PHARMACOLOGIC TREATMENTS OF INPATIENTS (≤18 Y/O) WITH CONFIRMED COVID-19 TESTING FOR THE PICU & GENERAL INPATIENT UNIT (GIU)
(This pathway will be reassessed & updated regularly based on experience & emerging data)

**Pediatric Patient (≤ 18 Y/O) With Confirmed + COVID-19 Testing**
Provide supportive care w/ acetaminophen/NSAIDs prn clinician’s discretion, prone position & consider COVID-19 pharmacologic treatment criteria for the GIU & PICU

**GIU Criteria**
- **Requiring:** ≥ 2 L/min NC O₂ for 24-48 hrs without being able to wean OR
- **Worsening clinical trajectory** with increasing oxygen support within 24-48 hrs of starting O₂

**PICU Criteria**
- **Requiring:**
  - Non-invasive vent support
  - Mechanical ventilation OR ECMO

**Patients > 18 Y/O should be managed using the adult treatment protocols.** The Pediatric Covid/ID Teams will consult and be the point of contact for ID related COVID questions for ALL patients in the Children’s Hospital

**For Both PICU & GIU:**
May also consider treatment for patients with no oxygen requirement (or lesser degree of resp. support) who have fever and respiratory distress AND a history of:
- Congenital cardiac disease, chronic lung disease, immunosuppression and/or other concerning illness

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**Contact Pediatric COVID-19 Treatment Team (PCTT) if Considering Treatment**
(Find PCTT contact in mobile heartbeat - Available from 8am-5pm, ID fellow available for overnight consults & weekends)

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If Caregiver & Team Agree to Therapy

**Obtain Baseline EKG & Labwork:**
- CBC w/diff, CRP*, Procalcitonin*, Ferritin*, CMP*, Mg*, Troponin, BNP, D-Dimer, Fibrinogen, ESR, PT/PTT, cytokine panel
- *Priority tests if there is limited blood volume

- For PICU, add quantiferon gold, may start tx before get result

- Consider
  - Blood/ETT CX’s prior to antibiotics - yield highest for PICU pts
  - Use of antibiotics as per clinical discretion
  - Cardiology consult if abnormal EKG/cardiac enzymes

**Provide Recommended Treatment**
1st Line = Remdesivir
(See Recs for Age/Wt Based Dosing. Exclusion Criteria and Considerations on Escalation of Care)

- Utilize “COVID-19 Treatment Medications” for Pharmacy/ID Provider Entry - Pediatric Orderset in EPIC

**For GIU:**
- Repeat above labs q24hrs for first 2 hospital days (repeat cytokine panel if transfer to PICU) - discuss need for repeating further labs w/ PCTT based on clinical progression

**For PICU:**
- Repeat q12 hrs: CRP, D-Dimer, (Troponin x 3) - Repeat q24 hrs: CBC with diff, CMP, Mg, Ferritin, Procalcitonin, BNP, D-dimer, PT/PTT - Repeat q 48 hrs: Cytokine panel

- Return to Inpatient Pathway when ready for discharge for guidance on home care
- Complete treatment course for outpatients as guided by PCTT
## INFORMATION ON REMDESIVIR

### Indication
- If ≥ 12 y/o & ≥ 40kg - Eligible for Yale Clinical Trial*  
- If <12 y/o or <40kg - Obtain via compassionate use*  
- Emergency use Remdesivir may be considered, depending on the formulation(s) available, if patients are ineligible for clinical trial enrollment or procurement via compassionate use

### Dosing
- <40 kg: loading dose: 5 mg/kg (max 200 mg) once; then maintenance dose (starting 24 hours after loading dose) of 2.5 mg/kg (max 100 mg) every 24 hours  
- ≥40 kg: loading dose: 200 mg once; then maintenance dose (starting 24 hours after loading dose) of 100 mg every 24 hours  
- Duration of Therapy: Patients receiving mechanical ventilation and/or ECMO support = 10 days, Patients NOT receiving mechanical ventilation and/or ECMO = 5 days (including loading dose)  
  - Duration may be extended to 10 days if clinical improvement is not evident after 5 days

### Exclusion Criteria
- Participation in any other clinical trial of an experimental treatment for COVID-19  
- Concurrent treatment with other agents with actual or possible direct acting antiviral activity against SARS-CoV-2 is prohibited < 24 hours prior to study drug dosing  
- Evidence of multiorgan failure (severe)  
- Mechanically ventilated (including V-V ECMO) ≥ 5 days, or any duration of V-A ECMO (severe)  
- Requiring mechanical ventilation at screening (moderate) (CPAP is accepted)  
- ALT or AST > 5 x ULN  
- Creatinine clearance < 50 mL/min (Cockcroft-Gault for ≥ 18 yo and Schwartz for < 18 yo)  
- Positive pregnancy test  
- Breastfeeding woman  
- Known hypersensitivity to the study drug, the metabolites, or formulation excipient

### Monitoring
- Days 3, 5, 8, 10, and 14 or until discharge (daily while in PICU):  
  - CBC, BUN, creatinine, glucose, total bilirubin, ALT, AST

### Side Effects
- Not yet FDA approved  
- Known potential side effects include: elevated transaminases, reversible kidney injury, and hypotension during infusion.

## CONSIDER FOLLOWING MEDICATIONS IN DISCUSSION WITH PCTT/RHEUMATOLOGY FOR PATIENTS WITH CONCERNS FOR SEVERE DISEASE/CLINICAL DETERIORATION

| ANAKINRA | 4mg/kg SC every 24 hours x 3 doses |  
| METHYL PREDNISOLONE | 1mg/kg/dose (Max 40mg) IV every 8 hours x 72 hours - Review extending course/steroid taper with PCTT |  
| Anticoagulation | Consider anticoagulation based on significant elevations in D-Dimers/evidence of thrombosis (agent at discretion of team) |  

*See Pathway for Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with COVID-19

Discuss further rees on exclusion criteria, monitoring/labwork, and side effects with PCTT prior to starting.
MORE INFORMATION ON PHARMACOLOGIC AGENTS FOR SUPPORTIVE CARE

- For supportive care, it should be safe to use both acetaminophen and NSAIDs on a prn basis per clinician discretion
  - There is no firm data to show that NSAIDs worsen the course of COVID-19
  - There is a theoretical risk given the fact that COVID-19 virus uses ACE2 to enter cells and NSAIDs (and ACE inhibitors) may increase ACE2 circulation.
  - However, there is some data to show other coronaviruses that also use ACE2, like SARS, have reduced viral replication with NSAIDs (indomethacin).
  - The WHO and FDA do not recommend against the use of NSAIDs for COVID-19 infections, but will be further investigating the issue - we will update our recs accordingly

- For children > 1 y/o, recommend attempting prone position for 2 hours twice daily to help with oxygenation
REFERENCES


13. Chan JF-W, Yao Y, Yeung M-L, et al. Treatment With Lopinavir/Ritonavir or Interferon-$


