Mission Peds/PICU Guidance for COVID19

COHORTING: Patients should be cohorted physically and with respect to nursing care when possible. If multiple COVID+ patients are admitted, those patients should be grouped together and cared for by the same nurse if possible to minimize exposure. In PICU, prefer G331 (if negative pressure needed) & G332. On Peds, G319 (if negative pressure needed) and G318-G315. Assigned nurse should attempt to stay at the same workstation throughout the day.

ADMISSION LABS: For any patient requiring supplemental oxygen, obtain CBC w/ differential, CRP, ESR, CMP, LDH, Ferritin, D-dimer, PT/INR, PTT, fibrinogen, Type and Screen, Pregnancy test if appropriate

UNIT PLACEMENT: Patients requiring 4L of oxygen and greater or any signs of hemodynamic instability should be admitted to the PICU.

TREATMENT:

<table>
<tr><td>Mild disease</td><td colspan="2">Supportive care.</td></tr>
<tr><td rowspan="3">Moderate disease
(requiring supplemental oxygen)

Utilize the “PD Pediatric COVID-19 and MIS-C” PowerPlan</td><td>Consider:
Decadron</td><td>o Dosing:
o 0.15 mg/kg/dose IV or PO daily for up to 10 days. Max dose 6 mg per dose.
May discontinue at discharge or when no longer requiring supplemental O2.</td></tr>
<tr><td>Consider:
Remdesivir</td><td>• FDA approved for hospitalized patients ≥12 years of age weighing ≥40kg. Patients <12 years OR <40kg are eligible to receive Remdesivir via the FDA’s EUA process. Provide family with FDA Fact Sheet for Health Care Providers
PROVIDER DOCUMENTATION OF RECEIPT REQUIRED FOR EUA.

• Dosing:
o 5mg/kg IV x 1 (max dose 200 mg), then 2.5 mg/kg IV daily (max dose 100 mg) for 5-10 days.
o Use the pediatric subplan to order Remdesivir:
PD Pediatric Remdesivir for Coronavirus 19 (COVID-19) Subplan (System)

• OK to discontinue prior to day 5 if off oxygen and ready for discharge.

• Side effects are elevated LFTs and GI upset. Follow serial LFTs to monitor for side effects.</td></tr>
<tr><td>Consider:
convalescent plasma

*May consider ID consult</td><td>• Available via FDA’s EUA process. Provide family with EUA Fact Sheet for Patients and Caregivers . PROVIDER DOCUMENTATION OF RECEIPT REQUIRED. See attached document: HCA North Carolina Division Guidance for Convalescent Plasma Use – Pediatrics.

• CONSENTS: Mission Blood Consent AND Secondary Consent for Convalescent Plasma are required. (Can also be obtained from the print shop MHS-00001-222-0920)

• Dosing:
o Weight based dosing of 10 mL/kg
o Put “Covid-19 convalescent plasma” in order comments</td></tr>
</table>

	Consider:
	Lovenox
	** Consider heme/onc consult*
		• Dosing:
		  o **Prophylactic:** 0.5 mg/kg SQ q12h (max dose 50 mg)
		  o **Treatment:** 1 mg/kg SQ q12h
		• Use the following order set to order Lovenox: "PD Pediatric COVID-19 and MIS-C" PowerPlan
		• Consider continuation of anticoagulation therapy for 30 days or until mobile

Severe disease (requiring HFNC, NIV, invasive ventilation or other organ failure) *Utilize the "PD Pediatric COVID-19 and MIS-C" PowerPlan*	*All patients:* **Decadron**	o Dosing: o **0.15 mg/kg/dose IV** or PO daily for up to 10 days. Max dose 6 mg per dose. May discontinue at discharge or when no longer requiring supplemental O2.

	Consider:
	Remdesivir
		• FDA approved for hospitalized patients ≥12 years of age weighing ≥40kg. Patients <12 years OR <40kg are eligible to receive remdesivir via the FDA's EUA process. Provide family with FDA Fact Sheet for Health Care Providers
		PROVIDER DOCUMENTATION OF RECEIPT REQUIRED FOR EUA.
		• Dosing:
		  o **5mg/kg IV x 1** (max dose 200 mg), **then 2.5 mg/kg** IV daily (max dose 100 mg) for 5-10 days.
		  o Use the pediatric subplan to order Remdesivir:
		  PD Pediatric Remdesivir for Coronavirus 19 (COVID-19) Subplan (System)
		• OK to discontinue prior to day 5 if off oxygen and ready for discharge.
		• Side effects are elevated LFTs and GI upset. Follow serial LFTs to monitor for side effects.

	Consider:
	Convalescent Plasma
	
	**May consider ID consult*
		• Available via FDA's EUA process. Provide family with EUA Fact Sheet for Patients and Caregivers . PROVIDER DOCUMENTATION OF RECEIPT REQUIRED. See attached document: HCA North Carolina Division Guidance for Convalescent Plasma Use – Pediatrics.
		• *CONSENTS*: Mission Blood Consent **AND** Secondary Consent for Convalescent Plasma are required. (Can also be obtained from the print shop MHS-00001-222-0920)
		• Dosing:
		  o Weight based dosing of 10 mL/kg
		  o Put "Covid-19 convalescent plasma" in order comments

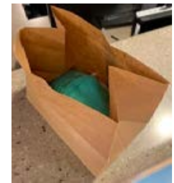
	Prone positioning	• Prone positioning should be done at least **12 hours/day**

	All patients:
	Lovenox
	** Consider heme/onc consult*
		• Dosing:
		  o **Prophylactic:** 0.5 mg/kg SQ q12h (max dose 50 mg)
		  o **Treatment:** 1 mg/kg SQ q12h
		• Use the following order set to order Lovenox: "PD Pediatric COVID-19 and MIS-C" PowerPlan
		• Consider continuation of anticoagulation therapy for 30 days or until mobile

PPE – All COVID+ patients require full PPE including eye protection, gown, gloves, and level 3 mask if no or minimal O2 requirements/N-95 if high flow, NIV, or intubated. **You may obtain green scrubs to wear during your shift if you are caring for a COVID+ patient.** **Eye protection is required for *all* patient care, regardless of COVID or PUI status.**

Any patient on the ventilator, bi-pap, or cpap	N95 or PAPR plus eye protection (If PUI or COVID+, also gown and gloves)
Any patient on high-flow O2 (Peds and PICU)	N95 or PAPR plus eye protection (If PUI or COVID+, also gown and gloves)
Any patient receiving nebulized treatments (Peds and PICU)	N95 or PAPR plus eye protection while neb is being delivered and for 30 minutes after (If PUI or COVID+, also gown and gloves)
Any patient receiving any other aerosol-generating procedures (AGPs) (Peds and PICU)	N95 or PAPR plus eye protection while neb is being delivered and for 30 minutes after (If PUI or COVID+, also gown and gloves)
PUI/COVID+ *not* receiving AGPs (Peds and PICU)	Level 3 mask and eye protection, gown, gloves
***Non* PUIs on the Peds floor**	Level 1 mask and eye protection
***Non* PUIs in the PICU**	Level 1 mask plus eye protection

- Utilize brown paper bags to store N-95 for your shift. You can cut the bag to make it shorter, making it easier to access your mask. If you are going to multiple COVID+ rooms, you may leave your mask and eye protection on (change gown and gloves).



- It is recommended to wear a full face shield in COVID+ rooms to help protect the N-95. If you do this, you do not need to wear a level 3 over your N-95. If you do decide to wear a level 3, this mask should be specific to this purpose. If you are wearing a level 3 mask while at the nursing station, it should be a different (clean) level 3.

COVID-19 Discharge process/education:

Provide education on signs/symptoms of DVT (swelling, pain, redness, warmth). This document can be attached to the patient's discharge to provide education on DVTs: DVT (Deep Vein Thrombosis): General Info
NUS office has packets of other COVID-related discharge documents in the Peds COVID notebook. Documents are: - Steps for People After COVID-19 Testing - What to do if you are sick with coronavirus disease 2019 (COVID-19) - Visitor Log
AAP Back to Play Recommendations: Educate families that patients who have tested positive for COVID-19 should refrain from exercise until asymptomatic for 14 days and have received clearance from the Primary Care Provider. (https://services.aap.org/en/news-room/news-releases/aap/2020/american-academy-of-pediatrics-updates-guidance-on-returning-to-sports-activities/)

Mission Peds/PICU MIS-C Management

MIS-C Case Definition: Individual less than 21 years with fever, and laboratory evidence of inflammation (ESR, CRP, d-dimer, ferritin, fibrinogen), severe illness requiring hospitalization and ≥2 organ systems involved; no alternative diagnosis and a positive COVID result, positive COVID antibodies, or exposure to a suspected or confirmed case within 4 weeks of onset of symptoms.

Consider MIS-C diagnosis for children with: fever, rash, GI upset, elevated inflammatory markers, conjunctivitis, red cracked lips, swelling of hands and feet, shock

Admission Placement: Patients should be admitted to the PICU for the following: evidence of shock *after* 40mL/kg fluid resuscitation, cardiac dysfunction on echocardiogram or moderately elevated BNP or troponin levels.

Transfer to ECMO facility if patient fails standard therapy or displays arrhythmias and/or moderate cardiac dysfunction.

TREATMENT:

	Labs/Diagnostics	Consults/Monitoring	Treatments
Suspected MIS-C *Utilize the "PD Pediatric COVID-19 and MIS-C" PowerPlan*	**Labs:** • CBC • CRP/ESR • CMP • LDH • PT/PTT • D-dimer • Fibrinogen • Ferritin • Troponin • BNP • COVID PCR • COVID antibody • Infectious labs including blood and urine culture if sepsis suspected **Diagnostic Studies:** • EKG • Consider ECHO	• Consider cardiology and/or ID consult • Telemetry • Follow serial labs daily or as needed to monitor response to treatment	*Consider*: • **IVIG**: 1-2 gm/kg/dose x1 (maximum 100 gm/dose). ○ May consider repeating dose daily x1 for continued fever 24-36h or worsening clinical condition. • **Solumedrol**: 2 mg/kg day (then taper over 3 weeks) • **Aspirin**: 3-5 mg/kg/day; max 81 mg/day. Avoid if platelet count ≤80K • *Consider adding a proton pump inhibitor for patients receiving steroids + aspirin to decrease risk for GI bleed*

<table>
<tr>
<td>Confirmed MIS-C

Utilize the "PD Pediatric COVID-19 and MIS-C" PowerPlan</td>
<td>Labs:
• CBC
• CRP/ESR
• CMP
• LDH
• PT/PTT
• D-dimer
• Fibrinogen
• Ferritin
• Troponin
• BNP
• COVID PCR
• COVID antibody
• Blood culture
• Urinalysis/urine culture

Diagnostic Studies:
• EKG
• Echocardiogram</td>
<td>• Consider cardiology and/or ID consult

• Telemetry

• Follow serial labs daily or as needed to monitor response to treatment</td>
<td><u>First line:</u>
• IVIG: 1-2 gm/kg/dose x1 (maximum 100 gm/dose).
    o May consider repeating dose daily x1 for continued fever 24-36h or worsening clinical condition.

• Solumedrol: 2 mg/kg day (then taper over 3 weeks).
    o May consider increasing to 10mg/kg dose x1 for moderate disease

• Aspirin: 3-5 mg/kg/day; max 81 mg/day. Avoid if platelet count ≤80K

• Consider adding a proton pump inhibitor for patients receiving steroids + aspirin to decrease risk for GI bleed

<u>Consider for severe disease</u>:
• High dose Solumedrol for severe disease: 30 mg/kg daily x 3 days and transfer to ECMO facility

• Anakinra 1-2 mg/kg/day SC; May consider increasing up to a maximum of 10 mg/kg/day and transfer to ECMO facility for refractory cases</td>
</tr>
<tr>
<td>Kawasaki's Disease

<u>Diagnostics</u>:
Fever ≥5 days plus 4 out of 5 of:
-Changes in lips/oral cavities
-Conjunctivitis
-Rash
-Erythema/edema of hands/feet
-Lymphadenopathy > 1.5cm</td>
<td>Labs:
• CBC
• CRP/ESR
• CMP
• LDH

Consider:
• PT
• PTT
• D-dimer
• Fibrinogen
• Ferritin
• Troponin
• BNP
• COVID PCR
• COVID antibody

Diagnostic Studies:
• EKG
• Echocardiogram</td>
<td>• Cardiology Consult

• Telemetry Monitoring</td>
<td><u>First line:</u>
• IVIG: 2 gm/kg/dose x1 (maximum 70-100 gm/dose).
    o May consider repeating dose daily x1 for continued fever 36h or worsening clinical condition.

• Aspirin: 30-50 mg/kg/day divided q6h. Avoid if platelet count ≤80K
    o Decrease to 3-5 mg/kg (max 81mg) daily once afebrile

<u>Consider</u>:
• Prednisone 1mg/kg BID for high risk or refractory cases

• Anakinra 1-2 mg/kg/day SC; May consider increasing up to a maximum of 10 mg/kg/day and transfer to ECMO facility for refractory cases</td>
</tr>
</table>

MIS-C Discharge Considerations:

- Patients should have cardiology follow up within 2 weeks of discharge.
- AAP Return to Play guidelines for MISC: 3-6 months (https://services.aap.org/en/news-room/news-releases/aap/2020/american-academy-of-pediatrics-updates-guidance-on-returning-to-sports-activities/)

Resources:

CHOP clinical pathway: https://www.chop.edu/clinical-pathway/covid-disease-clinical-pathway

Cincinnati Children's: COVID-19 MIS-C Algorithm version 2.1

Duke Children's Hospital: Inpatient Management of Multisystem Inflammatory Syndrome in Children (MIS-C)

UNC Children's: Evaluation and Management of COVID-19 and Related Syndromes at UNC Children's

Levine Children's Hospital: COVID-19 Treatment Guidance – Pediatric Patients

NIH guidelines: https://www.covid19treatmentguidelines.nih.gov

American College Rheumatology: ACR COVID-19 Clinical Guidance Summary MIS-C Hyperinflammation