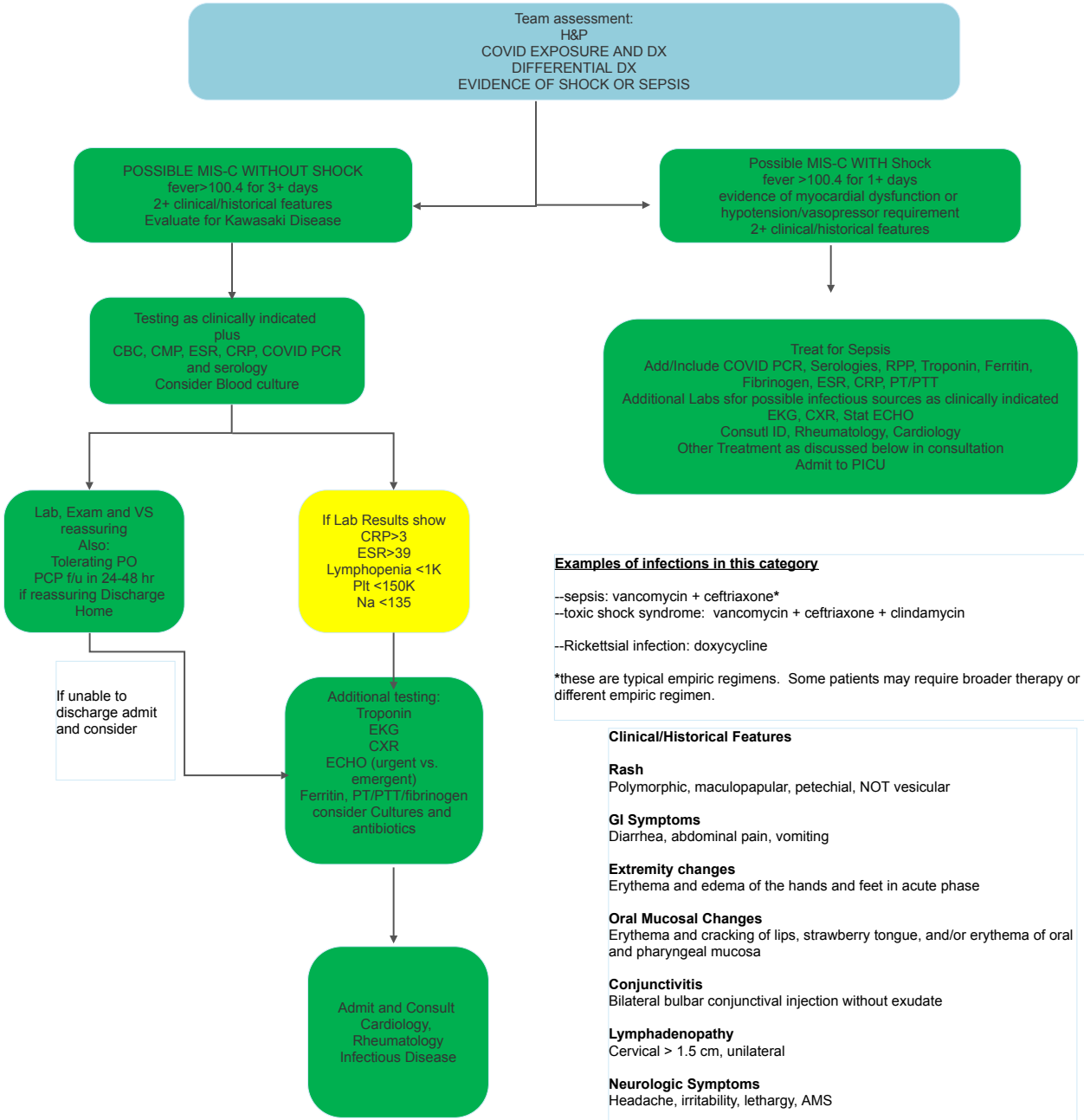
## Approach to Diagnosis and Management of Children with Suspected MIS-C




**Examples of infections in this category**

--sepsis: vancomycin + ceftriaxone*
--toxic shock syndrome: vancomycin + ceftriaxone + clindamycin

--Rickettsial infection: doxycycline

*these are typical empiric regimens. Some patients may require broader therapy or different empiric regimen.

**Clinical/Historical Features**

**Rash**
Polymorphic, maculopapular, petechial, NOT vesicular

**GI Symptoms**
Diarrhea, abdominal pain, vomiting

**Extremity changes**
Erythema and edema of the hands and feet in acute phase

**Oral Mucosal Changes**
Erythema and cracking of lips, strawberry tongue, and/or erythema of oral and pharyngeal mucosa

**Conjunctivitis**
Bilateral bulbar conjunctival injection without exudate

**Lymphadenopathy**
Cervical > 1.5 cm, unilateral

**Neurologic Symptoms**
Headache, irritability, lethargy, AMS

**Epidemiologic Link to COVID**
Patient with history of COVID disease or close contact with known Positive COVID case in past 4 weeks, or person placed in quarantine


**SSMHealth Cardinal Glennon**
**Access Center Transfer Line**
**888-229-2424**


1. SSMHealth Cardinal Glennon CPG Home

2. Resources

**There are increasing reports internationally and throughout the United States of an inflammatory process in pediatric patients who have been exposed to COVID-19. As of 5/20/20, New York State has reported up to 146 patients and 3 deaths in previously healthy children, approximately 2-6 weeks post-infection per the New York Dept of Health. These cases often resemble Kawasaki Disease, but also can have clinical features consistent with toxic shock syndrome and macrophage activation syndrome (MAS). When compared to acute COVID-19 disease, these children are less likely to present with focal respiratory illness.**
**Given emerging information about this syndrome, this guideline will be reviewed in 3, 6 and 12 months**

The CDC has published the following case definition:

- < 21 years of age
- Fever (100.4F, or subjective >24h
- laboratory evidence of inflammation
- evidence of clinically severe illness requiring hospitalization
- multisystem (>2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); **AND**
- No alternative plausible diagnoses; **AND**
- Positive COVID PCR or serology or known exposure in the last 4 weeks

**Please note that the above case definition does not define who should have a diagnostic evaluation for MIS-C (e.g. inflammatory markers, ECHO, etc). Evaluation at this time is a topic of discussion and should be based on clinical judgment. The general consensus includes a patient with persistent fever without source, particularly with abdominal pain, rash, conjunctivitis or neurologic changes.**

**References**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**The following initial testing is recommended in concert with Infectious Diseases, Cardiology and Rheumatology consultations and symptom presentation:**

**Labs**:

- •SARS-CoV-2 PCR and serology for IgG
- •CBC, CMP, U/A, UCx, Blood Cx
- •ESR/CRP, ferritin, troponin, PT/PTT/fibrinogen
- •Evaluation for other sources of infection:
  - o RPP (e.g. adenovirus)
  - o If history suggests increased risk of tick bites, Ehrlichia blood PCR/RMSF serology panel
  - o If history and exam suggestive, rapid strep and culture (e.g. scarlet fever)
  - o Consider Monospot, EBV serology panel, CMV IgM/IgG
  - o LP if indicated clinically
- •The below labs should be considered for patients with suspected MIS-C. Not all of these labs will be necessary for all patients. Please use your clinical judgment based on patient symptoms and planned management when ordering, bearing in mind the turn-around time for the lab:
  - o BNP
  - o IL-6
  - o D-dimer
  - o Procalcitonin
  - o Lactate
  - oTriglycerides

Other Diagnostic Studies/Imaging:

- •EKG
- •CXR
- •ECHO (discuss with cardiology emergent vs urgent ECHO)

Fluids/Treatment:

- •Often fluid refractory, consider clinical cardiac state when determining volume of fluids
- •Epinephrine or norepinephrine for hemodynamic support
- •IVIG and aspirin if meeting criteria for Kawasaki Disease or incomplete Kawasaki Disease.
  - o Otherwise, for those MIS-C patients with signs of possible cardiac involvement, including:
    - *unexplained persistent tachycardia*
    - *ECG abnormalities suggesting carditis*
    - *elevated troponin*
    - *echo changes (whether it be abnormal function or pathologic valve regurgitation)*
    - *patients with clinical findings of CHF or poor cardiac output*

IVIG should be considered due to initial reports indicating its potential role in improving cardiac function, as well as potentially mitigating further development of coronary vasculitis. Risks and benefits should be considered for individual patients based on the overall clinical picture. This decision should be made in consultation with cardiology and primary attending

If IVIG is to be administered, the prescribing practitioner and primary team should be aware of the more common adverse effects as well as the less common, but more serious adverse effects as they are commonly unrecognized in the setting of critical illness. The most common adverse effects occur soon after infusion and can include headache, flushing, chills, myalgia, wheezing, tachycardia, lower back pain, nausea, and hypotension. The serious adverse effects include hemolysis, anaphylaxis, and aseptic meningitis that may be delayed or shortly after beginning the infusion. A full list of potential adverse effects can be found here for your reference (IVIG ADEs).

- •Broad spectrum antibiotics for patients meeting sepsis criteria: vancomycin, ceftriaxone; add clindamycin to antibiotic regimen if concern for toxic shock
- •Consider, based on patient symptoms and in discussion with Cardiology, Rheumatology and Infectious Diseases, further treatment may include:
  - o Lovenox (enoxaparin) or aspirin
  - o Anakinra
  - o Solumedrol/Decadron/Steroid