

UKID Pharmacotherapy Guidance for Adult (≥18 Years Old) Patients Positive for COVID-19

**Information related to testing, treatment, and monitoring of COVID-19 is rapidly changing and subject to availability of the latest data. Be aware that recommendations may change as quickly as day-to-day.*

General Information:

- Overall treatment resembles that for any viral pneumonia and no antiviral therapy has been proven to be completely effective for COVID-19 to date. Many experimental treatments are unavailable for ordering at this time so strategic utilization in patients with confirmed COVID-19 and meet criteria as delineated below is critical.
- Risk factors for progression of disease include: older age (>60) and underlying chronic medical conditions such as lung disease, cancer, heart failure, renal disease, liver disease, pregnancy, diabetes, and immunocompromising conditions.

Outpatient (Mild Symptoms)

- Focus on prevention of transmission. Patients should remain home and wear a facemask when making any contact with others in the same room or vehicle or when presenting to a health care setting.
- While at home, patients should remain in an isolated room with a dedicated bathroom if others live within the residence. Regular environmental disinfection with appropriate chemicals is advised.
- Monitor for worsening of symptoms or clinical deterioration that requires hospitalization

Outpatient Treatment Recommendations for Patients with Confirmed COVID-19
There is insufficient evidence to recommend use of anti-infectives in outpatient treatment. <ul style="list-style-type: none">• In patients with lung disease (i.e., COPD) or lung transplant diagnosed with COVID-19, consider starting hydroxychloroquine (see Table 1).
There is insufficient evidence to recommend prophylactic use of chloroquine or hydroxychloroquine
The CDC and WHO recommend <u>against</u> routine use of systemic corticosteroids as they have been associated with prolonged viral shedding. ^{1,2} <ul style="list-style-type: none">• There may be some benefit in patients with lung disease (i.e., COPD). See Appendix A for dose recommendations.
There is insufficient evidence to recommend discontinuing ACE inhibitors (e.g., lisinopril), ARBs (e.g., losartan), or direct renin inhibitors (e.g., aliskiren).
Outpatient treatment should focus on symptoms management. <ul style="list-style-type: none">• See Appendix B for OTC medication recommendations.• See Appendix C for homemade rehydration solution recommendations.

Inpatient (Moderate/Severe Symptoms)

- Overall treatment resembles that for most any viral pneumonia and no antiviral therapy has been proven to be completely effective for COVID-19 to date. Many experimental treatments such as hydroxychloroquine, chloroquine, and lopinavir/ritonavir may be unavailable for ordering at this time.
- Patients with severe disease (ARDS) often require oxygenation support. High-flow oxygen and noninvasive positive pressure ventilation have been used, but the safety of these measures is uncertain, and they should be considered aerosol-generating procedures that warrant specific isolation precautions.

- Some patients may develop ARDs and warrant intubation with mechanical ventilation; extracorporeal membrane oxygenation may be indicated in patients with refractory hypoxia.
- Monitor for and treat co-infections as necessary (initiate antimicrobials within 1h of sepsis identification).
- Corticosteroids should not be employed for COVID-19 pneumonia unless a serious indication exists (eg, exacerbation of COPD, etc.).
- Pharmacotherapy considerations for patients with confirmed COVID-19:
 - Mild disease or moderate disease with no risk factors: supportive measures only
 - Moderate disease with risk factors: consider hydroxychloroquine (see Table 1)
 - Severe disease: consider hydroxychloroquine and apply for remdesivir usage (see Table 1).

Table 1: Treatment Recommendations in Patients with Confirmed COVID-19 Disease

Disease Severity	Recommendations
Step down/ICU Level Care (Severe Disease)	<ul style="list-style-type: none"> • Confirmed COVID-19: Consider hydroxychloroquine² 400 mg PO BID on day 1 then 200 mg PO BID days 2-5 (see contraindications below) AND • Apply for remdesivir¹ via compassionate use for mechanically ventilated patients (https://rdvcu.gilead.com/). <p><i>The use of antiretrovirals (e.g., HIV protease inhibitors) should not be considered a first line option for management. For seriously ill patients who are not improving while on recommended therapy and where use of alternative experimental agents not listed here is being considered, obtain an infectious disease consult.</i></p>
Floor Level Care in Patients with Risk Factors³ (Moderate Disease)	<ul style="list-style-type: none"> • Confirmed COVID-19: Consider hydroxychloroquine² 400 mg PO BID on day 1 then 200 mg PO BID days 2-5 (see contraindications below) in consultation with infectious disease
Outpatient Care in Patients with Lung Disease or Lung Transplant	<ul style="list-style-type: none"> • Confirmed COVID-19: Consider hydroxychloroquine² 400 mg PO BID on day 1 then 200 mg PO BID days 2-5 (see contraindications below).

¹Inclusion criteria for remdesivir include the following: hospitalization, confirmed SARS-CoV-2 by PCR, and invasive mechanical ventilation. Exclusion criteria 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, or use in conjunction with other experimental antiviral agents for COVID-19

²Contraindications to hydroxychloroquine use include: QT>500, drug interactions, myasthenia gravis, porphyria, retinal pathology, epilepsy. Pregnancy is not a contraindication so assess benefit versus risk and consider pregnancy testing in women of childbearing age prior to initiation. Use with caution in patients with gastrointestinal, neurological, or blood disorders, and in those with sensitivity to quinine. Monitor for drug interactions.

³age >60years or underlying chronic medical conditions such as lung disease, cancer, heart failure, renal disease, liver disease, diabetes, and immunocompromising conditions

Pharmaceutical Considerations with Experimental COVID-19 Therapies

- Monitor for drug specific adverse effects and avoid use if contraindications.
- Drug-drug interactions: https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_InteractionSummary_Web_2020_Mar12.pdf
- Administration in cases of swallowing difficulties: https://liverpool-covid19.s3.eu-west-2.amazonaws.com/landing-page/Covid_Swallowing_2020_Mar13.pdf

Appendix A. Corticosteroid Dose Recommendations

GOLD Guidelines for COPD: Prednisone 40mg x 5 days³

Prednisone 10mg 21 Tablet Dose Taper

Day	Breakfast	Lunch	Dinner	Bedtime
1	2 tabs	1 tab	1 tab	2 tabs
2	1 tab	1 tab	1 tab	2 tabs
3	1 tab	1 tab	1 tab	1 tab
4	1 tabs	1 tab		1 tab
5	1 tab			1 tab
6	1 tab			

Prednisone 10mg 48 Tablet Dose Taper:

Day	Breakfast	Lunch	Dinner	Bedtime
1	2 tabs	1 tab	1 tab	2 tabs
2	2 tabs	1 tab	1 tab	2 tabs
3	2 tabs	1 tab	1 tab	2 tabs
4	2 tabs	1 tab	1 tab	2 tabs
5	1 tab	1 tab	1 tab	1 tab
6	1 tab	1 tab	1 tab	1 tab
7	1 tab	1 tab	1 tab	1 tab
8	1 tab	1 tab	1 tab	1 tab
9	1 tab			1 tab
10	1 tab			1 tab
11	1 tab			1 tab
12	1 tab			1 tab

Appendix B. OTC Supportive Care Recommendations⁴

Antipyretics/Analgesics			
Drug	Adult Dose	Pediatric Dose	Notes
Acetaminophen	325mg – 625mg every 4 to 6 hours Do not exceed 4,000mg/day Chronic liver disease: do not exceed 2,000mg/day	10 – 15 mg/kg every 4 to 6 hours Do not exceed 75mg/day Do not exceed 4,000mg/day	Acetaminophen is contained in many OTC cough and cold products. Remember to add those doses in total daily dose Preferential antipyretic for patients with chronic cardiovascular and chronic kidney disease OTC suppository available if unable to tolerate oral meds
Ibuprofen	400mg every 4 to 6 hours	<6 months: 4 – 10 mg/kg every 4 to 6 hours >6 months: 10 mg/kg every 4 to 6 hours Do not exceed 40mg/kg/day Do not exceed 400mg/dose	Avoid use in patients with CKD 4 or 5 Avoid use in patient with chronic cardiovascular disease
Aspirin	>18 years: 325mg every 4 to 6 hours Do not exceed 4,000mg/day	Do not use. Use of aspirin in viral illness is associated with Reye Syndrome	Avoid if on current antiplatelet therapy (e.g., clopidogrel, ticagrelor, etc.) OTC suppository is available if unable to tolerate oral meds
Antitussive/Expectorant			
Drug	Adult Dose	Pediatric Dose	Notes
Dextromethorphan	10 – 20mg every 4 hours 20 – 30mg every 6 to 8 hours Extended release: 60mg every 12 hours Do not exceed 120mg/day	2 to <6 years: 5mg every 4 hours 6 to <12 years: 10mg every 4 hours ≥12 years: 20mg every 4 hours Do not exceed 6 doses/day	Consult pediatrician before use in children <4 years Commonly co-formulated with guaifenesin
Guaifenesin	Immediate release: 200 – 400mg every 4 hours Extended release: 600 – 1,200mg every 12 hours Do not exceed 2,400mg/day	2 to <4 years: 50 – 100mg every 4 hours 4 to <6 years: 50 – 100mg every 4 hours 6 to <12 years: 100 – 200mg every 4 hours ≥12 years: 200 – 400mg every 4 hours Do not exceed 6 doses/day	Counsel patients to drink plenty of water Do not use in children in <2 years

Decongestants			
Drug	Adult Dose	Pediatric Dose	Notes
Chlorpheniramine	Immediate release: 4mg every 4 to 6 hours Extended release: 12mg every 12 hours Do not exceed 24mg/day	2 to <6 years: 1 mg every 4 to 6 hours 6 to <12 years: 2 mg every 4 to 6 hours ≥12 years: 4 mg every 4 to 6 hours 2 to <6 years: do not exceed 6mg/day 6 to <12 years: do not exceed 12mg/day ≥12 years: do not exceed 24mg/day	No renal or hepatic dose adjustments Use with caution in patients with cardiovascular disease, glaucoma, symptomatic BPH
Oxymetazoline	0.05%: instill 2 to 3 sprays in each nostril every 12 hours	Do not use in children <6 years ≥6 years: refer to adult dosing	<u>DO NOT USE for >3 days</u>
Pseudoephedrine	Immediate release: 60mg every 4 to 6 hours Extended release: 120mg every 12 hours Do not exceed 240mg/day	Consult pediatrician prior to use. Not routinely recommended in children.	No renal or hepatic dose adjustments Avoid use in patients with chronic cardiovascular disease Use with caution in patients with chronic kidney disease, glaucoma, symptomatic BPH, and seizure disorders Available behind the pharmacy counter with driver's license
Phenylephrine	10mg every 4 hours Do not exceed 60mg/day	4 to 5 years: 2.5mg every 4 hours 6 to 11 years: 5mg every 4 hours ≥12 years: 10mg every 4 hours 4 to 5 years: do not exceed 15mg/day 6 to 11 years: do not exceed 30mg/day ≥12 years: do not exceed 60mg/day	No renal or hepatic dose adjustments

Antidiarrheal			
Loperamide	Initial 4mg dose; 2mg after each loose stool Do not exceed 16mg/day	<p>2 to 5 years (13 to <21 kg): 1mg after each loose stool 6 to 8 years (21 to 27 kg): initial 2mg dose; 1mg after each loose stool 9 to 11 years (27.1 to 43 kg): initial 2mg dose; 1mg after each loose stool ≥12 years: initial 4 mg dose; 2 mg after each loose stool</p> <p>2 to 5 years (13 to <21 kg): do not exceed 3mg/day 6 to 8 years (21 to 27 kg): do not exceed 4mg/day 9 to 11 years (27.1 to 43 kg): do not exceed 6mg/day ≥12 years: do not exceed 8mg/day</p>	
Herbals			
Elderberry	Consult package labeling	<p>Consult package labeling Syrup not recommend for children <1 year Gummies not recommend for children <3 years</p>	<p>Counsel patients to only use commercially prepared products with a “USP” or “GMP” seal on the product</p> <p>Although efficacy is questionable, it is generally safe when using a commercially prepared product</p> <p>Counsel patients to avoid homemade products. Case reports of severe GI distress, pancreatitis, and death have been reported with homemade products.</p>

Appendix C. Homemade Rehydration Solutions⁵

Base Beverage	Recipe	
Water	<ul style="list-style-type: none"> • 1 quart water • ¼ teaspoon table salt • 2 tablespoons sugar 	
Chicken Broth	<ul style="list-style-type: none"> • 4 cups water • 1 dry chicken broth cube • ¼ teaspoon table salt • 2 tablespoons sugar 	OR <ul style="list-style-type: none"> • 2 cups liquid chicken broth (not low sodium) • 2 cups water • 2 tablespoons sugar
Tomato Juice	<ul style="list-style-type: none"> • 2 and ½ cups plain tomato juice • 1 and ½ cups water 	
Cranberry Juice	<ul style="list-style-type: none"> • ¾ cup cranberry juice • 3 and ¼ cups water • ¼ teaspoon table salt 	

References:

1. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>. Accessed 3/16/20.
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3. <https://goldcopd.org/wp-content/uploads/2019/11/GOLD-2020-REPORT-ver1.0wms.pdf>. Page 107. Accessed 3/15/20.
4. All drug dosing and safety recommendations found in Lexicomp. Accessed 3/14/20.
5. <https://med.virginia.edu/ginutrition/wp-content/uploads/sites/199/2018/09/Homemade-Oral-Rehydration-Solutions-9-2018.pdf>. Accessed 3/15/20.
6. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>
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