

# Low testosterone may increase risk of COVID-19 hospitalization for men

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Among men diagnosed with COVID-19, those with low testosterone levels are more likely to become seriously ill and end up in the hospital than men with normal levels of the hormone, according to a study by researchers at Washington University School of Medicine in St. Louis and Saint Louis University School of Medicine.

The team analyzed the cases of 723 men who tested positive for COVID-19, mostly in 2020 before vaccines were available. The data indicate that low testosterone is an [independent risk factor](#) for COVID-19 hospitalization, similar to diabetes, heart disease and [chronic lung disease](#).

They found that men with low testosterone who developed COVID-19 were 2.4 times more likely to require hospitalization than men with hormone levels in the normal range. Further, men who were once diagnosed with low testosterone but successfully treated with [hormone replacement therapy](#) were no more likely to be hospitalized for COVID-19 than men whose testosterone levels had always tested in the normal range.

The findings, published Sept. 2 in *JAMA Network Open*, suggest that treating men with low testosterone may help protect them against [severe disease](#) and reduce the burden on hospitals during COVID-19 waves.

"It is very likely that COVID-19 is here to stay," said co-senior author Abhinav Diwan, MD, a professor of medicine at Washington University. Diwan, who treats patients at Barnes-Jewish Hospital, is also a professor of cell biology & physiology, and of obstetrics & gynecology. "Hospitalizations with COVID-19 are still a problem and will continue to be a problem because the virus keeps evolving new variants that escape immunization-based immunity. Low testosterone is very common; up to a third of men over 30 have it. Our study draws attention to this important risk factor and the need to address it as a strategy to lower hospitalizations."

Diwan and co-senior author Sandeep Dhindsa, MD, an endocrinologist at Saint Louis University, previously had shown that [men hospitalized with COVID-19 have abnormally low testosterone levels](#). However, severe illness or traumatic injury can cause [hormone levels](#) to drop temporarily. Data from men who are already hospitalized with COVID-19 doesn't really answer the question of whether low testosterone is a risk factor for severe COVID-19 or a result of it. For that, the researchers needed to know whether men with chronically low testosterone levels get sicker than men with normal levels.

Diwan, Dhindsa and colleagues—including co-author Cosette Champion, MD, an internal medicine resident at Barnes-Jewish—conducted a chart review of patients at SSM Health and BJC HealthCare, two major hospital systems in the St. Louis area. They identified 723 men whose testosterone levels had been measured between Jan. 1, 2017, and Dec. 31, 2021, and who had documented cases of COVID-19 in 2020 or 2021.

In some cases, testosterone levels were measured after the patient recovered from COVID-19. Since low testosterone is a chronic condition, men who tested low a few months after recovering from COVID-19 probably had low levels before as well, Dhindsa said.

The researchers identified 427 men with normal testosterone levels, 116 with low levels, and 180 who previously had low levels but were being successfully treated, meaning that they were on hormone replacement therapy and their testosterone levels were in the normal range at the time they developed COVID-19.

"Low testosterone turned out to be a risk factor for hospitalization from COVID, and treatment of low testosterone helped to negate that risk," Dhindsa said. "The risk really takes off below a level of 200 nanograms per deciliter, with the normal range being 300 to 1,000 nanograms per deciliter. This is independent of all other risk factors that we looked at: age, obesity or other health conditions. But those people who were on therapy, their risk was normal."

Men with [low testosterone levels](#) can experience [sexual dysfunction](#), depressed mood, irritability, difficulty with concentration and memory, fatigue, loss of muscular strength and a reduced sense of well-being overall. When a man's quality of life is clearly diminished, he is typically treated with [testosterone replacement therapy](#). When the symptoms are mild, though, doctors and patients may hesitate to treat.

The two main concerns related to testosterone therapy are an increased risk of prostate cancer and heart disease. Prostate cancer is common in older men, and it is often driven by testosterone. Boosting testosterone could possibly speed the growth of such cancers, worsening the disease. For [heart disease](#), the evidence for risk is more ambiguous. A large clinical trial on the relationship between heart health and testosterone supplementation is expected to be completed soon.

"In the meantime, our study would suggest that it would be prudent to look at testosterone levels, especially in people who have symptoms of low

testosterone, and then individualize care," said Diwan, whose specialty is cardiology. "If they are at really high risk of cardiovascular events, then the doctor could engage the patient in a discussion of the pros and cons of hormone replacement therapy, and perhaps lowering the risk of COVID hospitalization could be on the list of potential benefits."

This study is observational, so it only suggests—not proves—that boosting [testosterone levels](#) may help men avoid severe COVID-19, Diwan cautioned. A clinical trial would be needed to demonstrate conclusively whether such a strategy works.

**More information:** Association of Male Hypogonadism with Risk of Hospitalization from COVID-19, *JAMA Network Open* (2022). DOI: [10.1001/jamanetworkopen.2022.29747](https://doi.org/10.1001/jamanetworkopen.2022.29747)

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