**Aim:** To provide guidance for management of patients with COVID-19.

**Patient with confirmed COVID-19** (positive PCR or rapid antigen)
- Appropriate PPE, rooming and staffing. Educate family on positive test and isolation.

**Assess COVID-19 Illness Level (note 1)**
- Signs/symptoms, vital signs, hydration respiratory status. Consider also alternate etiologies for illness.

**Asymptomatic**
- Tested for reasons other than symptoms (e.g., pre-op, behavioral health admission).
- No additional tests/treatments needed
  - Manage primary condition
  - See “behavioral health” order set for updated guidance on retesting in behavioral health patients

**Mild**
- Symptomatic, but not generally requiring hospitalization for their COVID problem.
  - Guide tests/treatments on symptoms
    - Supportive cares in clinic/ED and recs for home (note 2).
    - Assess eligibility for anti-COVID-19 monoclonal antibodies (Page 3 and Appendix A)
    - Evaluate and treat suspected coinfections based on symptoms (note 3).
    - Hospitalized patients with mild symptoms may be managed as above. Escalate testing/therapies if clinical status worsens.

**Moderate**
- (Can include “severe pneumonia,” see p. 4)
  - Signs or symptoms of COVID-19 requiring med-surg care but not generally meeting criteria for critical care.
  - Additional testing
    - Obtain CBC+diff, CRP, CMP, IgG.
    - If patient ≥ 12 yrs age OR has additional VTE risk factors (see COVID VTE guideline) add PT/PTT/fibrinogen, d-dimer AND start VTE prophylaxis.
    - CXR if respiratory symptoms
    - Supportive cares (note 2).
    - Evaluate and treat suspected coinfections based on symptoms (note 3).
    - Antibiotics per suspected sepsis order set if sepsis is present
    - See separate MIS-C guideline
    - Consider additional therapies specific to COVID-19 (see subsequent pages for detail)

**Severe**
- Critically ill, requiring ICU level of care.
  - Additional testing
    - Obtain CBC+diff, CRP, procalcitonin, CMP, IgG, PT/PTT/fibrinogen, d-dimer, rapid 4-plex cytokine panel, immune comprehensive panel, LDH, ferritin, TG, CPK, troponin, blood culture, CXR.
    - VTE prophylaxis per COVID VTE guideline
    - Evaluate and treat suspected coinfections based on symptoms (note 3).
    - Antibiotics per suspected sepsis order set if sepsis is present
    - Consult immunology, pulmonology, ID and other specialists as indicated.
    - See separate MIS-C guideline
    - Additional therapies specific to COVID-19 (see subsequent pages for detail)

Disclaimer: This guideline is designed for general use with most patients; each clinician should use his or her own independent judgment to meet the needs of each individual patient. This guideline is not a substitute for professional medical advice, diagnosis or treatment.

Reviewer: Workgroup | Rev 2/21 | Exp 2/24 | Page 1
**NOTE 1: SEVERITY OF ILLNESS CATEGORIES**

- **Mild:** No respiratory distress or oxygen requirement; able to self-hydrate (may be after initial fluid support)
- **Moderate:** Requiring ongoing IVF support OR requiring respiratory support including low flow nasal cannula for hypoxia or high flow nasal cannula for increased work of breathing. If hypoxia and/or respiratory distress are not improved with trial of low or high flow nasal cannula, escalate to severe category. If suspected MIS-C but no cardiac dysfunction (e.g. abnormal echo, EKG or troponin, etc.) and patient without shock or hemodynamic stability may consider admitted to med-surg unit.
- **Severe:** Hypoxia or work of breathing requiring non-invasive or invasive ventilation or concern that patient status is worsening on high flow nasal cannula OR SIRS/Sepsis/Shock OR rapidly worsening status. If suspected MIS-C and any cardiac dysfunction (e.g. abnormal echo, EKG or troponin, etc.), and/or shock/hypotension or concern for rapid progression patient should be admitted to ICU.
- Consider also risk factors for more severe COVID-19 in considering to step-up to next level of severity for disposition decisions (shared decision making with family and other providers) in your patient: immunocompromise, age < 12 months, complex chronic conditions, obesity, chronic kidney disease, chronic hepatitis, endocrine disorders. Consider also ability of family/guardian to provide supportive cares as well as follow-up options.

**NOTE 2**

- If bronchodilator indicated, use MDI instead of nebulizer, follow treatment with inhaled corticosteroid (e.g. QVAR, up to Q4).
- Systemic corticosteroids may be used for asthma/croup indications. Discuss with multidisciplinary team in patients requiring persistent/escalating supplemental oxygen or mechanical ventilation.
- Acetaminophen preferred 1st line. Motrin/Ibuprofen ok for 2nd line analgesia/antipyretic.
- Maintain euvolemia, avoid overhydration as this may increase ARDS risk.

**NOTE 3**

Bacterial co-infection at time of presentation with COVID-19 is uncommon (<2% in adult patients). Only use antibiotics with strong suspicion for bacterial pneumonia due to both clinical exam and imaging findings.

*Treatment Recommendations for Pneumonia (CAP):*

- **Age ≤ 28 days OR preterm infant (less than 37 weeks gestation) with PMA less than 41 weeks**
  - Follow febrile infant guideline for workup, use Ampicillin plus Ceftazidime; Cefdinir for ongoing oral CAP treatment
- **> 28 days OR preterm infant (less than 37 weeks gestation) with PMA ≥ 41 weeks–4 months**
  - Ceftriaxone/Cefdinir
- **> 4 mo and fully immunized for age**
  - Amoxicillin/Ampicillin (PCN exposure or allergy not anaphylaxis - Cefuroxime/Cefprozil)
- **> 4 mo and has not received 2 Hib and Pneumococcal vaccine doses**
  - Ceftriaxone/Cefdinir
- **Consider adding Azithromycin for patients ≥ 5 yr.**
- **Oseltamivir if influenza positive.**
- **Antibiotics per suspected sepsis orderset if sepsis is present.**
- **Consult ID for empiric antibiotic recommendations if hospital-acquired infection suspected.**

**Discharge criteria:**

- Routine medical criteria
- Encourage virtual or in-clinic follow-up with PCP
- Speak with MDH/infection prevention on-call for guidance for home isolation.

**Workgroup:** Hester, Koutsari, Pomputius, COVID Clinical Core

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*Note that information on COVID-19 incidence and management is rapidly evolving. Please refer to [www.CDC.gov](http://www.CDC.gov), [www.who.int](http://www.who.int), [https://www.health.state.mn.us/](https://www.health.state.mn.us/) or Children’s Minnesota infection prevention team for updates. Due to the dynamic nature of this guideline, it is not run through the Guideline Governance Council but is updated regularly by clinical leadership.*
### Clinical Management for Patients with Confirmed COVID-19

**CLINICAL GUIDELINE**

**MEDICAL MANAGEMENT FOR PATIENTS WITH CONFIRMED COVID-19**

*Age <25 years*

This guidance document is based on available knowledge and multidisciplinary input. It is intended as a living document that will be updated in real time as more data emerge.

**Reviewer:** Workgroup | Rev 2/21 | Exp 2/24 | Page 3

#### Bamlanivimab

Bamlanivimab can be given in non-hospitalized patients with confirmed SARS-CoV-2 infection (PCR or antigen) who are ≥12 years old and ≥40 kg. **Dose:** 700 mg IV via EUA (non-hospitalized patients). **Decision points:**

- **If symptom progression:** 1 outpatient infusion.
- **On admission:**
  - • < 6 months: < 200 mg/dL (for high risk criteria)
  - • 1–5 years: ≥ 40
  - • 6–12 years: ≥ 35
  - • 13–18 years: ≥ 30 and no signs of severe pneumonia

#### CLINICAL SEVERITY

<table>
<thead>
<tr>
<th>Mild Illness</th>
<th>SUPPORTIVE CARE</th>
<th>THERAPEUTIC AGENTS</th>
<th>COMMENTS</th>
<th>MONITORING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consider Anti-SARS-CoV-2 Monoclonal Antibodies via EUA (non-hospitalized patients)</strong></td>
<td>• Bamlanivimab can be given in non-hospitalized patients with confirmed SARS-CoV-2 infection (PCR or antigen) who are ≥12 years old and ≥ 40 kg, are at high-risk for progressing to severe COVID-19, and are within 10 days from symptom onset (Appendix A for high-risk criteria)</td>
<td>• FDA EUA Bamlanivimab Fact Sheet for Healthcare Providers</td>
<td>• FDA EUA Bamlanivimab Provider Talking Points/FAQs</td>
<td>• FDA EUA Bamlanivimab Provider Memo</td>
</tr>
<tr>
<td>• Dose: 700 mg IV &lt; 1 outpatient infusion</td>
<td>• FDA EUA Bamlanivimab Fact Sheet for Patients and Caregivers</td>
<td>Bamlanivimab Provider Talking Points/FAQs</td>
<td>EUA: Emergency Use Authorization</td>
<td><strong>Bamlanivimab Provider Memo</strong></td>
</tr>
</tbody>
</table>

#### Non-Severe Pneumonia

**Pediatric Patients**

- Cough or dyspnea plus tachypnea
- Tachypnea (breaths/min):
  - < 2 months: ≥ 60
  - 2–11 months: ≥ 50
  - 1–5 years: ≥ 40
  - 6–12 years: ≥ 35
  - 13–18 years: ≥ 30 and no signs of severe pneumonia

**Adult Patients**

- No signs of severe pneumonia and no need for supplemental oxygen

**Clinical experience in adults has shown that rapid clinical deterioration can take place within a few hours.** Physical exam and close monitoring of symptoms are essential.

**Consider Anti-SARS-CoV-2 Monoclonal Antibodies via EUA (non-hospitalized patients)**

- Bamlanivimab can be given in non-hospitalized patients with confirmed SARS-CoV-2 infection (PCR or antigen) who are ≥12 years old and ≥ 40 kg, are at high-risk for progressing to severe COVID-19, and are within 10 days from symptom onset (Appendix A for high-risk criteria)

**Dose:** 700 mg IV < 1 outpatient infusion

**Consider Convalescent Plasma under FDA EUA (hospitalized pediatric and adult patients)**

- Can be administered in hospitalized patients of any age
- Pediatric dose: 5 mL/kg (max 2 units)
- See Note 4 for documentation and reporting requirements

**Recommend Oseltamivir when influenza is co-circulating with COVID-19 (hospitalized patients)**

- Oseltamivir until upper respiratory tract (NP swab) influenza PCR test is negative

**Treat suspected pneumonic coinfections**

- per recommendations included in Note 3, page 2.

**Consider IVIG Replacement**

- If initial IgG is below the following age-based thresholds, consider IVIG at 400 mg/kg (based on ideal body weight) × 1 dose:
  - 0–1 month: < 200 mg/dL
  - 1–< 7 months: < 200 mg/dL
  - 7 months < 3 years: < 250 mg/dL
  - 3–< 6 years: < 350 mg/dL
  - 6 years–adults < 500 mg/dL

**SUPPORTIVE CARE**

- • Fever, fatigue, cough, anorexia, malaise, muscle pain, sore throat, dyspnea, nasal congestion, or headache
- • Anti-SARS-CoV-2 antibodies
- • Antipyretics
- • Antihistamines
- • Pneumonia-specific antibiotics

**Regardless of risk:**

- • Baseline CBC+diff, CRP, CMP, IgG, serum to save (≥ 3 mL)
- • Daily labs
- • Anti-SARS-CoV-2 IgM/IgG
- • Blood culture
- • CXR
- • Rapid 4-plex cytokine panel, immune comprehensive panel, LDH, ferritin, triglycerides, CPK, troponin, blood culture, CXR

**MONITORING**

- • Baseline CBC+diff, CRP, CMP, IgG, serum to save (≥ 3 mL)
- • During hospitalization:
  - • Daily labs as clinically indicated
  - • If symptom progression (persistent high fever, worsening respiratory distress, increasing O2 requirements, or transfer to ICU); CBC+diff, CRP, procalcitonin, CMP, IgG, PT/PTT/fibrinogen, D-dimer
  - • Rapid 4-plex cytokine panel, immune comprehensive panel, LDH, ferritin, triglycerides, CPK, troponin, blood culture, CXR

**DISCLAIMER:** This guideline is designed for general use with most patients; each clinician should use his or her own independent judgment to meet the needs of each individual patient. This guideline is not a substitute for professional medical advice, diagnosis or treatment.
### CLINICAL SEVERITY

<table>
<thead>
<tr>
<th>Severe Pneumonia</th>
<th>Pediatric Patients</th>
<th>CLINICAL PRESENTATION&lt;sup&gt;1&lt;/sup&gt;</th>
<th>THERAPEUTIC AGENTS</th>
<th>COMMENTS</th>
<th>MONITORING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Presentation</strong></td>
<td>Cough or dyspnea, plus at least one of the following:</td>
<td>• Central cyanosis or SpO2 &lt; 90%</td>
<td><strong>Recommend Systemic Corticosteroids</strong></td>
<td><strong>Systemic Corticosteroid</strong></td>
<td><strong>All hospitalized patients</strong></td>
</tr>
<tr>
<td></td>
<td>• Severe respiratory distress (e.g. grunting, very severe chest indrawing)</td>
<td>• Signs of pneumonia with a general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions</td>
<td>• Dexamethasone 0.15 mg/kg (max 6 mg/dose) PO/NG/IV q24h for up to 10 days for patients requiring persistent supplemental O2 or mechanical ventilation</td>
<td><strong>Recommend gastric ulcer prophylaxis</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fever or suspected respiratory infection, plus one of the following:</td>
<td>• Respiratory rate &gt; 30 breaths/min</td>
<td>• FDA EUA applies to pediatric patients ≥ 12 years of age and ≥ 40 kg and to all adult patients</td>
<td><strong>Systemic Corticosteroid Alternatives</strong> (If dexamethasone is unavailable)</td>
<td><strong>During hospitalization</strong></td>
</tr>
<tr>
<td></td>
<td>• History of chronic respiratory disease</td>
<td>• Severe respiratory distress</td>
<td>• FDA EUA applies to pediatric patients &lt; 18 years of age who weigh 3.5 kg to &gt; 40 kg and to pediatric patients &lt;12 years of age who weigh at least 3.5 kg.</td>
<td>• Prednisolone 1 mg/kg (max 40 mg/dose) PO/NG q24h for up to 10 days</td>
<td><strong>- Daily labs as clinically indicated</strong></td>
</tr>
<tr>
<td></td>
<td>• SpO2 ≤ 95% on room air</td>
<td>• SpO2 ≤ 90% who are not covered under either FDA EUA or FDA approval</td>
<td>• Methylprednisolone 0.8 mg/kg (max 32 mg/dose) IV q24h for up to 10 days</td>
<td>• Methylprednisolone 0.8 mg/kg (max 32 mg/dose) IV q24h for up to 10 days</td>
<td><strong>- If symptom progression (persistent high fever, worsening respiratory distress, increasing O2 requirements, or transfer to ICU):</strong> CBC-diff, CRP, procalcitonin, BMP, IgG, PT/PTT/fibrinogen, D-dimer, rapid 4-plex cytokine panel, immune comprehensive panel, LDH, ferritin, triglycerides, CPK, troponin, blood culture, consider repeat CXR</td>
</tr>
</tbody>
</table>

#### Clinical Monitoring

- Labs prior to initiation and daily:
  - CBC+diff, CRP, BMP, ferritin, LDH, CMP, IgA, IgG, IgM, blood culture, serum to save (≥ 3 mL)
  - Full-term neonates (≥ 28 days old) with eGFR < 30 mL/min, OR
  - Full-term neonates (≥ 28 days old) with Scr ≥ 1 mg/dL
- Systemic Corticosteroids: Recommend gastric ulcer prophylaxis
- **Useful websites**
  - https://www.covid19druginteractions.org/
## MEDICAL MANAGEMENT FOR PATIENTS WITH CONFIRMED COVID-19

### (Age <25 years)

<table>
<thead>
<tr>
<th>CLINICAL SEVERITY</th>
<th>CLINICAL PRESENTATION</th>
<th>THERAPEUTIC AGENTS</th>
<th>COMMENTS</th>
<th>MONITORING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARDS</strong></td>
<td><strong>Pediatric ARDS Definition</strong></td>
<td>Oxygen saturation index (OSI) preferred over oxygen saturation index (OSI) • <strong>Mild ARDS (invasively ventilated)</strong>: 4 ≤ OSI &lt; 8 or 5 ≤ OSI &lt; 7.5 • <strong>Moderate ARDS (invasively ventilated)</strong>: 8 ≤ OSI &lt; 10 • <strong>Severe ARDS (invasively ventilated)</strong>: 10 ≤ OSI ≤ 12.3</td>
<td><strong>Recommend Systemic Corticosteroids</strong> • Dexamethasone 0.15 mg/kg (max 6 mg/dose) PO/NG/IV q24h for up to 10 days for patients requiring persistent supplemental O2 or mechanical ventilation • Recommend against use in patients not requiring supplemental O2 • In preterm neonates, risks vs. benefits should be considered based on gestational age, postnatal age, and illness severity</td>
<td><strong>Consider Remdesivir</strong> [Restricted to ID] • FDA approval applies to pediatric patients ≥ 12 years of age and ≥ 40 kg and to all adult patients • FDA EUA applies to pediatric patients &lt; 18 years of age who weigh 3.5 kg to &lt; 40 kg and to pediatric patients &lt;12 years of age who weigh at least 3.5 kg.</td>
</tr>
</tbody>
</table>
|                   | **Berlin ARDS Definition for Adults** | PaO2/FiO2 ratio • Mild ARDS: 200 mmHg × PaO2/FiO2 ≤ 300 mmHg • Moderate ARDS: 100 mmHg × PaO2/FiO2 ≤ 200 mmHg • Severe ARDS: PaO2/FiO2 ≤ 100 mmHg | **Remdesivir Dosing** 3.5 kg to < 40 kg: 5 mg/kg IV × 1, followed by: • 2.5 mg/kg q24h × 4 days (if no mechanical ventilation or ECMO). If no clinical improvement after a total of 5 days of treatment, treatment can be extended to up to a total of 10 days, OR • 2.5 mg/kg q24h × 9 days (if mechanical ventilation or ECMO) ≥ 40 kg: 200 mg IV × 1, followed by: • 100 mg IV q24h × 4 days (if no mechanical ventilation or ECMO). If no clinical improvement after a total of 5 days of treatment, treatment can be extended to up to a total of 10 days, OR • 100 mg IV q24h × 9 days (if mechanical ventilation or ECMO) | **Remdesivir not recommended for:** • Adult and pediatric patients (> 28 days old) with eGFR ≤ 30 mL/min, OR • Full-term neonates (≥ 7 days to ≤ 28 days old) with SCR ≥ 1 mg/dL | **Useful websites** • COVID-19 drug interactions [http://www.covid19-druginteractions.org/](http://www.covid19-druginteractions.org/)

### COMMENTS

- **Systemic Corticosteroids** Recommend gastric ulcer prophylaxis
- **Systemic Corticosteroid Alternatives** (If dexamethasone is unavailable) • Prednisolone 1 mg/kg (max 40 mg/dose) PO/NG/IV q24h for up to 10 days • Methylprednisolone 0.8 mg/kg (max 32 mg/dose) IV q24h for up to 10 days

**MONITORING**

- **MONITORING**
  - **All hospitalized patients**
    - On admission: Baseline CBC-diff, CRP, CMP, ferritin, LDH, CPK, D-dimer, IgA, IgG, IgM, rapid 4-plex cytokine panel, immune comprehensive panel, blood culture, serum to save (≥ 3 mL)
    - **During hospitalization**
      - Daily labs as clinically indicated
      - If symptom progression (persistent high fever, worsening respiratory distress, increasing O2 requirements, or transfer to ICU): CBC-diff, CRP, procalcitonin, CMP, IgG, PT/PTT/fibrinogen, D-dimer, rapid 4-plex cytokine panel, immune comprehensive panel, LDH, ferritin, triglycerides, CPK, troponin, blood culture

**Patients on Remdesivir**

- Labs prior to initiation and daily: BMP, CBC-diff, AST, ALT, alkaline phosphatase, T/D bilirubin, PT (at least on initiation)
- **Consider discontinuation if ALT > 10 × ULN during treatment**
- **Discontinue if ALT elevation is accompanied by s/s of liver inflammation**

**Patients on Empiric Antibiotics**

- Need, duration, and spectrum of antibiotics should be assessed daily based on microbiology results and clinical status

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NOTE 4: Convalescent Plasma FDA EUA Documentation and Reporting Requirements

- Providers must document in EMR that patient/caregiver was:
  1) Given the Fact Sheet for Patients and Caregivers;
  2) Informed of alternatives to convalescent plasma;
  3) Informed of risks and benefits of convalescent plasma, and
  4) Informed that convalescent plasma is not an FDA approved biological product
- Providers must report any infusion reactions to the Blood Bank which will initiate appropriate investigations if necessary

NOTE 5: Remdesivir FDA EUA Documentation and Reporting Requirements

- Providers must document in EMR that patient/caregiver was:
  1) Given the Fact Sheet for Patients and Caregivers;
  2) Informed of alternatives to remdesivir, and
  3) Informed that remdesivir is an approved drug that is authorized for this unapproved use
- Providers must report all medication errors and serious adverse events potentially related to remdesivir within 7 calendar days from the event by:
  1) Submitting an MedWatch Report, and
  2) Emailing a copy of the submitted MedWatch Report to Gilead Safety_fc@gilead.com

NOTE 6: Documentation and Reporting Requirements for Remdesivir Use in Neonates < 3.5 kg who are not enrolled in GS-US-540-5823

- Providers should document the following in EMR:
  1) Remdesivir is not FDA approved or authorized for use in these patients;
  2) Why patient is considered for remdesivir;
  3) All other options have been evaluated;
  4) Risk/benefits discussed with parents/caregivers;
  5) How was dosing derived; and
  6) Consent has been signed and a copy has been given to parent/caregiver
- Providers should report all medication errors and serious adverse events potentially related to remdesivir within 7 calendar days from the event by:
  1) Submitting an MedWatch Report, and
  2) Emailing a copy of the submitted MedWatch Report to Gilead Safety_fc@gilead.com
### APPENDIX A – ANTI-SARS-COV-2 MONOCLONAL ANTIBODIES (BAMLANIVIMAB)

#### Emergency Use Authorization (EUA) for Non-Hospitalized Patients

<table>
<thead>
<tr>
<th>Eligibility Criteria</th>
<th>Patients must meet the following criteria to be eligible for EUA bamlanivimab:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Positive direct SARS-CoV-2 viral test (PCR or antigen) AND</td>
</tr>
<tr>
<td></td>
<td>• ≥12 years-old AND ≥ 40 kg AND</td>
</tr>
<tr>
<td></td>
<td>• Non-hospitalized due to COVID-19 and within 10 days from symptom onset</td>
</tr>
<tr>
<td></td>
<td>• High risk for progression to severe COVID-19 infection and/or hospitalization</td>
</tr>
</tbody>
</table>

**High risk for Children’s Minnesota implementation of the EUA is defined as:**

**Patients 12-54 years of age AND have one of the following:**
- Body mass index (BMI) ≥35 in adult
- Chronic kidney disease
- Diabetes
- Immunosuppressive disease
- Currently receiving immunosuppressive treatment including chemotherapy

**Patients 12-17 years of age AND have one of the following:**
- BMI ≥95th percentile for their age and sex based on CDC growth charts
- Sickle cell disease
- Complex or severe congenital or acquired heart disease
- Neurodevelopmental disorders
- Medically-related technological dependence
- Asthma or other chronic respiratory disease that requires daily medication for control

<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
<th>Patients who:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Are hospitalized due to COVID-19, or</td>
</tr>
<tr>
<td></td>
<td>• Require oxygen therapy due to COVID-19, or</td>
</tr>
<tr>
<td></td>
<td>• Require an increase in baseline oxygen flow rate due to COVID-19 in those on chronic oxygen therapy due to underlying non- COVID-19 related comorbidity</td>
</tr>
</tbody>
</table>

| Provider Tools | • Bamlanivimab Provider Memo |
|               | • FDA EUA Bamlanivimab Fact Sheet for Healthcare Providers |
|               | • FDA EUA Bamlanivimab Fact Sheet for Patients and Caregivers |
|               | • Bamlanivimab Provider Talking Points/FAQs |
REFERENCES
Guidelines, Expert Reviews, Evidence Summaries

Drug Interactions
16. COVID-19 drug interactions, University of Liverpool http://www.covid19-druginteractions.org/

Remdesivir

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Corticosteroids

Convalescent Plasma
https://www.fda.gov/media/141477/download

Anti-SARS-CoV-2 Monoclonal Antibodies
42. Fact Sheet for Healthcare Providers for Emergency Use Authorization (EUA) of bamlanivimab https://www.fda.gov/media/143601/download
43. Fact Sheet for Patients And Parent/Caregivers for Emergency Use Authorization (EUA) of bamlanivimab https://www.fda.gov/media/143893/download

IVIG

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**Clinical Guideline**

**Medical Management for Patients with Confirmed COVID-19**

(For Ages <25 years)

<table>
<thead>
<tr>
<th>Reviewers: COVID-19 Interim Clinical Guidance Writing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christina Koutsari PharmD PhD (ASP/ID) [Lead], Bill Pomputius MD (ASP/ID) [Lead], Anu Kalaskar MD (ID), Tamara Pozos MD PhD (Immunology), Manar Abdalgani MBBS (Immunology), Lane Miller MD (Hem/Onc), Jeff Nowak MD (Intensive Care), Brooke Moore MD (Pulmonology), Gabrielle Hester MD MS (Quality)</td>
</tr>
</tbody>
</table>

*Created: 05/11/20*

1. Added criteria for use and dosing of remdesivir per Emergency Use Authorization; 2. Revised criteria for use of remdesivir via compassionate use (eIND); 3. Added required laboratory monitoring prior to initiation and daily during remdesivir therapy; 4. Replaced cytokine panel with rapid 4-plex cytokine panel; 5. Included recommendation that doxycycline is preferred over azithromycin for empiric coverage of atypical bacteria if hydroxychloroquine is considered due to QTc prolongation concerns; 6. Included recommendation for hydroxychloroquine dose reduction by 50% if GFR < 10 mL/min, hemodialysis or peritoneal dialysis per hydroxychloroquine Emergency Use Authorization; 7. Added Appendix A for guidance with QTc prolonging pharmacotherapies; 8. Updated literature

**Revised: 05/25/20**

1. Added convalescent plasma as investigational option for prophylaxis or treatment of COVID-19; 2. Added Appendix B with eligibility criteria for use of convalescent plasma; 3. Updated literature

**Revised: 05/29/20**

1. Added clarification regarding remdesivir dosing in pediatric patients ≤ 7 days of age or born prematurely; 2. Updated literature

**Revised: 06/17/20**

1. Added restriction of remdesivir to Infectious Disease per P&T Committee approval on 6.17.20; 2. Removed hydroxychloroquine as treatment option; 3. Removed doxycycline as alternative to azithromycin if labs (except in ARDS); 4. Added use program (https://rdvcu.gilead.com/) as a pathway for obtaining remdesivir; 5. Replaced IRB 2005-051 (Expanded Access Program via Mayo Clinic) for use of convalescent plasma in adults with the FDA Emergency Use Authorization (EUA); 6. Removed language regarding use of convalescent plasma for prophylaxis or treatment prior to or during hospitalization not interfering with eligibility for initiation or continuation of remdesivir (both remdesivir and convalescent plasma are available via EUA with no restrictions in place); 7. Updated literature

**Revised: 07/07/20**

1. Added dexamethasone as treatment consideration in patients requiring supplemental oxygen or mechanical ventilation; 2. Added methylprednisolone and prednisolone as alternative treatment considerations if dexamethasone is unavailable; 3. Updated convalescent plasma eligibility criteria for the pediatric study to a) include medically complex children on technological support associated with developmental delay or genetic anomalies, and b) extend the onset of symptoms up to 7 days; 4. Updated convalescent plasma eligibility criteria for the adult study to include patients with clinically-suspected diagnosis of SARS-CoV-2 infection; 5. Updated literature

**Revised: 09/25/20**

1. Removed tocilizumab as treatment consideration in patients with severe pneumonia or ARDS; 2. Removed IVIG 400 mg/kg/day × 3 days as treatment consideration if admission or follow-up labs suggest HLH physiology or cytokine storm; providers are now referred to discuss with Immunology use of biologic modifiers, including IVIG, for severe pneumonia or ARDS; 3. Included dosing weight recommendations for IVIG replacement; 4. Removed Gilead’s compassionate use program (https://rdvcu.gilead.com/) as a pathway for obtaining remdesivir; 5. Replaced IRB 2005-051 (Expanded Access Program via Mayo Clinic) for use of convalescent plasma in adults with the FDA Emergency Use Authorization (EUA); 6. Removed language regarding use of convalescent plasma for prophylaxis or treatment prior to or during hospitalization not interfering with eligibility for initiation or continuation of remdesivir (both remdesivir and convalescent plasma are available via EUA with no restrictions in place); 7. Updated literature

**Revised: 01/20/21**

1. Added rapid antigen as confirmation for COVID-19; 2. Revised daily labs to daily labs as clinically indicated; 3. Removed the rapid 4-plex cytokine panel and the immune comprehensive panel from the admission labs (except in ARDS); 4. Added prothrombin time (PT) as required lab prior to and during remdesivir treatment; 5. Added a new section on page 3 for asymptomatic patients with high-risk SARS-CoV-2 exposure; 6. Added guiding statements “May consider” vs. “Consider” vs. “Recommend” for all COVID-19 therapeutic agents; 7. Added anti-SARS-CoV-2 monoclonal antibodies as a treatment option for eligible, non-hospitalized patients with mild or moderate COVID-19; 8. Included information about timing of Covid-19 vaccination after administration of monoclonal antibodies treatment for Covid-19 or convalescent plasma; 9. Revised the remdesivir section to include information on a) patient populations that are covered under FDA approval vs. FDA EUA; b) the process for using remdesivir in patients < 3.5 kg who are not covered under FDA approval or EUA; and c) recommendations for remdesivir use in renal and hepatic dysfunction; 10. Added documentation and reporting requirements for FDA EUA convalescent plasma, FDA EUA remdesivir, and remdesivir use in patients <3.5 kg; 11. Added recommendations for oseltamivir use when influenza is co-circulating with COVID-19; 12. Removed convalescent plasma from Severe Pneumonia and ARDS; 13. Updated literature

**Revised: 02/10/21**

1. Removed convalescent plasma for confirmed infection or high risk exposure in pediatric patients (IRB 2005-044) as a treatment option

Disclaimer: This guideline is designed for general use with most patients; each clinician should use his or her own independent judgment to meet the needs of each individual patient. This guideline is not a substitute for professional medical advice, diagnosis or treatment.