CLINICAL PATHWAY:

Post SARS-CoV-2 Vaccine Myopericarditis

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

- **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 Multi-System Inflammatory Syndrome in Children (MIS-C) (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 PCR (via multi-viral LIAT)
- *If MIS-C suspected:* follow the MIS-C Clinical Pathway.

Consultation:

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

*** 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)

Likely vaccine-induced myopericarditis?
*(signs/symptoms of myopericarditis **AND** 1 new finding of: elevated troponin, abnormal ECG or echocardiogram consistent with myopericarditis **AND** no other identifiable cause of the signs, symptoms and findings)*

NO → Manage off pathway

YES

Admit to Cardiology Service

Additional imaging and labs: (see Appendix A for blood volumes and required tubes)

- Trend troponin:
  - q3hr if initial troponin WNL; q6hr if already elevated at admission
- Daily NT-proBNP
- Send additional labs, if not already done:
  - TSH, free T4, respiratory Biofire
  - Additional labs per Infectious Diseases (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)

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

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

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Connecticut Children's

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 admitted:
    - TSH; Free T4: Green top lithium heparin gel or non-gel barrier tube, 1 ml (0.5 ml minimum)

****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)* – needs to be full
    - Can run: CBC w diff, ESR
- Green top lithium heparin with gel barrier tube – needs to be full
    - Can run: liver function panel, chem 10, CRP, LDH, ferritin, troponin, NT-proBNP, CKMB, cortisol
- Blue top sodium citrate tube – needs to be full
    - Can run: coagulation tests, fibrinogen, D-dimer

Additional studies, per Infectious Diseases:

- Adenovirus PCR (blood):
    - Adenovirus Qualitative 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
- Lyme IgG & IgM w reflex to Elisa: Red non-gel barrier tube or SST, 1 ml (0.5 ml minimum)
- Enterovirus qualitative PCR on blood: Lavender top EDTA or Yellow top ACD tube: minimum 0.3 ml serum