

Imaging test may predict patients most at risk of some heart complications from COVID-19

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Researchers at Johns Hopkins Medicine have shown that a type of echocardiogram, a common test to evaluate whether a person's heart is

pumping properly, may be useful in predicting which patients with COVID-19 are most at risk of developing atrial fibrillation—an irregular heartbeat that can increase a person's risk for heart failure and stroke, among other heart issues. The new findings, published online May 30 in the *Journal of the American Society of Echocardiography*, also suggest that patients with COVID-19 who go on to develop atrial fibrillation more commonly have elevated levels of heart-related proteins called troponin and NT-proBNP in blood test samples.

If further studies confirm the findings, "this could lead to new therapies to prevent strokes and heart attacks in certain COVID-19 patients who are at the highest risk," says Allison Hays, M.D., medical director of echocardiography programs at The Johns Hopkins Hospital and senior author of the published paper.

The COVID-19 pandemic has affected more than 170 million people around the world, and previous studies of complications and long-term effects of SARS-CoV-2 infection have found that patients who are hospitalized with COVID-19 have more than double the rate of arrhythmias, including [atrial fibrillation](#) and [atrial flutter](#), a similar rapid rhythm that can lead to [heart failure](#) and stroke.

But exactly how the virus causes these heart complications, and who is most at risk of developing atrial fibrillation because of COVID-19, has been poorly understood.

In this study, Hays and her colleagues compared 80 patients with COVID-19 with 34 patients who did not have COVID-19 who were also treated at The Johns Hopkins Hospital in the intensive or intermediate care units for respiratory issues. None of the patients had a history of heart arrhythmia.

In the study, carried out between March and June 2020, the researchers

analyzed echocardiograms of hospitalized patients, applying a special kind of analysis called speckle-tracking strain to determine how well the left atrium of the heart moves with each heartbeat.

The team found that, overall, patients with COVID-19 had reduced function of their left atrium, the chamber of the heart that receives oxygenated blood from the lungs. Left atrial strain—a measure of the movement of the left atrium's walls—was significantly lower in patients with COVID-19 (28.2% compared with 32.6%, $p=0.026$; normal $>38%$) and left atrial emptying fraction—a measure of how much blood the atrium empties with each contraction—was also lower in the patients with COVID-19 (55.7% compared with 64.1%, p

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