

## A Guide to Admitting and Rounding on Critically Ill COVID Patients

### Gathering the Information:

**Labs:** Each patient needs at least one “full” set of labs for the current hospital admission, including:  
CBC, CMP, PTT/INR, type and screen. If these labs have not been collected, ensure they are ordered  
If the patient has an arterial line, collect an ABG upon ICU admission.

Order daily CBC and CMP as well as COVID-specific inflammatory markers (D-dimer, fibrinogen, CRP, IL-6, LDH, ferritin, procalcitonin). The timing of labs is not critical - please try to bundle nursing tasks. The “COVID Order Set” will help you order these labs.

**EKG:** Each patient needs an EKG upon ICU admission and daily. Pay attention to QTc, rhythm, ST segment elevations/depressions, and T wave inversions.

- If QTc >500 msec, discontinue QT prolonging medications (hydroxychloroquine, azithromycin, ondansetron).
- Ischemic changes (ST segment changes, T wave inversions) as well as heart block may be evidence of myocarditis. If present, start by trending cardiac enzymes and EKG q8 hours.

**CXR:** Patients admitted to the ICU will have had a CXR in the ED. Repeat the CXR only if an ETT or feeding tube has been placed since (to confirm position). **Daily CXR is not indicated.**

### Home Medications:

Many home medications are **HELD** upon ICU admission, including:

- Antihypertensives (most patients are hypotensive from sepsis or sedation)
- Tamsulosin (exacerbates hypotension)
- Metformin (causes metabolic acidosis, manage glucose with insulin)
- ACE inhibitors and ARBs - These medications should be discontinued in COVID + patients

Home medications to **CONTINUE** include:

- Anticoagulation/antiplatelets
- Steroids
- Please see anticoagulation and steroid protocols below

### Assessment of vascular access (Is the current access adequate?):

ICU patients not on pressors need two peripheral IVs (preferably at least 20g).

ICU patients on pressors (NE, AVP) need central access.

## Reviewing and Generating a Systems Based Plan:

**Palliative Care/ Goals of Care:** Initiation early discussions with family/health care proxy. This may limit futile interventions and provider exposure, as well as relieve suffering. Beeper 9399

**Neuro/Sedation:** Typical sedative infusions include propofol 20-80 mcg/kg/min, fentanyl 50-150 mcg/hr, hydromorphone 1-2 mg/hr, midazolam 1-3 mg/hr.

- Orders should be written to titrate to a RASS score of -4 to facilitate ventilator synchrony.
- Paralytics can be added if the patient is asynchronous on two or more sedative infusions. Start cisatracurium at 2 mcg/kg/min and titrate to ventilator synchrony. Orders for these medications can be found under "**CSICU Medications.**"
- Remember that opioid and benzodiazepine infusions have a very long context-sensitive half time (the medication lasts longer the longer it has been on). If the infusion has been on for days, it will take days for the patient to wake up. If the patient is getting close to extubation, switch to propofol.

### Respiratory:

Oxygenation: **Goal SpO<sub>2</sub> >88% and PaO<sub>2</sub> >55**

Determine current level of respiratory support: NC, facemask, HFNC, BiPAP, ETT

If SpO<sub>2</sub> <88%, will need to increase FiO<sub>2</sub> or upgrade type of support.

**FiO<sub>2</sub> and PEEP control oxygenation. Adjust these parameters according to the ARDSNet protocol (specifically the "Higher PEEP/lower FiO<sub>2</sub>" grid) shown below to achieve SpO<sub>2</sub> >88% and PaO<sub>2</sub> >55.**

Calculate P/F ratio (PaO<sub>2</sub>/FiO<sub>2</sub>) daily:

If >150, continue current therapy with the lowest FiO<sub>2</sub> possible

If <150 utilize the following strategies to improve oxygenation:

- Paralysis with cisatracurium infusion
- Prone positioning (proning team lead by Dr. Acquah)
- In very rare cases, discussion about VV ECMO

#### **Lower PEEP/higher FiO<sub>2</sub>**

<b>FiO<sub>2</sub></b>	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7
<b>PEEP</b>	5	5	8	8	10	10	10	12

<b>FiO<sub>2</sub></b>	0.7	0.8	0.9	0.9	0.9	1.0
<b>PEEP</b>	14	14	14	16	18	18-24

#### **Higher PEEP/lower FiO<sub>2</sub>**

<b>FiO<sub>2</sub></b>	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5
<b>PEEP</b>	5	8	10	12	14	14	16	16

<b>FiO<sub>2</sub></b>	0.5	0.5-0.8	0.8	0.9	1.0	1.0
<b>PEEP</b>	18	20	22	22	22	24

Ventilation: **Goal pH 7.20-7.40**

Tidal volume and respiratory rate control ventilation. The product of TV and RR is minute ventilation.

**If the patient is intubated, start with TV 6 cc/kg IBW (not actual body weight) and RR 20.** Collect an ABG. If pH <7.20, increase RR by 4 and repeat ABG. Continue until pH >7.20.  
**Remember, the ideal PaCO<sub>2</sub> is not 40 and the ideal pH is NOT 7.40. The goal is a pH >7.20. This concept is known as “permissive hypercapnea.”**

If a patient is mechanically ventilated, an ABG should be collected every six hours at minimum.

**Measure the plateau pressure (Pplat) daily to avoid traumatic injury to the lungs.** This is done by pressing the “inspiratory pause” button on an ICU ventilator. If Pplat is >30 cm H<sub>2</sub>O, decrease TV by 1 cc/kg IBW and increase RR by 2 to maintain minute ventilation.

**Evaluation for SAT/SBT:** If the patient has adequate oxygenation and ventilation on minimal vent settings (FiO<sub>2</sub> 40%/PEEP 8), wean sedation and attempt SBT. If respiratory mechanics are adequate (TV >4 cc/kg, RR <35, pH >7.30, RSBI <100), consider extubation. Most of these patients are marginal, so strongly consider extubation to facemask or HFNC.

### COVID-Specific Therapies and Protocols:

**Note: Every COVID patient should have an ID consult.**

### Anticoagulation

See Anticoagulation Policy

### Steroids:

Based on data from the RECOVERY Trial, All patients with Increased O<sub>2</sub> requirements should be started on dexamethasone 6mg IV or PO daily

For refractory shock, consider hydrocortisone +/- fludricortisone as used in non-COVID patients.

### Study Drugs:

Please review the most recent version of “Mount Sinai Health System Treatment Guidelines for SARS-CoV-2-Infection (COVID-19).”

**Co-Infection:** Many COVID patients are started on empiric antibiotics for bacterial infections. If a patient is on antibiotics:

- Order at least one set of blood cultures.
- Common empiric antibiotics are vancomycin and cefepime.
- For patients with normal renal function, collect a vancomycin trough prior to the fourth scheduled dose.
- For patients with renal impairment, dose by level.
- Consider discontinuing empiric antibiotics after a three day course. If the patient is decompensating (worsening hypotension or hypoxemia), consider broadening antibiotics in consultation with the ID team.

**Cardiac:** Goal MAP is >65 mmHg using vasopressors preferentially to fluid

- Norepinephrine 2 mcg/min or phenylephrine 20 mcg/min are first line (starting doses)
- Vasopressin 2.4 U/hr is second line
- Consider inopressors (epinephrine) in refractory cases

**Endocrine/GI:** Nutrition in the first 48-72 hour period is of secondary importance. In other words, it is more important to control glucose than to feed.

Goal BS 140-180

For patients receiving tube feeds use NPH q6 hour dosing:

Mild hyperglycemia: NPH 3 to 5U q6 hours  
 Moderate hyperglycemia: NPH 6-8U q6 hours  
 Severe hyperglycemia: NPH 9-11U q6 hours

Add Lispro correction to be given every 3 to 6 hours. Choose low or high dose depending on severity of hyperglycemia.

**Renal:**

Consult nephrology if indication for renal replacement therapy  
 Can use the Hyperkalemia protocol if pt found with hyperkalemia  
 Replete Potassium for  $K < 4$ , Mg for  $Mg < 2$ , and Phos for  $Phos < 3$  for patients not in renal failure

**ICU Prophylaxis:**

GI: Indicated for intubated patients. Famotidine 20 mg IV q12 hours (q24 hours for renal impairment)  
 Bowel regimen: Miralax daily and Senna  
 DVT (if not on therapeutic anticoagulation): Enoxaparin 40mg SQ daily or SQH 7500 SQ BID (esp if  $CrCl < 30$ ml/min) and SCDs  
 Foley: For all intubated patients  
 The above can be found under **Critical Care OrderSet**

**Documentation:**

Every day each patient needs 2 pieces of documentation:

1. A daily ICU note: This is an H&P on the day of ICU admission and a progress note each day thereafter. It is written by the resident, PA, or NP caring for the patient and then edited or cosigned by the attending.
2. A "Goals Sheet" which should be written by a resident, PA, or NP on rounds who is not actively presenting. Click nthe "ICU Daily Goals" tab and entering the 5 main goals for the patient for the day.

Procedures (central line placement, arterial line placement, and endotracheal intubation), require a "Procedure Note."

**Useful Order Sets:**

"COVID-19 OrderSet" - Includes COVID-specific labs

"Adult ICU Daily Orders" - ICU general nursing orders (vitals), vent orders, prophylaxis, labs, Pressors and sedation (with starting doses and titration parameters included)

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