



BC Centre for Disease Control  
Provincial Health Services Authority

655 West 12th Avenue  
Vancouver, BC V5Z 4R4

Communicable Diseases &  
Immunization Service

www.bccdc.ca  
www.immunizebc.ca

Tel 604.707.2548  
Fax 604.707.2515

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Dear Doctor:

**Re: Myocarditis/ pericarditis in association with receipt of mRNA COVID-19 vaccine**

In late May 2021, the World Health Organization vaccine safety committee noted that myocarditis and pericarditis following vaccination with COVID-19 mRNA vaccines are events of special interest for continued evaluation.<sup>1</sup>

A small number of case series have emerged from Israel and the United States.<sup>2,3,4</sup> The US Centres for Disease Control and Prevention has provided recommendations for clinicians.<sup>5</sup>

Available information indicates that:

- Symptom onset was typically within several days after vaccination
- Cases were mainly male adolescents and young adults after the second dose
- Cases experienced mild illness, responded well to conservative treatment and rest, and their symptoms improved quickly.

**No clear association has been established between myocarditis/pericarditis and mRNA vaccines**, and to date, no regulatory action has been taken in Canada or internationally.

**Situation in Canada and BC**

As part of ongoing COVID-19 vaccine safety efforts, BC Centre for Disease Control (BCCDC) along with local medical health officers, the Public Health Agency of Canada (PHAC) and Health Canada are closely monitoring myocarditis/pericarditis in passive and active Canadian safety surveillance systems, including the Canadian Adverse Events Following Immunization Surveillance System (CAEFISS)<sup>6</sup>, the Canada Vigilance Program<sup>7</sup>, the Canadian National Vaccine Safety Network (CANVAS)<sup>8</sup> and the Canadian Immunization Monitoring Program ACTIVE (IMPACT).<sup>9</sup>

In BC and elsewhere in Canada, there have been a small number of reports of pericarditis or myocarditis following vaccination with a COVID-19 mRNA vaccine. We are **not** currently seeing higher rates than would be expected due to other causes. The weekly Canadian<sup>10</sup> and BC<sup>11</sup> adverse events following COVID-19 vaccine reports provide updates on the latest numbers.

**Diagnosis and reporting**

Myocarditis and pericarditis involve inflammation of the heart in response to an infection or some other trigger. Symptoms can include shortness of breath, chest pain, or the feeling of a rapid or abnormal heart rhythm.



A research and teaching centre affiliated with UBC

**Healthcare providers should consider myocarditis and pericarditis in evaluation of acute chest pain or pressure, documented arrhythmia, shortness of breath or other clinically compatible symptoms after vaccination.** They should consider doing an electrocardiogram (ECG), troponins, BNP (brain natriuretic peptide), and C-reactive protein. If these markers are consistent with myocardial involvement and acute coronary syndromes are not high on the differential, testing for acute COVID-19 infection (e.g., PCR testing), prior SARS-CoV-2 infection (e.g., detection of SARS-CoV-2 spike and nucleocapsid antibodies), and other viral etiologies (e.g., respiratory viruses associated with myocarditis) are recommended in consultation with the BCCDC Medical Microbiologist (telephone 604-661-7033). An echocardiogram can be undertaken **in consultation with cardiology at BC Children's** (telephone 604-875-2161), or **adult cardiology** as appropriate. While the gold standard(s) for the diagnosis of myocarditis is cardiac MRI, PET or endomyocardial biopsy, these will typically not be necessary for this diagnosis in an otherwise well adolescent or young adult. **Consultation can be sought with** infectious disease and/or rheumatology if other etiologies are being considered.

**All cases of myocarditis or pericarditis following vaccination should be [reported to the local health authority](#).**<sup>12</sup> BCCDC and other Canadian public health authorities will continue to closely monitor reports of myocarditis and/or pericarditis. Health Canada is also working closely with the manufacturers and international regulators to review information as it becomes available and will take appropriate action as needed. More information will be shared as it becomes available.

The benefits of the mRNA vaccines continue to outweigh their risks including in adolescent populations, and parents and teens should be reassured that the safety surveillance program has not seen an abnormal association of these events with the vaccines. There are clear benefits of mRNA vaccines in reducing hospitalizations and deaths due to COVID-19 infections.

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<sup>1</sup> COVID-19 subcommittee of the WHO Global Advisory Committee on Vaccine Safety (GACVS) reviews cases of mild myocarditis reported with COVID-19 mRNA vaccines.  
<https://www.who.int/news/item/26-05-2021-gacvs-myocarditis-reported-with-covid-19-mrna-vaccines>

<sup>2</sup> Mouch SA, Roguin A, Hellou E, Ishai A et al. Myocarditis following COVID-19 mRNA vaccination. Vaccine. 2021 May 28;S0264-410X(21)00682-4. doi: 10.1016/j.vaccine.2021.05.087. Epub ahead of print. PMID: 34092429.  
2021. <https://doi.org/10.1016/j.vaccine.2021.05.087>

<sup>3</sup> Snapiri O, Rosenberg D, Chen MD, Shirman N, et al. Transient Cardiac Injury in Adolescents Receiving the BNT162b2 mRNA COVID-19 Vaccine. Pediatr Infect Dis J. 2021 June 2. doi: 10.1097/INF.0000000000003235. Online ahead of print.  
[https://journals.lww.com/pidj/Abstract/9000/Transient\\_Cardiac\\_Injury\\_in\\_Adolescents\\_Receiving.95800.aspx](https://journals.lww.com/pidj/Abstract/9000/Transient_Cardiac_Injury_in_Adolescents_Receiving.95800.aspx)

<sup>4</sup> Marshall M, Ferguson ID, Lewis P, Jaggi P, et al. Symptomatic Acute Myocarditis in Seven Adolescents Following Pfizer-BioNTech COVID-19 Vaccination. Pediatrics. 2021 Jun

4:e2021052478. doi: 10.1542/peds.2021-052478. Epub ahead of print. PMID: 34088762.

<https://pubmed.ncbi.nlm.nih.gov/34088762/>

<sup>5</sup> Myocarditis and Pericarditis Following mRNA COVID-19 Vaccination.

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/myocarditis.html>

<sup>6</sup> Canadian Adverse Events Following Immunization Surveillance System (CAEFISS).

<https://www.canada.ca/en/public-health/services/immunization/canadian-adverse-events-following-immunization-surveillance-system-caefiss.html>

<sup>7</sup> Canada Vigilance Program. <https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/canada-vigilance-program.html>

<sup>8</sup> Canadian National Vaccine Safety Network (CANVAS). <https://cirnetwork.ca/network/national-ambulatory-network/>

<sup>9</sup> Canadian Immunization Monitoring Program ACTIVE (IMPACT). <https://www.cps.ca/impact>

<sup>10</sup> Reported side effects following COVID-19 vaccination in Canada. <https://health-infobase.canada.ca/covid-19/vaccine-safety/>

<sup>11</sup> BC Centre for Disease Control. BC's weekly report on adverse events. BC Report: AEFI with COVID-19 vaccines. <http://www.bccdc.ca/health-info/diseases-conditions/covid-19/covid-19-vaccine/monitoring-vaccine-uptake-safety-and-effectiveness>

<sup>12</sup> BC Centre for Disease Control. How to report an AEFI. Report of Adverse Event Following Immunization with COVID-19 Vaccine. <http://www.bccdc.ca/health-professionals/clinical-resources/adverse-events-following-immunization>