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COVID-19 vaccines and cardiac inflammation

Cases of myocarditis and pericarditis after COVID-19 vaccines are rare: mostly reported in males under 40 years of age, after the second dose. Cases do occur in both females and males, at any age, and after any dose, including a third or fourth dose. Most cases are mild and patients recover quickly.

Myocarditis and pericarditis

There is a link between COVID-19 vaccines and rare side effects of myocarditis and pericarditis.

- Myocarditis is inflammation of the heart muscle.
- Pericarditis is inflammation of the pericardium (the thin, sac-like tissue surrounding the heart muscle).

Myocarditis and pericarditis can occur together or separately.

Myocarditis and pericarditis occur in the general population from a variety of causes. Not all cases that occur after vaccination are caused by the vaccine. Myocarditis and pericarditis can also be caused by COVID-19.

The risk of myocarditis is highest in people aged 16 to 30 years (peak 16 to 18 years), and is higher in males than females.¹⁻³ The risk does not appear to be as high with booster doses compared with dose 2 of the primary course.^{3,4}

Up-to-date information on cases and rates reported to the Therapeutic Goods Administration (TGA) is available in its COVID-19 Vaccine Safety Reports.

Evidence suggests that AstraZeneca and Novavax are probably associated with a small increased risk of myocarditis and pericarditis.

This risk after AstraZeneca looked lower than the risk after Moderna original formulation or Pfizer original formulation. The small number of total doses of Novavax given globally prevents the calculation of a precise risk as of February 2023.

There is no evidence to suggest myocarditis or pericarditis is more severe following a particular brand of vaccine.

ATAGI will continue to monitor data as it emerges and update advice accordingly.

Most myocarditis and pericarditis cases linked to COVID-19 vaccination have been mild and patients have recovered quickly. Longer-term follow-up of these cases is ongoing.

The risk of myocarditis and pericarditis is much lower in children aged 5 to 11 years compared to adolescents. The risk also looks lower after a booster than the primary course.

In children aged 6 months to less than 5 years, there is no clear attributable risk of myocarditis and pericarditis after COVID-19 vaccines.

A longer interval between doses of the primary course may reduce the likelihood of myocarditis and pericarditis by a small amount. A longer interval may also improve vaccine protection. The recommended interval between 2 doses of Pfizer original formulation or Novavax is 8 weeks. The interval can be shortened in some circumstances (such as for people with increased risk of severe COVID-19) to 3 weeks for Pfizer original formulation and Novavax. Moderna original ≥ 6 years formulation (red cap) and AstraZeneca are no longer available in Australia as of early 2023.

As of February 2023, the risk of myocarditis or pericarditis after booster doses with Pfizer or Moderna bivalent original/Omicron vaccines has not been fully characterised.

Guidance

The Australian Technical Advisory Group on Immunisation (ATAGI) and the Cardiac Society of Australia and New Zealand (CSANZ) have jointly developed guidance on managing these conditions.

The guidance contains advice on assessment, management and follow up.



**COVID-19 vaccination – Guidance
on myocarditis and pericarditis
after COVID-19 vaccines**

This guide provides information on pericarditis and myocarditis following COVID-19 vaccines.

Risk/benefit profile

ATAGI emphasise that the overwhelming benefits of vaccination in protecting against COVID-19 greatly outweigh the rare risk of these conditions.

People aged 6 months and over can be vaccinated against COVID-19 if they do not have any contraindications to the vaccine.

People who develop myocardiitis or pericarditis attributed to their first dose of mRNA vaccine should defer further doses and discuss this with their treating doctor.

Initial investigations for people presenting with symptoms or signs of myocardiitis or pericarditis should include ECG, troponin, chest X-ray, and other investigations for other differential diagnoses as clinically indicated.

- pain when breathing.
- shortness of breath
- fainting
- irregular, skipped heartbeats or 'fluttering'
- pressure or discomfort in the chest
- chest pain

Symptoms of myocardiitis or pericarditis typically appear within 1 to 5 days of vaccination. People who experience any of these symptoms after having an mRNA COVID-19 vaccine should seek prompt medical attention:

Symptoms

See the guidance document for details.

Most pre-existing cardiac conditions are **not** contraindications to vaccination. Some patients should consult a GP or cardiologist about the best timing for vaccination and if any additional precautions are needed.

Pre-existing cardiac conditions

- what symptoms to look out for.
- there is a rare risk of myocardiitis or pericarditis

During the consent process, advise people receiving mRNA vaccines: