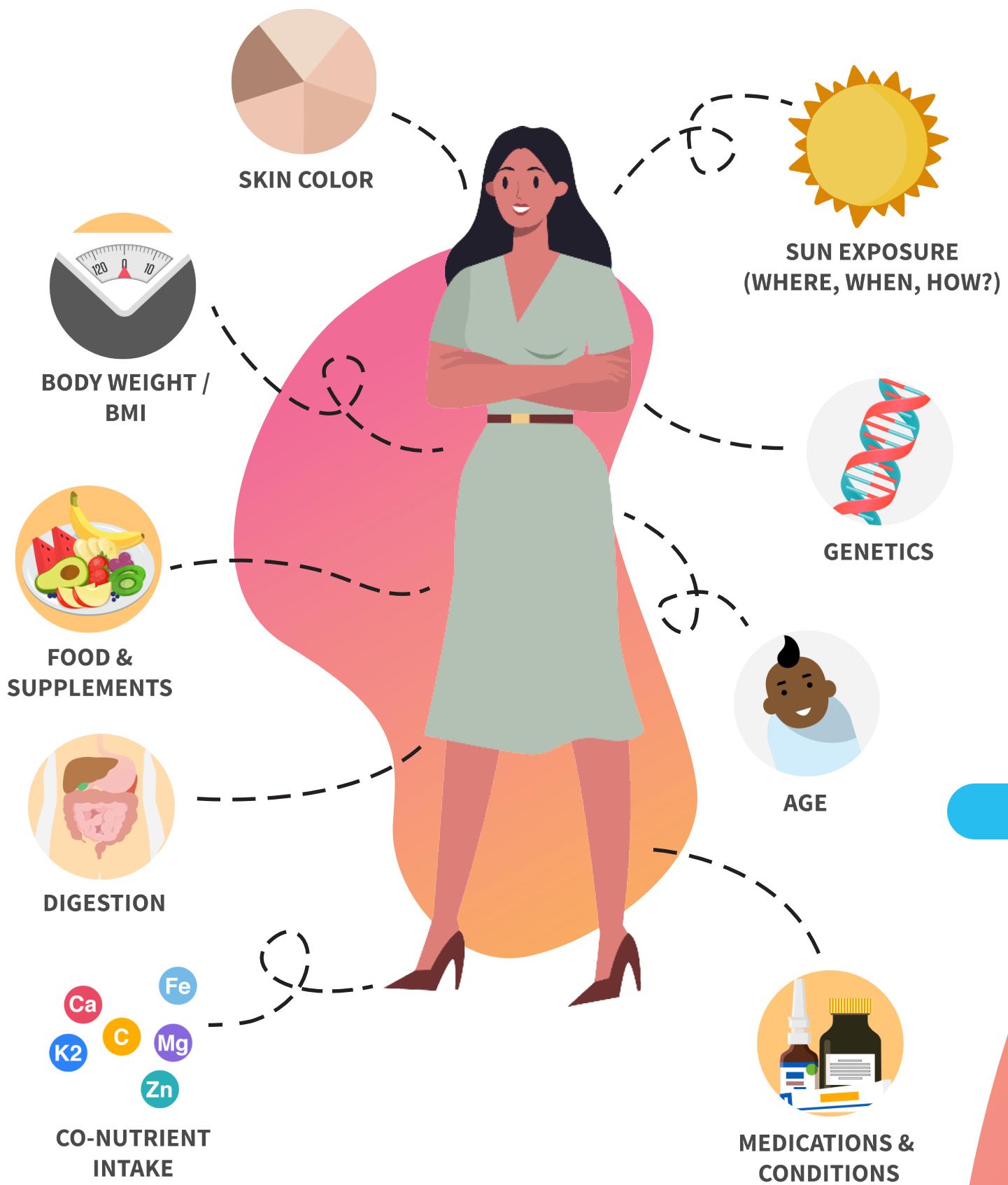
YES! Your vitamin D level is one way to tell if you are getting enough sunshine, especially if not taking vitamin D supplements. Sunshine has many benefits beyond vitamin D, and helps the body produce other important chemicals and nutrients, such as nitric oxide and melatonin. Sunshine exposure also results in the production of serotonin and beta-endorphins, which promote mood enhancement and relaxation, relieve pain, and boost immunity. Proper sun exposure is a must, with the most important rule being “don’t burn!”

What factors can affect your Vitamin D level?

There are many factors that can influence your vitamin D response and it's important to understand what these factors are when taking steps to achieve your target vitamin D level.

Everyone responds differently to vitamin D... by up to 6 times for the same supplement amount! To help explain this phenomenon, it is possible for a supplemental intake of 4000 IU/ day to result in a serum level of 25 ng/ml (62.5 nmol/L) in one individual and 60 ng/ml (150 nmol/L) in another. Whether getting your vitamin D from the sun or a supplement, several factors can affect how much vitamin D is made, absorbed, or converted for use in the body, and determine how much vitamin D your cells may actually be getting on a daily basis. It is important to understand how these factors can influence your vitamin D response when taking steps to achieve your target vitamin D level.

Factors that can affect your Vitamin D level:



How can you know if you are Vitamin D deficient?

The only way to know is to measure your vitamin D level. The total 25(OH)D level is the accepted measure used to determine your current vitamin D status. Measuring vitamin D is essential to know if an individual is getting enough and how much additional vitamin D may be needed!

People who have current vitamin D deficiency may not have any symptoms or may experience any of the following symptoms: **lack of focus, dizziness, frequent infections, exhaustion, weakness, headaches, body pain, depression, and anxiety.**

FOR MORE INFORMATION

🔗 <https://www.grassrootshealth.net/blog/14-signs-vitamin-d-deficiency>

What other nutrients are important?

A major influence on how the body is able to respond to a specific nutrient is the status of its co-nutrients. Co-nutrients that are especially important to vitamin D include omega-3 fatty acids, magnesium, vitamin K2, calcium, boron, zinc, and B vitamins. It is essential to ensure an adequate supply of these nutrients through diet and/or supplementation.

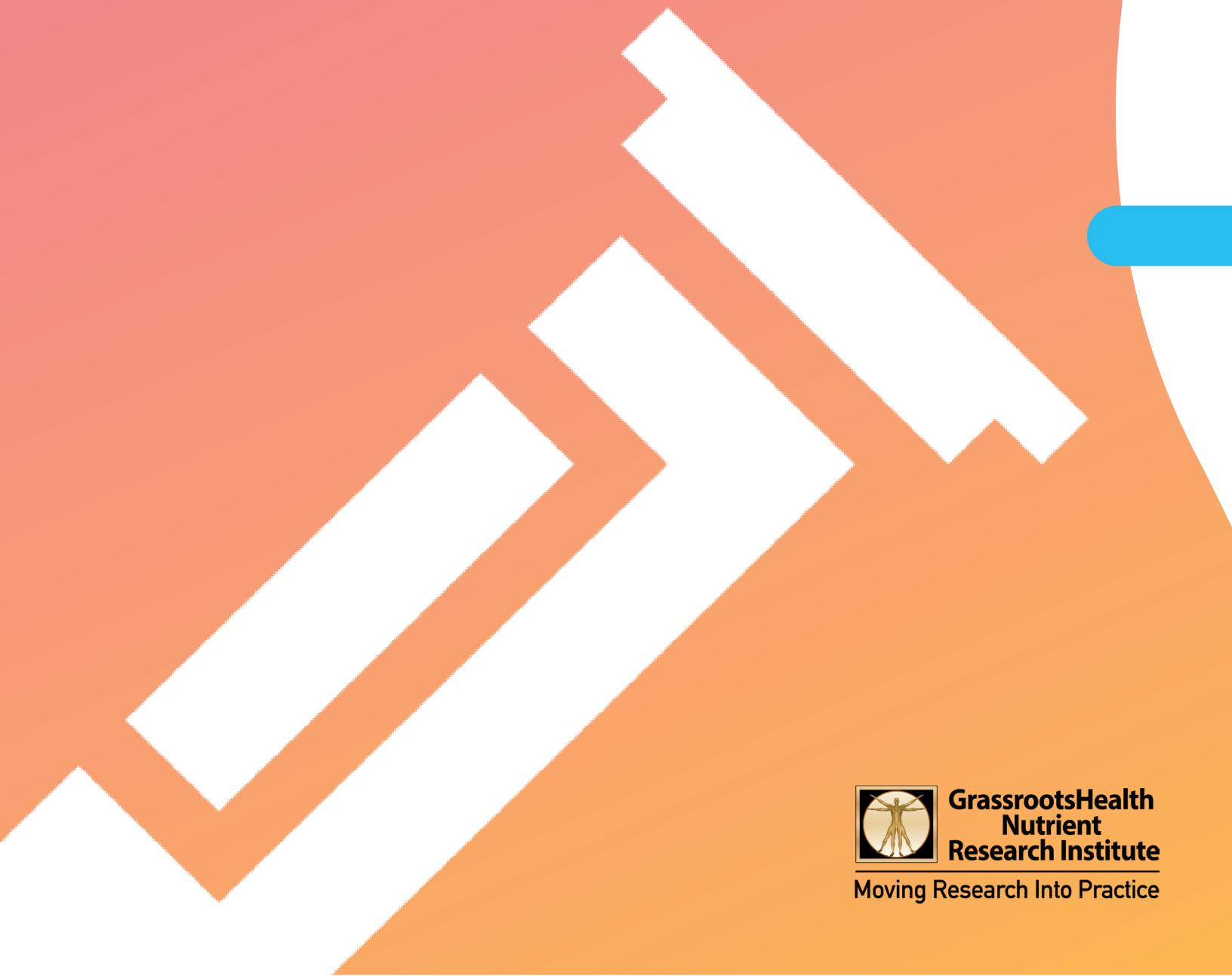
FOR MORE INFORMATION

🔗 <https://www.grassrootshealth.net/blog/science-speaks-vitamin-d-co-nutrients-important>

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Vitamin D Testing is
Essential!



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Total **25(OH)D** results will either be in **ng/ml** (for the United States and some other countries) or **nmol/L** (most of Europe and Canada). To convert ng/ml to nmol/L simply multiply by **2.5**.

How to convert ng/ml to nmol/L

$$\text{ng/ml} \times 2.5 = \text{nmol/L}$$

How to get your Vitamin D test results

If you were recently tested, identify your vitamin D test results.

- + Ask your provider's office or look in your healthcare eChart to find the test result [**total 25(OH)D level**] for your vitamin D blood test.

If you have not been tested, or if it has been more than 6 months since your last test, ask your provider for a vitamin D test. At home testing options are also available online.

- + Ask your health care provider's office to order a vitamin D blood test for you.
- + Home blood spot testing kits are available through **grassrootshealth.net** as part of participating in the D*action study. Learn more at **daction.org**.

The target blood level is in the range of:

40-60 ng/ml (100-150 nmol/L)

Higher Results (Greater than 100 ng/ml or 250 nmol/L)

While there is not sufficient evidence to support a vitamin D level over 100 ng/ml (250 nmol/L), toxicity is very rare and not a concern until a vitamin D level of 200 ng/ml or higher has been reached. If toxicity is a concern, blood or urine calcium levels should be measured immediately. In addition, if blood levels are above 200 ng/ml (500 nmol/L), the daily vitamin D dose should be cut by an amount depending on what the current vitamin D blood level is.

FOR MORE INFORMATION

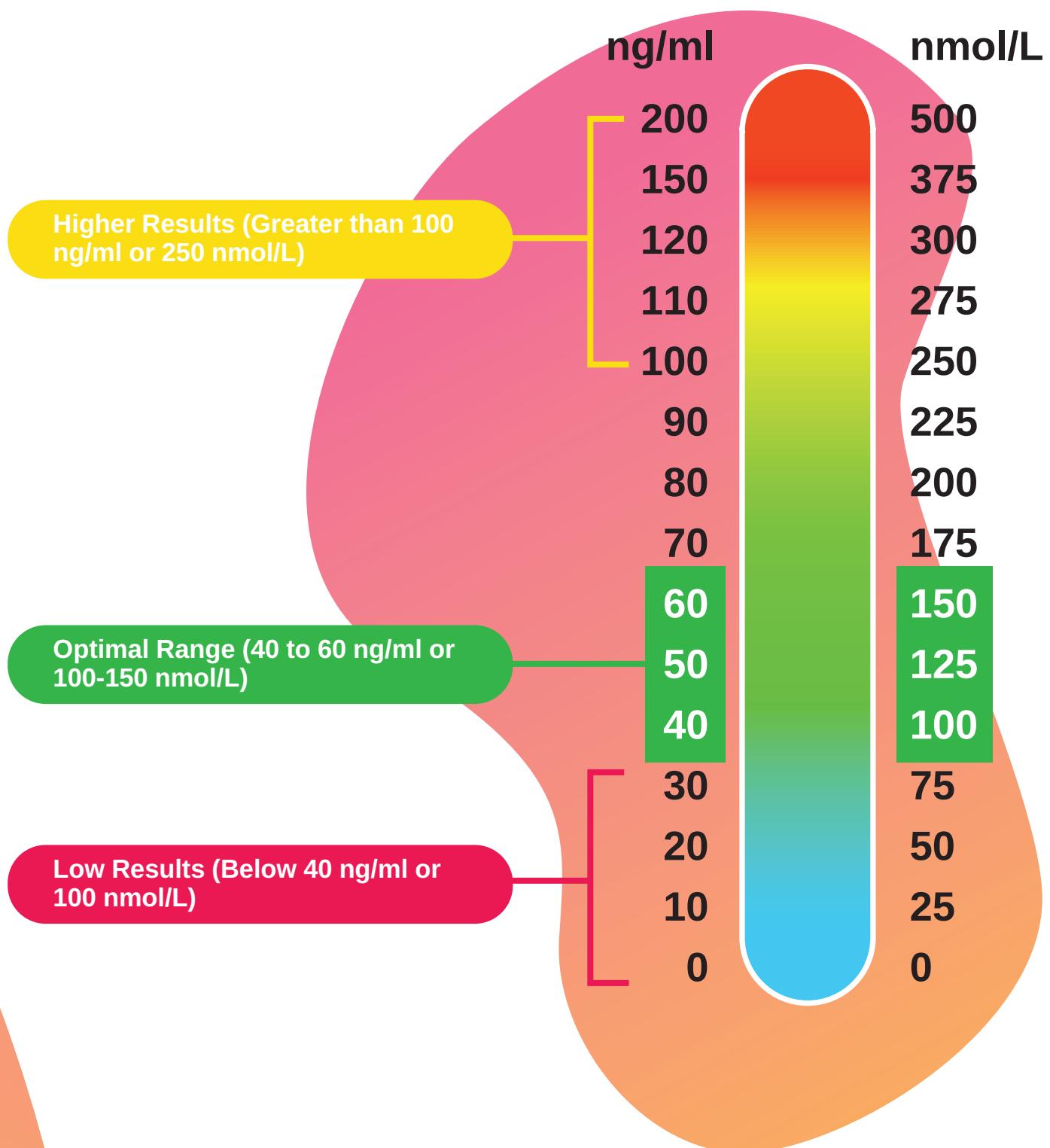
- 🔗 <https://www.grassrootshealth.net/blog/vitamin-d-level-higher-want/>
- 🔗 <https://www.grassrootshealth.net/document/vitamin-d-toxicity/>
- 🔗 <https://www.grassrootshealth.net/blog/vitamin-d-kidney-stones-myth/>

Optimal Range (40 to 60 ng/ml or 100-150 nmol/L)

Low Results (Below 40 ng/ml or 100 nmol/L)

If your vitamin D is below 40 ng/ml (100 nmol/L), it's time to fill your vitamin D tank!

How does your level compare? Are you high, low, or just right?



Supplementing with Vitamin D3 to Achieve Optimal Vitamin D Levels

First, based on your current vitamin D level, consider a loading dose to kick-start filling your vitamin D tank. This loading dose can be taken for the number of days suggested, followed by the daily maintenance dose below.

Loading Dose*

Loading Dose Protocol Following a Vitamin D Blood Test Below 40ng/ml		
Starting serum vitamin D level (ng/ml)	Loading Dose (IU)	Note
<10	50,000 IU per day x 6 days	
11-15	50,000 IU per day x 5 days	
16-20	50,000 IU per day x 5 days	
21-30	50,000 IU per day x 4 days	
31-39	50,000 IU per day x 2 days	

Maintenance (Daily) Dose*

Daily Dose Protocol following a Vitamin D Blood Test Below 40ng/ml			
Serum vitamin D level (ng/ml)	Daily Dose	Re-test vitamin D level at	Note
<10	7,000 - 10,000 IU	2-3 months	
11-15	6,000 - 9,000 IU	2-3 months	
16-20	6,000 - 8,000 IU	2-3 months	
21-30	5,000 - 7,000 IU	2-3 months	
31-39	3,000 - 5,000 IU	2-3 months	The dose should be taken daily in the morning with food.

*Doses calculated according to the D*calculator with an average weight of 150 lbs. and a target vitamin D serum level of 50 ng/ml. © GrassrootsHealth



D*Calculator

To further individualize vitamin D dosing options, use the vitamin D*calculator at <https://grassrootshealth.net/dccalculator>, which offers a more accurate calculation based on weight, current vitamin D level, and preferred target vitamin D level.

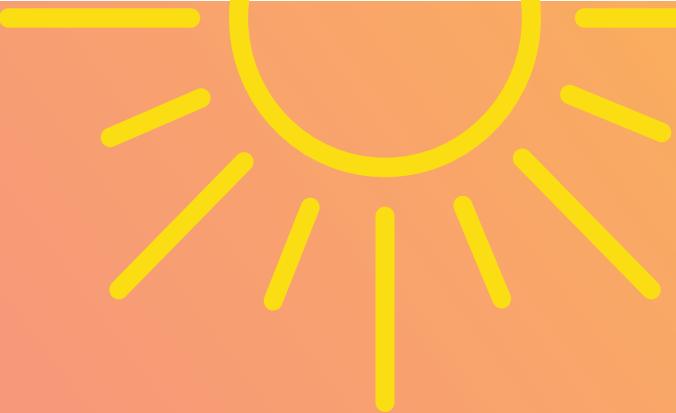
Follow-Up

After you have filled your vitamin D*Tank with the regimen above, schedule a follow-up test or appointment with your health care provider to retest your blood levels three months after the original test date.

Track your progress and repeat the process to keep your D*Tank full:

- 1 Test (every 3-6 months as needed)
- 2 Calculate a new dose to achieve the target level
- 3 Continue the daily supplementation regimen
- 4 Intentionally incorporate a healthy sun exposure routine
- 5 Maintain a healthy diet to maximize your vitamin D absorption

REFERENCES



Dudenkov DV, Yawn BP, Oberhelman SS, Fischer PR, Singh RJ, Cha SS, Maxson JA, Quigg SM, Thacher TD. Changing Incidence of Serum 25-Hydroxyvitamin D Values Above 50 ng/mL: A 10-Year Population-Based Study. Mayo Clin Proc. 2015 May;90(5):577-86. doi: 10.1016/j.mayocp.2015.02.012. PMID: 25939935; PMCID: PMC4437692.

Grant WB, Al Anouti F, Boucher BJ, et al. A Narrative Review of the Evidence for Variations in Serum 25-Hydroxyvitamin D Concentration Thresholds for Optimal Health. Nutrients. 2022;14(3):639. Published 2022 Feb 2. doi:10.3390/nut14030639

Holick MF. Vitamin D Is Not as Toxic as Was Once Thought: A Historical and an Up-to-Date Perspective. Mayo Clin Proc. 2015;90(5):561-564. doi:10.1016/j.mayocp.2015.03.015

Kimball SM, Holick MF. Official recommendations for vitamin D through the life stages in developed countries. Eur J Clin Nutr. 2020;74(11):1514-1518. doi:10.1038/s41430-020-00706-3

Kimball, S.M.; Mirhosseini, N.; Holick, M.F. Evaluation of vitamin D₃ intakes up to 15,000 international units/day and serum 25-hydroxyvitamin D concentrations up to 300 nmol/L on calcium metabolism in a community setting. Dermatoendocrinology 2017, 9, e1300213

McCullough, P.J.; Lehrer, D.S.; Amend, J. Daily oral dosing of vitamin D₃ using 5000 TO 50,000 international units a day in long-term hospitalized patients: Insights from a seven year experience. J. Steroid Biochem. Mol. Biol. 2019, 189, 228-239