SARS-CoV-2/COVID-19 Treatment Guidance

General Treatment Recommendations:\(^1\):\(^3\):

- The recommendations for COVID-19 are rapidly changing and are updated regularly and there are currently no FDA approved pharmacotherapies. Please refer to the following websites for up to date information regarding treatment protocols.
  - www.idsa.org
  - NIH: [https://covid19treatmentguidelines.nih.gov/](https://covid19treatmentguidelines.nih.gov/)
  - www.Clinicaltrials.gov
- In general follow standard of care for viral pneumonia and ARDS
- Provide symptomatic treatments, such as antipyretics for fever\(^1\)
  - Use acetaminophen instead of ibuprofen when possible
- Avoid corticosteroids given potential for prolonging viral replication as observed in MERS-CoV patients, unless needed for other indications\(^1\):\(^3\)
  - Examples of patients who may need corticosteroids:
    - Asthma
    - Mod-severe COPD exacerbation\(^4\)
    - Septic shock if fluids and vasopressors are unable to restore hemodynamic stability\(^5\)
      - IV hydrocortisone 200 mg per day\(^5\)
    - ARDS: new or worse supplement oxygen with early ARDS
      - **low dose methylprednisolone** with a short course (e.g. 0.5-1 mg/kg/day based on actual body weight divided in 2 doses for 3 days)
- Avoid excessive fluid resuscitation\(^1\)
- Consult pulmonary/critical care for patients requiring supplemental oxygen with RR >20/min
- Periodic prone positioning during mechanical ventilation\(^7\)
- Empiric antibiotics only if patient is septic or bacterial superinfection is suspected; routine use of antibiotics for viral infection is not indicated\(^1,7\)
- There are no data supporting harmful effects of ACE-I and ARBs relating to COVID-19 despite some theoretical concerns. The American College of Cardiology, American Heart Association, Heart Failure Society of America, and European Society of Cardiology recommend continuation of these agents if indicated\(^8,9\)

Additional Treatment Recommendations (for non-pregnant adults):
• **DISCLAIMER**: No drugs are FDA-approved for the treatment of SARS-CoV-2 infection (aka COVID-19). The additional agents mentioned below are supported by limited, poor-quality data. Their clinical impact and ideal place in therapy in terms of severity and timing are still unknown. **At this time, use for COVID-19 should be restricted to Infectious Diseases (where available) after careful consideration of potential risks, benefits, and interactions.**

• **Supplies of these drugs are limited.**
• Reserve use of these agents for confirmed cases (positive SARS-CoV-2 PCR) or cases with high clinical suspicion.
• The following drugs are unlikely to be effective for COVID-19 and, thus, **NOT** recommended unless needed for another indication: azithromycin, lopinavir/ritonavir,1⁰ boosted darunavir,1¹ nitazoxanide (Romark, L.C., email communication, March 2020), and neuraminidase inhibitors (i.e., oseltamivir, peramavir, zanamivir)1²

Table 1: Therapy considerations for non-pregnant adults

<table>
<thead>
<tr>
<th>Outpatient (no O₂ requirements, mild presentation)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mild illness with no risk factors*</td>
<td>• Symptomatic/Supportive care</td>
</tr>
<tr>
<td>Cough, fever, myalgias</td>
<td>• Fever acetaminophen</td>
</tr>
<tr>
<td>On Room air / baseline SAO₂ 94% or above</td>
<td>• Cough:</td>
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<tr>
<td>No radiographic evidence of pulmonary infiltrates</td>
<td>o Vaporizer/humidifier</td>
</tr>
<tr>
<td></td>
<td>o Dextromethorphan: dry</td>
</tr>
<tr>
<td></td>
<td>o Guaifenesin: productive</td>
</tr>
<tr>
<td>Mild illness with risk factors*</td>
<td>• Symptomatic/Supportive care</td>
</tr>
<tr>
<td></td>
<td>• LRTI: Consider admission</td>
</tr>
<tr>
<td>Hospitalized</td>
<td></td>
</tr>
<tr>
<td>Mild illness</td>
<td>• Symptomatic/Supportive care</td>
</tr>
<tr>
<td>• No hypoxia or radiographic evidence of pneumonia</td>
<td>• Consider appropriate DVT prophylaxis</td>
</tr>
<tr>
<td>Moderate illness</td>
<td>• Symptomatic/Supportive care</td>
</tr>
<tr>
<td>• supplemental oxygen use or Sao₂ less than 94%, fever of ≥ 36.6°C armpit, ≥ 37.2 °C oral, or ≥ 37.8°C rectal, radiographic evidence of pulmonary infiltrates</td>
<td>• Consider appropriate DVT prophylaxis</td>
</tr>
<tr>
<td></td>
<td>• Consider Hydroxychloroquine**</td>
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</tbody>
</table>
Critical illness requiring mechanical ventilation

- Symptomatic/Supportive care
- Consider appropriate DVT prophylaxis

*Risk factors: age > 60 years; d-dimer > 1000 ng/mL; comorbidities such as immunocompromised state, underlying structural lung disease, cardiac disease, hypertension, and diabetes

Hold oral agents if pressor requirements EXCEED norepinephrine 0.2 mcg/kg/min (or equivalent) as oral absorption is likely compromised.
**Laboratory monitoring**

- **Patients highly suspected or confirmed patients:** Baseline CBC with differential, BMP, magnesium, LFTs, procalcitonin, ferritin, CRP, LDH, d-dimer, CPK, high sensitivity troponin, Influenza A & B PCR, respiratory pathogen panel, streptococcal antigen, urine legionella
- **Confirmed:** prevalence of co-infection with other viral and bacterial pathogens is unclear at this point
- **Draw upon admission to ICU:** Triglyceride, DIC panel (in addition to labs listed above if not previously ordered), PT/INR
- **Baseline 12-Lead ECG** (Due to QTc prolongation and use with azithromycin, which also prolongs the QTc, must use caution and should obtain an ECG upon at 2-4 hours after 1st dose, 48 hours after 1st dose, and as needed through therapy course)

<table>
<thead>
<tr>
<th></th>
<th>Moderate symptoms, hospitalized</th>
<th>Severe, hospitalized (ICU)</th>
</tr>
</thead>
</table>
| **Baseline (if not done in ER)** | • Procalcitonin  
     • Ferritin  
     • BMP  
     • Magnesium  
     • CBC with differential  
     • Troponin  
     • CPK  
     • LFT  
     • CRP  
     • PT/INR | • DIC panel  
     • Procalcitonin  
     • Ferritin  
     • BMP  
     • Magnesium  
     • CBC with differential  
     • Troponin  
     • CPK  
     • LFT  
     • CRP  
     • PT/INR |
| **Daily** | • BMP  
     • Magnesium  
     • CBC with differential | • BMP  
     • Magnesium  
     • CBC with differential |
| **Every 48 hours** | • D-dimer  
     • LFT  
     • CRP  
     • LDH  
     • CPK  
     • PT/INR | • High sensitivity troponin  
     • d-dimer  
     • Triglycerides (if on propofol)  
     • CRP  
     • LDH  
     • CPK  
     • Ferritin |
<table>
<thead>
<tr>
<th>Clinical worsening</th>
<th>PT/INR</th>
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<tbody>
<tr>
<td>• Troponin</td>
<td>• Troponin</td>
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<tr>
<td>• BMP</td>
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<tr>
<td>• Magnesium</td>
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<tr>
<td>• CBC with differential</td>
<td>• CBC with differential</td>
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<tr>
<td>• Ferritin</td>
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<tr>
<td>• CRP</td>
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<td>• LDH</td>
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<tr>
<td>• CPK</td>
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<tr>
<td>• D-dimer</td>
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### Other Treatment Modalities

<table>
<thead>
<tr>
<th>Fluid Management</th>
<th>Conservative fluid management</th>
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<tbody>
<tr>
<td>Anticoagulation</td>
<td>Appropriate DVT prophylaxis</td>
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<tr>
<td>ACEi/ARB</td>
<td>Continue home ACEi/ARB for conditions with known mortality benefit (e.g. heart failure, ischemic heart disease, or hypertension with diabetes). If therapy for no compelling indication, consider alternate therapy</td>
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<tr>
<td>Statin</td>
<td>Continue home statin and monitor for side effects (e.g. LFTs, CPK) and hold if deemed clinically necessary. Do not initiate statin therapy if no medical indication exists.</td>
</tr>
<tr>
<td>NSAIDS</td>
<td>avoid</td>
</tr>
<tr>
<td>Steroids</td>
<td>Avoid unless otherwise indicated</td>
</tr>
</tbody>
</table>
References:


2. www.covidprotocols.org


20. COVID-10 Guidelines from the Infectious Disease Society in the Lombardy Region. 2020.