

## Assessment References

### A CLINICAL PRESENTATION

- Incubation: 4-5 days (range 2-14 days)
- Initial symptoms (first week of illness)
  - Common: non-productive cough, fever, headache, sore throat, myalgias
  - Less common: nausea, abdominal discomfort, diarrhea, anorexia, anosmia
- 80% have mild course and recover, 15% progress, 5% will be critical
- Progressive symptoms (later first week, early second week of illness)
  - Common: dyspnea, hypoxia (with or without dyspnea), bilateral viral pneumonia (severity of CXR often doesn't correlate with hypoxia)
  - Less common: ARDS, multiorgan failure, myocarditis, ARF

### GENERAL TREATMENT PRINCIPLES

- Supportive care including respiratory support as needed
- Avoid overhydration, IV fluids only for hypotension or to attain euvolemia
- Discuss therapies for inpatients with hospitalist/intensivist (steroids, convalescent plasma, remdesivir)

### B RISK FACTORS

- Age  $\geq$  65 (60-70)
- Chronic heart disease (CHF, severe CAD, HTN)
- Chronic lung disease (COPD, asthma, etc.)
- Chronic Liver disease
- ESRD/dialysis
- DM
- Obesity (BMI > 40)
- Immunosuppressed
- Congregate Living

### C DISTANT EVALUATION

- Goal is to limit clinician exposure and preserve PPE
- Only use for mild to moderate illness in low risk patients with normal mental status and normal or expected vital signs (fever and proportional tachycardia)
- Evaluate patient by video chat, through window, or from a distance
- Consider an appropriate differential diagnosis which could include PE, CHF, EVALI, bacterial pneumonia, meningitis, etc.

## Treatment References

### 1 CRITERIA FOR ADMISSION

- Persistent/unrelieved increased respiratory effort
- Respiratory failure/ARDS
- SpO<sub>2</sub> <92%, other concerning abnormal vital signs
- SpO<sub>2</sub> <95%, for pregnant patients
- Altered mental status

### 2 RESPIRATORY SUPPORT

- See appendix A
- If ventilator supply is adequate, consider an early intubation strategy. However there is some suggestion that invasive ventilation could be harmful
- If ventilator supply is limited (but negative airflow rooms available): NC, then NRB, then HFNC, then CPAP (preferred over BiPAP)

- ### 3 TESTING FOR ADMITS:
- CBC, BMP, CXR, COVID-19 test; other testing if needed to confirm diagnosis, otherwise could be deferred to Hospitalist as it doesn't determine disposition or ED intervention

### TYPICAL LABORATORY FINDINGS:

- CBC: Leukopenia (particularly lymphocytopenia), thrombocytopenia
- Prolonged PT, elevated lactate dehydrogenase and CRP, abnormal LFTs, normal procalcitonin, elevated CRP, elevated ferritin
- D-dimer: often elevated and maybe prognostic; evaluate for PE only if in differential diagnosis

### IMAGING

- CXR - ground glass opacities, maybe patchy, may be basilar/peripheral. Generally do not see effusions or cavitation.
- Lung POCUS: B-lines, more sensitive than CXR but risks close exposure
- CT: diffuse, peripheral, ground glass opacities; should not be routinely utilized

### 4 CRITERIA FOR ICU ADMISSION

- Hypoxia of <92% on O<sub>2</sub> >10 lpm
- Significant confusion/altered mental status
- ARDS (Acute respiratory distress syndrome)
- Worsening oxygen requirement, increasing work of breathing
- Hypercapnia (pCO<sub>2</sub> >50 considering individual baseline) or acidosis (pH <7.3)
- Hypotension SBP <90, MAP <65
- Very high risk, severe comorbidities

### 5 CRITERIA FOR INTUBATION

- Altered mental status, unable to participate. Permissive hypoxia considered until mental status deteriorates.
- Respiratory fatigue

## Currently available outpatient therapeutics:

Paxlovid (oral), Molnupiravir (oral), Remdesivir (IV), Bebtelovimab (IV)

## Focusing on Oral Antivirals (most likely to prescribe)

### Who is eligible for oral therapies?

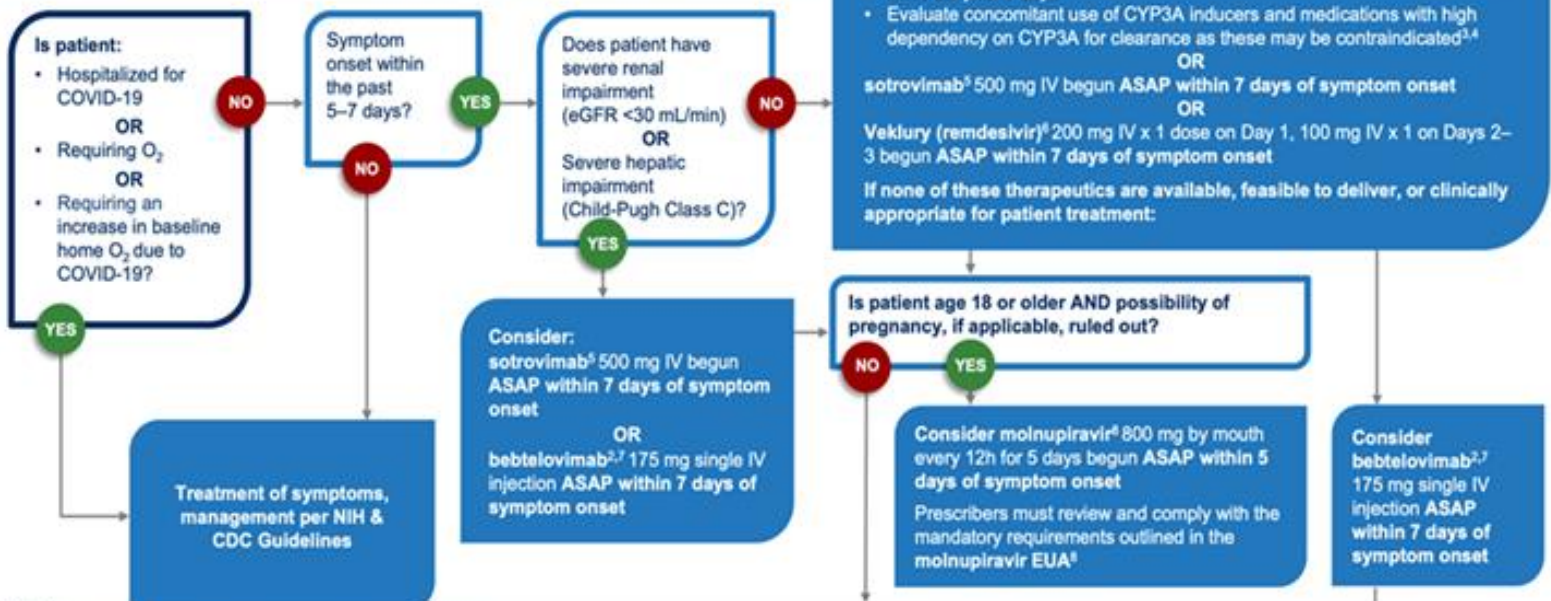
- **Paxlovid first line and Molnupiravir second**
- Treatment of mild to moderate COVID-19 not requiring hospitalization
- Patient has moderate to high risk for disease progression Underlying Medical Conditions Associated with Higher Risk for Severe COVID-19
- Must begin within 5 days of symptom onset to be effective
- Not for pre-exposure or prophylaxis
- CURRENTLY, there is a sufficient supply of oral antivirals. If demand outpaces supply, a priority system is employed using the M-MASS score COVID-19 Monoclonal Antibody Therapy and Risk of Hospitalization
- We can prescribe this in known positive patients, but know that only select pharmacies will have the medicine available so check with your hospital system or pharmacist

### What to say to patients who tested positive for Covid-19 and are eligible for treatment?

- Oral antivirals are investigational treatments that have been approved for emergency use by the FDA
  - Studies have show significant reduction in hospitalization and death
    - 88% for Paxlovid
    - 30% for molnupiravir
  - Discuss benefits and side effects
  - Importance of starting the medication as soon as possible
  - Encourage close contacts of patients to monitor for symptoms and test early so they can be treated if indicated
- \*\*\*Sotrovimab is not currently authorized in Minnesota any longer due to lack of efficacy against BA.2 variant**

## COVID-19 Outpatient Therapeutics Clinical Decision Aid for Ages 12+

Adult or pediatric patient (ages 12 and older weighing at least 40 kg) with mild to moderate COVID-19 and at high risk for progression to severe disease



<sup>1</sup> NIH COVID-19 Treatment Guidelines, Therapeutic Management of Nonhospitalized Adults With COVID-19. <https://www.covid19treatmentguidelines.nih.gov/therapies/statement-on-therapies-for-high-risk-nonhospitalized-patients/>

<sup>2</sup> FDA COVID-19 Treatment Guidelines, Statement on bebtelovimab. <https://www.covid19treatmentguidelines.nih.gov/therapies/statement-on-bebtelovimab/>

<sup>3</sup> Paxlovid EUA. <https://www.fda.gov/media/15005/download>

<sup>4</sup> NIH COVID-19 Treatment Guidelines, Panel's Statement on Potential Drug-Drug Interactions Between Ribavirin-Based Nirmatrelvir (Paxlovid) and Concomitant Medications. <https://www.covid19treatmentguidelines.nih.gov/therapies/statement-on-paxlovid-drug-drug-interactions/>

<sup>5</sup> Sotrovimab EUA. <https://www.fda.gov/media/14934/download>

<sup>6</sup> Veklury (remdesivir) prescribing information. [https://www.gilead.com/media/files/pdfs/medinfo/covid-19/veklury\\_veklury\\_pi.pdf](https://www.gilead.com/media/files/pdfs/medinfo/covid-19/veklury_veklury_pi.pdf)

<sup>7</sup> Bebtelovimab EUA. <https://www.fda.gov/media/138152/download>

<sup>8</sup> Molnupiravir EUA. <https://www.fda.gov/media/15004/download>

### Paxlovid

- Combination of *nirmatrelvir* tablets and a pharmacologic boosting pill called *ritonavir*
  - Nirmatrelvir – anti-viral protease inhibitor
  - Ritonavir – CYP3A inhibitor to boost anti-viral but does not have direct action against SARS-CoV-2
- For ages 12 and up and weighing at least 40kg
- Take 3 pills at a time (two nirmatrelvir and one ritonavir) twice a day for 5 days
- Dose reduced for renal insufficiency of GF 30-60, take only one nirmatrelvir and one ritonavir
- Not to be used if severe renal failure (GFR<30) or severe liver failure
- Potential side effects – altered or loss of taste, diarrhea, hypertension, or muscle aches
- Many drug interactions – [Liverpool COVID-19 Drug Interactions website](#)
  - Not all drug interactions are absolute contraindications
  - Options include:
    - lower dose of medication
    - use alternative medication
    - hold medication for 8 days while on Paxlovid
- Can be used in pregnancy but as always discuss risk/benefit

### Molnupiravir

- Oral nucleoside analogue that inhibits SARS-CoV-2 replication
- 18 and older (can affect bone and cartilage growth)
- 4 capsules (200mg each) twice a day for 5 days
- Potential side effects – nausea, diarrhea and dizziness
- Not approved while pregnant or breastfeeding
- Reduce efficacy of oral contraceptives and should use additional contraception during treatment and up to 4 days after for women of childbearing age. Men of child bearing potential should use effective contraception during treatment and 3 months after treatment

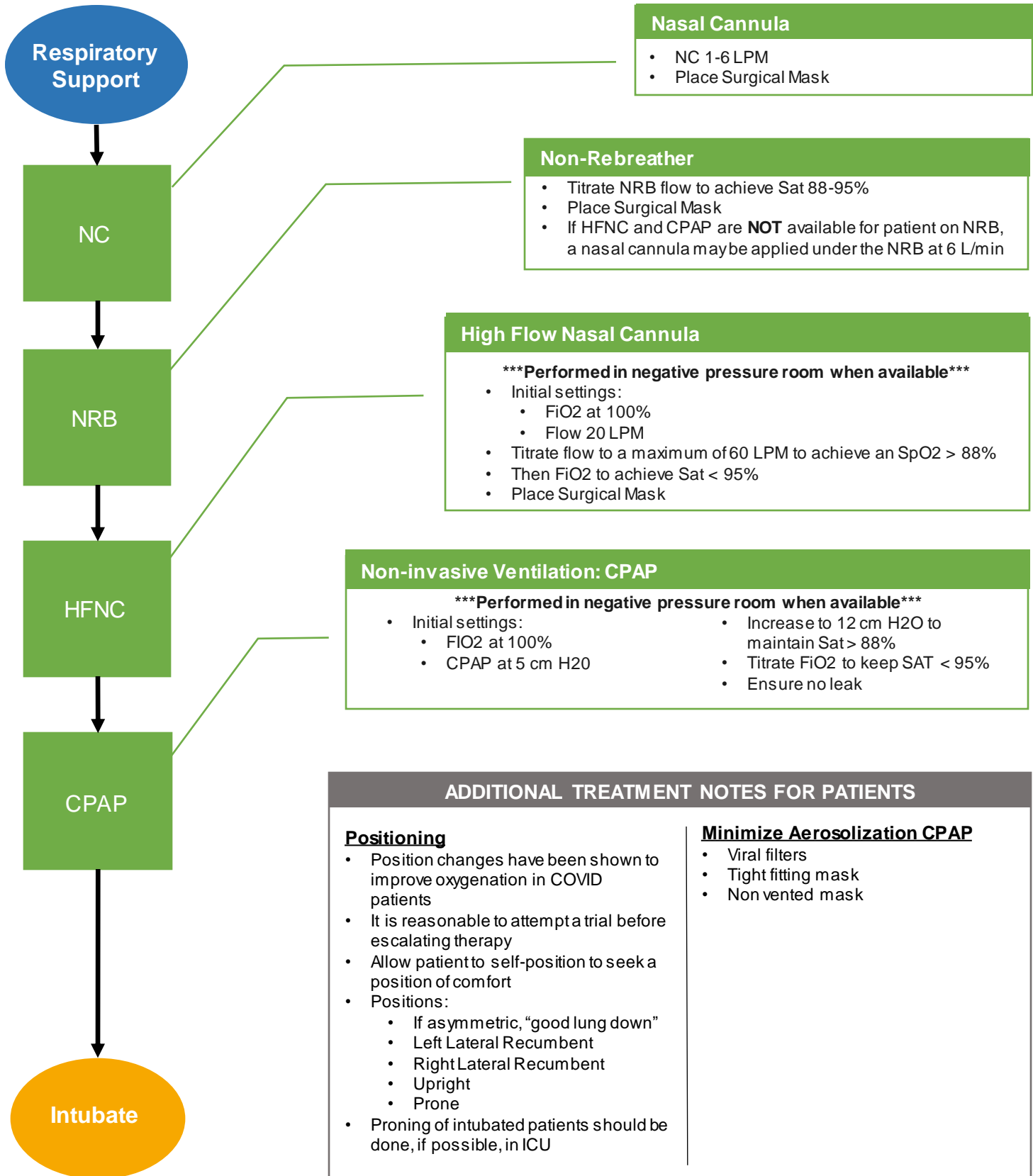
### Remdesivir (Veklury)

- As of January 21, 2022, Remdesivir has been approved for both inpatient and outpatient treatment of Covid-19 (IV only so must be given at an infusion center, home health or nursing home setting)
- For patients who are not eligible for oral antivirals, orals not available or symptom onset 5-7 days
- 87% reduction in hospitalization and death
- For adults and pediatric patients greater than 3.5kg and at high risk for progression to severe illness
- Dosing is 200mg IV day 1, followed by 100mg IV day 2 and 3
- Must be started within 7 days of symptom onset
- Side effects may include hypersensitivity reactions and elevated liver enzymes
- Know there are significant barriers to administering this as an outpatient including insurance issues and availability. Pediatric patients will likely require admission.

### Bebtelovimab

- Monoclonal antibody currently in use but virus variants are associated with resistance to different mAbs so this may change rapidly
- Authorized for use only in patients for whom alternative COVID-19 treatment options approved and authorized by FDA are not accessible or clinically appropriate.
- Adults ages 12 years and older and weighing at least 40kg with high risk for progression to severe illness
- Single, 175mg IV dose
- Must be started within 7 days of symptom onset
- Physician referral to Minnesota Resource Allocation Platform (MNRAP) [MNRAP](#)

### EPPA Procedures for RSI in COVID or COVID PUI PATIENTS



### EPPA Procedures for RSI in COVID or COVID PUI PATIENTS

#### PRINCIPLES

- Intubation and resuscitation are the situations most likely to expose us to COVID
- Securing the airway first allows for the best source control
- PPE first; no staff to be compromised even in emergency
- Critically ill patients likely have the highest viral load
- Minimize the number of personnel in the room while balancing with safety and optimal care for the patient

#### PERSONNEL & PPE

##### In Room:

(negative pressure if available)

- Physician
- RN
- RT

##### In Hallway:

- PPE spotter for donning and doffing
- Runner (ED Tech)
- Pharmacist (when available)
- Physician backup (with PPE ready)
- Second RN (with PPE ready)
- Charge RN (when available)

##### Personal Protective Equipment (PPE):

- N95 or CAPR/ PAR
- Gloves
- Face shield
- Gown

#### ADDITIONAL TREATMENT NOTES

##### Medication

- **Quick List** (average adult)
  - **Ketamine 150mg IV**
  - **Rocuronium 100mg IV**
- Induction:
  - Etomidate 0.3 mg/kg IV (**etomidate 20mg IV** for average adult)
  - Ketamine 1.5 to 2 mg/kg IV (**ketamine 150mg** for average adult)
- Paralytic:
  - Succinylcholine 1.5 to 2 mg IV (**succinylcholine 150mg** for average adult)
  - Rocuronium 1 to 1.5 mg/kg (**rocuronium 100mg IV** for average adult)

##### Intubation Technique

- If necessary, two person BVM with viral filter or NIPPV with viral filter
- Begin with video laryngoscopy
- If necessary, direct laryngoscopy (bougie if needed)
- If necessary, LMA
- If necessary, cricothyrotomy

##### Sedation to minimize coughing

- Propofol, Fentanyl, Ketamine, Midazolam prn or drip
- Consider paralysis

##### Initial Vent Settings (initial lung protective strategy)

- Mode: volume assist control
- Tidal Volume: 6 to 8 ml/kg (IBW)
- RR: 15/min
- PEEP: 5 cm H<sub>2</sub>O (8 if obese)
- FiO<sub>2</sub>: 30% and titrate
- Goal oxygenation: 88 to 95%

##### Persistent Hypoxia

- Rule out complication (PTX)
- Positioning
  - HOB 30 degrees
  - Left/right decub
- PEEP Trial
  - 10-15cm H<sub>2</sub>O for 5-10 min (watch BP)
- Recruitment Maneuver
  - 30cmH<sub>2</sub>O for 30 seconds
- Deep Sedation and/or paralysis

To be used for patients who require supplemental oxygen **and** desire to be discharged home after shared decision-making. Admit any patient with a new oxygen requirement who does not feel comfortable with discharging on home O2.

**Inclusion Criterion:** Confirmed or suspected COVID pneumonia with hypoxia (room air O2<90%)

## Considerations for Discharge on Home O2:

1. PE ruled out: clinically, or by d-dimer/imaging study when appropriate
2. No radiographic evidence of severe lung involvement (all patients should have a chest x-ray at minimum)
3. Imaging pattern not suggestive of bacterial or secondary infection, such as lobar consolidation or pleural effusion
4. No historical/clinical indicators of rapidly progressive disease (take day of illness into consideration, see Shared Decision-Making Points below)
5. Requiring **no more than 3 LPM** to maintain O2 saturation of at least 90%
6. While on supplemental O2:
  - a. Respiratory rate less than or equal to 20
  - b. No clinical indicators of respiratory distress (retractions, accessory muscle use, conversational dyspnea)
  - c. Baseline mental status
7. Able to obtain close primary care follow-up (keep in mind this will likely be telehealth)
8. Able to monitor pulse oximetry at home
9. Able to return to ED if worse
10. Consider both rest and ambulatory oxygen levels in considering criteria for supplementation and stability for discharge

### Consider Risk Factors for Severe Disease:

- |                          |                           |                     |
|--------------------------|---------------------------|---------------------|
| • Male                   | • Cerebrovascular Disease | • Malignancy        |
| • Age >60                | • COPD                    | • Obesity (BMI >30) |
| • Black                  | • Diabetes Type II        | • Renal Disease     |
| • Cardiovascular Disease | • Hypertension            |                     |

\*Note that a patient with one or more risk factors for severe disease may still be appropriate for discharge depending on clinical presentation and trajectory of illness.

## Discharge Checklist:

- Oxygen concentrator/tubing (site-dependent)
- Pulse oximeter
- Dexamethasone 6 mg daily for up to 10 days
- Consider famotidine 20 mg BID for GI protection

## Shared Decision-Making Points:

- Peak risk is 7-10 days after onset of symptoms. Take into account duration of illness and clinical trajectory. (e.g., A patient on day 5 of illness who is worsening is much higher risk than a patient on day 14 whose symptoms are more slowly progressive or stable.)
- Remdesivir is used to reduce hospital stay, but current evidence suggests no mortality benefit. Even in hospitalized patients, remdesivir is most indicated early in course of illness. At this time, it is probably not beneficial to admit for remdesivir alone, but this should be addressed in the SDM conversation.
- Consider risk of hyperglycemia with dexamethasone in diabetic patients.
- Must be able to return if feeling worse

## OVERVIEW OF THERAPEUTICS

**Dexamethasone:** Recommended for patients requiring supplemental oxygen.

Dose: 6 mg daily for up to 10 days. Shorter course reasonable if weaned off O<sub>2</sub>.

Precautions:

- Consider GI prophylaxis
- Consider risk of hyperglycemia in diabetic patients
- **International Patients:** Patients who originate outside the US, Australia, Europe, or Canada (at any time) require prophylactic treatment for strongyloides (a parasitic infection that can emerge after corticosteroid treatment). Treatment regimen is two doses of ivermectin, one day apart, with first dose preferably given prior to steroids. If a patient originates from West Africa, consult with ID prior to steroids due to Loa Loa risk.

**Anticoagulation:** Not routine, but could be considered for high-risk patients:

- Active cancer
- Prior history of VTE
- Poor mobility

Balance with individual risk for bleeding adverse event. Typically, rivaroxaban 10 mg daily for 5 weeks.

**Convalescent plasma:** No meaningful benefit, not widely used.

**Monoclonal antibodies:** No indication for hypoxic or hospitalized patients. Emergency use authorization is for patients with high-risk but early & mild disease (reduces viral load and ED visits/hospitalizations but not mortality).

HOW TO ORDER HOME O<sub>2</sub> (BY SITE)**Allina:**

1. Write DME note
  - Open a new note (+ Create Note)
  - Insert the following SmartText: DME HOME OXYGEN (can be found by typing "oxygen")
  - Fill out and sign
2. Order Home O<sub>2</sub>
  - Navigate to Dispo tab
  - In Prescriptions & Orders, click "New Order"
  - Order Oxygen-Air Delivery Systems (HOME OXYGEN)
    - Can be found by typing "oxygen" or "293274"
  - Fill out and sign (length of need 1 month)
3. Contact Case Manager or Charge Nurse to:
  - Arrange O<sub>2</sub> delivery to ED
  - Supply with pulse-oximeter
4. Arrange follow-up
  - Case Manager and/or
  - Order from BestPractice Advisory on Dispo tab (click Follow-Up Actions)

**Fairview:**

1. Documentation:
  - Complete the following dot phrases:  
**.shhomeoxygen** AND **.homeO2facetoface**
2. Place Order:
  - Oxygen (order RT109)
  - In comments, select "New Home Oxygen Order"
  - 1 month
3. Contact FV Home Medical Equipment
  - Call 651-632-9800 with the following information:
    - a. Patient name
    - b. MRN
    - c. Any isolation precautions
    - d. Where to bring the tank (can drop off at ER, may take up to 2 hours)

**CentraCare:**

1. Documentation: no additional documentation required beyond provider note.
2. Order "Home O<sub>2</sub> Evaluation"
3. RN/RT performs necessary documentation of O<sub>2</sub> necessity and provider signs off
4. Patient will go home with oxygen from the ED