

Cardiovascular Disease and COVID-19: A Dangerous Mix

More than 120 million Americans live with heart disease. So when researchers signaled that cardiovascular problems were an underlying condition that could worsen COVID-19 outcomes, lots of people sat up and listened.

“We are living through distressing times,” says Dr. Mauricio Cohen, interventional cardiologist, and director of the Cardiac Catheterization Lab at the University of Miami Health System. “Having a heart condition, or other serious underlying condition, can result in a worse outcome for patients. You’re simply more vulnerable.”

First in February, then in early March, the American College of Cardiology (ACC) issued bulletins warning patients about potential risks and encouraging “additional, reasonable precautions.” It specifically recommended patients remain current with vaccinations, including the pneumococcal vaccine (because of the increased risk of secondary bacterial infection), and also suggested the influenza vaccination to prevent a source of fever which could be initially confused with the coronavirus infection.

The ACC cited some worrisome statistics

While the overall fatality rate for COVID-19 cases was 2.3%, the rate for patients with comorbidities was substantially higher:

- 10.5% for those with cardiovascular disease

- 6% for those with hypertension

Rates for other chronic illnesses include:

- Diabetes (7.3%)
- Chronic respiratory disease (6.3%)
- Cancer (5.6%)

What's more, early reports also showed that about 40% of virus patients in the hospital had cardiovascular disease or cerebrovascular disease (stroke or other problem with flow in the brain).

Though the novel coronavirus typically manifests itself in respiratory symptoms (cough, shortness of breath), anecdotes from the front lines as well as medical studies show it also damages the cardiovascular system. In fact, while the virus develops slowly in healthy patients, it accelerates quickly in vulnerable populations. Intensive care and emergency room physicians have reported that many patients die of cardiac failure, not respiratory failure.

In general, the SARS-CoV-2, the virus that causes COVID-19, has an inflammatory effect on the entire body, which can also lead to heart inflammation. The consequences of heart inflammation are dangerous. Myocarditis, the inflammation of the heart muscle, can result in an abnormal heartbeat and, ultimately, in heart failure. One study found that fast, aberrant heart rhythms accounted for 44% of the intensive care unit cases of COVID-19 in Wuhan, China.

What we know about how COVID affects heart patients:

A diseased heart has to work harder to pump oxygenated blood through the body. When the lungs (the virus's main target) are compromised, that means the heart — which is already having problems — has to work double-time. “When blood is not

oxygenated properly,” Dr. Cohen explains, “it affects the entire body and all the other organs. It can ultimately lead to multi-organ system failure.”

People with underlying heart issues, he adds, also have lower functional reserve, which complicates the body’s response to any viral or bacterial agent that enters the body.

Initial reports also suggest that COVID may be particularly risky for those who have plaque (fatty buildup) in their arteries, as they are more likely to develop more severe symptoms, with heart failure and collapse.

While patients on ACE inhibitors (angiotensin-converting-enzyme inhibitors) for hypertension or heart failure are worried that these medications may increase the risk of COVID complications, Dr. Cohen, in following the ACC’s recommendations, is telling his patients to continue taking them as directed. These medicines have proven to be of benefit and discontinuation can lead to decompensation and worsening of symptoms of heart disease. The concerns arise because of research that shows the novel coronavirus sticks itself to ACE2 proteins on the surface of cells in the lungs and then hijacks the cells to reproduce. Animal studies have shown that ACE inhibitors can raise the expression of ACE2 proteins.

“We must keep in mind that these are animal studies,” Dr. Cohen adds, “and animal studies don’t always translate into human. It’s important to stay on your medications.”

Here are Dr. Cohen’s other suggestions for cardiovascular patients:

- **Follow the Centers for Disease Control and Prevention guidelines for staying safe.** Wash your hands often. Don’t touch your face. Disinfect

surfaces. Practice social distancing. Shelter in place. Consider using a delivery service for groceries.

- Stock up on your medications.
- **Monitor potential symptoms**, such as fever, shortness of breath, chest pain, even confusion or drowsiness. Contact your doctor immediately if you experience any of these.
- **Make sure you have the necessary medical equipment**, including a blood pressure machine and thermometer.
- **Check with your healthcare professional** to see if he or she offers telemedicine consultations. Cohen and others at UHealth have moved to this platform and also participate in regular virtual meetings with colleagues around the country to keep informed.

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How a Coronavirus Infection Progresses Through the Body



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