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# Rapid Vitamin D Delivery May Result in Better COVID Outcomes

Analysis by Dr. Joseph Mercola ✔ Fact Checked

## STORY AT-A-GLANCE -

- One study published in Nutrients found supplementing with vitamin D in patients with confirmed COVID-19 shortened the length of hospitalization, even in those with comorbidities
- This data is part of mounting evidence that those with optimal levels of vitamin D may have a reduced risk of getting infected and, if infected, a lowered risk of severe disease and mortality
- The only way to definitively identify a deficiency is through a blood test. Look for these general signs and symptoms that you need to get tested sooner rather than later. They include frequent infections, fatigue, daytime sleepiness and head sweating

Since the start of the pandemic, natural supplements have been a bone of contention with researchers, pharmaceutical companies, doctors and health experts. Newly published data[1] again support past research that vitamin D has a significant impact on COVID-19.

Vitamin D was discovered in the early 1900s. Work by Sir Edward Mellanby from Great Britain and Elmer McCollum from the University of Wisconsin demonstrated that vitamin D could cure rickets.[2] In the early 1970s, 25-OH-D3 was identified as scientists focused on the endocrine system, and the function that vitamin D has in the body.

Your body is capable of producing vitamin D with exposure to sunlight.[3] In fact, with adequate exposure, your skin can produce enough vitamin D to support your health. Early research showed that too little vitamin D led to poor calcium homeostasis. In turn, this can lead to osteoporosis, osteomalacia and rickets.

Multiple studies[4,5] have since demonstrated that a deficiency "is associated with increased risk and greater severity of infection, particularly of the respiratory tract."[6] While nearly every study finds a relationship between vitamin D and upper respiratory infections, not all find that vitamin D has the same impact on the infections.

One factor that may influence the varied results is how the researchers measure the intervention and data. In other words, are they measuring the amount of supplementation being given or are they looking at the vitamin D blood levels demonstrating deficiency against the impact on infection?[7]

## Study Shows Vitamin D Shortens COVID and Decreases Mortality

A study[8] published in November 2021 sought to identify if vitamin D may play a role in the treatment of COVID-19. The researchers noted that patients admitted to the intensive care unit had high plasma levels of biomarkers indicating inflammation. They wrote:[9]

> *"Given the natural three-stage clinical course of the disease, inadequate innate immune response in the first stage and immune-mediated damage due to dysregulated immune response in the second stage are considered to be the major determinants of poor outcomes."*

Should a supplement or drug be able to support the immune response in the first or second stage, it may help reduce the severity and mortality of the illness. The researchers first gathered retrospective data from 867 patients at the Istanbul University-Cerrahpasa Faculty Hospital.

The patients had a confirmed diagnosis of COVID-19 but were excluded from the cohort if they had comorbidities associated with vitamin D deficiency, such as cancer, kidney

disease, cardiovascular disease or autoimmune diseases. Each of the patients received an antiviral and some received anti-cytokine treatment. Clinical outcomes were measured against serum vitamin D status.

In the retrospective arm of the study, the researchers split the participants into four groups determined by their serum 25OHD level. The data from this arm revealed that the risk of hospitalization longer than eight days was 1.9 times higher in patients in three of the groups.

The second part was designed as a prospective study involving 210 people with confirmed COVID-19. The researchers included 23 healthy individuals. In this group there were 163 participants with serum 25OHD levels less than 30 ng/mL. These individuals received vitamin D3 treatment according to the protocol that was created by reviewing evidence from past literature.

The researchers administered vitamin D3 based on whether patients were an inpatient or in the ICU and which group they were in. The total time the vitamin D was administered ranged from 14 days for inpatients to three days for ICU patients.

Researchers measured peripheral blood samples in all their patients on Days 1 through 3 before treatment and on Day 7 and Day 14 in those who received treatment. Participants in the prospective group were also treated according to the current national guidelines, which at the time did not recommend vitamin D supplementation.

The treatment protocol increased the serum 25OHD level significantly above 30 ng/mL within two weeks in those receiving the intervention. They found that vitamin D treatment shortened the length of hospitalization in those with COVID-19, even when there were comorbidities present. They concluded:[10]

> *"Having vitamin D treatment decreased the mortality rate by 2.14 times. It has been determined that vitamin D supplementation is effective on various targeted parameters; therefore, it is an important parameter for the course of COVID-19, and serum vitamin D levels and correlation analyses between these parameters confirm this inference."*

## Further Evidence Vitamin D Impacts COVID Outcome

There is strong scientific evidence that vitamin D plays a central role in your immune response and your ability to fight infections. In this video, Ivor Cummins, biochemist and chief program officer for Irish Heart Disease Awareness, explains how recent studies supporting higher levels of vitamin D may reduce your risk of negative outcomes from COVID-19.

He also identifies some of the conditions known to be associated with low vitamin D levels. These include low sun exposure, insulin and leptin resistance, high levels of inflammation and a poor diet. One study Cummins reviews was released by Mark Alipio, who received no funding for his work.[11]

The data was an analysis of 212 people who had lab-confirmed COVID-19 and for whom serum 25OHD levels were available. Alipio used the classification system based on past research similar to the four categories used in the featured Nutrients study. The difference was that two categories from the featured study were combined, but the classification of the other two remained the same.

Alipio discovered that vitamin D levels were strongly correlated to the severity of illness. As you can see in the graphic Cummins used from the study at minute 2:20 in the video above, of the 49 who had mild illness, 47 had vitamin D levels above 30 ng/mL. It is important to note that most experts consider this level roughly half of what optimal vitamin D levels should be, which is 40ng/mL to 60ng/mL.[12]

This means 96% of the patients with mild illness had normal levels of vitamin D.[13] Of the other two categories combining severe or critical illness, only 4% had normal levels of vitamin D.

One early study[14] hypothesized that vitamin D protects the body against SARS-CoV-2 infections and sought to assess if there was an association between vitamin D levels and the number of COVID-19 infections. The data included only European countries and found a significant relationship between the mean (average) vitamin D level and the number of infections.[15]

People who were most vulnerable to this respiratory infection were the most deficient. Another early study that evaluated the role vitamin D deficiency plays in preventing respiratory infections found similar results.[16] The researchers wrote that vitamin D had:[17]

> *"… significant protective effect when it was given daily or weekly to people with lowest vitamin D levels: the risk of having at least one ARI was reduced from 60% to 32% in these people."*

Later studies throughout 2020 and 2021 have added to the mounting evidence that vitamin D has a significant effect on the severity and mortality of people with COVID-19 and may help reduce hospitalization rates.

Low vitamin D is associated with rising inflammatory cytokines and increased risk of pneumonia and respiratory tract infections.[18]

Vitamin D influences the regulation of the inflammatory cascade and deficiency is associated with "increased risk of infections including influenza virus, tuberculosis (TB), human immunodeficiency virus (HIV) and the recent pandemic due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)."[19]

Vitamin D deficiency increases risk of COVID-19 severity and mortality.[20]

Vitamin D reduces inflammation caused by T-cells, which could potentially benefit people with COVID-19.[21,22]

Literature review showed serum levels of vitamin D are associated with the risk of infection, severity of illness and mortality from COVID-19.[23]

Vitamin D deficiency is associated with increased risk of infection, severity of illness and mortality from COVID-19; presented at the American Society for Bone and Mineral Research 2021 Annual Meeting.[24]

Data revealed that 83% of 11,901 patients from 23 studies were either deficient or had insufficient levels of vitamin D making the odds of getting infected 3.3 times

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| higher and developing severe disease five times higher in those with deficiency.[25] |
| The active form of vitamin D can inhibit the replication of SARS-CoV-2, the virus that causes COVID-19.[26,27] |
| Vitamin D deficiency in 489 patients increased the risk of testing positive by 1.77 times compared to those with sufficient levels. Deficiency was defined by levels of 25OHD of less than 20ng/mL.[28] |
| Bolus vitamin D supplementation in frail elderly just before or during COVID-19 was associated with better survival rates and less severe disease.[29] |
| Study demonstrated the association between vitamin D deficiency and severity and mortality from COVID-19.[30] |
| Vitamin D supplementation may prevent COVID-19 or treat the disease in adults and children.[31] |

## Top Signs You May Have a Vitamin D Deficiency

The only way to definitively identify a vitamin D deficiency is through blood testing. However, there are some general signs and symptoms that may indicate you should get your vitamin D tested sooner rather than later.

- Ongoing musculoskeletal pain or achy bones[32]
- Frequent illnesses or infections[33]
- Neurological symptoms,[34] including depression[35]
- Fatigue and daytime sleepiness[36,37]
- Head sweating[38]

One of the easiest and most cost-effective ways of measuring your vitamin D level is to participate in GrassrootsHealth's D*Action,[39] which is a vitamin D intervention population

program. The test is done in the convenience of your home and the results are sent directly to you.

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