

# UConn HEALTH

## UConn JOHN DEMPSEY HOSPITAL

### Guidance for Management of HOSPITALIZED Patients with COVID-19 Infection

*This document is for the management of HOSPITALIZED patients with a clinical syndrome consistent with COVID-19*

*AND*

*CONFIRMED POSITIVE SARS-CoV-2 infection (via PCR or rapid antigen test)*

Version #14 – Release Date **10/19/2022**

*[Details on this document history, versions, and revisions to this guidance document can be found on the last page]*

**IMPORTANT NOTES ABOUT THIS GUIDANCE DOCUMENT AND INPATIENT TREATMENT OF COVID-19 INFECTED PATIENTS:**

1. Treatments recommended in this guidance document are based on evolving scientific evidence from the ongoing pandemic. Evidence for possible benefits/risks of current and new therapies are discussed at the quarterly UConn Health Think Tank committee meetings. Members review & discuss key primary scientific literature on COVID-19 treatment as well as COVID-19 treatment guidelines issued by the NIH (<https://www.covid19treatmentguidelines.nih.gov/>) and IDSA (<https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/>) on a regular basis.
2. Each primary care team should use sound clinical judgement when initiating any treatments. A detailed consideration of the potential risks of each recommended medication should be performed frequently in the context of the current status of each individual patient with COVID-19 infection. It may be appropriate to deviate from the recommendations in certain circumstances for individual cases.
3. **ALL** patients should receive general supportive care measures.
4. **COVID-19 Specific Laboratory & Other Monitoring:** There are comprehensive lists of recommended tests to order in our **COVID-19 EPIC order sets**. A list of the commonly-recommended tests and their ordering frequency also can be found on **Page 6** of the guidance document.
5. ID Approval is **NOT** required to start a patient with **severe COVID-19 disease** on Remdesivir (5-day course), Baricitinib, or Tocilizumab. However, ID approval **is required for:**
  - Any patient where **Paxlovid** or **Remdesivir** or **Monoclonal antibodies** are being considered for **mild/moderate disease** (for *prevention of progression to severe disease*)
6. Multiple trials show that the use of **Dexamethasone** (Regimen: 6mg PO or IV once-daily for 10 days) can improve clinical outcomes/reduce mortality in patients who require supplemental oxygen therapy. This effect appears most significant for **critically-ill patients who require mechanical ventilation**. However, **worse outcomes** can occur if systemic steroids are started in patients **who do not require sustained use of supplemental oxygen therapy**. Please refer to Table #1 for details on the approach for use of systemic steroids in patients with COVID-19 infections.
7. Per the **NIH COVID-19 Treatment Guidelines**, patients who are taking corticosteroids, ACE inhibitors, Angiotensin-Receptor Blockers (ARBs), and/or statin medications prior to inpatient care should be continued on these medications as long as there are no acute contraindications to their use (e.g., hypotension, acute significant elevations in LFTs, etc.).
8. All peer-reviewed, well-conducted clinical research on the use of **Ivermectin** for treatment of COVID-19 infection indicate that there are **no clinical benefits** of its use for this infection. Its use is **not recommended** in any care guidelines (NIH, IDSA, and WHO COVID-19 care guidelines).
  - At this time, we **DO NOT** recommend that Ivermectin be added to the therapy of any UConn Health John Dempsey Hospital inpatient managed for documented or suspected COVID-19 infection. The Think Tank will continue to review research and may modify guidance, if warranted.
9. This guidance document was jointly-developed and revised with input from clinicians across multiple departments. It is updated as new data emerge. Please contact Jeff Aeschlimann (Pharmacy / Infectious Diseases) at [aeschlimann@uchc.edu](mailto:aeschlimann@uchc.edu) for questions or suggestions about content.

Table 1. Treatment for confirmed COVID-19-infected inpatients based on clinical situation.

Patient Status	COVID-19 Treatment Recommendations	Recommended Anticoagulation
<ul style="list-style-type: none"> <li>Hospitalized with a definitive, <b>non-COVID-19 indication</b></li> <li><b>Coincidentally</b> found to be COVID-19 positive upon required screening</li> </ul>	<ul style="list-style-type: none"> <li>Assess patient for early signs/symptoms of COVID-19 disease</li> <li>Determine if patient is at <b>“high risk”</b> for progression to severe COVID-19 disease<sup>a</sup> <ul style="list-style-type: none"> <li>Consider <b>Paxlovid®</b> or <b>remdesivir</b> (3 day course) <b>ONLY</b> if symptoms develop in a <b>“high risk”</b> patient.</li> <li>Stronger consideration should be made for use in high-risk patients who are <b>unvaccinated, inadequately boosted and/or significantly immunosuppressed</b></li> </ul> </li> </ul>	<p>For patients without a clear non-COVID-19 indication for therapeutic anticoagulation:</p> <ul style="list-style-type: none"> <li><b>Prophylactic</b> dosing of enoxaparin or heparin (unless contraindicated)</li> </ul>
<ul style="list-style-type: none"> <li>Hospitalized with <b>mild/moderate COVID-19</b> symptoms and other non-COVID acute medical issues</li> <li>Does <b>NOT</b> require oxygen supplementation</li> </ul>	<ul style="list-style-type: none"> <li><b>DO NOT start dexamethasone or other systemic corticosteroids</b> (unless needed for non-COVID-19 indications)<sup>a</sup></li> <li>If COVID-19-related symptoms present for <b>≤ 7 days</b> and the patient is at <b>“high risk”</b> of progressing to severe disease:<sup>a</sup> <ul style="list-style-type: none"> <li>Consider <b>Paxlovid®</b> or <b>remdesivir</b> (3 day course)</li> <li>Stronger consideration should be made for use in patients who are <b>unvaccinated, inadequately boosted and/or significantly immunosuppressed</b></li> </ul> </li> </ul>	<p>For patients without a clear non-COVID-19 indication for therapeutic anticoagulation:</p> <ul style="list-style-type: none"> <li><b>Prophylactic</b> dosing of enoxaparin or heparin (unless contraindicated)</li> </ul>
<ul style="list-style-type: none"> <li>Hospitalized with primary diagnosis of <b>severe COVID-19 infection with hypoxia</b></li> <li>Requires conventional oxygen therapy (&lt; 6 L O<sub>2</sub> via nasal cannula)</li> </ul>	<p>For patients with <b>minimal inconsistent oxygen needs</b> (&lt; 2L O<sub>2</sub>), <b>AND</b> symptom duration <b>≤ 10 days</b>:</p> <ul style="list-style-type: none"> <li><b>DO NOT start dexamethasone or other systemic corticosteroids</b> (unless needed for other non-COVID-19 reasons)<sup>b</sup></li> <li>Consider <b>remdesivir (5-day course)</b><sup>c</sup></li> </ul> <p>For patients needing <b>consistent oxygen therapy</b> (&gt; 2L) <b>AND</b> within 10 days of symptom onset:</p> <ul style="list-style-type: none"> <li>Start <b>dexamethasone (10 day course)</b> plus <b>remdesivir (5 day course)</b><sup>c</sup></li> </ul> <p>For patients needing &gt; 2L O<sub>2</sub> <b>BUT</b> with symptom duration &gt;10 days:</p> <ul style="list-style-type: none"> <li>Start <b>dexamethasone (10 day course)</b><sup>c</sup></li> </ul> <p>For patients on <b>dexamethasone +/- remdesivir</b> with rapid ↑ in O<sub>2</sub> needs:</p> <ul style="list-style-type: none"> <li>Consider adding <b>baricitinib</b> or <b>tocilizumab</b> to above therapies<sup>d,e</sup></li> </ul>	<p>For nonpregnant patients with D-dimer levels above the upper limit of normal range who do not have an increased bleeding risk:<sup>f</sup></p> <ul style="list-style-type: none"> <li>Consider <b>Therapeutic</b> dosing of enoxaparin or heparin</li> </ul> <p>For all other patients:</p> <ul style="list-style-type: none"> <li><b>Prophylactic</b> dosing of enoxaparin or heparin (unless contraindicated)</li> </ul>

**Table 1 (continued). Treatment for confirmed COVID-19-infected inpatients based on clinical situation.**

Patient Status	COVID-19 Treatment Recommendations (See Table 1 for details on doses/durations/monitoring)	Recommended Anticoagulation (See Table 1 for details on doses/durations/monitoring)
<ul style="list-style-type: none"> <li>Hospitalized with primary diagnosis of <b>severe COVID-19 with hypoxia</b></li> <li>Requires high-flow oxygen (<math>\geq 6</math> L O<sub>2</sub> non-invasive ventilation)</li> </ul>	<p>For <b>ALL</b> patients:</p> <ul style="list-style-type: none"> <li><b>Preferred:</b> Start dexamethasone (IV or PO) + baricitinib (PO)<sup>d,e</sup></li> <li><b>Alternative:</b> Start dexamethasone (IV or PO) + tocilizumab (IV)<sup>d,e</sup></li> </ul> <p>For patients with significant immunosuppression:</p> <ul style="list-style-type: none"> <li>Consider adding <b>remdesivir</b> to above therapies</li> </ul>	<p>For patients without a clear non-COVID-19 indication for therapeutic anticoagulation:</p> <ul style="list-style-type: none"> <li><b>Prophylactic</b> dosing of enoxaparin or heparin (unless contraindicated)</li> </ul>
<ul style="list-style-type: none"> <li>Hospitalized with primary diagnosis of <b>severe COVID-19 with hypoxia</b></li> <li>Requires invasive mechanical ventilation</li> </ul>	<p>For <b>ALL</b> patients:</p> <ul style="list-style-type: none"> <li><b>Preferred:</b> Start dexamethasone (IV or PO) + baricitinib (PO)<sup>d,e</sup></li> <li><b>Alternative:</b> Start dexamethasone (IV or PO) + tocilizumab (IV)<sup>d,e</sup></li> </ul>	<p>For patients without a clear indication for therapeutic anticoagulation:</p> <ul style="list-style-type: none"> <li><b>Prophylactic</b> dosing of enoxaparin or heparin (unless contraindicated)</li> </ul>

**Notes:**

<sup>a</sup> - Unvaccinated patients with one or more of the following risk factors are considered “high risk” for progression to severe COVID-19 disease: age  $\geq 60$  years, obesity (BMI  $\geq 30$ ), chronic lung disease, hypertension, cardiovascular or cerebrovascular disease, diabetes mellitus, immunocompromised state, chronic mild or moderate kidney disease, chronic liver disease, current cancer, and sickle cell disease.

<sup>b</sup> - Corticosteroids that are prescribed for an underlying condition should be continued.

<sup>c</sup> - Both dexamethasone (and remdesivir) can be stopped before the recommended 10 (or 5) day duration of therapy if the patient is clinically improved and is ready to be discharged.

<sup>d</sup> - Baricitinib therapy is preferred. If PO baricitinib and IV tocilizumab are not available or not feasible to use, PO tofacitinib can be used instead of PO baricitinib, and IV sarilumab can be used instead of IV tocilizumab

<sup>e</sup> - If baricitinib, tofacitinib, tocilizumab, or sarilumab cannot be obtained (or are contraindicated): Dexamethasone monotherapy is appropriate

<sup>f</sup> - Contraindications for the use of therapeutic anticoagulation in patients with COVID-19 include: platelet count  $< 50 \times 10^9/L$ , Hgb  $< 8$  g/dL, need for dual antiplatelet therapy, bleeding within the past 30 days (required an ED visit or hospitalization), history of a bleeding disorder, or an inherited or active acquired bleeding disorder.

Adapted from NIH: [Therapeutic Management of Hospitalized Adults with COVID-19 \(accessed 10/4/22\)](#)

**Table 2. COVID-19 Treatment Dosing, Administration, and Considerations.**

Drug Name and Dosing Regimen	Duration of Therapy	Clinical Use Considerations
<b>Baricitinib:</b> <ul style="list-style-type: none"> <li>▪ eGFR ≥60 mL/min/1.73 m<sup>2</sup>: 4 mg PO once daily</li> <li>▪ eGFR 30 to &lt;60 mL/min/1.73 m<sup>2</sup>: 2 mg PO once daily</li> <li>▪ eGFR 15 to &lt;30 mL/min/1.73 m<sup>2</sup>: 1 mg PO once daily</li> <li>▪ eGFR &lt;15 mL/min/1.73 m<sup>2</sup>: Not recommended</li> </ul>	14 days or until hospital discharge	<ul style="list-style-type: none"> <li>▪ Can be crushed and administered through a feeding tube</li> <li>▪ Monitor ANC and ALC</li> <li>▪ Only for patients who are receiving high-flow oxygen therapy, Non-Invasive, or Invasive Mechanical Ventilation</li> <li>▪ Data from randomized trials evaluating the safety of short-term use of JAK inhibitors in patients with COVID-19 have not revealed significant safety signals, including thrombosis</li> </ul>
<b>Dexamethasone:</b> 6 mg PO or IV	X 10 days; can consider discontinuation upon patient discharge if < 10 days	<ul style="list-style-type: none"> <li>▪ Should not be given to patients who do not require supplemental oxygen therapy</li> </ul>
<b>Paxlovid® (nirmatrelvir/ritonavir)</b> <ul style="list-style-type: none"> <li>▪ eGFR ≥60 mL/min: Nirmatrelvir 300 mg with ritonavir 100 mg PO twice daily</li> <li>▪ eGFR ≥30 to &lt;60 mL/min: Nirmatrelvir 150 mg with ritonavir 100 mg PO twice daily</li> <li>▪ eGFR &lt;30 mL/min: Not recommended</li> </ul>	X 5 days	<ul style="list-style-type: none"> <li>▪ *ID Approval Required*</li> <li>▪ Start only if ≤ 5 days from symptom onset</li> <li>▪ Screen &amp; monitor medication list for potential drug interactions. Screening tool:               <ul style="list-style-type: none"> <li>▪ <a href="https://www.covid19-druginteractions.org/checker">https://www.covid19-druginteractions.org/checker</a></li> </ul> </li> <li>▪ Not recommended in severe hepatic impairment (Child-Pugh Class C)</li> </ul>
<b>Remdesivir:</b> <ul style="list-style-type: none"> <li>▪ 200 mg IV once, then 100 mg IV once daily</li> </ul>	Prevention of progression to severe disease: <ul style="list-style-type: none"> <li>▪ 3 days (total)</li> </ul> Treatment of severe disease: <ul style="list-style-type: none"> <li>▪ 5 days (total) or until hospital discharge</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor Scr, CrCl, and LFTs daily</li> <li>▪ If a patient progresses to needing high-flow oxygen or non-invasive/invasive mechanical ventilation, the course of treatment can be continued &amp; completed</li> <li>▪ FDA product label does not recommend using remdesivir in patients with an eGFR of &lt;30 mL/min, but observational data suggest that it can be used in patients with an eGFR of &lt;30 mL/min if the potential benefits outweigh the risks</li> <li>▪ Can consider preferentially using the lyophilized powder formulation in patients with renal impairment</li> </ul>
<b>Tocilizumab:</b> <ul style="list-style-type: none"> <li>▪ 8 mg/kg actual body weight (up to 800 mg) administered as a single IV dose</li> <li>▪ Dose selection and dose rounding based on weight:               <ul style="list-style-type: none"> <li>▪ 40 - 65 kg: 400 mg</li> <li>▪ &gt;65 – 90 kg: 600 mg</li> <li>▪ &gt;90 kg: 800 mg</li> </ul> </li> </ul>	X 1 dose <ul style="list-style-type: none"> <li>▪ may consider a 2<sup>nd</sup> dose within 24 hours based on the clinical response to 1<sup>st</sup> dose</li> </ul>	<ul style="list-style-type: none"> <li>▪ First dose should be administered within 24 hours of ICU admission AND within 24 hours of starting either high-flow oxygen therapy, Non-Invasive, or Invasive Mechanical Ventilation</li> <li>▪ Only ~29% of patients received a 2<sup>nd</sup> dose of tocilizumab in clinical studies. It is unclear whether a 2<sup>nd</sup> dose has added benefits and/or risks</li> <li>▪ Use with caution in patients with: immunosuppression (especially those who have recently received other biologic immunomodulating drugs), ALT &gt;5 times the upper limit of normal, high risk for gastrointestinal perforation, uncontrolled serious non-COVID infections, ANC &lt;500 cells/μL, Platelets &lt;50,000 cells/μL</li> </ul>

**Table 2 (continued). COVID-19 Treatment Dosing, Administration, and Considerations.**

<p><b>Sarilumab</b></p> <ul style="list-style-type: none"> <li>▪ Used if Baricitinib or tocilizumab are not available</li> <li>▪ 400 mg IV infusion over 1 hour</li> </ul>	<p>X 1 dose</p>	<ul style="list-style-type: none"> <li>▪ Monitor ANC, platelets, and AST/ALT</li> <li>▪ See detailed cautions about tocilizumab above</li> </ul>
<p><b>Tofacitinib</b></p> <ul style="list-style-type: none"> <li>▪ Used if Baricitinib or tocilizumab are not available</li> <li>▪ eGFR &gt;60 mL/min/1.73 m<sup>2</sup>: 10mg PO twice daily</li> <li>▪ eGFR &lt;60 mL/min/1.73 m<sup>2</sup>: 5 mg PO twice daily</li> </ul>	<p>14 days or until hospital discharge</p>	<ul style="list-style-type: none"> <li>▪ See detailed comments about Baricitinib above</li> </ul>

**COVID-19 – Specific Common Suggested Laboratory & Other Monitoring Parameters**

**(This list is NOT comprehensive...Refer to data in EPIC Ordering Sets for Comprehensive Lists):**

<p><b><u>Labs:</u></b></p> <p>Suggested to draw at <b>Baseline ONLY:</b></p> <ul style="list-style-type: none"> <li>• HIV-1/HIV-2 antibody/antigen, Procalcitonin</li> <li>• Blood Type &amp; Screen</li> </ul> <p>Suggested to draw at <b>Baseline and Daily:</b></p> <ul style="list-style-type: none"> <li>• CHEM-7, CBC with Differential</li> </ul> <p>Suggested to draw at <b>Baseline and every 72 hours:</b></p> <ul style="list-style-type: none"> <li>• AST/ALT, Bili, CRP, Ferritin, LDH, Procalcitonin, Troponin, D-dimer, Fibrinogen, PT/PTT,</li> <li>• Complete automated urinalysis testing with microscopic urine sediment examination, urine protein creatinine ratio, urine microalbumin-creatinine ratio</li> </ul>	<p><b><u>Suggested Other Testing/Monitoring:</u></b></p> <ul style="list-style-type: none"> <li>• Baseline ECG</li> <li>• Continuous O2 monitoring</li> </ul>
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**Table Notes:**

1 – These are in addition to any other daily laboratory tests considered part of “routine supportive care” (i.e., basic metabolic panel, CBC w/ diff, etc.).

**Table 3. Approach to Anticoagulation for PCR-Confirmed COVID-19 patients based on location of care**

<p><b>Important Considerations for ALL patients:</b></p> <ul style="list-style-type: none"> <li>• <b>Please get full coagulation panel</b> which includes: PT, PTT, fibrinogen, thrombin time, d-dimer when abnormalities persist and trying to make an anticoagulation decision</li> <li>• <b>Physical Exam notes:</b> Clearly report in physical exam any pertinent positive or negative relationship to bleeding. Any petechiae, any mucosal bleeding like in the mouth, any purpura, any bleeding from lines, or placement of lines. Also please comment on presence or absence of non-uniform swelling in arms or legs as it relates to thrombosis</li> <li>• <b>When liver dysfunction or vitamin K deficiency</b> is suspected replete with 1 mg IV vitamin K x 3 days and monitor</li> <li>• Even in the presence of <b>abnormal coagulation studies</b>, anticoagulation can be given depending on the circumstance</li> <li>• Patients should have dopplers performed only as clinically indicated.</li> <li>• If Suspected or Confirmed DVT or PE - Initiate <b>FULL-DOSE</b> anticoagulation:</li> <li>• <u>If CLcr &gt; 30 ml/min:</u> Enoxaparin 1 mg/kg (dose rounded to nearest 10mg increment) SQ every 12h <b>OR</b> High-Intensity IV heparin infusion (per Nomogram)</li> <li>• <u>If CLcr &lt; 30 ml/min:</u> Enoxaparin 1 mg/kg (dose rounded to nearest 10mg increment) SQ every 24h <b>OR</b> High-Intensity IV heparin infusion (per Nomogram)</li> </ul>
<p><b>Non-Pregnant Patients in the ED and all floors EXCEPT the ICU who are receiving only LOW-FLOW oxygen delivery by nasal cannula with an elevated D-Dimer:</b></p> <p>Consider <b>therapeutic</b> anticoagulation if anticipated stay in hospital is <math>\geq 72</math> hours <b>AND</b> the patient has low bleeding risk*</p> <ul style="list-style-type: none"> <li>• <u>If CLcr &gt; 30 ml/min:</u> Enoxaparin 1 mg/kg (dose rounded to nearest 10mg increment) SQ every 12h <b>OR</b> High-Intensity IV heparin infusion (per Nomogram)</li> <li>• <u>If CLcr &lt; 30 ml/min:</u> Enoxaparin 1 mg/kg (dose rounded to nearest 10mg increment) SQ every 24h <b>OR</b> High-Intensity IV heparin infusion (per Nomogram)</li> </ul> <ul style="list-style-type: none"> <li>• Therapeutic anticoagulation should continue for <b>up to 14 days or until transfer to the ICU, or patient discharge</b> from the hospital</li> <li>• <i>If the patient is subsequently transferred to ICU transition to <b>prophylactic anticoagulation</b></i></li> </ul> <p>OR</p> <p><b>Regular thromboprophylaxis</b> is indicated for patient with high risk for bleeding or anticipated stay in hospital is &lt;72 hours (<i>as per standard UConn Health Pharmacologic VTE Prophylaxis Guidelines</i>):</p> <ul style="list-style-type: none"> <li>• <u>If CLcr &gt; 30 ml/min:</u> Enoxaparin 40 mg SC Q24H <b>OR</b> heparin 5000 units SC Q8H (**If Age <math>\geq 75</math> years old: Heparin 5000 units SC Q12H) <ul style="list-style-type: none"> <li>◦ **If Weight &gt;100kg and/or BMI &gt;40: Consider Enoxaparin 40 mg SC Q12H <b>OR</b> Heparin 7500 units SC q8h</li> </ul> </li> <li>• <u>If CLcr &lt; 30 ml/min:</u> Enoxaparin 30 mg SC once-daily <b>OR</b> heparin 5000 units SC Q8H</li> </ul>
<p><b>Patients needing ICU-level care: (defined as high flow nasal cannula, noninvasive or invasive mechanical ventilation, use of vasopressor or inotropes, or organ support)</b></p> <p><b>Regular thromboprophylaxis</b> is indicated (<i>as per standard UConn Health Pharmacologic VTE Prophylaxis Guidelines</i>):</p> <ul style="list-style-type: none"> <li>• <u>If CLcr &gt; 30 ml/min:</u> Enoxaparin 40 mg SC Q24H <b>OR</b> heparin 5000 units SC Q8H (**If Age <math>\geq 75</math> years old: Heparin 5000 units SC Q12H) <ul style="list-style-type: none"> <li>◦ **If Weight &gt;100kg and/or BMI &gt;40: Consider Enoxaparin 40 mg SC Q12H <b>OR</b> Heparin 7500 units SC q8h</li> </ul> </li> <li>• <u>If CLcr &lt; 30 ml/min:</u> Enoxaparin 30 mg SC once-daily <b>OR</b> heparin 5000 units SC Q8H</li> </ul>
<p><b>Anticoagulation on Discharge from the Hospital:</b></p> <ul style="list-style-type: none"> <li>• NIH guidelines currently do not recommend continuing therapeutic anticoagulation upon discharge unless other non-COVID-19 infection reasons exist for continuing therapy</li> <li>• The NIH Panel also recommends against routinely continuing VTE prophylaxis after hospital discharge for patients with COVID-19 unless they have another indication or are participating in a clinical trial</li> </ul>

### **Considerations for Use of COVID-19 Treatments in Pregnancy:**

**Remdesivir:** The following data are listed in the product insert:

Available data from published case reports and compassionate use of remdesivir in pregnant women are insufficient to evaluate for a drug-associated risk of major birth defects, miscarriage, or adverse maternal or fetal outcomes. In nonclinical reproductive toxicity studies, remdesivir demonstrated no adverse effect on embryo-fetal development when administered to pregnant animals at systemic exposures (AUC) of the predominant circulating metabolite of remdesivir (GS-441524) that were 4 times (rats and rabbits) the exposure in humans at the recommended human dose (RHD) (see Data).

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. All pregnancies have a background risk of birth defect, loss, or other adverse outcomes. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2 to 4% and 15 to 20%, respectively.

Per the NIH guidelines, remdesivir should be offered to pregnant individuals if it is indicated. While pregnant patients were excluded from the clinical trials that evaluated the safety and efficacy of remdesivir for the treatment of COVID-19, subsequent reports on the use of remdesivir in pregnant patients have been reassuring

[https://www.gilead.com/-/media/files/pdfs/medicines/covid-19/veklury/veklury\\_pi.pdf](https://www.gilead.com/-/media/files/pdfs/medicines/covid-19/veklury/veklury_pi.pdf)

**Baricitinib:** The following data are listed in the Emergency Use Authorization (EUA) and the product labelling:

Baricitinib should be used during pregnancy only if the potential benefit justifies the potential risk for the mother and the fetus. Consistent with the mechanism of action, embryo-fetal toxicities including skeletal anomalies and reduced fertility have been observed in animals dosed in excess of the maximum human exposure. The limited human data on use of baricitinib in pregnant women are not sufficient to inform a drug-associated risk for major birth defects or miscarriage.

<https://www.fda.gov/media/143823/download>

<https://uspl.lilly.com/olumiant/olumiant.html#pi>

**Tocilizumab:** The following data are listed in the Emergency Use Authorization (EUA):

The limited available data with Tocilizumab in pregnant women are not sufficient to determine whether there is a drug-associated risk for major birth defects and miscarriage. Tocilizumab should be used during pregnancy only if the potential benefit justifies the potential risk for the mother and the fetus.

<https://www.fda.gov/media/150321/download>



**Document History:**

<b>Guidance Document: Guidance for Management of <u>HOSPITALIZED</u> Patients with COVID-19 Infection</b>	
<b>CATEGORY:</b> Clinical	<b>Date Originated:</b> 03/25/2020
Page 9 of 9	<b>Last Reviewed:</b> 9/23/2022
<b>Owner:</b> Dept. of Pharmacy, Div. of Infectious Diseases, Depts. of Critical Care, Pulmonology, Internal Medicine	<b>Last Revised:</b> 10/4/2022
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<b>Document Revision History:</b>	
3/25/2020	Production & distribution of Version #1
4/1/2020	<ul style="list-style-type: none"> <li>-Adjusted recommendations on corticosteroid use, Removed recommendations for use of lopinavir/ritonavir</li> <li>-Adjusted recommendations on ordering G6PD testing related to hydroxychloroquine</li> <li>-Added details about considerations for use of Tocilizumab and recommendation for ordering IL-6 levels in COVID-19 infected patients</li> <li>-Adjusted screening methods and guidelines for use of Tocilizumab</li> <li>-Modified list of labs to order in COVID-19 – positive patients</li> <li>-Added summary of FDA’s <i>Emergency Use Authorization</i> for use of hydroxychloroquine during the COVID-19 pandemic and FDA information about eIND for Convalescent Plasma use</li> <li>-Added section on <i>Approach to Use of Hydroxychloroquine +/- Azithromycin and Consideration of Risk for Drug-Associated QTc Prolongation</i></li> </ul>
4/10/2020	<ul style="list-style-type: none"> <li>-Adjusted recommendations on labs and other diagnostic tests to order and evaluate (types &amp; frequencies); added ABO blood typing, decreased frequencies of ordering for tests such as IL-6, ferritin, D-dimer, etc.</li> <li>-Added information promoting use of oral azithromycin in patients who can take PO medications</li> <li>-Added recommendation that clinicians can consider starting HCQ +/- AZI in a patient who has a clinical presentation consistent with COVID-19 but who does not yet have PCR confirmation of COVID-19.</li> <li>-Adjusted recommendations for ID consultation for non-ICU and ICU patients, as well as for added requirement for ID consult for patients where consideration may be made for use of convalescent plasma</li> <li>-Added/adjusted wording for QTc monitoring recommendations and added guidance for approach to discharge of patients who have received HCQ +/- AZI</li> </ul>
4/26/2020	<ul style="list-style-type: none"> <li>-Revised information about lack of proven therapies for treatment of COVID-19 infection to represent statements from the IDSA and NIH guidelines</li> <li>-Revised information and recommendations concerning the use of HCQ +/- AZI in both the “Important Notes” section and the Tables sections of the guidance document</li> <li>-Added recommendations about continuing ACE inhibitors, Angiotensin-Receptor Blockers (ARBs), and statin medications if patients were taking these medications prior to inpatient care and if there are no acute contraindications to their use</li> <li>-Removed laboratory testing recommendations from the Treatment tables (put at end of document as a supplement)</li> <li>-Added in detailed guidance and recommendations for Anticoagulation prophylaxis / treatment for both ICU and non-ICU patients with COVID-19 infection</li> </ul>
5/22/2020	<ul style="list-style-type: none"> <li>-Added information about EUA Remdesivir use in COVID-19 infected patients</li> <li>-Modified information about corticosteroid use in COVID-19 infected patients</li> <li>-Deleted recommendations for use of hydroxychloroquine +/- azithromycin and associated supporting information</li> </ul>
6/19/2020	-Revised corticosteroid use recommendations (added specifics about use of dexamethasone)
8/10/2020	-Further revised corticosteroid recommendations (added specifics about use of dexamethasone, obtaining verbal consent before use)

**Version #14 – 10/19/2022**

	<ul style="list-style-type: none"><li>-Revised information about use of Remdesivir</li><li>-Removed recommendations for use of Tocilizumab</li></ul>
10/23/2020	<ul style="list-style-type: none"><li>-Revised information for use of Remdesivir to reflect new clinical trial data (ACTT-1 &amp; SOLIDARITY), and FDA approval on 10/22/2020</li><li>-Revised information about use of Convalescent plasma</li><li>-Revised information about recommended COVID-19 specific laboratory parameters</li></ul>
12/23/2020	<ul style="list-style-type: none"><li>-Revised anticoagulation guidelines to remove high-intensity anticoagulation options for all patients</li><li>-Added information recommending against Baricitinib therapy at this time</li><li>-Added clarifications about use of Dexamethasone and Remdesivir</li></ul>
1/22/2021	<ul style="list-style-type: none"><li>-Added information recommending against Ivermectin therapy at this time</li><li>-Added information about use of Tocilizumab therapy in patients receiving either high-flow oxygen therapy, non-invasive mechanical ventilation, or invasive mechanical ventilation and/or admitted to the ICU for &lt;24 hours</li><li>-Revised recommendations for the use of Convalescent Plasma therapy</li></ul>
4/23/2021	<ul style="list-style-type: none"><li>--Revised information about use of Tocilizumab therapy in patients receiving either high-flow oxygen therapy, non-invasive mechanical ventilation, or invasive mechanical ventilation and/or admitted to the ICU for &lt;24 hours based on recent updates to NIH &amp; IDSA guidelines</li><li>-Revised recommendations for the use of Convalescent Plasma therapy based on recent updates to NIH &amp; IDSA guidelines</li></ul>
8/27/2021	<ul style="list-style-type: none"><li>-Added guidance on substitution of Sarilumab, Baricitinib, or Tofacitinib for Tocilizumab given current nationwide shortages of Tocilizumab</li><li>-Revised guidance on anticoagulation based on recently-published REMAP-CAP, ACTIV-4a, and ATTACC clinical trial results</li></ul>
10/19/2022	<ul style="list-style-type: none"><li>-Reviewed all recent updates to IDSA &amp; NIH COVID-19 treatment guidelines to assure that UConn Health recommendations continue to align with best-practices outlined in these two guidelines</li><li>-Significantly revised "Important Notes", and Tables on therapeutic guidance to reflect current state of COVID-19 infection management, revised JDH recommendations for ID consults and approvals of medications, dosing regimen information, and monitoring for safety for therapeutic agents</li><li>-Revised information about use of COVID-19 therapeutic agents in pregnancy</li></ul>