COVID-19 Treatment Recommendations for Hospitalized Patients

Recommendations

- Contact ID team for questions about treatment recommendations
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Table 1: UH Treatment Recommendations for Adults with COVID-19

Disease Severity	Recommended Therapy
Asymptomatic patients	No treatment necessary
Not hospitalized/Outpatient	Steroids are NOT recommended Refer to COVID-19 Treatment Recommendations for Outpatients
Patients in ED not meeting criteria for hospitalization, in the observation unit or hospitalized for indication other than COVID • Do not require supplemental O_2 • Symptoms < 10 days • Weigh at least > 40 kg and ≥ 12 years • Considered high risk for progressing to severe COVID-19 and/or hospitalization (see Appendix B)	May consider administration of **monoclonal antibodies (if available)** or remdesivir or may provide outpatient prescription for **oral antivirals** as specified in COVID-19 Treatment Recommendations for Outpatients Higher consideration for treatment warranted in severely immunosuppressed patients and those with multiple risk factors (see Appendix B)
Hospitalized but does not require supplemental oxygen • Considered high risk for progression to severe COVID-19 (see Appendix B)	Steroid are not recommended May consider **oral antivirals**, **remdesivir** 200 mg IV x 1 dose on day 1, 100 mg IV x 1 on days 2 and 3 or **monoclonal antibodies (if available)** as specified in COVID-19 Treatment Recommendations for Outpatients
Hospitalized and requires supplemental oxygen (but does not require high-flow, non-invasive or invasive mechanical ventilation, or ECMO)	**Remdesivir** 200 mg IV x 1 day, followed by remdesivir 100 mg x 4 days or until hospital discharge May consider addition of **dexamethasone** 6 mg IV or PO daily for up to 10 days or until discharge and/or **baricitinib** 4 mg daily X 14 days or until discharge

Approved by Antimicrobial P&T Subcommittee: 12/01/20; 12/07/20, 12/28/20, 04/26/21, 07/26/21, 09/21/21, 12/21/21, 01/20/22, 03/2022, 07/2022, 10/2022, 01/04/2023, 01/2024
Approved by Pulmonary P&T Subcommittee: 07/26/21
Approved by Pharmacy &Therapeutics Committee: 12/3/20 (expedited); 12/11/20, 01/08/21, 05/14/21, 07/30/21 (expedited), 10/01/21, 01/06/22 (expedited), 01/27/22 (expedited), 3/28/22 (expedited), 08/12/22, 12/2022, 01/05/2023 (expedited), 02/2024

Table 1: UH Treatment Recommendations for Adults with COVID-19 (cont.)

Disease Severity	Recommended Therapy
Hospitalized and requires oxygen delivery through a high-flow device or non-invasive ventilation	**Remdesivir** 200 mg IV x 1 day, followed by remdesivir 100 mg IV x 4 days or until hospital discharge + **Dexamethasone** 6 mg IV or PO daily for up to 10 days + ***EITHER*** baricitinib 4 mg daily x 14 days **OR** tocilizumab 8 mg/kg IV (up to 800 mg) ***Do not use baricitinib and tocilizumab in combination** ***Please see baricitinib and tocilizumab sections below for more information about patient selection and dosing.** **In patients not currently receiving baricitinib**, may consider tocilizumab as one-time dose of 8 mg/kg IV (up to 800 mg) in patients requiring high-flow nasal cannula (40% FiO2, 30 L/min) with a C-reactive protein (CRP) ≥75 mg/L who were admitted within the previous 3 days
Hospitalized and requires invasive mechanical ventilation or ECMO	*(For patients who have been intubated < 36 hours)* **Remdesivir** 200 mg IV x 1 day, followed by remdesivir 100 mg x 4 days or until hospital discharge + **Dexamethasone** 6 mg IV or PO daily for up to 10 days or until discharge + May consider addition of tocilizumab as one-time dose of 8 mg/kg IV (up to 800 mg) in patients within 24 hours of ICU admission ***Please see tocilizumab sections below for more information about patient selection and dosing.**

Baricitinib

- Baricitinib (Olumiant®) received emergency use authorization (EUA) from the FDA in November of 2020 in combination with remdesivir for the treatment of hospitalized COVID-19 patients needing oxygen.
- Patient selection:
  - Patients receiving supplemental oxygen with a contraindication to corticosteroids
  - Baricitinib should not be used in combination with tocilizumab
  - Baricitinib is not recommended for patients:
    - On dialysis
    - With end-stage renal disease (ESRD, EGFR < 15 mL/min/1.73 m^2)
    - With acute kidney injury
  - Evaluate baseline eGFR, liver enzymes, and complete blood count to determine treatment suitability and dose. Monitor closely patients with abnormal baseline and post-baseline laboratory values. Dosage adjustments necessary for patients with laboratory abnormalities. (See Appendix A)
- In the event of limited supply, Infectious Diseases may tier eligible patients, giving preference to those most likely to benefit

Monoclonal Antibodies

- Currently there are no monoclonal antibodies available at University Health

Tocilizumab

- Tocilizumab (Actemra®) is an IL-6 inhibitor that received FDA approval for treatment of COVID-19 in hospitalized adults who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO
    - For pediatric patients (2 years and older) there is currently an EUA approval from the FDA
- Patient selection
    - Tocilizumab should be given as a one-time dose of 8 mg/kg up to 800 mg as a weight-based fixed dose in combination with corticosteroids in hospitalized adult patients with COVID-19 who meet the following criteria
        - NOT currently receiving baricitinib
        - Critically ill patients within 48 hours of admit to the intensive care unit
        - Non-critically ill patients:
            - Timing: within first 3 days of hospitalization
            - Oxygenation: patients requiring high-flow nasal cannula oxygen (40% FIO2, 30 L/min), noninvasive ventilation or mechanical ventilation
        - Inflammatory markers: CRP ≥ 75 mg/L
    - Exclusions
        - Active tuberculosis
        - Active fungal/opportunistic infection
        - Preexisting CNS demyelinating disease
        - Active hepatic disease or hepatic impairment (AST/ALT > 10 X ULN)
- Weight-based fixed dosing recommendations
    - > 90 kg = 800 mg
    - > 65 and ≤ 90 kg = 600 mg
    - > 40 and ≤ 65 kg = 400 mg
    - ≤ 40 kg = 8 mg/kg
- In the event of limited supply, Infectious Diseases may tier eligible patients, giving preference to those most likely to benefit

Pediatric Considerations

- Pediatric patients may receive EUA baricitinib or tocilizumab at physician discretion
- Recommend consultation with Pediatric Infectious Diseases prior to initiation
- Baricitinib EUA: > 2 years old
    - 2-9 years of age dosing: 2 mg daily
    - > 9 years of age dosing: 4 mg daily
- Tocilizumab EUA: > 2 years old
    - Patients weighing < 30 kg: 12 mg/kg IV x 1 (up to 800 mg)
    - Patients weighing ≥ 30 kg: 8 mg/kg IV x 1 (up to 800 mg)

Approved by Antimicrobial P&T Subcommittee: 12/01/20; 12/07/20, 12/28/20, 04/26/21, 07/26/21, 09/21/21, 12/21/21, 01/20/22, 03/2022, 07/2022, 10/2022, 01/04/2023, 01/2024
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Appendix A

Dosage Adjustment for Baricitinib in Patients with Abnormal Laboratory Values

Laboratory	Laboratory Value	Recommendation*
eGFR	≥ 60 mL/min/1.73 m^2	• Adults and pediatric patients 9 years of age and older: No dosage adjustment • Pediatric patients 2 years to less than 9 years of age: 2 mg once daily
	30-60 mL/min/1.73 m^2	• Adults and pediatric patients 9 years of age and older: 2 mg once daily • Pediatric patients 2 years to less than 9 years of age: 1 mg once daily
	15-< 30 mL/min/1.73 m^2	• Adults and pediatric patients 9 years of age and older: 1 mg once daily • Pediatric patients 2 years to less than 9 years of age: Not recommended
	< 15 mL/min/1.73 m^2	Not recommended
Absolute Lymphocyte Count (ALC)	≥ 200 cells/µL	Maintain dose
	< 200 cells/µL	Consider interruption until ALC is ≥ 200 cells/µL
Absolute Neutrophil Count (ANC)	≥ 500 cells/µL	Maintain dose
	< 500 cells/µL	Consider interruption until ANC is ≥ 500 cells/µL
Aminotransferases	If increase in ALT or AST are observed and drug-induced liver injury (DILI) is suspected	Interrupt baricitinib until the diagnosis of DILI is excluded

ALC = absolute lymphocyte count, ALT = alanine transaminase, ANC = absolute neutrophil count, AST = aspartate transaminase, DILI = drug induced liver injury, eGFR = estimated glomerular filtration rate, hrs = hours

*If a laboratory abnormality is likely due to the underlying disease state, consider the risks and benefits of continuing baricitinib at the same or a reduced dose

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Appendix B

Patient Factors with High Risk for Progressing to Severe COVID-19 and/or Hospitalization

***Not listed in order of degree of risk conferred**

- Body mass index (BMI) ≥ 25 (age 12-17 you BMI ≥ 85th percentile)
- Pregnancy
- Chronic kidney disease
- Diabetes
- Immunosuppressive disease
- Currently receiving immunosuppressive treatment
- ≥ 65 years of age
- Cardiovascular disease (including congenital heart disease)
- Hypertension
- Chronic obstructive pulmonary disease/other chronic respiratory disease (including asthma, interstitial lung disease, cystic fibrosis and pulmonary hypertension)
- Sickle cell disease
- Neurodevelopmental disorders, for example, cerebral palsy or Down's Syndrome, OR
- A medical-related technological dependence, for example, tracheostomy, gastrostomy, or positive pressure ventilation (not related to COVID-19)
- Other risk factors for severe COVID as identified by CDC: https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-care/underlyingconditions.html
- Or most recent criteria in FDAs most recent EUA update

Reference

1. COVID-19 Treatment Guidelines. Last updated 10/10/2023. https://www.covid19treatmentguidelines.nih.gov

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