

## Myocarditis/Pericarditis and mRNA Vaccines

### What are mRNA vaccines?

The Pfizer and Moderna vaccines are both messenger RNA, mRNA vaccines. mRNA is taken up in cells. The cell then processes the mRNA to make proteins. Once the proteins are produced, the immune system will recognize them and make a response against them to create immunity. In COVID-19 mRNA vaccines, the protein produced is the COVID-19 spike protein.

### What is myocarditis and pericarditis?

Myocarditis is inflammation of the heart muscle. Pericarditis is inflammation of the outer lining of the heart. Both can have a variety of causes, including viruses like COVID-19. Inflammation is the body's immune system response to infection or another trigger. Vaccine-induced myocarditis is more [mild](#) than that caused by natural infection.

### What are the symptoms of myocarditis and pericarditis?

Symptoms of myocarditis and pericarditis include chest pain, shortness of breath or an abnormal heartbeat (fast, fluttering or pounding). Symptoms may vary depending on severity of inflammation. **Seek medical care if you or your child have symptoms of these conditions, especially after viral infection or if it is within one week after COVID-19 vaccination.**

### What causes myocarditis and pericarditis?

Myocarditis and pericarditis are most commonly caused by viral or bacterial infections. Noninfectious causes of myocarditis and pericarditis include toxins, hypersensitivity to medications or immunological syndromes. Myocarditis can occur after COVID-19 disease.

### How common is myocarditis after getting the COVID-19 vaccine?

Reports of myocarditis and pericarditis are rare. The rate of myocarditis/pericarditis post-vaccination is highest among males between the ages of 16-17 years old, at [69 cases per million](#) doses administered. Myocarditis is more common in males than females.

CDC continues to investigate cases of myocarditis and pericarditis reported to the [Vaccine Adverse Event Reporting System \(VAERS\)](#). They are actively monitoring for these events in the [Vaccine Safety Datalink \(VSD\)](#).

## How common is myocarditis after COVID-19 infection?

Myocarditis is also caused by COVID-19 illness. In one [study](#), the rate of myocarditis in those between the ages of 12-17 years old after infection was 876 cases per one million infected. Another [study](#) found that people with COVID-19 were 16 times more likely to have myocarditis than those not infected.

## What are the long-term effects of myocarditis?

Most people with myocarditis and pericarditis recover quickly after their myocarditis/pericarditis event. Hospitalizations are typically short, and these patients have responded well to conservative and supportive treatment. A [recent study](#) indicated myocarditis/pericarditis patients had a median hospital stay of 1 day. Data presented at the November 2, 2021 [ACIP meeting](#) indicated 91% of cardiologists or health care providers reported their patient was fully recovered after 3 months following their myocarditis/pericarditis event. CDC is actively [investigating](#) the long-term effects of myocarditis and pericarditis after COVID-19 vaccination.

## Should I still get myself or my child vaccinated for COVID-19?

Yes. Experts, including CDC, American Academy of Pediatrics and the American Academy of Family Physicians, continue to recommend everyone ages 5 and older get vaccinated for COVID-19. The benefits of vaccination far outweigh the risk of myocarditis and pericarditis. Vaccination has been shown to prevent COVID-19 disease, hospitalization and death. Furthermore, myocarditis after COVID-19 disease occurs at a higher rate than that after COVID-19 vaccination. If you have concerns about COVID-19 vaccination, talk with a health care provider.

## I received the Janssen (Johnson & Johnson) vaccine. Am I at greater risk of getting myocarditis?

There has not been a pattern of myocarditis/pericarditis observed after receipt of the Janssen COVID-19 vaccine (Johnson & Johnson).

## Where can I get more information?

If you have concerns about myocarditis/pericarditis following mRNA COVID-19 vaccination, please visit with a health care provider and visit the [CDC website](#) for more information.