

New Heart Disease Diagnosis After COVID-19 Vaccination Very Rare

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Abstract: 19.4 patients per million experience myocarditis after COVID-19 vaccination, which is not much higher than baseline rates.

Recent studies^{1,2} have suggested a possible association between the mRNA COVID-19 vaccination and myocarditis, an inflammation of the heart muscle. The CDC is actively reviewing rare reports of post-vaccination myocarditis, especially in adolescent males.³

We studied 15 million patients who were vaccinated between December 11, 2020 and June 9, 2021 and found 291 cases where patients were newly diagnosed with myocarditis within 30 days of receiving the vaccine, for a rate of 19.4 per million patients.



Figure 1. Number of patients with a new myocarditis diagnosis within 30 days of vaccination with an mRNA vaccine.

To contextualize these findings with historical baselines, we counted the number of patients with an encounter with a new diagnosis of myocarditis within 30 days after an office visit in 2019. We found a rate of 14.5 new diagnoses of myocarditis per million patients, meaning that the incidence of myocarditis following the COVID-19 vaccine is not substantively different from historical risk rates.

These data come from Cosmos, a HIPAA-Limited Data Set of more than 119 million patients from 141 Epic organizations including 832 hospitals and 13,421 clinics, serving patients in all 50 states. This study was completed by two teams, each comprised of a clinician and research scientists who worked independently. The two teams came to similar conclusions.

References

1. Montgomery J, Ryan M, Engler R, et al. Myocarditis Following Immunization With mRNA COVID-19 Vaccines in Members of the US Military. JAMA Cardiol. Published online June 29, 2021. [10.1001/jamacardio.2021.2833](https://doi.org/10.1001/jamacardio.2021.2833)
2. Kim HW, Jenista ER, Wendell DC, et al. Patients With Acute Myocarditis Following mRNA COVID-19 Vaccination. JAMA Cardiol. Published online June 29, 2021. doi:[10.1001/jamacardio.2021.2828](https://doi.org/10.1001/jamacardio.2021.2828)
3. Centers for Disease Control. Myocarditis and Pericarditis Following mRNA COVID-19 Vaccination. CDC: COVID-19. Last updated June 23, 2021. [Myocarditis and Pericarditis Following mRNA COVID-19 Vaccination | CDC](https://www.cdc.gov/media/releases/2021/s0623-myocarditis-pericarditis.html)

Data Definitions

Term	Definition
Myocarditis Diagnoses	The earliest date on which a diagnosis mapped to ICD-10 codes I40.0, I40.1, I40.8, or I40.9 was documented on a patient as an encounter diagnosis, final billing diagnosis, or problem list problem. We included both adult and pediatric patients in our study because the relative rarity of myocarditis diagnoses meant that we couldn't stratify the data by age with statistical confidence.
COVID-19 Vaccination	Documentation of a completed COVID-19 vaccination on or after December 11, 2020.
Broad Population	All patients with an office visit in 2019, adjusted for vaccine eligibility age. The first office visit date in 2019 per patient defines the start of the 30-day window in which to identify any onset of myocarditis.