Vidant Health COVID-19 Treatment

Positive COVID-19 (SARS-Coronavirus-2) Inpatient

Mild/Uncomplicated Disease

- URTI
- LRTI
- No oxygen requirement

Supportive care

If risk factors for severe disease, low threshold to start therapy

Risk factors: CV disease, HTN, age >55-60, underlying lung disease, smoker, chronic liver disease, DM, CKD, cancer, HIV, transplant, on steroids or immunosuppression, chemotherapy, SNF/LTAC residents, obesity, pregnancy

Consider (see drug info table below for help deciding):

- Convalescent plasma
- Remdesivir
- Casirivimab/imdevimab (if COVID finding is incidental and admission is not COVID related OR as post-exposure prophylaxis)

Requiring O2

- LRTI: Cough, SOB, hypoxia, radiographic changes
- Oxygen requirement (O2 sat <93% on room air)

Consider (see drug info table below for help deciding):

- Dexamethasone
- Remdesivir
- Baricitinib
- Tocilizumab (shortage)
- Convalescent plasma

Mechanically Ventilated

- LRTI
- Mechanical ventilation
- Cytokine Release Syndrome
  - ARDS
  - Septic Shock
  - Capillary leak
  - Arrhythmias
  - Renal failure
  - Transaminitis
  - Coagulopathy
  - HLH

Consider (see drug info table below for help deciding):

- Dexamethasone
- Baricitinib
- Tocilizumab (shortage)
- Remdesivir (but less likely to have an impact at this stage of disease)

Outpatient:

- Casirivimab/imdevimab (Hotline 252-847-6500, M-F, 0800-1700)
- Call or text 252-414-2655 to hear current outpatient trial options (best to call same day as positive result)

Decision to use these agents should be made only with close attention to the patient's clinical status, comorbidities, interacting medications, and with the understanding that there are limited/controversial data available to support use. Use of some of these agents for COVID-19 requires ID or investigator approval (details below).

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Vidant Health COVID-19 Treatment

Drug Information:

Remdesivir (Veklury®)	• **Adult use is allowed without ID approval if the patient meets the following criteria:** Adult patient on low-flow oxygen only AND within 7 days of symptom ONSET (including ANY general viral symptom while outpatient and prior to positive test result).
	• **All other adult use requires ID approval by any ID attending. Call 252-814-4296 from 08:00–21:00 seven days a week. Any request after 21:00 will need to be approved and started the following morning. All pediatric use requires pediatric ID approval, contact Dr. William Alex Dalzell, Dr. Salma Syed, or Dr. Yamini Mandelia.**
	• Recommended use: Greatest benefit may be in patients early in the course of disease (<7 days of symptoms). Remdesivir is unlikely to be beneficial in patients with diffuse infiltrates on CXR or CT scan, those requiring high supplemental oxygen, or those with markedly elevated inflammatory markers such as CRP or D-Dimer.
	• Mechanism: Broad-spectrum antiviral nucleotide prodrug with potent in vitro activity against a range of RNA viruses including Ebola virus, Marburg, MERS-CoV, SARS-CoV, respiratory syncytial virus, Nipah virus, and Hendra virus. The mechanism of action of remdesivir is premature termination of viral RNA transcription.
	• Options for obtaining remdesivir:
	  ○ FDA approved on October 22, 2020 and available via wholesaler
	  ○ Emergency Use Authorization (EUA) still required for hospitalized children weighing 3.5 kg-40 kg or hospitalized children less than 12 years of age
	• Adult dosing: Suggested dose is a single loading dose of remdesivir 200 mg IV on Day 1, followed by once-daily maintenance doses of remdesivir 100 mg IV for 4 days. Remdesivir is to be administered via IV infusion in a total volume of up to 250 mL 0.9% saline. Doses of 200 mg will be infused over 2 hours and doses of 100 mg will be infused over 1 hour. Duration can be shortened if otherwise ready for discharge.
	• Monitoring: Suggest daily renal and hepatic function monitoring
	• Renal dysfunction: There are now several case reports describing use of remdesivir in patients with AKI or ESRD. These patients can be considered on a case by case basis. Dose and duration should be the same. When given on HD days make sure dose is after HD (as drug is cleared by HD).

Baricitinib (Olumiant®)	• **Adult use is allowed without ID approval if the patient meets the following criteria:** Within 5 days of requiring at least >6 L NC respiratory support for COVID-19 pneumonia, AND has at least one elevated inflammatory marker, AND eGRF >15 mL/min. • **All other adult use requires ID approval by any ID attending. Call 252-814-4296 from 08:00–21:00 seven days a week. Any request after 21:00 will need to be approved and started the following morning. All pediatric use requires pediatric ID approval, contact Dr. William Alex Dalzell, Dr. Salma Syed, or Dr. Yamini Mandelia.** • Recommend use in patients who are in the inflammatory component of their illness and are at least requiring 6 L oxygen, including those who are rapidly deteriorating despite dexamethasone. Factors that will be considered include: use of supplemental oxygen, CXR or CT scan findings, inflammatory markers particularly CRP and D-Dimer, and how long into inflammatory phase the patient is since drug more likely to be effective if given earlier in the course of the inflammatory process. • Mechanism: Inhibitor of JAK1 and JAK2. Baricitinib is proposed to reduce an inflammatory response and have potential antiviral activity against COVID-19.

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Vidant Health COVID-19 Treatment

	• This drug is now being used via EUA. Baricitinib is authorized for emergency use by the US FDA for treatment of COVID-19 in hospitalized adult patients requiring supplemental oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO). It is the responsibility of the primary team to provide the Patient Fact Sheet for Patients, Parents, and Caregivers; obtain verbal consent from the patient/caregiver and document in the chart, place the appropriate drug order based on renal function, and monitor renal/hepatic function plus ANC/ALC daily during treatment. Documentation is included in the order by appropriately answering "Yes" when the above criteria have been satisfied. Mandatory reporting of all medication errors and all serious adverse events is required. • Dose: 4 mg PO/per tube daily x 14 days or until discharge. Dose adjustment or drug interruption may be needed for decreasing eGFR, ALC <200 cells/uL, ANC <500 cells/uL, or if drug induced liver injury (AST/ALT increase) is suspected (see fact sheet for specific recommendations). Tocilizumab may be preferred in severe renal dysfunction or when PO/per tube is not feasible, but will be a patient specific decision. • Remdesivir plus baricitinib: In general, patients who begin to qualify for baricitinib will be entering a phase of their illness that will no longer benefit from remdesivir. Therefore, if a patient on remdesivir is being considered for baricitinib, it usually makes most sense that remdesivir is discontinued as baricitinib is initiated. An exception to this would be in a patient who is on remdesivir and would qualify for concomitant dexamethasone but cannot receive a corticosteroid due to contraindication (this patient could be on remdesivir plus baricitinib). • Other considerations: Risk of latent TB reactivation or other infection; and thrombosis.
Tocilizumab (Actemra®)	• Drug shortage is currently impacting supply. • **Adult use requires ID approval by any ID attending. Call 252-814-4296 from 08:00–21:00 seven days a week. Any request after 21:00 will need to be approved and started the following morning. All pediatric use requires pediatric ID approval, contact Dr. William Alex Dalzell, Dr. Salma Syed, or Dr. Yamini Mandelia.** • **EHR order may say "for outpatient use only except for heme/onc and transplant patients", however, this can be bypassed if you have ID approval for COVID-19.** • Recommend use in patients who are in the inflammatory component of their illness, are exhibiting rapid respiratory deterioration despite dexamethasone due to COVID-19, and are at least requiring 6 L oxygen. Factors that will be considered include: use of supplemental oxygen, CXR or CT scan findings, inflammatory markers particularly CRP and D-Dimer, and how long into inflammatory phase the patient is since drug more likely to be effective if given earlier in the course of the inflammatory process. • Mechanism: monoclonal anti-IL-6 receptor blocking antibody proposed as a therapeutic agent to mitigate hyperinflammation associated with COVID-19. FDA approved for various rheumatologic conditions as well as cytokine release syndrome associated with CAR-T cell therapy. • This drug is now being used via EUA. Tocilizumab is authorized for emergency use by the FDA fort treatment of COVID-19 in hospitalized adult and pediatric patients (2 years of age and older) who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO. Providers must communicate to the patient and/or caregiver information consistent with the Fact Sheet for Patients, Parents, and Caregivers and provide them with a copy of this Fact Sheet prior to the administration. However, if providing this information will delay the

Vidant Health COVID-19 Treatment

	administration to a degree that would endanger the life of a patient, the information must be provided as soon as feasible after administration. Mandatory reporting of all medication errors and all serious adverse events is required. • Dose: 8mg/kg based on actual body weight (max dose 800 mg). Clinical assessment and laboratory assessment (including CRP) to guide need for repeat dosing, which can be done at least 8 hours after the initial dose. Round dose to nearest vial size (either 80 mg or 200 mg vials depending on availability). • Other considerations: Risk of latent TB reactivation or other infection; risk vs benefit for initiation in patients with neutropenia, thrombocytopenia, or elevated AST/ALT; and need for concomitant steroid therapy.
Convalescent plasma	• Beginning 8/28/20 at 11:59PM convalescent plasma can be given by anyone without consent for participating in a research protocol (access changed from expanded access program to EUA). It will require ID approval and distribution of an FDA fact sheet. • **Adult use requires ID approval by any ID attending. Call 252-814-4296 from 08:00–21:00 seven days a week. Any request after 21:00 will need to be approved and started the following morning. All pediatric use requires pediatric ID approval, contact Dr. William Alex Dalzell, Dr. Salma Syed, or Dr. Yamini Mandelia.** • Recommended use: Greatest benefit may be in patients early in disease (~4 days from diagnosis or ~7 days of symptoms. • Please go to the Greenville blood connection website for a link for patients who want to be assessed as a donor. Donors are needed.
NCT04427501 Outpatient Clinical Trial (BLAZE-1)	• For outpatients only. Currently closed for adults. Still open for high risk pediatric patients 2 years old and younger. Patients can travel from anywhere to Greenville and only have to be seen in Greenville once. Please call to make sure the patient is eligible before they travel to Greenville. • Call or text study coordinators at 252-744-1913, 252-744-3962, or 252-414-2655 • Mechanism: LY-CoV555 is a potent, neutralizing IgG1 monoclonal antibody directed against the spike protein of SARS-CoV-2. It is designed to block viral attachment and entry into human cells, thus neutralizing the virus, potentially preventing and treating COVID-19. LY-COV555 has unique binding properties utilizing a validated monotherapy antiviral antibody approach. As with Ebola and RSV, the only two historically successful therapies in this class, the hope is that individual potent neutralizing antibodies are an effective way to treat viral pathogens.

Casirivimab/ imdevimab (REGEN-COV®)	• Available for VMC and VH community hospitals. For self or patient referrals contact the hotline at 252-847-6500 Monday through Friday from 0800-1700.
	• **Available for ordering by all providers for adult patients meeting criteria.** Documentation is included in the order by appropriately answering "Yes" when one of the two criteria have been satisfied:
	  ○ The adult patient has laboratory confirmed COVID-19 and is within 10 days of symptom onset (not requiring hospitalization due to COVID-19 or any new oxygen requirement) ***AND*** has been given the EUA Fact Sheet For Patients/Caregivers ***AND*** verbally consented to receive the infusion/injection
	  ○ The adult patient is immunocompromised and potentially exposed to a COVID-19 positive patient ***AND*** has been given the EUA Fact Sheet For Patients/Caregivers ***AND*** verbally consented to receive the infusion/injection

Vidant Health COVID-19 Treatment

	• **All pediatric use requires pediatric ID approval, contact Dr. William Alex Dalzell, Dr. Salma Syed, or Dr. Yamini Mandelia.** • The FDA has released 3 EUA's for neutralizing monoclonal antibodies: casirivimab/imdevimab (Nov 21, 2020), bamlanivimab/etesevimab (Feb 9, 2021), and sotrovimab (May 26, 2021). NC DHHS will no longer ship single agent bamlanivimab due to increasing SARS-CoV-2 variants. Vidant changed from bamlanivimab/etesevimab to casirivimab/imdevimab in Jul 2021 due to increasing variants. • Mechanism of neutralizing antibodies: Neutralizing antibodies directed at the receptor-binding domain of SARS-CoV-2 spike protein have been evaluated as prophylactic and therapeutic agents for COVID-19. In animal models there is evidence that antibody therapy may more rapidly reduce viral load in the upper and lower airways of infected animals resulting in reduced viral-induced pathology. Potential advantages of neutralizing antibodies include the ability to standardize the amount of neutralizing activity and the possibility of conferring protection more rapidly than with vaccine-induced immune responses (which generally take several weeks). • EUA has two indications ○ Treatment of mild to moderate COVID-19 in adults and pediatric patients with positive results of direct SARS-CoV-2 viral testing who are 12 years of age and older weighing at least 40 kg, and who are at high risk for progressing to severe COVID-19 and/or hospitalization. It is NOT authorized for use in those who are hospitalized due to COVID-19, or who require oxygen therapy due to COVID-19, or who require an increase in baseline oxygen flow rate due to COVID-19 in those on chronic oxygen therapy due to underlying non-COVID-19 related comorbidity. ○ Post-exposure prophylaxis: For adult and pediatric patients (12 years of age and older weighing at least 40 kg) for post-exposure prophylaxis of COVID-19 in individuals who are at high risk for progression to severe COVID-19, including hospitalization or death and are not fully vaccinated (or who are not expected to mount an adequate immune response to complete vaccination such as those with immunocompromising conditions or taking immunosuppressive medications) AND have either been exposed to an individual infected with SARS-CoV-2 consistent with close contact criteria per CDC or are at high risk of exposure to an individual infected with SARS-CoV-2 because of occurrence in other individuals in the same institutional setting such as a nursing home, prison, etc. ○ Post-exposure prophylaxis is NOT a substitute for vaccination ○ This is NOT authorized for pre-exposure prophylaxis for prevention • The following medical conditions or other factors may place adults and pediatric patients (age 12-17 years and weighing at least 40 kg) at higher risk for progression to severe COVID-19: ○ Older age (for example age ≥ 65 years of age) ○ Obesity or being overweight (for example, adults with BMI >25 mg/m^2, or if age 12-17, have BMI ≥85th percentile for their age and gender based on CDC growth charts ○ Pregnancy ○ Chronic kidney disease ○ Diabetes

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Vidant Health COVID-19 Treatment

	○ Immunosuppressive disease or immunosuppressive treatment ○ Cardiovascular disease (including congenital heart disease) or hypertension ○ Chronic lung disease (for example, chronic obstructive pulmonary disease, asthma [moderate-to-severe], interstitial lung disease, cystic fibrosis, and pulmonary hypertension) ○ Sickle cell disease ○ Neurodevelopmental disorders (for example, cerebral palsy) or other conditions that confer medical complexity (for example, genetic or metabolic syndromes and severe congenital anomalies) ○ Having a medical-related technological dependence (for example tracheostomy, gastrostomy, or positive pressure ventilation (not related to COVID-19)) ○ Other medical conditions or factors (for example, race or ethnicity) may also place individual patients at high risk for progression to severe COVID-19 and authorization of casirivimab/imdevimab under the EUA is not limited to the medical conditions or factors listed above. For additional information on medical conditions and factors associated with increased risk for progression to severe COVID-19, see the CDC website: https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html. Healthcare providers should consider the benefit-risk for an individual patient. • <u>Administration and observation:</u> ○ Administer as soon as possible after positive viral test for SARS-CoV-2 and within 10 days of symptom onset. ○ Clinically monitor patients during infusion and observe patients for at least 1 hour after infusion is complete. ○ Health care providers must submit a report on all medication errors and ALL SERIOUS ADVERSE EVENTS. The prescribing health care provider and/or the provider's designee are/is responsible for mandatory reporting of all medication errors and serious adverse events occurring within 7 calendar days from the onset of the event. Must be submitted to FDA MedWatch and Regeneron. ○ Patients treated should continue to self-isolate and use infection control measures (e.g., wear mask, isolate, social distance, avoid sharing personal items, clean and disinfect "high touch" surfaces, and frequent handwashing) according to CDC guidelines.
Ivermectin	• <u>Ivermectin has not been added to Vidant treatment recommendations.</u> • <u>IDSA guideline recommendation:</u> In hospitalized patients with severe COVID-19, the IDSA panel suggests against ivermectin use outside of the context of a clinical trial (conditional recommendation, very low certainty of evidence). In outpatients with COVID-19, the IDSA panel suggests against ivermectin use outside of the context of a clinical trial (conditional recommendation, very low certainty of evidence). See guideline for data summary. • <u>Mechanism:</u> Anti-parasitic agent FDA approved for some indications. Has in-vitro activity against some viruses, including SARS-CoV-2 but no proven therapeutic utility. Concentrations needed to obtain the in-vitro IC50 for SARS-CoV-2 are considerably higher than those achieved in human plasma and lung tissue.

Vidant Health COVID-19 Treatment

Hydroxychloroquine (HCQ)	• HCQ was officially removed from Vidant algorithm in the June 16, 2020 update. On June 15, 2020, based on FDA's continued review of the scientific evidence available for HCQ and chloroquine (CQ) to treat COVID-19, FDA has determined that the statutory criteria for EUA as outlined in Section 564(c)(2) of the Food, Drug, and Cosmetic Act are no longer met. Specifically, FDA has determined that CQ and HCQ are unlikely to be effective in treating COVID-19 for the authorized uses in the EUA. Additionally, in light of ongoing serious cardiac adverse events and other serious side effects, the known and potential benefits of CQ and HCQ no longer outweigh the known and potential risks for the authorized use. This warrants revocation of the EUA for HCQ and CQ for the treatment of COVID-19. • IDSA guideline recommendation: Among hospitalized patients with COVID-19, the IDSA guideline panel recommends against hydroxychloroquine. See guideline for data summary.
HCQ + Azithromycin	• HCQ + azithromycin combination was officially removed from Vidant algorithm in the April 30, 2020 update. • IDSA guideline recommendation: Among hospitalized patients with COVID-19, the IDSA guideline panel recommends against hydroxychloroquine plus azithromycin. See guideline for data summary.
Lopinavir/ritonavir (Kaletra)	• Kaletra was officially removed from Vidant algorithm in the May 8, 2020 update. • IDSA guideline recommendation: Among hospitalized patients with COVID-19, the IDSA guideline panel recommends against the use of the combination lopinavir/ritonavir. See guideline for data summary.
Interferon Beta-1a	• Interferon Beta-1a has not been added to Vidant treatment recommendations. • Mechanism: Subcutaneous interferon beta-1a is approved in the U.S. and more than 90 other countries for the treatment of multiple sclerosis. Interferon beta-1a has the same amino acid sequence as a naturally occurring protein called interferon beta, which is part of a class of proteins called type 1 interferons. Infected cells normally produce type 1 interferons to help the immune system fight pathogens, especially viruses. Interferon beta has both antiviral and anti-inflammatory properties. • A randomized, controlled clinical trial evaluating the safety and efficacy of a treatment regimen consisting of the antiviral remdesivir plus the immunomodulator interferon beta-1a in patients with coronavirus disease 2019 (COVID-19) has begun. The study, called the Adaptive COVID-19 Treatment Trial 3 (ACTT 3), is anticipated to enroll more than 1,000 hospitalized adults with COVID-19 at as many as 100 sites in the US and abroad. Clinical trial is the only way to obtain drug and Vidant is not part of this clinical trial. The closest site in NC is Duke. More data can be found here: https://clinicaltrials.gov/ct2/show/NCT04492475

Vidant Health COVID-19 Treatment

General COVID-19 Information:

1. COVID-19 is the disease caused by SARS-Coronavirus-2 or SARS-CoV-2.
2. Incubation period ~5 days (ranges from 2-14 days).
3. Frequently signs and symptoms at illness onset include fever (83-98%), dry cough (76-82%), and myalgia/fatigue (11-44%). GI symptoms have also become a common occurrence (anorexia, diarrhea, vomiting, abdominal pain, anosmia, dysgeusia). In one report, 10% (n=20) presented without digestive or respiratory symptoms, 3% (n=7) with digestive symptoms but without respiratory symptoms (all except 1 did have fever), 42% (n=85) with respiratory symptoms but without digestive symptoms, and 45% (n=92) with both respiratory and digestive symptoms.
4. CXR have shown bilateral involvement in most patients. CT patterns have revealed patchy infiltrate, bilateral disease, and have been consistent with viral infection.
5. Potential for clinical deterioration during second week of illness.
6. Co-infection of COVID-19 with other viruses and bacteria is possible.
7. False negative COVID-19 results are possible. Poor quality of specimen can be a reason for false negative.

Recommended Labs and Monitoring:

1. Daily: CBC with differential (follow lymphopenia) and complete metabolic panel (includes LFTs)
2. To help rule out bacterial co-infection: Procalcitonin
3. For risk stratification and worry of cytokine release syndrome: LDH, troponin, CPK, D-dimer, CRP, ESR, triglycerides, ferritin, and fibrinogen. May consider trending these as appropriate.
    a. Ideally would obtain IL-6 levels but this lab is a send out from Vidant that will take 4-7 days to result so we are not currently recommending it.
4. Pregnancy test
5. Vitamin D, total (VITDT)

General Drug Considerations:

1. There are clinical trials of HCQ that include supplemental zinc, vitamin C, and vitamin D. For all COVID-19 positive patients suggest 14 days of the following **nutritional supplements**:
    a. **Multivitamin with minerals** (Theragran-M tablet) twice daily. The preference is to use the Theragran-M tablet product, even if need to crush finely and administer per tube, due to the copper concentration in this vitamin (2 mg/tab) vs Centrum liquid (0 mg). If absolutely needed, can use the Centrum liquid multivitamin with iron-minerals. But, the copper supplementation may be important due to Zinc binding copper absorption.
    b. **Zinc sulfate** 220 mg capsule daily (50 mg elemental zinc) or oral suspension if need liquid (220 mg/5mL). Zinc has anti-viral activity, including inhibition of viral RNA dependent RNA polymerase (like remdesivir). Zinc deficiency is common in elderly people and is associated with anosmia (an early sign of COVID-19 disease).
    c. **Ergocalciferol** 50,000 IU twice weekly or ergocalciferol drops if liquid needed (50,000 IU/6.25 mL). Need for further supplementation should be based on vitamin D level results. Vitamin D is a known immunomodulator and deficiency is more common in African Americans, who are at higher risk for severe disease. Vitamin D inhibits proinflammatory cytokines, including IL-6. We are giving ergocalciferol over cholecalciferol based on the high dose and available supplies. The shorter half-life of the ergocalciferol also will help to see effects earlier and reach steady state more quickly.

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Vidant Health COVID-19 Treatment

2. The Vidant Health **anticoagulation** subcommittee has developed a guideline for inpatient prophylaxis, discharge prophylaxis, and treatment of VTE in COVID-19 patients. Please see their separate document.
3. **Dexamethasone 6 mg IV or PO for 10 days (or until discharge if earlier)**. An equivalent glucocorticoid dose may be substituted if dexamethasone unavailable. Equivalent total daily doses of alternative glucocorticoids to dexamethasone 6 mg daily are methylprednisolone 32 mg and prednisone 40 mg. IDSA guideline recommendations are as follows: Among hospitalized critically ill patients with COVID-19, the IDSA guideline panel recommends dexamethasone rather than no dexamethasone (Strong recommendation, moderate certainty of evidence). Critical illness is defined as patients on mechanical ventilation and ECMO. Critical illness includes end organ dysfunction as is seen in sepsis/septic shock. In COVID-19, the most commonly reported form of end organ dysfunction is ARDS. Among hospitalized patients with severe, but non-critical COVID-19 the IDSA guideline panel suggests dexamethasone rather than no dexamethasone (Conditional recommendation, moderate certainty of evidence). Severe illness is defined as patients with SpO2 ≤ 94% on room air, including patients on supplemental oxygen. Among hospitalized patients with non-severe COVID-19 without hypoxemia requiring supplemental oxygen, the IDSA guideline panel suggests against the use of glucocorticoids. Non-severe illness is defined as patients with a SpO2 >94% not requiring supplemental oxygen. See guideline for data summary.
4. If no contraindications, continue **statins** or consider starting in those with a guideline indication for one.
5. Do not need to stop home **ACEI/ARB** therapy, unless there is another compelling reason.
6. Avoid starting new prescriptions for **NSAIDs.** Can see IDSA guideline for some discussion of NSAIDs.
7. Use **inhalers** over nebulizers.
8. Many institutions are noting that patients with COVID-19 tend to have higher than normal baseline triglyceride levels secondary to an HLH-type syndrome and many institutions are avoiding discontinuation of their **propofol** infusions in these patients until TG levels are closer to 750/1000 mg/dL. This would avoid having to change to an alternative/less desired sedative agent in these patients (ie: benzodiazepines which are less than ideal due to the longer elimination time and association with longer intubation times). It is recommended to continue to monitor these patients closely for any signs and symptoms of PRIS while on propofol therapy.
9. Due to the frequency of every one hour blood glucose checks for patients who are receiving intravenous **insulin** with Endotool, it would be preferred to manage these patients with basal/bolus regimen of insulin if possible or tolerate a blood glucose that is slightly above our goal. This will aide in decreasing the number of times the nurse has to enter the room to obtain a finger stick for insulin drip titrations. See separate document for subcutaneous insulin management of mild/moderate DKA in the COVID-19 patient.
10. In patients who are intubated **scheduled eye care** is administered in the form of Clear Eyes solution and petrolatum ointment both given every 4 hours alternating which results in an eye drop being administered every 2 hours to aide in lubrication secondary to dryness that results from the ventilator. In an effort to reduce nursing exposure and since most patients should be maintained at a light level of sedation, it is recommended to omit the petrolatum ointment and use only the Clear Eyes solution in these patients with a frequency of 'four times day' or 'three times a day' with the specific times correlating with other medication administration times.
11. In an effort **to minimize aerosolization during extubation** consider strategies of prevention of post extubation coughing and gagging. IV lidocaine 1 mg/kg (max 100 mg) can be given 3-5 minutes prior to extubation or 1 mg/kg of 2% lidocaine solution can be instilled intratracheally into the outer aperture of the ETT 5 minutes prior to extubation to blunt the post extubation cough response. In patients with heart block/bradycardia without a pacemaker AVOID IV lidocaine administration and can consider utilization of 0.5 mg/kg of 2% lidocaine solution via the ETT in these patients.
12. Anecdotal reports from China suggest that patients infected with coronavirus who were receiving **famotidine**, a H2 receptor antagonist to treat conditions such as acid reflux and peptic ulcer disease, had improved survival vs those receiving proton pump inhibitors. This post hoc finding has led to interest in the drug, though no predominant theory describing a mechanism for its efficacy yet exists. One theory is that famotidine, like many other compounds,

binds and therefore inhibits the coronavirus main protease, 3C-like main protease (3Clpro). Among hospitalized patients with severe COVID-19, the IDSA panel suggests against famotidine use for the sole purpose of treating COVID-19 outside of the context of a clinical trial (conditional recommendation, very low certainty of evidence). See guideline for data summary. If stress ulcer prophylaxis is indicated, consider choosing famotidine over PPIs. This is already in agreement with current MICU practices for critically ill intubated patients.

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