INPATIENT GUIDANCE FOR TREATMENT
OF COVID-19 IN ADULTS AND CHILDREN

Patient population:
Adult and pediatric patients with COVID-19 infection, who are admitted on an inpatient floor or to the intensive care unit.

Key points:
Details regarding isolation/precautions, personal protective equipment, patient movement, family/visitor policy, and cleaning/disinfection can be found here.

Clinical symptoms:
Range from uncomplicated upper respiratory tract viral infection to pneumonia, acute respiratory distress syndrome (ARDS), sepsis, and septic shock (Table 1)

Diagnosis:
See link to current COVID-19 testing recommendations: Send testing for COVID-19

Treatment:
There is no current evidence from RCTs to recommend any specific anti-COVID-19 treatment for patients with suspected or confirmed COVID-19 infection.
Treatment should be considered in symptomatic patients requiring hospitalization or those with conditions associated with severe disease (Table 2). All agents described in Table 3 are considered investigational/for compassionate use, and decision to use these should be made only with close attention to the patient’s clinical status, comorbidities, and interacting medications.

Supportive care:
Appropriate treatment of concomitant pneumonia, respiratory failure, ARDS, sepsis, septic shock.

Concomitant use of NSAIDs and/or ACE-I/ARBs:
There is theoretical concern that the use of non-steroidal anti-inflammatory drugs (NSAIDs) or angiotensin converting enzyme inhibitors/angiotensin II receptor blockers (ACE-I/ARBs) may be associated with increased risk of COVID-19 infection. However, there are no data demonstrating beneficial or adverse outcomes with use of these drugs in COVID-19 or among COVID-19 patients with a history of cardiovascular disease taking these medications. As such, the American Heart Association, American College of Cardiology, and Heart Failure Society of America do not recommend stopping ACE-I or ARBs based on this theoretical concern. See joint statement at: https://www.acc.org/latest-in-cardiology/articles/2020/03/17/0859/hfsa-acc-aha-statement-addresses-concerns-re-using-raas-antagonists-in-covid-19

Limited evidence supporting routine use of corticosteroids:
Prior studies assessing outcomes in patients receiving systemic corticosteroids for infections due to closely related viruses (SARS-CoV and MERS-CoV) found a lack of effectiveness and possible harm. However, corticosteroids may still be warranted for other medical indications (i.e., ARDS, COPD exacerbation). If steroids are utilized, continue anti-COVID-19 therapy.

Recommend against routine use of azithromycin:
Preliminary data evaluating the combination of hydroxychloroquine and azithromycin for treatment of COVID-19 were recently published (Gautret et al.). The authors of this study conclude that combination therapy led to greater viral load reduction compared to monotherapy with hydroxychloroquine. However, more patients receiving hydroxychloroquine monotherapy had higher baseline viral burden (estimated by cycle threshold values). When limiting the analysis to those with comparable baseline cycle threshold values, combination therapy with hydroxychloroquine and azithromycin led to a similar proportion of negative testing by day 6 compared to hydroxychloroquine monotherapy. Furthermore, the study does not report the clinical outcomes of these patients, and it is unknown if reductions in viral load correlate with improvements in clinical outcomes. Thus, based on this limited (only 6 patients in combination group) and weak evidence, we recommend against the routine use of azithromycin for the treatment of COVID-19 at this time.

Further details regarding the clinical syndrome and management of COVID-19 infections can be found in the below reference:
Table 1. Clinical syndromes associated with COVID-19 infection

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Description</th>
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<tbody>
<tr>
<td>Uncomplicated illness</td>
<td>Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain or malaise. The elderly and immunocompromised may present with atypical symptoms. These patients do not have any signs of dehydration, sepsis or shortness of breath.</td>
</tr>
<tr>
<td>Mild pneumonia</td>
<td>Patient with pneumonia and no signs of severe pneumonia. Child with non-severe pneumonia has cough or difficulty breathing + fast breathing: fast breathing (in breaths/min): &lt;2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40 and no signs of severe pneumonia.</td>
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<tr>
<td>Severe pneumonia</td>
<td>Adolescent or adult: fever or suspected respiratory infection, plus one of respiratory rate &gt;30 breaths/min, severe respiratory distress, or SpO₂ &lt;90% on room air (adapted from [1]). Child with cough or difficulty in breathing, plus at least one of the following: central cyanosis or SpO₂ &lt;90%; severe respiratory distress (e.g. grunting, very severe chest indrawing); signs of pneumonia with a general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions. Other signs of pneumonia may be present: chest indrawing, fast breathing (in breaths/min): &lt;2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40. The diagnosis is clinical; chest imaging can exclude complications.</td>
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<tr>
<td>Acute Respiratory Distress</td>
<td>Onset: new or worsening respiratory symptoms within one week of known clinical insult. Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules. Origin of oedema: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of oedema if no risk factor present.</td>
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</tbody>
</table>
| Syndrome⁷,⁹                    | Oxygenation (adults):  
|                                | • Mild ARDS: 200 mmHg < PaO₂/FIO₂ < 300 mmHg with PEEP or CPAP ≥5 cmH₂O⁷, or non-ventilated⁹  
|                                | • Moderate ARDS: 100 mmHg < PaO₂/FIO₂ <200 mmHg with PEEP ≥5 cmH₂O, or non-ventilated⁹  
|                                | • Severe ARDS: PaO₂/FIO₂ < 100 mmHg with PEEP ≥5 cmH₂O, or non-ventilated⁹  
|                                | • When PaO₂ is not available, SpO₂/FiO₂ < 315 suggests ARDS (including in non-ventilated patients)  
|                                | Oxygenation (children; note OI = Oxygenation Index and OSI = Oxygenation Index using SpO₂):  
|                                | • Bilateral NIV or CPAP ≥5 cmH₂O via full face mask: PaO₂/FiO₂ ≥ 300 mmHg and SpO₂/FiO₂ ≥ 264  
|                                | • Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5  
|                                | • Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI < 12.3  
|                                | • Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3  
| Sepsis¹⁰,¹¹                   | Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection, with organ dysfunction*. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia. Children: suspected or proven infection and ≥2 SIRS criteria, of which one must be abnormal temperature or white blood cell count. |
| Septic shock¹⁰,¹²              | Adults: Persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 55 mmHg and serum lactate level ≥ 2 mmol/L. Children (based on [12]): any hypotension (SBP < 95th centile or > 2 SD below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR < 90 bpm or >160 bpm in infants and HR < 70 bpm or > 150 bpm in children); prolonged capillary refill (>2 sec) or warm vasoconstriction with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia. |

Abbreviations: ARI, acute respiratory infection; BP, blood pressure; bpm, beats/minute; CPAP, continuous positive airway pressure; FiO₂, fraction of inspired oxygen; MAP, mean arterial pressure; NIV, noninvasive ventilation; OI, Oxygenation Index; OSI, Oxygenation Index using SpO₂; PaO₂, partial pressure of oxygen; PEEP, positive end-expiratory pressure; SBP, systolic blood pressure; SD, standard deviation; SIRS, systemic inflammatory response syndrome; SpO₂, oxygen saturation. * If altitude is higher than 1000 m, then correction factor should be calculated as follows: PaO₂/FiO₂ x Barometric pressure/760. A SOFA score of 2 or more indicates severe systemic inflammatory response syndrome (SIRS) in patients with sepsis. It is calculated by summing the component scores for respiration, cardiovascular system, coagulation, liver, and renal function. Sepsis is defined by an increase in the Sequential (Sepsis-related) Organ Failure Assessment (SOFA) score of ≥2 points. Assume the baseline score is zero if data are not available.

Source: World Health Organization
Table 2: Factors associated with severe COVID-19

<table>
<thead>
<tr>
<th>Factor</th>
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<tbody>
<tr>
<td>Age &gt;65 years</td>
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<tr>
<td>Chronic cardiovascular, pulmonary, hepatic, renal, hematologic, or neurologic conditions</td>
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<tr>
<td>Immunocompromised</td>
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Table 3: Agents under investigation for treatment of COVID-19

<table>
<thead>
<tr>
<th>Antiviral therapy</th>
<th>Dosing &amp; Duration</th>
</tr>
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<tbody>
<tr>
<td><strong>Hydroxychloroquine</strong></td>
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<tr>
<td><strong>Indications for use:</strong></td>
<td>COVID-19 positive, admitted patients with one of the following:</td>
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<tr>
<td></td>
<td>1. ALT or AST &gt;5x the ULN</td>
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<td></td>
<td>2. Creatinine Clearance &lt;50 ml/min</td>
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<tr>
<td></td>
<td>3. Non-pregnant adult patients on mechanical ventilation</td>
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<tr>
<td></td>
<td>4. SpO2 &lt;94% on RA</td>
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<tr>
<td></td>
<td>All other patients will be reviewed for clinical trials or compassionate use eligibility within 24 hours and if not a candidate should get hydroxychloroquine.</td>
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<tr>
<td><strong>Primary teams should not discuss potential clinical trials with patients or families.</strong></td>
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</tbody>
</table>

**Adult dosing (≥18 years):**
- 600 mg PO BID x2 doses (load), then 200 mg PO TID

**Pediatric dosing (<18 years):**
- 10 mg/kg (max: 600 mg/dose) PO BID x2 (load), then 3 mg/kg PO TID (max: 200 mg/dose)

**Duration:**
- 5 days

In select patients with extended ventilation or profound immunosuppression duration may be extended

No dose adjustments for renal or liver dysfunction

Consider adding tocilizumab when concerned for cytokine storm (see criteria below) and patient is not a candidate for sarilumab trial or cannot receive sarilumab in a timely fashion.

**Adverse events:**
- Retinopathy rash, nausea, glucose fluctuations, and diarrhea. GI symptoms can be mitigated by taking hydroxychloroquine with food.
  - Use with caution in diabetic patients; hypoglycemia may occur. Insulin requirements may decrease.
  - Use with caution in patient at risk for QT prolongation.
  - Recommend obtaining G6PD test. Post-marketing studies suggest the risk of hemolysis is very low. It is reasonable to start hydroxychloroquine in most patients while awaiting G6PD testing.
  - Recommend avoid taking hydroxychloroquine with antacids. Separate administration by at least 4 hours.
  - Hydroxychloroquine can be crushed.

**Contraindications:**
- Porphyria

**Pregnant and Nursing Mothers:**
- Hydroxychloroquine has been associated with fetal ocular toxicity in animal studies. Additionally, hydroxychloroquine is excreted into breast milk. Thorough evaluation of the risk:benefit should be discussed with the patient prior to starting therapy.
<table>
<thead>
<tr>
<th>Antiviral therapy</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Tocilizumab</strong> &lt;br&gt; <strong>ID APPROVAL NEEDED</strong></td>
<td><strong>Dose rounding currently built into Epic order. Doses should be rounded to nearest available full vial (80 mg, 200 mg, 400 mg vials)</strong>&lt;br&gt;<strong>Adult Dosing (≥18 years):</strong>&lt;br&gt;8 mg/kg (max: 800 mg/dose)&lt;br&gt;<strong>Pediatric Dosing (&lt;18 years):</strong>&lt;br&gt;&lt;30 kg: 12 mg/kg&lt;br&gt;≥30 kg: 8 mg/kg (max: 800 mg/dose)&lt;br&gt;<strong>Duration:</strong> One dose</td>
<td>Adjunct therapy with interleukin-6 inhibitors, like tocilizumab, may improve oxygenation and time to symptom resolution in patients at high risk of cytokine storm. Laboratory Parameters also supportive of cytokine storm:&lt;br&gt;• Serum IL-6 ≥3x upper normal limit&lt;br&gt;• Ferritin &gt;300 ug/L (or surrogate) with doubling within 24 hours&lt;br&gt;• Ferritin &gt;600 ug/L at presentation and LDH &gt;250 U/L&lt;br&gt;• Elevated D-dimer (&gt;1 mg/L)&lt;br&gt;Contraindications:&lt;br&gt;• Avoid in pregnancy&lt;br&gt;• Tocilizumab may be harmful to newborns, and mothers should stop breastfeeding if receiving tocilizumab&lt;br&gt;Serious adverse events:&lt;br&gt;• Gastrointestinal perforation&lt;br&gt;• Anemia&lt;br&gt;• Hepatitis&lt;br&gt;• Infusion reaction</td>
</tr>
</tbody>
</table>

Consider adding to antiviral therapy for a patient meeting criteria #1 AND #2 below and is not a candidate for the sarilumab trial due to exclusion criteria or cannot receive sarilumab in a timely fashion. Please note that only patients in the RICU or SICU are potential candidates for the sarilumab trial.

1. COVID-19 positive
2. All of the following respiratory findings:
   a. Abnormal chest imaging consistent with COVID-19
   b. Rapidly worsening gas exchange requiring >6 L/min O₂
   c. Absence of systemic bacterial or fungal co-infection
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<tr>
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<tbody>
<tr>
<td>Remdesivir</td>
<td></td>
<td><strong>Drug only available through Gilead with approved investigational new drug (IND) application for children and pregnant women.</strong></td>
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<tr>
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<td><strong>Preferred therapy for children and pregnant women who are hospitalized due to COVID-19 if criteria are met for obtaining product from manufacture (see comments)</strong></td>
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<td></td>
<td><strong>Adult dosing:</strong> 200 mg IV load, then 100 mg IV q24h</td>
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<td><strong>Pediatric dosing</strong>:  &lt;40 kg: 5 mg/kg IV load, then 2.5 mg/kg q24h</td>
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<tr>
<td></td>
<td>≥40 kg: 200 mg IV load, then 100 mg IV q24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Duration:</strong> Per protocol</td>
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</tbody>
</table>
|                   | **Inclusion Criteria:**  
  - Hospitalization  
  - SARS-CoV-2 by PCR  
  - Mechanical ventilation | |
|                   | **Exclusion Criteria:**  
  - Multi-organ failure  
  - Vasopressor requirement  
  - ALT >5x ULN  
  - CrCl <30 mL/min, dialysis, or CVVH  
  - Concomitant use of other experimental antiviral agents (e.g., lopinavir-ritonavir) | |
|                   | **To start the request for remdesivir through Gilead’s expanded access program, please send an email to the UMHS Expanded Access Group at [UM-Expanded-Access-Request@med.umich.edu](mailto:UM-Expanded-Access-Request@med.umich.edu). Email this group regardless of hours, but the expanded access program typically responds M-F during daytime hours. For urgent weekend and evening/over-night requests, please contact the research pharmacy on-call pager at 2944. After contacting the expanded access program, a request can be initiated via this portal: [https://rdvcu.gilead.com/](https://rdvcu.gilead.com/).** | |
|                   | **Adverse events:** Increased liver enzymes. Also potential to have drug-drug interactions with medications metabolized through cytochrome system | |
### Antiviral therapy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosing &amp; Duration</th>
<th>Comments</th>
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</table>
| **Lopinavir-ritonavir (Kaletra®)**  
*Alternative therapy if remdesivir and hydroxychloroquine are unavailable or if the patient has contraindications or adverse effects* |**Adult dosing:**  
400 mg-100 mg PO BID  
**Pediatric dosing:**  
*14 days to 6 months old:*  
lopinavir component 16 mg/kg PO BID  
*6 months to 18 years:*  
15-25 kg:  
200 mg-50 mg PO BID  
26-35 kg:  
300 mg-75 mg PO BID  
>35 kg:  
400 mg-100 mg PO BID  
**Duration:**  
5 days  
In select patients with extended ventilation or profound immunosuppression duration may be extended | **Check HIV antigen/antibody prior to first dose**  
**Adverse events:**  
Hepatotoxicity, pancreatitis, diabetes, QT prolongation, lipid elevations, and fat redistribution  
Major substrate and inhibitor of Cytochrome P450, and can cause severe drug-drug interactions. Thorough evaluation of a patient’s medication profile should be reviewed before starting therapy.  
**Pregnancy:**  
Lopinavir-ritonavir is safe to use during pregnancy |
| **Nitazoxanide**  
*Alternative* |**Adult dosing:**  
500 mg PO BID  
**Pediatric dosing:**  
*1-3 years:*  
100 mg PO BID  
*4-11 years:*  
200 mg PO BID  
*≥12 years:*  
500 mg PO BID  
**Duration:**  
5 days  
In select patients with extended ventilation or profound immunosuppression duration may be extended | Very limited vitro data evaluating activity and currently there is literature evaluating its use in patients with COVID-19.  
**Adverse events:**  
Headache, nausea, abdominal pain, urine discoloration  
**Pregnant and Nursing Mothers:**  
Use is safe in pregnancy after the first trimester. There is no data on excretion into breast milk. |

*pediatric dosing of remdesivir is taken from the WHO recommendations for treatment of Ebola virus, as no specific dosing recommendations exist for COVID-19.*

**Do not use** (therapies without any supportive evidence and/or associated with potential harm): oseltamivir, baloxavir, interferon, ribavirin, IVIG
Antibiotic Management for Pneumonia in PUI and Confirmed COVID-19 Patients

Summary of Recommendations:

1. In patients admitted with suspected COVID-19 pneumonia (testing pending), decisions whether to initiate antibiotic therapy should be based on guidance provided in the institutional pneumonia treatment and procalcitonin usage guidelines.

2. Continuation/initiation of antibiotic therapy solely due to confirmation of COVID-19 pneumonia is not indicated as described below.

3. In patients with confirmed COVID-19 pneumonia, secondary bacterial infection is uncommon early in the course, and elevated procalcitonin levels are not reliably associated with bacterial infection, especially in the setting of concomitant renal dysfunction. Empiric antibiotic therapy may still be warranted if: elevated WBC or clinically deemed necessary based on presentation or hemodynamic instability. Note that an extended duration of fevers is typical in COVID-19 patients. De-escalation/discontinuation of antibiotics should be considered based on clinical and microbiological data.

4. In patients who test negative for COVID-19 pneumonia, antibiotic therapy should be based on guidance provided in the institutional pneumonia treatment and procalcitonin usage guidelines.

Reports thus far have not identified unusual associations between COVID-19 infection and bacterial co-infection. Additionally, no unique association with resistant pathogens, including MRSA or Pseudomonas, has been made.

In the study of adult patients by Zhou et al.:

- 15% of hospitalized COVID-19 patients developed a secondary bacterial infection (definition: clinical symptoms or signs of pneumonia or bacteremia with a positive culture).
- The median time to secondary bacterial infection was 17 days (13 to 19 days).
- Of all COVID-19 patients in their cohort, 79% had a WBC <10.
- Only 1% of survivors developed a secondary bacterial infection, yet the median duration of fever in survivors was 12 days and cough persisted for 19 days. Thus, ‘just in case’ treatment of bacterial infection can result in prolonged durations of therapy.

As such, the literature and experience to date suggests that adult patients with COVID-19 infection can be managed as per our standard institutional guidelines regarding antibiotic use in patients with suspected pneumonia.

Data in pediatric patients are limited, but one small study (Xia et al.) suggests that procalcitonin may be higher in children with COVID-19, regardless of suspected bacterial superinfection. Decisions about antibiotic management for children should continue to be guided by clinical judgment.

Adult pneumonia treatment guidelines are summarized here, and adult and pediatric pneumonia treatment guidelines are available in their entirety at:

- Pneumonia Treatment (Adult)
- Community-Acquired Pneumonia Treatment (Pediatrics)
- Procalcitonin Use Guidelines
Procalcitonin

- Although PCT levels should not be used in isolation to decide whether to initiate antibiotics in patients with suspected bacterial pneumonia, **bacterial co-infection is unlikely in a confirmed COVID-19 patient with a low procalcitonin (<0.25), and antibiotics can be safely withheld.** In addition, PCT levels >0.25 are not uncommon in patients with COVID-19 pneumonia, and do not appear to be a reliable marker of bacterial superinfection. Importantly, patients with CKD and AKI have falsely elevated PCT levels, and as such PCT is not reliable in such settings. Procalcitonin should also NOT be routinely used to extend treatment duration.

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### Adult Pneumonia Treatment Summary Recommendations

<table>
<thead>
<tr>
<th>Indication</th>
<th>1st Line Empiric Therapy (see guidelines for alternatives)</th>
<th>Duration of Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pathway A</strong> – Inpatient community-acquired with no risk factors</td>
<td><strong>Ampicillin-sulbactam</strong> 3 g IV q6h + Azithromycin 500 mg IV/PO x1 day, then 250 mg q24h x4 days</td>
<td><strong>Uncomplicated pneumonia:</strong> 5 days for patients who defervesce within 72 hours and have no more than 1 sign of CAP instability at the time of antibiotic discontinuation</td>
</tr>
<tr>
<td><strong>Pathway B</strong> – Inpatient pneumonia with risk factors as defined below</td>
<td><strong>Piperacillin-azobactam</strong> 4.5 g IV q6h (+ <strong>Tobramycin</strong> IV if admitted to ICU) + <strong>Vancomycin</strong>* IV (see <a href="#">Standard Dosing Guideline</a>)</td>
<td><strong>Uncomplicated pneumonia:</strong> 7 days</td>
</tr>
</tbody>
</table>

**PATHWAY B RISK FACTORS**

**Healthcare Exposure:**

- HAP (hospitalization ≥72h); VAP; Prior hospitalization ≥48h within previous 90 days; Current resident from LTCF, nursing home, ECF, SNF with at least partial functional dependence in ADLs (transfer, feeding, bathing, dressing, toileting, and continence)

**Disease Severity:**

- Septic shock requiring ICU admission

**Antibiotic Exposure:**

- Fluoroquinolone, linezolid or any intravenous antibiotic use within previous 90 days

**Immunosuppression:**

- AIDS, neutropenia (ANC <1000), or active malignancy undergoing intravenous chemotherapy; Kidney or liver transplant recipient within 1 year; Lung transplant recipient; Autologous stem cell transplant within 6 months; Allogeneic stem cell transplant within 1 year of transplant date or those with chronic GVHD

**Other:**

- Tube feeding; History of infection or colonization with Pseudomonas spp., MRSA, or other MDR pathogens within previous 12 months; Cystic fibrosis, chronic obstructive pulmonary disease (FEV1 <35% predicted, multiple antibiotic prescriptions in last year, multiple hospital admissions in last year), or chronic bronchiectasis
References:

1. https://rdvcu.gilead.com/
14. https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm

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<thead>
<tr>
<th>Antimicrobial Subcommittee Approval</th>
<th>N/A</th>
<th>Originated: 03/2020</th>
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<tbody>
<tr>
<td>P&amp;T Approval</td>
<td>N/A</td>
<td>Last Revised: 03/2020</td>
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Revision History:
3/16: Removed testing recommendations - added link to testing document.
3/17: Added tocilizumab, adjusted pediatric hydroxychloroquine dosing.
3/19: Adjusted tocilizumab criteria, added pneumonia guidance.
3/20: Changed tocilizumab dosing to weight based due to changes in Epic dose rounding capabilities, added limited data for corticosteroids in ARDS.
3/24: Added guidance on azithromycin, adjusted tocilizumab dosing, added clinical study enrollment appendix.
3/25: Modified criteria for HCQ use.
3/26: Adjusted tocilizumab criteria & included sarilumab study caveat.
3/27: Removed study flow diagram

The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

If obtained from a source other than med.umich.edu/asp, please visit the webpage for the most up-to-date document.