

Study shows vitamin D may have key role in fighting off COVID-19 pneumonia

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Clinical data increasingly has shown that patients with low vitamin D levels have a greater chance of COVID-19 infection—and severe disease and death. Now, research led by scientists from Lankenau Institute for Medical Research (LIMR), part of Main Line Health, points to an explanation for the link and provides evidence that higher vitamin D

intake can help fight off the disease.

The study, published this week in *Physiological Reports*, indicates the vitamin strengthens the lung lining, preventing COVID-19 as well as other viruses from penetrating the body's airways to cause infection, and possibly also reducing fluid leakage into the airways, which causes [pneumonia](#).

"Your body is mostly sacs and tubes," said senior author James Mullin, Ph.D., a LIMR professor and director of research for Lankenau Medical Center's gastroenterology division. "If their linings are in good shape, you're in good shape. If they're leaking and fail to provide a proper barrier, it's a problem. When you have a respiratory infection, that means the barrier in your lungs is leaking. Our research gives evidence that vitamin D strengthens the barrier function of the lung lining, likely helping to prevent or stop an infection."

The study examined cell cultures from human lung linings and examined them using two independent metrics. It found that vitamin D increased barrier function by 40% and 25%, respectively. The study builds on a body of research by Mullin's team indicating vitamin A, zinc and other micronutrients play a similar role to vitamin D. This same research group recently published a review article on the general topic of fluid leak in various diseases and combating it clinically with elevated levels of micronutrients.

Published literature has indicated that patients with vitamin D deficiency were five times more likely to become infected by COVID-19. Data supporting supplemental doses for those with vitamin D levels in the normal range are less clear, the authors said.

"The benefits, however, are so clear and the risks so minimal that we believe physicians should be recommending supplemental vitamin D

right away," Mullin said. "Cytokine storms, where the body's immune response kicks into overdrive and can result in severe disease and death in COVID, compromise the body's airway barrier function. We already know from past studies that vitamin D blunts cytokine storms in cases of flu. In cases of COVID-19, vitamin D therapy may allow time for a patient's own immune defenses to kick in before it's too late."

LIMR's Elizabeth Rybakovsky, MS, and Katherine M. DiGuilio, DO, co-authored the study. They were joined by researchers from Drexel University and the University of Pennsylvania.

More information: Elizabeth Rybakovsky et al, Calcitriol modifies tight junctions, improves barrier function, and reduces TNF- α -induced barrier leak in the human lung-derived epithelial cell culture model, 16HBE 14o-, *Physiological Reports* (2023). [DOI: 10.14814/phy2.15592](https://doi.org/10.14814/phy2.15592)

Provided by Main Line Health

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