

Myocarditis and Pericarditis after mRNA COVID-19 Vaccination: Management Algorithm for Health Care Providers



Canadian Cardiovascular Society

Epidemiology

- These are rare events; reporting rate of myocarditis is 1.2/100,000 mRNA COVID-19 vaccine doses in Canada, but varies with factors like sex, age, vaccine type, dose number, and dosing interval.
- The risk of COVID-19 associated myocarditis is consistently greater than the risk of post-vaccine myocarditis. The benefit outweighs the risk even further when considering the wider consequences of COVID-19 infection.
- Adolescent males are at greater risk for myocarditis from all causes.
- Post-vaccine myocarditis is more common after the second mRNA COVID-19 vaccine dose than the first.
- The incidence of post-vaccine pericarditis and events following booster doses is uncertain.

Patient with clinically suspected myo/pericarditis presents to primary care or ED

Consult specialist care (i.e., cardiology or internal medicine, as available)

Examine & manage based on risk profile

Risk Profiles:	Low Risk (Uncomplicated)	Moderate Risk (Complicated)	High Risk (Complicated) *Transfer patient to biopsy and CMR capable centre*
Symptoms	Chest pain, dyspnea, palpitations, diaphoresis, syncope, or edema	Same as low risk + acute heart failure, recurrent disease	Same as moderate risk + cardiogenic shock, cardiac arrest, sudden death
Assess for Alternative Etiology	COVID-19 PCR, chest x-ray, D-Dimer, and relevant individualized testing	Same as low risk + autoimmune testing + infectious testing (i.e., Lyme in endemic areas)	Same as moderate risk + in-depth investigation
Standard Investigations:			
<i>Cardiac Enzymes (troponin + CK)</i>	Normal, mildly elevated, or downtrending	Normal, elevated, or uptrending	Elevated or uptrending
<i>Inflammatory Markers (CRP + ESR)</i>	Normal, mildly elevated, or downtrending	Normal, elevated, or uptrending	Elevated or uptrending
<i>ECG/Holter</i>	Normal or non-specific changes	Normal, ectopy, or non-specific changes	Ventricular arrhythmia or high-grade heart block
<i>Echocardiography</i>	LVEF ≥ 50%, small or no pericardial effusion	LVEF 30-49%, moderate pericardial effusion without tamponade	LVEF <30%, any pericardial effusion with tamponade
<i>CMR</i>	CMR recommended No LGE or edema, normal parametric mapping	CMR recommended Normal, or minimally abnormal LGE, edema, or parametric mapping sequences	CMR recommended when stable Generally abnormal with LGE, edema, or abnormal parametric mapping
<i>Endomyocardial Biopsy</i>	No	May consider	Yes
<i>Coronary Evaluation</i>	Yes, if risk factors for CAD, infarct-like presentation, or age >45		
Treatment Setting	Consider outpatient management in select patients with early follow-up	Inpatient (admit to ward on telemetry)	Inpatient (admit to ICU/CICU)

Treat according to risk profile & clinical manifestation

1. NSAIDs, colchicine, PPI, and exercise restriction
2. Consider corticosteroids for severe disease
3. Heart failure GDMT
4. Cardiogenic shock management including MCS

Follow-up with specialist & complete AEFI reporting (all risk profiles)

Abbreviation List

AEFI = adverse events following immunization
CAD = coronary artery disease
CICU = cardiac intensive care unit
CK = creatine kinase

CMR = cardiac magnetic resonance imaging
CRP = C-reactive protein
ECG = electrocardiogram
ED = emergency department
ESR = erythrocyte sedimentation rate

GDMT = guideline-directed medical therapy
ICU = intensive care unit
LGE = late gadolinium enhancement
LVEF = left ventricular ejection fraction
MCS = mechanical circulatory support

NSAIDs = non-steroidal anti-inflammatory drugs
PCR = polymerase chain reaction test
PPI = proton pump inhibitors



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