

Myocarditis, pericarditis and COVID-19 vaccines in NZ

Key questions about myocarditis and pericarditis for vaccinators and other health professionals

An increased risk of heart inflammation (myocarditis, pericarditis, or both) has been observed in people who have received COVID-19 vaccines, predominantly mRNA COVID-19 vaccines in males under 40 years of age after the second vaccine dose. This factsheet gives further details about the risk factors and diagnosis of myocarditis and pericarditis following immunisation with Comirnaty (mRNA COVID-19 vaccine).

What are myocarditis and pericarditis, and can they occur after COVID-19 vaccination?

Heart inflammation can affect the heart muscle (myocarditis), the lining around the heart (pericarditis), or both. A small increase in risk of myocarditis and pericarditis has been observed in people who have received mRNA COVID-19 vaccines after any dose, particularly in males under 40 years after the second vaccine dose. However, these conditions may occur in both males and females at any age and after any dose.

For 1–3 days after vaccination, some people can feel unwell with headaches, tiredness, muscle aches, chills or a mild fever; this is a normal response, and is more common after the second dose and in younger people. If unwell, you are advised to **rest, drink plenty of fluids and to avoid vigorous exercise**, until you feel better. If symptoms persist or worsen after a few days, seek medical advice.

How do you recognise myocarditis and pericarditis?

A key symptom of both myocarditis and pericarditis is chest pain. Other symptoms include chest heaviness, discomfort or tightness; shortness of breath or breathing difficulty; feeling lightheaded, faint or dizzy; heart palpitations, racing or fluttering heart, or a feeling of skipped beats. Fever has also been reported.

One or more of these symptoms can occur shortly after vaccination due to stress or anxiety. However, if these symptoms begin more than 6 hours to a few weeks after receiving a COVID-19 vaccination (onset is typically around 1 to 5 days), they should seek immediate medical attention.

How likely is myocarditis or pericarditis after Comirnaty?

The benefits of vaccination in protecting against COVID-19 greatly outweigh the potential risks of adverse events including myocarditis.

- Confirmed cases of myocarditis or pericarditis are rare
- Myocarditis has been reported in around 1–2 in every 100,000 people who receive Comirnaty
- Cases of myocarditis are more common in males aged 12–30 years following the second dose. Even in the highest risk group, males aged 12 to 17 years, the risk reported internationally is between 1 and 39 per 100,000 vaccine doses
- The observed rates have declined since the interval between doses was widened. Furthermore, the risk following additional doses is lower than after dose two
- The risk of pericarditis is highest in people aged 18–39, and the risk is similar in males and females. Rates of pericarditis following Comirnaty were 4.4–4.5 per 100,000 doses for those aged 18–29 and 30–39 years in 2023 in Australia
- There have been very few cases of myocarditis and/or pericarditis following vaccination in children aged 11 years or younger
- The rate of reporting of myocarditis and pericarditis is less than 1 in every 100,000 people after an additional dose.

How likely is myocarditis and pericarditis following newer Comirnaty vaccines?

There are no plausible reasons to think the minor change in the mRNA of the newer vaccines would alter the risk of myocarditis or pericarditis. Rates of myocarditis and pericarditis have remained very stable since the introduction of the variant-specific Comirnaty vaccines.

How severe is myocarditis?

Most of the reported cases of myocarditis and pericarditis linked to mRNA vaccination have required hospital care for assessment and monitoring, because sudden death is a rare complication of myocarditis.

More than 80% of the reported cases have recovered quickly with rest and commonly used oral medications. Longer-term follow-up of these cases is ongoing.

Advice about being vaccinated

Comirnaty continues to be recommended for all people aged from 5 years. The only contraindication to the vaccine is

anaphylaxis to a vaccine component, which is very rare and requires specialist review. All who receive a COVID-19 vaccine should be advised verbally and in writing of the very rare risk of myocarditis and pericarditis, of the possible symptoms and what to do if such symptoms develop.

If feeling unwell after vaccination, it is advised to rest, drink plenty of fluids and avoid vigorous activities, such as going to the gym. Seek medical advice if symptoms worsen or persist for longer than three days.

All episodes of myocarditis and pericarditis following Comirnaty should be reported to CARM. **For further clinical advice and for plans for the patient's next vaccination, please contact IMAC.**

Indepth information for health professionals

Potential risk

A risk of myocarditis and pericarditis has been rarely observed in people who have received mRNA COVID-19 vaccines after any dose. Males aged 12 to under 40 years were at highest risk of myocarditis after their second vaccine dose (around 1 to 15 per 100,000 second doses). Pericarditis is a higher risk and is seen equally in males and females.

Myocarditis has also been reported following vaccination in children, but at a much lower and near background rate.

IMAC emphasises that the overwhelming benefits of vaccination in protecting against COVID-19 greatly outweigh the rare risk of these conditions, and Comirnaty (Pfizer mRNA vaccine) continues to be recommended for most people. COVID-19 infection can also cause myocarditis and pericarditis; the risk from Omicron variants is lower than earlier variants.

Outcomes

Most myocarditis and pericarditis cases linked to mRNA vaccination receive hospital care for assessment and monitoring. Generally, these have been mild, and patients have recovered quickly with standard treatment. However, sudden death is a rare complication of myocarditis so careful assessment and management of suspected cases is important.

A follow-up of over 500 patients with myocarditis following an mRNA vaccination found that over 80% were considered by their healthcare provider to be fully recovered but 26% remained on medications at more than 90 days after diagnosis.

In another study, cardiac medication use dropped from 8 in 10 patients in the first three months to 1 in 10 between 12 and 18 months after diagnosis. An Australian study noted that while male patients have higher initial troponin levels with vaccine-associated myocarditis, they are more likely to report earlier and more complete symptom recovery than female patients.

Vaccine-associated myocarditis outcomes are less severe than COVID-19-associated myocarditis or conventional myocarditis.

Those who develop myocarditis following vaccination should be referred to a cardiologist for assessment and ongoing follow up.

Diagnosis

Symptoms of myocarditis usually appear from one to five (median two) days of vaccination and include acute chest pain or pressure, pain with breathing, palpitations, increased sweating, fainting or dizziness.

Symptoms such as palpitations, which may include racing, fluttering heart, or feeling of skipped beats, chest pain or feeling short of breath, can occur in the first hours after vaccination in some people – symptoms appearing in this time frame are consistent with an immunisation stress related reaction. This is too soon after vaccine receipt for heart inflammation due to vaccination to appear.

Clinical investigations

Initial investigations for people presenting with symptoms or signs which may be consistent with myocarditis or pericarditis should include ECG, troponin, +/- CRP, chest X-ray, and investigations for other differential diagnoses as clinically indicated.

- Findings consistent with myocarditis include elevated troponin and ECG changes including paroxysmal or sustained atrial or ventricular arrhythmias, AV node conduction delays, intraventricular conduction defects or frequent atrial or ventricular ectopy.
- Findings suggestive of pericarditis include a pericardial rub, and in the presence of a large pericardial effusion, pulsus paradoxus and distant heart sounds may be evident on clinical examination. ECG changes with pericarditis can include widespread ST segment elevation or PR depression.

If initial suspicion of myocarditis or pericarditis is high, further advice should be sought, even if screening investigations are thought to be normal. Myocarditis and pericarditis may present atypically (e.g., absence of chest pain or with nonspecific symptoms). It is important to include cardiac issues in the differential diagnosis in someone with ongoing nonspecific symptoms in the one to two weeks following a COVID-19 vaccine.

More information to assist in diagnosis is available here <http://tinyurl.com/2pjw78db>



Precautions to vaccination with cardiac conditions

Most pre-existing cardiac conditions are not regarded as contraindications to Comirnaty vaccine. Those with a history of pericarditis or myocarditis unrelated to Comirnaty may have the vaccination if the condition is completely resolved, (i.e. no symptoms for at least three months and no evidence of ongoing heart inflammation).

However, young people who have active or clinically unstable heart disease should be advised to seek medical care promptly if they develop new or worsening pre-existing symptoms. A precautionary review in the days after their vaccination may also be advised.

Reassuringly in a group of 79 patients with previous but resolved myocarditis unrelated to COVID-19 or COVID-19 vaccine, there was no clinical evidence of acute myocarditis after receipt of mRNA COVID-19 vaccinations.

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