



Mount Sinai Health System Treatment Guidance for SARS-CoV-2 Infection (COVID-19)¹

Updated in the setting of Omicron variant of concern

Illness Severity ¹	Current Potential Therapy Options	Notes
Asymptomatic	Supportive care	<p>In both inpatients and outpatients, corticosteroids are not recommended.</p> <p><i>Currently, no agents authorized by the FDA are authorized for the treatment of patients with asymptomatic infection with SARS-CoV-2.</i></p>
Symptomatic not requiring supplemental oxygen (> 94% on room air)	<p style="text-align: center;">Supportive care</p> <p><u>Outpatient:</u> SARS-CoV-2 specific monoclonal antibody therapy is available for patients at high risk of progression to severe COVID-19 – provider referrals can be submitted through this referral form.</p> <p>Mount Sinai South Nassau in Long Island also provides SARS-CoV-2 specific monoclonal antibody therapy. Referrals for patients at high risk of progression to severe COVID-19 can be referred to the MSSN Outpatient Infusion Center at 516-632-4998.</p> <p>Due to increasing recovery of the Omicron variant of SARS-CoV-2 in our region, sotrovimab is the only SARS-CoV-2 specific monoclonal antibody being offered at this time.</p> <p>For oral antivirals (please see details below for the specific antiviral)</p> <ul style="list-style-type: none"> • Patient cannot be hospitalized for COVID-19 • Patient must be able to initiate treatment within 5 days of symptom onset • Patient must have a medical condition that increases their risk for severe illness or death from COVID-19 <p><u>Inpatient:</u> Inpatients not hospitalized for COVID-19 but who develop mild to moderate COVID-19 while hospitalized and who are at risk for progression to severe COVID-19 can be considered for EUA SARS-CoV-2 specific monoclonal antibody therapies if not requiring supplemental oxygen. Infectious diseases consultation and site-specific designee approval is required.</p>	<p>In both inpatients and outpatients, remdesivir and corticosteroids are not recommended in the patients not requiring supplemental oxygen for COVID-19.</p> <p><i>None of the authorized agents listed below are for use for pre-exposure or post-exposure prophylaxis. These medications do not substitute for COVID-19 vaccination.</i></p> <p><u>Sotrovimab</u> (Xevudy[®]) Sotrovimab is a SARS-CoV-2 specific monoclonal antibody which received an emergency use authorization (EUA) on May 26, 2021 for treatment of non-hospitalized patients with <i>symptomatic</i> COVID-19 not requiring supplemental oxygen and who are high risk for progression to severe COVID-19. Due to logistical and supply constraints prioritization for treatment has been outlined by the New York State and New York City public health departments based on recommendations from the NIH COVID-19 Treatment Guidelines for prioritization when there are logistical or supply constraints.</p> <p><u>Nirmatrelvir/Ritonavir (Paxlovid™)</u> Paxlovid™ is an oral antiviral which is a combination of nirmatrelvir/ritonavir which received an EUA on December 22, 2021 for the treatment of non-hospitalized patients with <i>symptomatic</i> COVID-19 who do not require supplemental oxygen and who are at high risk for progression to severe COVID-19. Paxlovid™ is currently only available through designated pharmacies at this time with limited allocation and prioritization outlined by New York State and New York City public health departments. Patients must start treatment within 5 days of symptom onset and must have a positive test result for SARS-CoV-2 infection.</p> <p><i>Caution must be used with concomitant medications. Please see below for detailed information.</i></p>

		<p><u>Molnupiravir</u></p> <p>Molnupiravir is an oral antiviral which received an EUA on December 23, 2021 for the <u>treatment of non-hospitalized</u> patients with <i>symptomatic</i> COVID-19 who do not require supplemental oxygen and who are high risk for progression to severe COVID-19. Molnupiravir is currently only available through designated pharmacies at this time with limited allocation and prioritization outlined by New York State and New York City public health departments. Molnupiravir is only available for those with contraindications to Paxlovid™ or if Paxlovid is unavailable. Patients must start treatment within 5 days of symptom onset and must have a positive test result for SARS-CoV-2 infection. <i>Caution must be used in persons of childbearing potential and those who are sexually active with persons of childbearing potential. Please see below for detailed information.</i></p> <p>Currently, the use of remdesivir is not recommended for outpatients with symptomatic COVID-19 not requiring supplemental oxygen.</p>
<p>Hospitalized requiring low-flow nasal cannula (SpO2 ≤ 94% on RA)</p>	<p>Supportive care</p> <p>Consider:</p> <ul style="list-style-type: none"> • SARS-CoV-2 specific antibody therapy* • Dexamethasone • Remdesivir <p>In addition to remdesivir, anticoagulation, and dexamethasone consider referring for enrollment in available Clinical Trials.</p> <p>*Not inclusive of EUA sotrovimab</p>	<p><u>Remdesivir — requires ID consultation and is non-formulary</u></p> <p>Remdesivir is not recommended in patients with an ALT > 5 times with upper limit of normal. Remdesivir was FDA-approved for the treatment of COVID-19 on October 22, 2020 in hospitalized patients 12 years of age and older weighing at least 40 kg.</p> <p><u>Dexamethasone 6 mg IV/PO once daily for up to 10 days</u></p> <p>Patients with symptom duration of < 7 days have not demonstrated benefit from dexamethasone. Dexamethasone should not be continued after discharge unless patient has a history of being on chronic steroid therapy.</p>
<p>Hospitalized requiring non-rebreather, high flow nasal cannula, or non-invasive ventilation (i.e., BiPAP)</p>	<p>Supportive care</p> <p>Recommended:</p> <ul style="list-style-type: none"> • SARS-CoV-2 antibody therapy* • Dexamethasone • Remdesivir • Baricitinib or tocilizumab <p>In addition to remdesivir, anticoagulation, antibody therapy, and dexamethasone consider referring for enrollment in available Clinical Trials.</p> <p>*Not inclusive of EUA sotrovimab</p>	<p>See above</p> <p><u>Baricitinib requires non-formulary ID and Critical Care approval</u></p> <p>On November 19, 2020, the FDA issued an EUA for the use of baricitinib for COVID-19. This EUA was updated on July 28, 2021. Due to the national shortage of tocilizumab, oral baricitinib can be considered in combination with dexamethasone in select patients within 5 days of hospital admission <i>and</i> within 24 hours of rapid progression to high-flow nasal cannula and non-invasive ventilation.</p> <p><u>Tocilizumab requires non-formulary ID and Critical Care approval</u></p>

		<p>On June 24, 2021, the FDA issued an EUA for the use of tocilizumab for select patients with COVID-19. A single-dose of tocilizumab, an IL-6-receptor antagonist, can be considered in combination with dexamethasone in select patients within 5 days of hospital admission and within 24 hours of rapid progression to high-flow nasal cannula, non-invasive ventilation, or mechanical ventilation.</p> <p>Currently, tocilizumab is on national allocation. There is a limited supply of tocilizumab available for the treatment of COVID-19 and baricitinib may be considered.</p>
Hospitalized requiring mechanical ventilation or ECMO	<p>Supportive care</p> <p>Consider</p> <ul style="list-style-type: none"> • Dexamethasone • Tocilizumab <p>In addition to anticoagulation and dexamethasone, consider referring for enrollment in available Clinical Trials.</p>	<p>Remdesivir is not recommended. See above.</p>

Medications used for TREATMENT of COVID-19:

Anticoagulation [The Mount Sinai Health System COVID-19 Anticoagulation Protocol](#)

Baricitinib (Olumiant®)

On November 19, 2020, a EUA was issued for the combination of baricitinib, a JAK inhibitor, with remdesivir for the treatment of COVID-19 in hospitalized patients requiring supplemental oxygen age 2 and older based on data from ACTT-2.² Patients treated with the combination had a median time to recovery of 1 day less compared to those treated with remdesivir alone. In a subsequent analysis, a day 29 mortality benefit was noted in patients who at baseline required low-flow or high flow oxygen, or non-invasive ventilation. The EUA for baricitinib was updated on July 28, 2021 to authorize the use of baricitinib without remdesivir based on data from the COV-BARRIER trial.³ In this phase III trial there was not a statistically significant difference in disease progression, however, a survival benefit was demonstrated in patients receiving baricitinib compared to placebo. The majority of patients in both arms received concomitant corticosteroids and primarily dexamethasone. Currently, use of baricitinib for the treatment of COVID-19 always requires ID consultation and non-formulary approval.

In the setting of a national shortage of tocilizumab, consider oral baricitinib in combination with dexamethasone (as outlined above), in patients within 5 days of hospital admission **and** within 24 hours of rapidly escalating oxygen requirements (e.g., requiring HFNC, BiPAP) with a recent CRP of ≥75. Site designated ID and Critical Care approval is required.

- Exclusions from initiation of baricitinib include those with a GFR < 15 mL/min or requiring renal replacement therapy, those with an absolute neutrophil count < 500, those with an absolute lymphocyte count of < 200, and ALT or AST > 5 times the upper limit of normal.
- Use of baricitinib and other immunosuppressants or immunomodulatory agents including corticosteroids may place the patient at higher risk for bacterial, viral, and fungal infections including opportunistic infections. In patients on concomitant immunosuppressants or immunomodulators (e.g., organ transplant or hematopoietic stem cell transplant), discuss use of baricitinib with primary attending physician.
- The use of baricitinib in a pregnant person must be discussed with maternal fetal medicine.

Discussion regarding off-label use must be documented in the EMR. A copy of the patient or caregiver [fact sheet](#) must be given to patient or caregiver.

Dosing:

Patients age 9 years of age and older:

GFR ≥ 60 mL/min the dose is 4 mg daily by mouth for 14 days or until hospital discharge, whichever is sooner

GFR 30- < 60 mL/min the dose is 2 mg daily by mouth for 14 days or until hospital discharge, whichever is sooner

For GFR 15- <30 mL/min the dose is 1 mg daily by mouth for 14 days or until hospital discharge, whichever is sooner

Caution:

- Due to potential increased risk for infectious complications, the combination of tocilizumab and baricitinib is not recommended

Dexamethasone^{4,5}

- Dexamethasone is recommended in patients with confirmed COVID-19 who require supplemental oxygen including those who require mechanical ventilation. Corticosteroid use has not been found to be beneficial in patients who do not require respiratory support and use in this population could be potentially harmful.
- The benefit of dexamethasone was observed in patients > 7 days out from symptom onset.
- Corticosteroids prescribed *specifically for the treatment COVID-19* should not be continued after 10 days or discharge whichever is earlier.
- Oral or inhaled corticosteroids prescribed prior to the diagnosis of COVID-19 for an underlying condition should not be discontinued.

Dosing:

Dexamethasone 6 mg PO or IV q 24 hours for up to 10 days

Alternative corticosteroids (dose equivalent to dexamethasone): Methylprednisolone 32 mg IV q 24 hours, Hydrocortisone 160 mg, or Prednisone 40 mg PO q 24 hours for up to 10 days

In the setting of escalating acuity, escalating dosing of corticosteroids, including stress-dose steroids, may be recommended in consultation with critical care. In a prospective meta-analysis of 7 trials, administration of corticosteroids was associated with lower all-cause mortality with the greatest benefit in those not receiving vasoactive medications. There was no evidence of mortality benefit when comparing high-dose and low-dose corticosteroids.⁵⁻⁷

Caution:

- Monitor for hyperglycemia, psychiatric effects, and secondary infections.

Nirmatrelvir/ritonavir (Paxlovid™)

On December 22, 2021 the FDA issued an EUA for the use of Paxlovid™. The EPIC-HR, a phase 2/3 randomized placebo-controlled trial in non-hospitalized high-risk adult patients with symptomatic COVID-19 demonstrated an 88% reduction in hospitalization and death in those taking paxlovid versus placebo within 5 days of symptom onset. Nirmatrelvir (PF-07321332) inhibits the SARS-CoV-2 protease and inhibits protein synthesis and viral replication. Nirmatrelvir is co-packaged with ritonavir which helps “boost” levels of nirmatrelvir. Ritonavir has been used in this capacity to treat HIV disease. Drug interactions are common with ritonavir and must be reviewed prior to prescribing. Paxlovid™ may lead to persons with HIV-1 developing HIV protease inhibitor resistance if given without complete antiretroviral therapy.

Treatment with Paxlovid™ is contraindicated in the following patients:

- History of hypersensitivity reactions to a ritonavir
- Patients on other medications relying on CYP3A for clearance (e.g., alfuzosin, amiodarone, flecainide, colchicine, clozapine, ergot derivatives, lovastatin, simvastatin, sildenafil (Revatio®) when used for pulmonary arterial hypertension) where elevated drug levels are associated with serious or life-threatening reactions. Please review [Section 4 of the Fact Sheet for Healthcare Providers](#).
- Patients on other medications which are CYP3A inducers (e.g., anticonvulsants like carbamazepine, phenobarbital, phenytoin; rifampin, St. Jon’s Wort) which can decrease Paxlovid™ concentrations and potentially decrease potency of Paxlovid or lead to resistance. Please review [Section 4 of the Fact Sheet for Healthcare Providers](#).
- Patients with kidney disease (eGFR < 30 mL/min) or Childs-Pugh Class C liver disease

Caution must be used with multiple other medications including but not limited to calcium channel blockers, oral contraceptives, immunosuppressants commonly used in organ transplantation and hematopoietic stem cell transplantation, antifungals, chemotherapeutics, corticosteroids, and anticoagulation. Please review [Section 7 of the Fact Sheet for Healthcare Providers](#) and your patient's medications prior to prescribing.

Paxlovid™ can be considered in the treatment of *symptomatic* adults and pediatric patients (≥ 12 years of age weighing at least 40 kg or 88 pounds) who have tested positive for SARS-CoV-2 infection. The patient/caregiver must be informed of the following prior to prescribing:

- Paxlovid™ is not FDA-approved and its use is authorized for emergency use by the FDA.
- There are no approved treatments for mild-moderate COVID-19, however other agents are authorized for similar indications under emergency use
- Please give patient a hard copy of the [Fact Sheet for Patients and Caregivers](#)

Due to limited supply, the [New York State](#) and New York City Public Health Departments have offered detailed information regarding prioritization and prescribing. Outpatient pharmacies capable of filling prescriptions have been designated by both New York State and New York City. Outside of New York City, please check with the pharmacy prior to prescribing and visit this [website](#). Please see detailed guidance regarding prescribing in New York City [here](#).

In New York City, Paxlovid™ can only be prescribed through [Alto Pharmacy](#). Fulfilled prescriptions will be delivered to patient's preferred New York City address. Prescriptions confirmed by 5 pm on weekdays or 1 pm on weekends will be delivered the same day. Phone prescriptions can be called to 800-874-5881.

- Patients must be symptomatic and able to start treatment within 5 days of symptom onset. Symptom onset must be documented in the pharmacist note section of the prescription order
- Patient must be considered at increased risk for severe COVID-19 and fulfillment of prescription will be based on supply and prioritization by [New York State](#) and [New York City](#) public health departments
- Verify patient's phone number and address for delivery
- In the pharmacist note section, document race/ethnicity from the following options: Asian/Native Hawaiian or other Pacific Islander; Black; Hispanic/Latino; native American/Alaskan Native; and White
- If you feel that your patient meets criteria and does not have a contraindication to the use of molnupiravir as an alternative, you can write a similar prescription with the same details and include "To be used in case Paxlovid™ prescription cannot be filled because of supply limitation."

Dosing:

300 mg of nirmatrelvir (two 150 mg tablets) with 100 mg ritonavir (one 100 mg tablet), with all three tablets taken together twice a day for a total of 5 days.

The medications can be taken with or without food

These medications must be swallowed whole and CANNOT be chewed, broken or crushed

For patients with eGFR ≥ 30 to < 60 mL/min, the dose must be adjusted: 150 mg of nirmatrelvir (one 150 mg tablet) with 100 mg ritonavir

If the patient misses a dose of Paxlovid™ within 8 hours of the time it is usually taken, the patient should take it as soon as possible and resume the normal dosing schedule. If the patient misses a dose by more than 8 hours, the patient should not take the missed dose and instead take the next dose at the regularly scheduled time.

Caution:

- Use of Paxlovid™ and certain other drugs may result in significant drug interactions. **Please review [Section 7 of the Fact Sheet for Healthcare Providers](#) and your patient's medications prior to prescribing. This [link](#) can be used to assess for drug interactions.**
- Hepatotoxicity has occurred in patients receiving ritonavir
- Adverse events should be reported to FDA [Medwatch](#).

[Molnupiravir](#)⁸

On December 23, 2021, the FDA issued an EUA for molnupiravir for the treatment of mild to moderate COVID-19. The MOVE-OUT trial, a randomized double-blinded placebo controlled trial demonstrated a 30% reduction in hospitalization or death in high risk adult participants taking molnupiravir versus placebo. Molnupiravir is a pro-drug of a nucleoside analog that can be incorporated in to the RNA and cause mutations that lead to an antiviral effect. Should be considered for patients age 18 and older for who an alternative treatment is not accessible or clinically appropriate. **Paxlovid™ is the preferred oral antiviral, if available.**

Treatment with molnupiravir is contraindicated in the following patients:

- Patients < 18 years old due to effects on bone and cartilage growth
- Pregnant persons due to embryo-fetal toxicity in animal studies. Providers must assess if the person is pregnant or of childbearing potential.
- In persons of childbearing potential, it is recommended that individuals use effective contraception correctly and consistently for *the duration of treatment and for 4 days after the last dose* of molnupiravir.
- Breastfeeding is not recommended *during treatment and for 4 days after the last dose* of molnupiravir. A lactating individual may consider interrupting breastfeeding and pumping and discarding breast milk during this time
- Males of reproductive potential who are sexually active with persons of childbearing potential should use reliable method of contraception correctly and consistently *during treatment and for at least 3 months after the last dose.*

Molnupiravir can be considered in the treatment of symptomatic adults (≥ 18 years of age weighing at least 40 kg or 88 pounds) who have tested positive for SARS-CoV-2 infection. The patient/caregiver must be informed of the following prior to prescribing:

- Molnupiravir is not FDA-approved and its use is authorized for emergency use by the FDA.
- There are no approved treatments for mild-moderate COVID-19, however other agents are authorized for similar indications under emergency use
- Please give patient a hard copy of the [Fact Sheet for Patients and Caregivers](#)

Due to limited supply, the [New York State](#) and New York City Public Health Departments have offered detailed information regarding prioritization and prescribing. Outpatient pharmacies capable of filling prescriptions have been designated by both New York State and New York City. Outside of New York City, please check with the pharmacy prior to prescribing and visit this [website](#). Please see detailed guidance regarding prescribing in New York City [here](#).

In New York City, molnupiravir can only be prescribed through [Alto Pharmacy](#). Fulfilled prescriptions will be delivered to patient's preferred New York City address. Prescriptions confirmed by 5 pm on weekdays or 1 pm on weekends will be delivered the same day. Phone prescriptions can be called to 800-874-5881.

- Patients must be symptomatic and able to start treatment within 5 days of symptom onset, Symptom onset must be documented in the pharmacist note section of the prescription order
- Patient must be considered at increased risk for severe COVID-19 and fulfillment of prescription will be based on supply and prioritization by [New York State](#) and [New York City](#) public health departments
- Verify patient's phone number and address for delivery
- In the pharmacist note section, document race/ethnicity from the following options: Asian/Native Hawaiian or other Pacific Islander; Black; Hispanic/Latino; native American/Alaskan Native; and White

Dosing:

800 mg (four 200 mg capsules) twice a day with or without food for a total of 5 days

These medications must be swallowed whole and CANNOT be chewed, opened, broken or crushed

If a dose is missed and it has been over 10 hours since the scheduled dose, resume the prescribed dosing schedule and discard the missed dose. If within 10 hours, take dose as soon as possible and resume dosing schedule.

- Adverse events should be reported to FDA [Medwatch](#).
- Pregnancy surveillance is occurring through Merck Sharp & Dohme's pregnancy surveillance at 1-877-888-4231 or <https://pregnancyreporting.msd.com/>

Remdesivir (Veklury®)^{9,10}

Remdesivir was FDA-approved for the treatment of COVID-19 on October 22, 2020 in hospitalized patients 12 years of age and older weighing at least 40 kg. The Adaptive COVID-19 Treatment Trial (ACTT-1) is a randomized placebo-controlled trial. In this trial hospitalized patients with lab-confirmed COVID-19 on low-flow oxygen had shorter median symptom duration (10 versus 15 days) and improved 29-day survival (HR for death 0.3). The trial was not powered to evaluate for differences in recovery time or mortality in patients receiving non-invasive ventilation. The WHO SOLIDARITY study combined data from four trials including ACTT-1. In the analysis, low and high flow oxygen were combined and did not demonstrate a mortality benefit. A randomized placebo-controlled trial¹¹ was conducted evaluating ambulatory off-label administration of remdesivir for three days in the setting of symptomatic COVID-19 in unvaccinated patients at high-risk for progression. The single study noted an 87% decrease in the risk of hospitalization compared with placebo. Currently, SARS-CoV-2 specific monoclonal antibody therapy and oral antivirals are preferred in this scenario.

- Exclusions for initiation and continuation of remdesivir include ALT > 5 times the upper limit of normal and those patients mechanically ventilated or requiring extracorporeal membrane oxygenation (ECMO).
- Consult Infectious Diseases for consideration for remdesivir therapy. Remdesivir is non-formulary and requires ID approval.
- Use of remdesivir in pediatric patients (< 12 years of age) and patients weighing < 40 kg would be considered off-label use of remdesivir. Use of the lyophilized powder for hospitalized pediatric patients weighing ≥ 3.5 kg is available under an emergency use authorization. Due to the lack of data in adults <40 kg, using the [EUA](#) to document the off-label use is recommended at this time.

Dosing:

Patients ≥ 40 kg: 200 mg IV on day 1 then 24 hours later start 100 mg IV q 24h for 4 days for a total duration of 5 days¹² or until hospital discharge, whichever is sooner. Patients should not remain hospitalized solely to complete course of remdesivir if discharge is appropriate. Dose adjustment for renal replacement therapy recommended.

Caution:

- Hepatic function tests should be checked prior to initiating remdesivir and daily. Elevation in transaminases have been observed in clinical trials including in both healthy volunteers and patients with COVID-19.
- Remdesivir should be discontinued if ALT > 5 times the upper limit of normal or if there is signs and symptoms of liver inflammation (e.g., increased bilirubin, alkaline phosphatase, or INR).
- Adverse events should be reported to FDA [Medwatch](#).

Sotrovimab (Xevudy)^{13,14}

The FDA issued an EUA for sotrovimab on May 26, 2021 for the treatment of symptomatic mild to moderate COVID-19. Sotrovimab is a monoclonal antibody targeting the spike protein of SARS-CoV2. Benefit has not been observed in patients who require oxygen or who are hospitalized for COVID-19. Sotrovimab therapy is not considered standard of care. Sotrovimab retains *in vitro* activity against the omicron variant.

- Patients 12 years or older (and over 40 kg) referred for sotrovimab must have a documented direct SARS-CoV2 viral test (lab based antigen or PCR), symptoms of COVID-19 for ≤ 5 days and be at high risk for progressing to severe COVID-19. These high-risk conditions are described in the [fact sheet for health care providers](#).

In the setting of supply constraints, administration of sotrovimab will be limited to those determined to be highest risk for progression to severe COVID-19 and hospitalization based on age, vaccination status, ability to mount a response to vaccination, and underlying medical comorbidities. Please review if your patient would benefit from an oral antiviral and has no contraindication to use of an oral antiviral prior to referral. Please refer to recommendations from the [New York State](#) and New York City health departments and the [NIH COVID-19 Treatment Guidelines for prioritization when there are logistical or supply constraints](#).

- The following must be documented in the medical record prior to prescribing sotrovimab: the patient/caregiver has received the appropriate fact sheet and that the patient has been informed of potential alternatives, and that sotrovimab is not FDA-approved but is authorized for use under an EUA.
- A [monoclonal antibody consent form](#) will need to be completed.

- If the patient receives SARS-CoV-2 specific monoclonal antibody therapy, receipt of any COVID-19 vaccination, including booster doses will be delayed for 90 days.

Dosing:

500 mg of sotrovimab x 1 dose infused over 30 minutes

Caution:

Monitor for infusion reactions and/or anaphylaxis for 1 hour after infusion

- Adverse events should be reported to FDA [Medwatch](#).

Tocilizumab (Actemra®)¹⁵⁻²²

The role of IL-6 antagonists (e.g., tocilizumab, siltuxumab, sarilumab) for the treatment of COVID-19 remains under review. On June 24, 2021, the FDA issued an EUA for the use of tocilizumab in select hospitalized patients age 2 years or older with COVID-19. A recent prospective meta-analysis of 27 trials noted a 28-day mortality benefit with the use of IL-6 antagonists with concomitant corticosteroids.

Consider a single dose of tocilizumab in combination with dexamethasone (as outlined above), in patients within 5 days of hospital admission **and** within 24 hours of rapidly escalating oxygen requirements (e.g., requiring HFNC, BiPAP, or mechanical ventilation with a FiO₂ >40%) with a recent CRP of ≥75. Site designated ID and Critical Care approval is required. **Due to a national shortage of tocilizumab, baricitinib may be considered (see above).**

- Exclusions from initiation of tocilizumab include ALT or AST > 5 times the upper limit of normal, thrombocytopenia (platelets < 50,000), and neutrophil count < 1,000.
- Use of tocilizumab and other immunosuppressants or immunomodulatory agents including corticosteroids may place the patient at higher risk for bacterial, viral, and fungal infections including opportunistic infections. In patients on concomitant immunosuppressants or immunomodulators (e.g., organ transplant or hematopoietic stem cell transplant), discuss use of tocilizumab with primary attending physician.
- The use of tocilizumab in a pregnant person must be discussed with maternal fetal medicine.

A [monoclonal antibody consent form](#) will need to be completed and discussion regarding off-label use must be documented in the EMR. A copy of the patient or caregiver [fact sheet](#) must be given to patient or caregiver.

Dosing:

Patients ≥30 kg: 8 mg/kg (actual body weight) IV x single dose (maximum dose: 800 mg)

Caution:

- Interaction: Tocilizumab may reduce levels of apixaban and rivaroxaban but does NOT interfere with enoxaparin or heparin
- Associated with lower gastrointestinal perforations in patients on concomitant steroids (> 10 mg prednisone daily or equivalent), NSAIDS, and/or methotrexate and in patients with diverticulitis
- Due to potential increased risk for infectious complications, the combination of tocilizumab and baricitinib is not recommended

Medications **not** currently recommended for the treatment of SARS-CoV2 (COVID-19), please consult Infectious Diseases with questions:

ACE inhibitors and ARBs ²³	Patients prescribed ACE inhibitors and ARBs for preexisting conditions 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 infections.
Azithromycin ²⁴	Azithromycin with or without hydroxychloroquine is NOT recommended for the treatment of COVID-19.
Bamlanivimab ²⁵ Bamlanivimab/Etesevimab ^{26,27}	The FDA issued an emergency use authorization (EUA) for bamlanivimab on November 9, 2020 and for bamlanivimab/etesevimab on February 9, 2021. Bamlanivimab is a monoclonal antibody targeting the spike protein of SARS-CoV-2 and bamlanivimab/etesevimab is a dual monoclonal antibody cocktail also targeting the spike protein. On September 16, 2021 the EUA was expanded to include the use of bamlanivimab/etesevimab for post-exposure prophylaxis. Due to increasing recovery of variants of interest and variants of concern (i.e., Omicron) neither bamlanivimab nor bamlanivimab/etesevimab are recommended.
Casirivimab/Imdevimab (REGEN-COV) ²⁸⁻³⁰	The FDA issued an EUA on November 21, 2020, for casirivimab/imdevimab, a dual monoclonal SARS-CoV2 antibody cocktail targeting the spike protein of SARS-CoV-2. An update to the EUA was released on July 30, 2021, to include the use of casirivimab/imdevimab for post-exposure prophylaxis. Due to increasing recovery of variants of interest and variants of concern (i.e., Omicron) neither bamlanivimab nor bamlanivimab/etesevimab are recommended.
Colchicine ³¹	Use of colchicine for the treatment of COVID-19 is currently not recommended for ambulatory patients outside of a clinical trial. Inpatient use of colchicine specifically for the treatment of COVID-19 is not recommended. Patients prescribed colchicine for gout should complete their limited course of colchicine.
Famotidine ³²	Use of H2 blockers or proton pump inhibitors specifically for the treatment of COVID-19 is not recommended.
Fluvoxamine ^{33,34}	Limited published data exist for the use of fluvoxamine, a selective serotonin-uptake inhibitor, for the treatment of COVID-19. Fluvoxamine is currently not recommended for the treatment of COVID-19 for ambulatory or hospitalized patients outside of a clinical trial.
Hydroxychloroquine ^{24,35-38}	Hydroxychloroquine is NOT recommended for prophylaxis or treatment of COVID-19. Co-administration of remdesivir and hydroxychloroquine or may result in reduced antiviral activity of remdesivir. ³⁹ Patients prescribed hydroxychloroquine for preexisting rheumatologic conditions should be continued on their current dose.
Interferons ⁴⁰	Data specific to SARS CoV-2 are lacking. Interferon is currently not recommended for the treatment of COVID-19. Clinical trials are ongoing.
Ivermectin ⁴¹⁻⁴⁵	<i>In vitro</i> studies demonstrate ivermectin inhibits SARS-CoV-2 replication and suggest the dosing required would be above what is recommended by the FDA for parasitic infections. Observational studies and small clinical trials evaluating the use of ivermectin for COVID-19 have been published or are available in pre-print. Most patients included in these reports are prescribed ivermectin early in diagnosis and/or hospitalization and variable comparators are used to determine outcomes including mortality. Regimens are variable in dose and duration. Randomized controlled trials evaluating the potential role of ivermectin are limited especially in hospitalized patients with severe or critical disease. Use of ivermectin for the treatment or prophylaxis of COVID-19 is currently considered unlabeled use and is not recommended outside of a clinical trial. If disseminated strongyloidiasis is being considered, ivermectin remains the treatment of choice and requires ID approval. ^{46,47}
IVIG	Use of IVIG for COVID-19 is not recommended outside of use for MIS-C and MIS-A.
Nitazoxanide ⁴⁸	Displays inhibitory activity against the SARS-CoV-2 <i>in vitro</i> . Nitazoxanide is currently not recommended for the treatment of COVID-19 for ambulatory or hospitalized patients with COVID-19.

Ribavirin	There are insufficient data to recommend the use of ribavirin for the treatment of COVID-19.
Tofacitinib⁴⁹	<p>Tofacitinib⁴⁹ is another JAK inhibitor that has been evaluated in clinical trials for the treatment of COVID-19 in hospitalized patients. The STOP-COVID-19 investigators recently published a multicenter study (n=289) conducted in Brazil that demonstrated lower 28-day mortality from respiratory failure in patients receiving tofacitinib versus placebo when offered within 72 hours of hospitalization in patients not requiring noninvasive and invasive mechanical ventilation and ECMO. Use of tofacitinib for the off-label treatment of COVID-19 always requires ID consultation and non-formulary approval.</p> <p>The use of combinations of IL-6 antagonists with JAK inhibitors for the treatment of COVID-19 is not recommended due to the potential risk of infectious complications.</p>

References:

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