Currently there is no FDA approved antiviral therapy for SARS-CoV-2 infection. The mainstay of therapy is supportive care. The treatment algorithm presented here is based on review of currently available literature. There is in vitro data to suggest antiviral activity of hydroxychloroquine against coronavirus and there are ongoing studies evaluating in vivo efficacy. A risk/benefit analysis should be performed with each patient prior to prescribing. Updates will be made as more data becomes available.

1. PUI: person under investigation
2. See Table 1
3. ID (Infectious Disease) approval required. Consult Peds ID for pediatric dosing.
4. Stop hydroxychloroquine (HCQ) if COVID-19 test is negative and alternative diagnosis is made. Ok to continue if there is strong clinical suspicion and/or second test is pending.
5. EKG upon starting HCQ – recommend against use if QTc > 500msec. Check for other drug-drug interactions.
6. See Table 2, Rheumatology consult required

UVMMC COVID-19 Therapeutic Algorithm

COVID-19 positive patient or PUI\(^1\) without alternative diagnosis for whom a test is ordered and pending

**Outpatient**
- Supportive care with close monitoring

**Non-ICU Admission**
- No risk factors or Category 1\(^2\) only
  - Supportive care
- At least 1 risk factor present from Category 2 or 3\(^2\)
  - Supportive care and consider starting hydroxychloroquine\(^3,4,5\)
  - Worsening clinical status\(^2\)

**ICU Admission**
- Consider starting hydroxychloroquine\(^3,4,5\)
- Consideration of biologics such as tocilizumab\(^6\)
<table>
<thead>
<tr>
<th>Category 1: Epidemiological risk factors</th>
<th>Category 2: Vital Signs</th>
<th>Category 3: Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-existing pulmonary disease</td>
<td>Respiratory rate &gt;24 breaths/min</td>
<td>D-dimer &gt;1000 ng/mL</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>Heart rate &gt; 125 beats/min</td>
<td>Creatine kinase &gt; 2x upper limit of normal</td>
</tr>
<tr>
<td>Diabetes with HbA1C &gt;7.6%</td>
<td>SpO2&lt;90% on ambient air</td>
<td>CRP &gt;100 mg/dL</td>
</tr>
<tr>
<td>History of hypertension</td>
<td></td>
<td>LDH &gt;245 U/L</td>
</tr>
<tr>
<td>Use of biologics</td>
<td></td>
<td>Elevated troponin</td>
</tr>
<tr>
<td>History of transplant or other immunosuppression</td>
<td></td>
<td>Admission absolute lymphocyte count &lt;0.8 k/dL</td>
</tr>
<tr>
<td>All patients with HIV (regardless of CD4 count)</td>
<td></td>
<td>Ferritin &gt;300 µg/L</td>
</tr>
</tbody>
</table>

Table 1. COVID-19 Risk Factors for Severe Disease
**Medication** | **Dosing** | **Notes**
--- | --- | ---
Hydroxychloroquine (HCQ) | 400 mg PO BID x 2 doses, then 200 mg PO BID for 4 days | There is no randomized, clinical trial data supporting the use of HCQ in the treatment of COVID-19. There is in vitro data suggesting both antiviral and antiinflammatory properties. HCQ can cause QTc prolongation, particularly in combination with other QTc-prolonging medications. Check for drug-drug interactions. It is recommended not to use HCQ if QTc > 500msec. HCQ can be crushed and administered via OG or NG tube. It is best to administer with food. Administer antacids at least 4 hours before or after HCQ. HCQ may cause hypoglycemia, exacerbations of psoriasis, hemolysis in the setting of G6PD deficiency, or delirium. Contraindications: any known hypersensitivity to 4-aminoquinoline compounds.

**Infectious Diseases approval required.**

Remdesivir | 200 mg IV on day 1, then 100 mg IV daily for up to 10 days | Remdesivir is currently only available via compassionate use for pregnant women and pediatric patients. Remdesivir is an investigational nucleotide analog with antiviral activity. Prior animal studies have looked at its utility for MERS and SARS. It is not FDA approved and does not have safety or efficacy profiles.

**Infectious Diseases approval required.**

Tocilizumab | 400mg IV x1 (Use order panel) | Tocilizumab is an interleukin-6 (IL-6) receptor inhibitor, binding to soluble and membrane-bound IL-6 receptors. It is currently under investigation as an agent targeting cytokine storm as a result of COVID-19. Criteria for consideration of use:
- COVID-19 positive
- Intubated and PaO\(_2\)/FiO\(_2\) <150; call Rheumatology if patient is being transferred from the floor to ICU with worsening respiratory decline.
- Onset of symptoms less than 1 week and hospitalization <48 hours
- Temperature > 38.3 C
- Labs
  - Ferritin > 1000 ng/mL
  - D-Dimer >1000 ng/mL
  - LDH >250 U/L
  - CRP > 70 mg/L or >40 mg/L and doubling within 48 hours
- Lymphocyte count < 0.6 x 10\(^9\)/L
- Likelihood of good clinical outcome based on age and other comorbidities

Contraindications: any known hypersensitivity to tocilizumab.

**Rheumatology approval required.**

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This document is subject to change. Updated by the UVMMC COVID-19 Therapeutics Working Group on 4/15/2020. Adapted from the Massachusetts General Hospital COVID-19 Treatment Guidance Version 1.0 3/17/2020.