Mount Sinai Health System Treatment Guidelines for SARS-CoV-2 Infection (COVID-19)[1-14]

Patient group	Current Potential Therapy Options	Notes
Mild disease: Not requiring hospitalization OR Hospitalized patient with (SPO2 > 94%), and NO radiographic evidence of pneumonia	Supportive care	• **Infectious Diseases consult required for all hospitalized patients with confirmed COVID19**
Moderate disease: Hospitalized patients with hypoxia (SPO2 ≤ 94 %) OR Radiographic evidence of pneumonia	Hydroxychloroquine 400 mg PO q 12 hrs. x 2 doses then 12 hours later start 400 mg PO daily for 5-10 days If discharged, discontinue hydroxychloroquine.	• **Infectious Diseases consult required for all hospitalized patients with confirmed COVID19** • Check EKG prior to hydroxychloroquine initiation for QT prolongation. Risk is increased when used with other QT prolonging drugs. • Recheck EKG once after drug initiation and manage clinically. • Review potential medication interactions and other possible side effects
Severe disease with respiratory failure but no other end organ damage: Patient requiring mechanical ventilation AND Not on pressors, CrCl > 30 ml/min, ALT < 5x upper limit of normal	Hydroxychloroquine 400 mg PO q 12 hrs. x 2 dose then 12 hours later start 400 mg PO daily for 5-10 days. Initiate process for obtaining compassionate use remdesivir	• **Infectious Diseases consult required for all hospitalized patients with confirmed COVID19** • **Remdesivir not to be used concomitantly with hydroxychloroquine or other antivirals** • Check EKG prior to initiation of hydroxychloroquine for QT prolongation. Risk is increased when used with other QT prolonging drugs. • Recheck EKG once after drug initiation and manage clinically. • Review potential medication interactions and other possible side effects
Severe disease with respiratory failure and other end organ damage: Patient requiring mechanical ventilation AND Requiring pressors or CrCl < 30 ml/min or receiving HD or CVVH or ALT > 5x upper limit of normal	**Not eligible for remdesivir compassionate use but may be eligible for the remdesivir or sarilumab clinical trial** Start hydroxychloroquine Hydroxychloroquine 400 mg PO q 12 hrs. x 2 doses then 12 hours later start 400 mg PO daily for 5-10 days.	• **Infectious Diseases consult required for all hospitalized patients with confirmed COVID19** • Check EKG prior to initiation of hydroxychloroquine for QT prolongation. Risk is increased when used with other QT prolonging drugs. • Recheck EKG once after drug initiation and manage clinically. • Review potential medication interactions and other possible side effects
Evidence of cytokine release syndrome Worsening of respiratory function with evidence of CRS including elevations of IL-6, fibrinogen, d-dimer, CRP	Consider Tocilizumab or sarilumab clinical trial.	• **Infectious Diseases consult required for all hospitalized patients with confirmed COVID19**

Updated: March 17, 2019

PLEASE NOTE: There are currently shortages of chloroquine and it might not be available.

Medications:

Hydroxychloroquine (Plaquenil®):

- May start in patient with moderate disease
- May start in patients with severe disease while awaiting remdesivir
- May start in patient with severe diseases who do not qualify for remdesivir

Dosing:
400 mg PO q 12 hours x 2 doses then 12 hours later start
400 mg PO q daily for 5 - 10 days (depending on clinical improvement)

- Pregnancy Category: D
- Renal and hepatic dose adjustments not recommended
- If GI discomfort, can change 400 mg daily to 200 mg BID
- Tablet can be crushed

Monitoring:
- Check EKG prior to hydroxychloroquine initiation for QT prolongation.
- Risk is increased when used with other QT prolonging drugs.
- Recheck EKG once after drug initiation and manage clinically.

Drug interaction Resources:
https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_InteractionDetailsClass_Web_2020_Mar12.pdf
https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_InteractionSummary_Web_2020_Mar12.pdf

Potential Side Effects: Cardiomyopathy, hypoglycemia, bone marrow suppression, dermatitis

Remdesivir:

- Consultation with Infectious Diseases required for obtainment/utilization
- May be requested from Gilead for compassionate use in critically ill patients that are:
    - Hospitalized
    - Have confirmed SARS-CoV-2 (COVID-19) by PCR
    - Intubated

Exclusions for compassionate use include:
- Evidence of multi-organ failure
- Pressor requirement to maintain blood pressure
- ALT levels > 5 X ULN
- Creatinine Clearance <30 mL/min or dialysis or Continuous Veno-Venous Hemofiltration
- **Remdesivir cannot be used in conjunction with any other potentially active agents (ex:hydroxychloroquine)**

Dosing per protocol

Drug interaction Resources:
https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_InteractionDetailsClass_Web_2020_Mar12.pdf
https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_InteractionSummary_Web_2020_Mar12.pdf

Potential Side Effects: Nausea, vomiting, elevated aminotransferase, headache, constipation, phlebitis, pain in extremity

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ACE inhibitors (angiotensin converting enzyme inhibitors) and **ARBs** (angiotensin-receptor blockers):[13]

- It is strongly recommended that patients **should be continued on their ACE inhibitor and ARB therapy**
- Currently, there is no scientific or clinical evidence that taking ACE inhibitors or ARBs increases the risk of acquiring COVID-19 or that use may increase the severity of illness for those acquiring the infections.
- **Patients should NOT be started on an ACE inhibitor or an ARB for the treatment of COVID-19**

Agents NOT recommended at this time	
Corticosteroids[15]	Per WHO guidelines, given the lack of effectiveness and possible harm, especially delayed viral clearance, routine corticosteroids should be avoided unless they are indicated for other reasons such as exacerbation of asthma, COPD and refractory septic shock.
Lopinavir/ritonavir (Kaletra)[16,17]	Lopinavir inhibits the protease activity of coronavirus in SARS. Two retrospective matched cohorts of lopinavir/ritonavir (used in combination with ribavirin and corticosteroids) in SARS demonstrated a potential role in clinical outcomes, especially when used in the early stages of diseases. Due to risk of adverse events and drug-drug interactions, along with lack of data in SARS-CoV-2 at present time, not currently recommended.
Darunavir/cobicistat (Prezcobix)[18-19]	Currently being evaluated in a clinical trial but no in vitro or in vivo data exist to support use at this time.
Oseltamivir	SARS-CoV-2, the virus that causes COVID-19, does not use neuraminidase as part of the viral replication cycle so oseltamvir is unlikely to be of therapeutic value, and supplies of the drug should be preserved for patients with influenza.
IVIG	IVIG remains on critical national shortage. The benefit in patient with COVID-19 is unclear.
Ribavirin	Role unclear, doses required for optimal antiviral activity often exceed limit of patient tolerability. Risk of toxicity likely outweighs potential clinical benefit.
Nitazonaxide[20]	Displays inhibitory activity against the virus in vitro however no clinical data in humans exists.

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