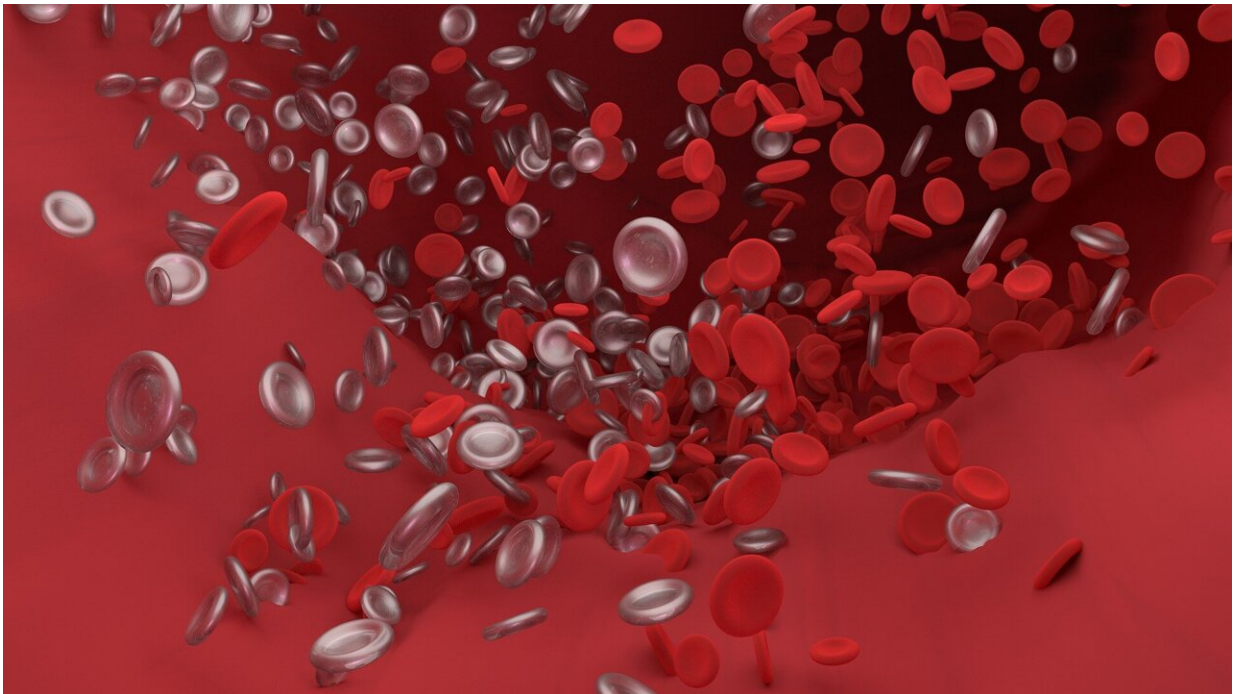


# Severe COVID-19 increases risk of life-threatening blood clots

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Individuals hospitalized with COVID-19 are more likely to develop venous thromboembolism—a potentially life-threatening condition—than those hospitalized with influenza, according to a new study from the Perelman School of Medicine. The study, published in the *Journal of the American Medical Association*, evaluates the absolute risk of hospitalized deep venous thrombosis or pulmonary embolism

events within 90 days after admission.

"Our research found this association both before and during vaccine availability, showing that the risk was not stemming from vaccination," says Vincent Lo Re III, an associate professor of infectious diseases and epidemiology and the study's first author. "And that's particularly important because individuals say they do not want to receive a COVID-19 vaccination because of clotting risks. COVID-19 itself is the true risk of these dangerous [clots](#), not the vaccines."

Venous thromboembolism, which is comprised of both deep vein thrombosis and pulmonary embolism, begins when a blood clot forms in a vein deep within the body, often the leg or pelvic region. The condition is dangerous because the clot can block blood circulation. During arterial thromboembolism, a clot causes a sudden interruption of blood flow to an organ or body part which in turn can lead to tissue damage, heart attack, or stroke.

Although COVID-19 is primarily considered a respiratory illness, some evidence suggests the virus may also induce excessive blood clotting, or hypercoagulability, in the body, but early studies on the topic were smaller and inconclusive.

This Penn study was the largest yet to tackle the issue, comprising of over 90,000 total patients. Among people hospitalized with influenza, the 90-day absolute risk of developing [venous thromboembolism](#) was 5.3%. For those hospitalized with COVID-19, the 90-day risk was 9.5% before vaccine availability and 10.9% after COVID-19 vaccines became available. The 90-day risk of arterial thromboembolism was 14.4 percent in patients hospitalized with influenza compared with 15.8 percent in those with COVID-19 before vaccine availability and 16.3 percent during vaccine availability.

Lo Re and colleagues said one potential explanation for the increased risk may be the coronavirus's ability to infect endothelial cells, which can incite [inflammation](#) and abnormalities in the coagulation process. However, the research team says more research is needed to confirm the association and investigate potential causes and possible mechanisms behind the blood conditions.

With collaboration from colleagues in Canada and Europe, the Penn researchers plan on examining COVID-19-related thrombotic cases outside the hospital setting and via an international meta-analysis.

**More information:** Vincent Lo Re et al, Association of COVID-19 vs Influenza With Risk of Arterial and Venous Thrombotic Events Among Hospitalized Patients, *JAMA* (2022). [DOI: 10.1001/jama.2022.13072](https://doi.org/10.1001/jama.2022.13072)

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