

Vitamin D in the Prevention of COVID-19

Analysis by [Dr. Joseph Mercola](#)

✓ Fact Checked

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STORY AT-A-GLANCE

- › The French National Academy of Medicine stresses the importance of vitamin D against COVID-19 and recommends everyone take supplemental vitamin D. For COVID-19 patients over 60, they recommend vitamin D testing, and if deficiency is found, a bolus dose of 50,000 to 100,000 IU
- › While vitamin D testing is not stressed for those under the age of 60, the French Agency recommends anyone under the age of 60 who receives a positive COVID-19 test start taking 800 IUs to 1,000 IUs of vitamin D per day anyway
- › Vitamin D modulates (can upregulate and downregulate as needed) the function of your immune system by stimulating dendritic cells (which detect the presence of antigens such as viruses or bacteria) and macrophages (responsible for triggering immune responses and destroying pathogens)
- › Vitamin D also regulates and suppresses the cytokine inflammatory response. This is particularly important for COVID-19, as out of control inflammation (cytokine storm) is a primary cause of death
- › Scotland and the U.K. are also starting to take vitamin D more seriously. The British Frontline Immune Support Team is providing U.K. National Health Service workers with free liposomal vitamin C, vitamin D and zinc to bolster and regulate their immune function

As noted by retired nursing teacher John Campbell¹ in the video above, vitamin D is "an important immunological molecule" that likely plays role in the COVID-19 pandemic.

In his video commentary, Campbell reviews a number of recent papers stressing the importance of vitamin D, starting with a press release² from the French National Academy of Medicine, dated May 22, 2020.

The press release correctly points out that vitamin D is a prohormone, meaning it acts as an endocrine hormone. As such, it has wide-ranging influence on health. There are vitamin D receptors throughout your body, in every tissue and organ. Campbell reviews some of the basics of where and how vitamin D is synthesized in the body.

In summary, vitamin D is synthesized in the dermis of your skin in response to ultraviolet light from the sun. From there, it is transported to your liver and kidneys, where it is converted into an active hormone that is then circulated throughout your body. People with liver or kidney problems may have a reduced ability to synthesize vitamin D. As noted by the French National Academy of Medicine, vitamin D:³

- Modulates (meaning it can upregulate and downregulate as needed) the function of your immune system by stimulating dendritic cells (which detect the presence of antigens such as viruses or bacteria) and macrophages (responsible for triggering immune responses and destroying pathogens)
- Regulates and suppresses the cytokine inflammatory response.⁴ The ability to downregulate the inflammatory response is particularly important for COVID-19, as out of control inflammation (cytokine storm) is a primary cause of death

Vitamin D – An Excellent Adjunct to Any Therapy

The French medical authority points out there's "a significant correlation between low serum vitamin D levels and mortality from COVID-19" – which one would expect considering its modulating and regulatory influence on immune function – and that "by mitigating the inflammatory storm and its consequences," vitamin D "could be considered as an adjunct to any form of therapy."

They cite research showing the inverse correlation between vitamin D and COVID-19 infection and mortality (the lower your vitamin D the greater your risk of infection and

death) in European countries has a confidence value of 95.4%, meaning there's only a 4.6% chance that this correlation is due to chance alone.

The press release ends by recommending the French population take supplemental vitamin D, as it is a "simple and inexpensive measure." The French authority also recommends "rapid serum vitamin D testing in people over 60 years of age with COVID-19."

“ Vitamin D can reduce the risk of infection by lowering the rate at which the virus replicates and reduce the pro-inflammatory cytokines that damage the lungs, leading to pneumonia. It also helps increase concentrations of anti-inflammatory cytokines that may help protect the lungs.”

As noted by Campbell, this is "a remarkably good idea." In those who are found to be deficient in vitamin D, the French National Academy of Medicine recommends an initial bolus dose of 50,000 IUs to 100,000 IUs.

And, while vitamin D testing is not stressed for those under the age of 60, they do recommend that anyone under the age of 60 who receives a positive COVID-19 test start taking 800 IUs to 1,000 IUs of vitamin D per day anyway.

Prospective Vitamin D for COVID-19 Studies Are Underway

The French recommendations are in stark contrast to the U.S., where Big Pharma-controlled health authorities and media are still trying to frighten people away from vitamin D supplementation. One reason for this could be because a healthier population is less likely to line up for inoculation with a fast-tracked vaccine.

It's worth noting that while the French National Academy of Medicine and Campbell state there are no randomized controlled trials looking at vitamin D supplementation

and COVID-19, this is not true. There are many such trials currently underway. They just haven't been completed and published yet, but you can find them (and may be able to enroll in them) by searching ClinicalTrials.gov.⁵

In the UK, there was the Covidence UK Study,⁶ an effort to collect data about how vitamin D deficiency impacts your COVID-19 risk. While the trial is no longer accepting participants, according to Adrian Martineau, a professor of respiratory infection and immunity at Queen Mary University of London, who is leading it:⁷

"Vitamin D could almost be thought of as a designer drug for helping the body to handle viral respiratory infections. It boosts the ability of cells to kill and resist viruses and simultaneously dampens down harmful inflammation, which is one of the big problems with Covid."

British Health Care Workers Get Free Vitamin D

Aside from the French, Scotland and the U.K. are also starting to take vitamin D optimization more seriously. For example, the British Frontline Immune Support Team is providing U.K. National Health Service workers with free liposomal vitamin C, vitamin D and zinc packs to bolster and regulate their immune function.⁸ As noted by The Frontline Immune Support Team:⁹

"Many Covid-19 patients have shown to be deficient in vitamin D, especially in the BAME community, so getting vitamin D as well as zinc levels up is another wise move when virally exposed since they both support healthy immune cell strength, and zinc also inhibits viral replication."

The British NHS is also assessing the evidence to determine whether vitamin D should be prescribed to hospitalized COVID-19 patients and as a prevention to high-risk groups.¹⁰

Scottish Government Recommends Daily Vitamin D Supplement

As of June 3, 2020, Scottish government COVID-19 guidance includes taking a daily vitamin D supplement. As reported by the Scotland Herald:¹¹

"Official Scottish Government guidance issued on June 3 states that everyone, including children, 'should consider taking a daily supplement containing 10 micrograms of vitamin D.'

However, it is 'specifically recommended' to all pregnant and breastfeeding women; infants and children under five years old; people from minority ethnic groups with dark skin such as those of African, African-Caribbean and South Asian origin, who require more sun exposure to make as much vitamin D; and people who are confined indoors."

Data Support Role of Vitamin D in COVID-19

Several studies have noted the inverse relationship between low vitamin D and a higher risk for COVID-19-positive test results,¹² severity of infection^{13,14} and mortality.¹⁵ These studies are correlation studies and do not confirm causation, but studies that will be able to prove causation are currently underway.

Examples of these correlation studies include The Irish Longitudinal Study on Ageing (TILDA),^{16,17} which suggests vitamin D deficiency could have serious implications for COVID-19. The researchers recommend adults over 50 take a vitamin D supplement year-round if they don't get enough sun exposure to optimize their levels.

Another Irish paper,¹⁸ "Vitamin D and Inflammation: Potential Implications for Severity of COVID-19," concluded there is "a strong plausible biological hypothesis and evolving epidemiological data supporting a role for vitamin D in COVID-19."

Some of those biological mechanisms have already been summarized above. Other mechanisms of action that can impact your risk of COVID-19 include the following:

SARS-CoV-2 is an enveloped virus, which means it's more difficult for your immune system to identify and destroy it. However, higher vitamin D levels are inversely associated with infection by many other enveloped viruses, including dengue, hepatitis, herpes, HIV, rotavirus, respiratory syncytial virus and influenza.^{19,20} We'll have to wait and see if the same holds true for SARS-CoV-2, but chances are it will.

Vitamin D strengthens cellular junctions, thereby making it more difficult for viruses to gain entry through your eyes, ears, lungs and mucus membranes. This in turn makes the infection less likely to migrate down into your lungs.²¹

Vitamin D can reduce the risk of infection by lowering the rate at which the virus replicates and can reduce the pro-inflammatory cytokines that damage the lungs, leading to pneumonia. It also helps increase concentrations of anti-inflammatory cytokines that may help protect the lungs. For these reasons, researchers suggest people who are at risk for COVID-19 should take:²²

"... 10,000 IU/d of vitamin D3 for a few weeks to rapidly raise 25(OH)D concentrations, followed by 5000 IU/d. The goal should be to raise 25(OH)D concentrations above 40-60 ng/mL (100-150 nmol/L)."

Vitamin D is an important component in the prevention and treatment of influenza²³ and upper respiratory tract infections.²⁴ While vitamin D does not appear to have a direct effect on the virus itself, it strengthens immune function, thus allowing the host body to combat the virus more effectively.²⁵

As detailed in "Vitamin D Prevents Infections," research shows high-dose vitamin D supplementation lowers the risk of respiratory illnesses and lung infections in the elderly by 40%. As noted by an author of that study, "Vitamin D can improve the immune system's ability to fight infections because it bolsters the first line of defense of the immune system."

As mentioned earlier, vitamin D also suppresses inflammatory processes and inhibits excessive production of proinflammatory cytokines that give rise to a cytokine storm.²⁶ Taken together, this might make vitamin D quite useful against COVID-19, because while robust immune function is required for your body to combat the virus, an overactivated immune system is also responsible for the cytokine storm we see in COVID-19 infection that can lead to death.

Vitamin D upregulates production of human cathelicidin, LL-37, which has antimicrobial and antiendotoxin activities.²⁷

Vitamin D supplementation has been shown to protect against acute respiratory infections.²⁸ Daily or weekly supplementation (opposed to infrequent bolus doses) of vitamin D had the greatest protective effect in those with the lowest vitamin D levels.²⁹

In one study,³⁰ those with severe vitamin D deficiency who took a daily or weekly supplement cut their respiratory infection risk in half, whereas the acute administration of high bolus doses of vitamin D had no significant impact on infection risk.

Data analysis³¹ by GrassrootsHealth shows people with a vitamin D level of at least 40 ng/mL reduced their risk of colds by 15% and flu by 41%, compared to those with a level below 20 ng/mL.

COVID-19-Specific Papers

In addition to the Irish papers cited above, several others have come to the same or similar conclusions. Additional examples include:

The vitamin D review paper³² "Evidence That Vitamin D Supplementation Could Reduce Risk of Influenza and COVID-19 Infections and Death," published in the journal *Nutrients*, April 2, 2020, which states that:

"To reduce the risk of infection, it is recommended that people at risk of influenza and/or COVID-19 consider taking 10,000 IU/d of vitamin D₃ for a few weeks to rapidly raise 25(OH)D concentrations, followed by 5000 IU/d.

The goal should be to raise 25(OH)D concentrations above 40–60 ng/mL (100–150 nmol/L). For treatment of people who become infected with COVID-19, higher vitamin D₃ doses might be useful."

In a study³³ that looked at data from 780 COVID-19 patients in Indonesia, those with a vitamin D level between 20 ng/mL and 30 ng/mL had a sevenfold higher risk of death than those with a level above 30 ng/mL. Having a level below 20 ng/mL was associated with a 12 times higher risk of death.

Research^{34,35} posted on the preprint server MedRxiv June 10, 2020, reports a combination of vitamin D₃, B12 and magnesium inhibited the progression of COVID-19 in patients over the age of 50, resulting in "a significant reduction in proportion of patients with clinical deterioration requiring oxygen support and/or intensive care support."

"The Role of Vitamin D in the Prevention of Coronavirus Disease 2019 Infection and Mortality"³⁶ – which looked at the average vitamin D levels and the number of COVID-19 cases and death rates in 20 European countries – found lower vitamin D levels correlated with higher caseloads and mortality. The authors concluded, "We believe that we can advise vitamin D supplementation to protect against SARS-CoV2 infection."

Northwestern University researchers report finding an inverse relationship between vitamin D and CRP, a marker for inflammation. Those with higher CRP had lower vitamin D and vice versa. According to the authors:³⁷

"COVID-19 patient-level data shows a notable OR of 3.4 ... for high CRP in severe COVID-19 patients.

Given that CRP is a surrogate marker for cytokine storm and is associated with Vit D deficiency, based on retrospective data and indirect evidence we see a possible role of Vit D in reducing complications attributed to unregulated inflammation and cytokine storm.

Further research is needed to account for other factors through direct measurement of Vit D levels in COVID-19 patients."

"The Possible Role of Vitamin D in Suppressing Cytokine Storm and Associated Mortality in COVID-19 Patients,"^{38,39} posted on the preprint portal medRxiv May 18, 2020, reports finding a strong correlation between severe vitamin D deficiency and higher mortality rates in countries across the globe.

The researchers attribute this to a connection between low vitamin D and high risk for cytokine storms. The analysis suggests higher vitamin D levels among the general population could cut mortality in half by reducing complications.⁴⁰

Now Is the Time to Optimize Your Vitamin D

Health experts are warning we're likely to see a second wave of COVID-19 this fall, as temperatures drop. This means the time to start optimizing your vitamin D is now.

Data from GrassrootsHealth's D*Action studies suggest the optimal level for health and disease prevention is between 60 ng/mL and 80 ng/mL, while the cutoff for sufficiency appears to be around 40 ng/mL. In Europe, the measurements you're looking for are 150 to 200 nmol/L and 100 nmol/L respectively.

I recently published a comprehensive vitamin D report in which I detail vitamin D's mechanisms of action and how to ensure optimal levels. I recommend downloading and sharing that report with everyone you know.

Access Free Report

A quick summary of the key steps is as follows:

- 1. First, measure your vitamin D level** – One of the easiest and most cost-effective ways of measuring your vitamin D level is to participate in the [GrassrootsHealth's](#) personalized nutrition project, which includes a vitamin D testing kit.

Once you know what your blood level is, you can assess the dose needed to maintain or improve your level. If you cannot get enough vitamin D from the sun (you can use the [DMinder app](#)⁴¹ to see how much vitamin D your body can make depending on your location and other individual factors), then you'll need an oral supplement.

As previously detailed in "[Magnesium and K2 Optimize Your Vitamin D Supplementation](#)," it's strongly recommended to take magnesium and K2 concomitant with oral vitamin D. Data from nearly 3,000 individuals reveal you need 244% more oral vitamin D if you're not also taking magnesium and vitamin K2!⁴²

What this means in practical terms is that if you take all three supplements in combination, you need far less oral vitamin D in order to achieve a healthy vitamin D level.

- 2. Assess your individualized vitamin D dosage** – To do that, you can either use the chart below, or use GrassrootsHealth's [Vitamin D*calculator](#). To convert ng/mL into the European measurement (nmol/L), simply multiply the ng/mL measurement by 2.5. To calculate how much vitamin D you may be getting from regular sun exposure in addition to your supplemental intake, use the [DMinder app](#).⁴³

Vitamin D intake observed to produce noted 25(OH)D serum levels in 90% of adults (age 18 years and older), weighing 150 lbs. (N=7324)

RECOMMENDED RANGE: 40-60 ng/ml

WHAT TO DO

- 1 Test
- 2 Establish recommended intake level
- 3 Test again in 3-6 months

(For supplements, vitamin D3, cholecalciferol may be used.)

Individuals should consult with a health care practitioner to develop a custom plan.

Change in Serum Level Based on Intake (IU/day) for 90% of Adults* (N=7324)

Expected Level (ng/ml)	20	30	40	50	60	
Current Level (ng/ml)	10	2000	4000	6000	10,000	10,000
15		1000	3000	6000	9000	10,000
20			2000	5000	8000	10,000
25			1000	4000	7000	10,000
30				3000	6000	10,000
35				1000	5000	9000
40					3000	8000
45					2000	6000
50						4000

* values rounded to the nearest 1000 IU; highest recommended intake is 10,000 IU/day

Example: With a starting serum level of 20 ng/ml, an additional intake of approximately 5000 IU/day would be sufficient for 90% of adults (age 18 years and older, weighing 150 lbs) to achieve a serum level of at least 40 ng/ml.

3. Retest in three to six months – Lastly, you'll need to remeasure your vitamin D level in three to six months, to evaluate how your sun exposure and/or supplement dose is working for you.

Sources and References

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- ^{39, 40} [Northwestern McCormick School of Engineering May 7, 2020](#)
- ^{41, 43} [DMinder app](#)
- ⁴² [GrassrootsHealth Magnesium and Vitamin K2 Combined Important for Vitamin D Levels](#)