

Management of Inpatients with Suspected SARS-CoV-2 (COVID-19)

All UMMC patients suspected of having COVID-19 should immediately be reported to Mississippi MED-COM at (601) 984-4655.

The backbone of the treatment strategy for COVID-19 is good quality supportive care as in any viral pneumonia. Certain therapies have shown benefit for COVID-19 and are included in the recommendations below, including inpatient (pages 1-3) and outpatient (page 4) treatments. This document will be updated continually as new evidence emerges and based on the availability of treatment regimens.

ADULT GUIDANCE

| Patient Admitted on Nasal Cannula | | |
|--|---|---|
| Disposition: Consider admission to intensive care unit if older than 65 years of age with a new oxygen requirement, D-dimer > 1,000 ng/L, or RR > 22 breaths/min | | |
| Fluids | Conservative fluid management strategy | |
| Medications | <i>Evaluate for enrollment in clinical trials (link below)</i> | |
| | Antimicrobials | Consider empiric antibiotics for bacterial pneumonia while COVID-19 results are pending |
| | Corticosteroids | Initiate dexamethasone for patients requiring O ₂ ; do not continue on discharge |
| | Bronchodilators | If needed, use metered dose inhalers and avoid nebulized therapies |
| Coagulopathy | See “Anticoagulation Dosing Recommendations for COVID-19 Patients” document. | |
| O ₂ Supplement | Target SpO ₂ >90%. If oxygen requirement increases to 5 L call primary team and ICU for evaluation. | |
| | Consider high-flow nasal cannula at 15 – 30 LPM with surgical mask over patient’s face. | |
| Patient Admitted to Intensive Care Unit | | |
| Fluids | Conservative fluid management strategy such as daily net neutral fluid balance in patients without evidence of shock | |
| Medications | <i>Evaluate for enrollment in clinical trials (link below)</i> | |
| | Antimicrobials | Consider empiric antibiotics for bacterial pneumonia while COVID-19 results are pending |
| | Corticosteroids | Initiate dexamethasone for patients requiring O ₂ or mechanical ventilation |
| | | |
| Coagulopathy | See “Anticoagulation Dosing Recommendations for COVID-19 Patients” document. | |
| O ₂ /Mechanical Ventilation | Target SpO ₂ >92%. Consider HFNC at 15-30LPM with surgical mask over patients face. | |
| | Once intubated, maintain plateau pressures < 30cm H ₂ O. Low Vt and high PEEP strategies are controversial. | |
| | If PaO ₂ /FiO ₂ < 150, consider early proning and use of paralytics | |
| | If PaO ₂ /FiO ₂ remains < 150 after proning and paralysis, consider cautious use of inhaled vasodilators and ECMO consult | |

Information about ongoing or potential clinical trials at UMMC can be found at:

<https://umc.edu/clinicaltrials/covid-19>

Additional Comments:

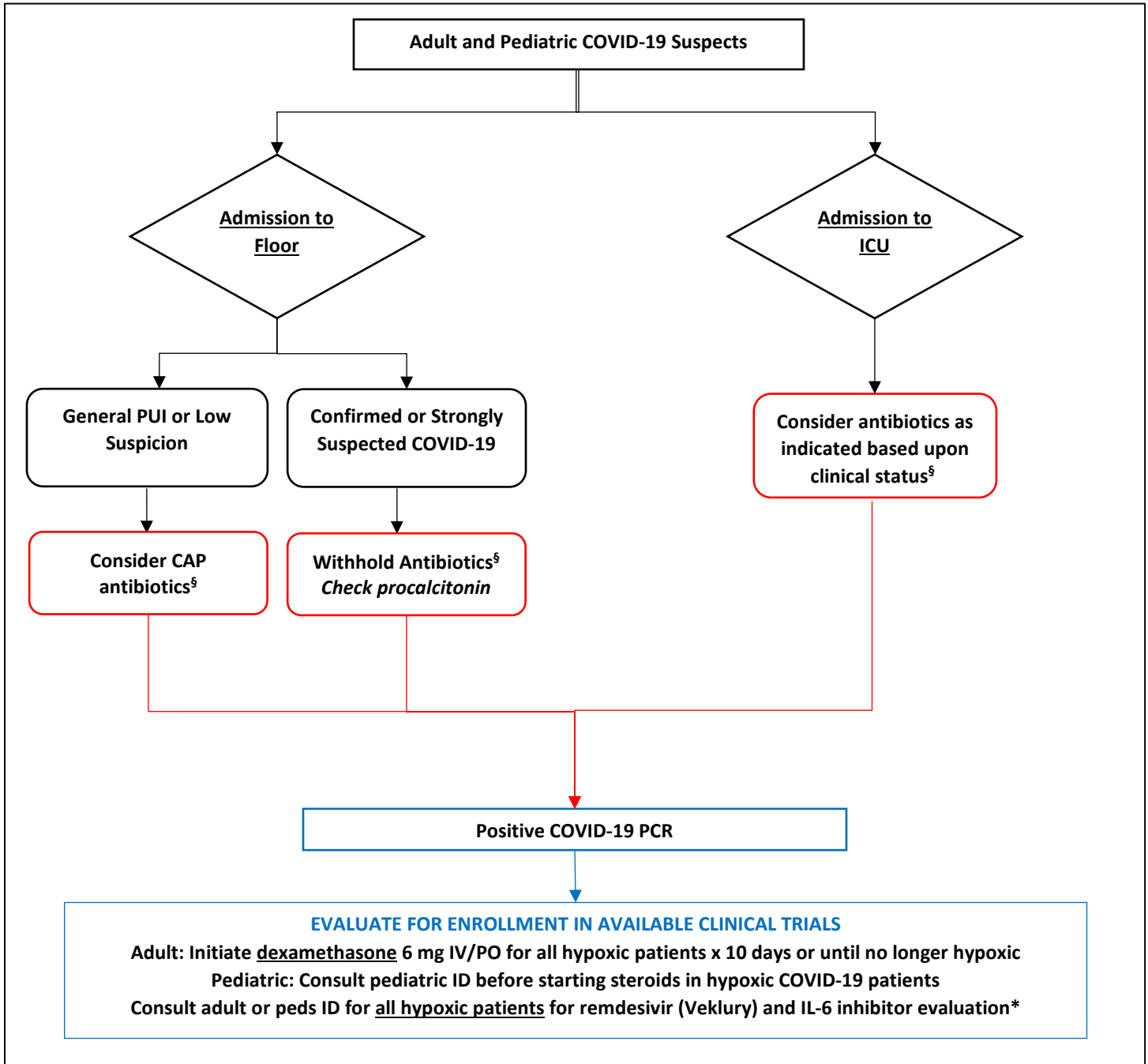
- Early intubation for hypoxemic respiratory failure is no longer required.

Agents not recommended for COVID-19 treatment

The agents listed below have no evidence supporting the use for treatment of COVID-19 but can be used for alternative diagnoses or in the context of clinical trials. * = drugs with low supply (recent shortage or currently on allocation) – contact pharmacy with questions.

- HIV protease inhibitors (more on lopinavir/ritonavir on page 4): darunavir, atazanavir
- H₂-receptor blockers: famotidine*, cimetidine
- Supplements: zinc*, ascorbic acid*, vitamin D
- Miscellaneous: hydroxychloroquine, IVIG*, interferon, azithromycin, cetirizine, ivermectin

Algorithm for Management of Hospitalized Patients with Suspected COVID-19



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*ID consult is not required for patients who are asymptomatic or not requiring oxygen. For patients who are readmitted, please contact infection prevention for questions regarding isolation.

§Multiple studies have shown low rate of bacterial co-infection in patients with COVID-19; therefore, antibiotics can be withheld in most patients. Use of procalcitonin can aid in decision making. Procalcitonin can be falsely elevated due to trauma, shock, renal dysfunction (ESKD or AKI), some forms of vasculitis, acute graft vs. host disease, and paraneoplastic syndromes due to medullary thyroid and small cell lung cancer.

Treatment Information

| Drug | Dose and Duration | Comments |
|---|---|---|
| Approved Therapies | | |
| <p>Remdesivir (Veklury)</p> <ul style="list-style-type: none"> • Direct acting antiviral • Allocation decisions made on an individual basis | <p>Adult 200 mg IV x 1 followed by 100 mg IV q24h</p> <p>Pediatric</p> <ul style="list-style-type: none"> • <40 kg: 5 mg/kg IV load followed by 2.5 mg/kg IV q24h • ≥40kg: Refer to adult dosing <p>Duration: 5 days or until no longer hypoxic</p> | <p>FDA approved for patients >12 years old weighing ≥40 kg. Available through emergency use authorization for pediatric patients <12 years old and/or <40 kg. Clinical trials for remdesivir in children have not completed yet.</p> <p>Pediatric criteria:</p> <ol style="list-style-type: none"> 1. Peds ID must be consulted for the use of remdesivir. 2. Remdesivir is recommended for children 12-15 years old with risk factors for severe disease and are requiring oxygen. 3. Remdesivir is recommended for children ≥16 years old who are requiring oxygen regardless of risk factors. <p>Adult criteria:</p> <ul style="list-style-type: none"> • Adult ID must be consulted for the use of remdesivir. • Requires O2 sat ≤94% or oxygen supplementation <ul style="list-style-type: none"> ○ Low-flow nasal cannula ○ High-flow nasal cannula within 24 hours of being placed on oxygen ○ No benefit seen in patients who are already mechanically ventilated <p>Monitoring:</p> <ul style="list-style-type: none"> • Requires baseline eGFR and ALT • Contraindicated with ALT > 10x UNL <p>A/E: Increased ALT/AST.</p> |
| <p>Corticosteroids <i>Dexamethasone</i></p> <ul style="list-style-type: none"> • Initiate in patients requiring mechanical ventilation or oxygen • Do not start in patients not requiring oxygen | <p>Adult Preferred: Dexamethasone 6 mg IV/PO* daily</p> <p>Pediatric Preferred: Dexamethasone 0.15 mg/kg/dose (max 6 mg daily)</p> <p>Duration: 10 days or until no longer hypoxic</p> | <p>Decreased mortality shown in the RECOVERY trial</p> <p>Not recommended for the treatment of non-hospitalized or non-hypoxic patients</p> <p>Pediatric considerations: Corticosteroids are recommended in pediatric patients who require mechanical ventilation, high flow oxygen, non-invasive ventilation, ECMO. They are not routinely recommended for patients only on low flow oxygen.</p> <p>Adult considerations: Corticosteroids are recommended for all patients requiring oxygen.</p> <p>Additional assessment</p> <ul style="list-style-type: none"> • Monitor blood sugar • Elevations in WBC can occur with corticosteroid use |
| Investigational Therapies | | |
| <p>Convalescent Plasma</p> | <p>Only available through clinical trials</p> <ul style="list-style-type: none"> • COVID-19 Convalescent Plasma trial (Contact: Amy Wigglesworth, ajwigglesworth@umc.edu) • PassItOn trial (Contact: Rebekah Peacock, rpeacock@umc.edu) | |

| | | |
|---|---|--|
| <p>Tocilizumab (Actemra)</p> <ul style="list-style-type: none"> • Adjunctive agent that targets IL-6 • Sarilumab can be used as a substitute for tocilizumab if out of stock. See information below. | <p>Adult 8 mg/kg IV x1 dose</p> <ul style="list-style-type: none"> • Use total body weight for dosing • Doses will be rounded to the nearest available full vial (80 mg, 200 mg, 400 mg vials) • Max dose = 800 mg <p>Pediatric Insufficient evidence for tocilizumab in hospitalized children with COVID or MIS-C. <i>Dosing:</i> <30 kg = 12 mg/kg; ≥30 kg = 8 mg/kg (max 800 mg)</p> <p>Duration: 1 dose</p> | <p>Mortality benefit shown in certain adult patient populations REMAP-CAP and RECOVERY trials; the FDA EUA for tocilizumab applies to patients 2 years of age and older.</p> <p>**Adults and peds ID MUST be consulted to use tocilizumab. Tocilizumab should only be used in combination with corticosteroids.**</p> <p>Inclusion Criteria:</p> <ol style="list-style-type: none"> 1. Symptoms <10 days 2. Hospitalized <48 hours 3. Patients who are rapidly progressing and are requiring >4L nasal cannula 4. CRP ≥7.5 <p>Exclusion Criteria:</p> <ol style="list-style-type: none"> 5. Current bacterial or fungal co-infection 6. Unlikely to survive >48 hours 7. Mechanical ventilation <p>Risk/benefit discussion for pregnant women.</p> <p>A/E: Increased ALT/AST, infusion related reactions, hematologic dyscrasias, increased LDL, secondary infections</p> |
| <p>Sarilumab (Kevzara)</p> <ul style="list-style-type: none"> • Adjunctive agent that targets IL-6 • Substitute for tocilizumab if out of stock. • Patients who meet inclusion criteria will undergo a secondary review for eligibility, and it does not guarantee receiving sarilumab. Given the limited supply, sarilumab allocation will be determined based on disease severity, risk factors, and overall clinical status. | <p>Adult 400 mg x 1 dose</p> <p>Pediatric Insufficient evidence for tocilizumab in hospitalized children with COVID or MIS-C.</p> <p>Duration: 1 dose</p> | <p>Mortality benefit shown in certain adult patient populations REMAP-CAP trial.</p> <p>**Adults and peds ID MUST be consulted to use sarilumab. Sarilumab should only be used in combination with corticosteroids.**</p> <p>Inclusion Criteria:</p> <ol style="list-style-type: none"> 1. Symptoms <10 days 2. Hospitalized <48 hours 3. Patients who are rapidly progressing and are requiring >4L nasal cannula 4. CRP ≥7.5 <p>Exclusion Criteria:</p> <ol style="list-style-type: none"> 1. Current bacterial or fungal co-infection 2. Unlikely to survive >48 hours 3. Mechanical ventilation <p>Risk/benefit discussion for pregnant women.</p> <p>A/E: Increased ALT/AST, infusion related reactions, hematologic dyscrasias, increased LDL, secondary infections</p> |

Information on drug interactions and administration for patients who cannot swallow can be found at: <http://www.covid19-druginteractions.org/>

Management of Non-Hospitalized Patients with Mild-Moderate COVID-19

At this time, no therapies have shown a favorable risk/benefit profile for outpatient treatment of COVID-19, including corticosteroids, azithromycin, and ivermectin. The FDA has approved the REGEN-COV™ (casirivimab/imdevimab) monoclonal antibodies for the use in outpatient adult and pediatric patients with mild-moderate COVID-19 who are at high risk of disease progression. In addition, it can be used in high-risk patients with a COVID-19 exposure who are either not fully vaccinated or fully vaccinated but immunocompromised. The monoclonal antibodies **should not** be used for patients who are hospitalized with COVID-19, require oxygen therapy for COVID-19, or have an increase in baseline oxygen flow rate due to COVID-19.

The criteria defined by the EUA for both monoclonal antibodies are below and can easily be accessed using the SmartPhrase “.COVIDABINFSCREENING”:

FOR TREATMENT OF MILD-MODERATE COVID-19

Initial Screening Criteria

- Within 10 days from symptom-onset
- ≥12 years of age
- Weighs ≥40kgs /88lbs.

FOR POST-EXPOSURE PROPHYLAXIS (PEP) OF COVID-19

Vaccine Status

- Vaccinated and immunocompromised*
- Unvaccinated

Initial Screening Criteria

- Within 7 days of close contact
- ≥12 years of age
- Weighs ≥40kgs /88lbs.

Patient must meet the criteria above (for treatment/PEP) PLUS 1 of the following risk factors for disease progression:

- ≥65 years of age

12-64 years of age AND have

- Body mass index (BMI) ≥25 or BMI ≥85th percentile for their age and gender based on CDC growth charts
- Chronic kidney disease or
- Diabetes or
- Cardiovascular disease/hypertension (including congenital heart disease) or
- Chronic lung disease (COPD, mod-severe asthma, interstitial lung disease, cystic fibrosis, pulmonary HTN) or
- Immunosuppressive disease* or
- Currently receiving immunosuppressive treatment (chemotherapy, transplant immunosuppressants, immune modulators such as Rituximab, etc.)
- Sickle cell disease or
- Neurodevelopmental disorders or other conditions that confer medical complexity or
- Medical-related technological dependence (tracheostomy, gastrostomy, or PPV not related to COVID-19) or
- Pregnant

*AIDS or CD4 count < 200, Complement deficiency, Grafts-Vs-Host disease (GVHD), HIV infection, Immunoglobulin deficiency/ Immunodeficiency, Immunosuppressive therapy (within the last 12 months), Leukemia, Lymphoma (Hodgkin's/ Non-Hodgkin's (NHL)), Metastatic cancer, Multiple Myeloma, Solid organ malignancy, Steroid therapy (within past 2 weeks), Bone marrow transplant (BMT) or peripheral stem cell transplant (PSCT), Solid organ transplant