

- **Inclusion Criteria:** Chest pain/pressure/discomfort, dyspnea/shortness of breath/pain with breathing or palpitations AND within one month of receipt of first or second dose of COVID-19 mRNA vaccine
- **Exclusion Criteria:** meets criteria for MIS-C diagnosis (see [MIS-C clinical pathway](#)), prior cardiac history, active COVID-19 infection, other clear etiology for the presentation

**Initial ED Work Up and Management :**

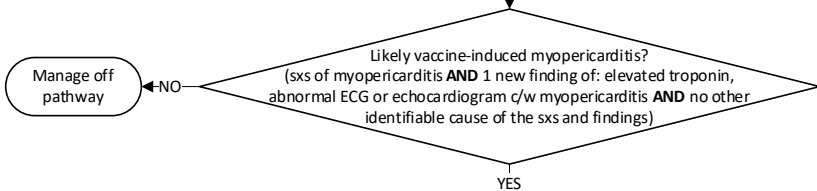
**If signs of cardiac shock:** Prompt recognition of shock is crucial. Rapid push/pull administration of 10 ml/kg aliquots of fluid as tolerated with frequent reassessment for signs of worsening heart failure, such as hepatomegaly, crackles, gallop, and other signs of fluid overload. Strong consideration should be given for early initiation of inotropic support and early PICU consultation.

**Initial imaging and lab studies:** (see [Appendix A](#) for blood volumes and required tubes)

- STAT: CBC with differential, "hepatic function panel (no coags)", chem 10, CRP, ESR, troponin, NT-proBNP, CK/CKMB
  - Extra red top tube to hold for further studies
- CXR 2 views
- ECG
- COVID-19/Influenza PCR
- *If ill appearing or strong possibility of MIS-C based upon above labs or clinical presentation, consider the following additional studies* (see [Appendix A](#) for blood volumes and required tubes): blood gas with lactate, coags, cortisol, fibrinogen, D-dimer, LDH, ferritin, procalcitonin, blood culture, urinalysis, urine culture, respiratory BIOFIRE, and enter order as "add on" for SARS-CoV-2 IgG antibodies (can be run from lavender top tube sent for CBC/CRP)

**Consultation:**

- **Consult Cardiology if abnormal ECG, elevated troponin, and/or signs cardiac failure**



**Admit to Cardiology Service**

**Additional imaging and labs:**

- Trend troponin:
  - q3hr if initial troponin WNL; q6hr if already elevated at admission
- Daily NT-proBNP
- Send additional labs, if not already done:
  - SARS-CoV-2 nucleocapsid IgG, SARS-CoV-2 spike protein, TSH, free T4, respiratory Biofire, blood Adenovirus PCR, EBV serology panel, CMV IgG & IgM, HIV 1/2 AG/AB, Parvovirus IgG & IgM, Herpesvirus 6 IgG & IgM, HSV 1/2 IgG & IgM, Lyme IgG & IgM w/reflex to Elisa, blood culture; enterovirus PCR on stool
  - Additional labs per Infectious Disease (ID)
- Daily ECG
- Echocardiogram

**Consultation:**

- Consult Infectious Diseases (ID) to investigate other possible causes of perimyocarditis

**Monitoring:**

- Continuous cardiorespiratory monitoring

**Reporting:**

- Report information to [Vaccine Adverse Event Reporting System \(VAERS\)](#)

* Abnormal Lab Values:	
•	Absolute Lymphocyte Count < 1000
•	Platelets < 100
•	CRP >3
•	ESR >40
•	Na < 135
•	ALT >45
•	NT-proBNP >800
•	CKMB/CK > 5%
•	Elevated Troponin T, high sensitivity (if elevated, discuss significance with Cardiology)

Once ID consultation completed and work-up has been sent, may proceed with treatment below if agreed upon by ID and Cardiology attendings

**Management:**

- **Methylprednisolone** IV 2 mg/kg x1 dose (max 80 mg) – give first and then start IVIG
- **IVIG** 2 g/kg x 1 (max 100 g/dose); may divide into 2 doses if concerns for volume overload/cardiac dysfunction
- Cardiac MRI must be performed approximately 1-2 weeks from time of presentation

**Discharge Criteria:**

Cardiac MRI scheduled (if not already completed), pain free, troponin down-trending, no arrhythmia, normal or improving cardiac function by echocardiogram

**Discharge Instructions:**

No exercise for at least 3 months, place 30-day cardiac event recorder upon discharge, follow-up with Cardiology at 2 weeks and 6 weeks post-discharge

NEXT PAGE

**CLINICAL PATHWAY:**  
**Post SARS-CoV-2 Vaccine Myopericarditis**  
**Appendix A: Blood Volumes and Required Tubes for Labs**

THIS PATHWAY  
SERVES AS A GUIDE  
AND DOES NOT  
REPLACE CLINICAL  
JUDGMENT.

**Initial Work Up:**

- CBC with differential: Whole blood, Lavender EDTA, Minimum 1 mL, 4mL collection tube or microtainer
- “Liver function panel” (without coags): Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1mL plasma
- Chem 10: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma
- CRP: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- ESR: Whole blood, Lavender EDTA, Minimum 1 mL, 4mL collection tube
- Troponin: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- NT-proBNP: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- CKMB: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- Hold extra red top tube for future studies, if able

*If ill-appearing or strong possibility of MIS-C, additional studies can be sent:*

- blood gas with lactate: 1mL of whole blood into a heparin syringe on ice or full Green Lithium Heparin tube (blood gas); Grey top or Li Heparin on ice (lactate)
- Coags: Full Blue top sodium citrate tube (coags)
- Cortisol: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- Fibrinogen: Full Blue top sodium citrate tube
- D-dimer: Full Blue top sodium citrate tube
- LDH: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- Ferritin: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- Procalcitonin: Green top Lithium Heparin with gel-barrier, minimum 2mL whole blood, 1 mL plasma.
- Blood culture: Bactec pedi bottle (no minimum amount needed)

**\*\*all tubes being sent need to be full if you wish the lab to run multiple tests off of the same tube – minimum volumes added together will not suffice\*\***

- Lavender top EDTA tube (*not the bullet*):
  - Amount of blood: needs to be full
    - can run: CBC w diff, ESR (can also add on SARS-CoV-2 antibody if requiring admission)
- Green top lithium heparin with gel barrier tube:
  - Amount of blood: needs to be full
    - Can run: liver function panel, chem 10, CRP, LDH, procalcitonin, ferritin, troponin, NT-proBNP, CKMB, cortisol
- Blue top sodium citrate tube:
  - Amount of blood: needs to be full
    - Can run: coagulation tests, fibrinogen, D-dimer



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**CLINICAL PATHWAY:**  
**Post SARS-CoV-2 Vaccine Myopericarditis**  
**Appendix A: Blood Volumes and Required Tubes for Labs**

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**Additional Work Up:**

- SARS-CoV-2 nucleocapsid IgG Qualitative: Red top or SST tube, 1 ml of serum (0.5 ml minimum); or plasma collected in lavender EDTA
- SARS-CoV-2 spike protein, Semi-Quantitative: Red top or SST tube, 1 ml of serum (0.5 ml minimum); or plasma collected in lavender EDTA
- TSH; Free T4: Green top lithium heparin gel or non-gel barrier tube, 1 ml (0.5 ml minimum)
- Adenovirus PCR (blood):
  - Adenovirus Qualitative PCR: Lavender top EDTA or Yellow top ACD tube: 1 ml whole blood
  - Adenovirus Quantitative PCR: Lavender top EDTA or Yellow top ACD tube: 1 ml whole blood
- EBV serology panel: Red top serum, 1.0 mL (0.5 mL) min required
- CMV
  - Cytomegalovirus (CMV) Antibody, IgG: Red top serum, 1 mL (0.5 mL minimum)
  - Cytomegalovirus (CMV) Antibody, IgM: Red top serum, 1 mL (0.5 mL minimum)
- HIV 1 / 2 Ag/Ab Rflx to Confirmation: Red top non-gel barrier/SST tube, 4 ml (3 ml minimum)
- Parvovirus IGG & IGM: Send out to Quest, Red top or SST tube, 2 mL (1 mL minimum) serum
- Herpesvirus 6 IgG & IgM: Red top or SST tube, 1 ml serum
- HSV 1 / 2 IgG & IgM: Red top or SST tube, 2 ml serum (1 ml minimum)
- Lyme IgG & IgM w reflex to Elisa: Red non-gel barrier tube or SST, 1 ml (0.5 ml minimum)
- Enterovirus PCR on stool: 0.5 grams or 0.5 ml of stool



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This pathway is subject to change, based on evolving recommendations from the CDC and CT DPH.  
LAST UPDATED: 3.17.23

