Critical Care COVID-19 Quick Guide

Note: The recommendations in this guide are meant to serve as treatment guidelines for use at the UVM Medical Center. Other UVM Health Network facilities should consider adopting to the extent possible, based on local policies and practice standards. These guidelines should not replace a provider's professional medical advice based on clinical judgement.

General Management

- Employ strategies to minimize unnecessary HCW trips in/out of room
- Face pump and ventilator displays toward windows
- Target goal RASS of 0 to -1 when possible
- Consider POC cardiac/lung US to assess volume status and pulmonary disease burden

Pain, Analgesia, and Delirium

- Acetaminophen 1,000 mg q6H PO/PR for fever.
- Analgesia FIRST: opioid IV infusion plus PRN
- Conservative use of propofol targeted to a RASS of 0 to -1. Higher doses may be utilized for up to 2 hours to allow for adjunct sedation to take effect
- Quetiapine/Olanzapine encouraged to treat delirium and/or mitigate the need for additional sedation
- Consider low dose ketamine infusions for synergy with opioids
- Melatonin qHS for sleep in non-intubated patients

Pulmonary

- Target SpO2 between 88-95%, PaO2 55-80 mmHg
- Consider NIV or HFNC O2 to avoid intubation in ICU setting - ONLY in negative pressure room
- Address prognosis and goals of care prior to intubation.
- For intubation procedure, please refer to COVID intubation guidelines
- Initial Volume Control settings:
    - Follow ARDS protocol: tidal Volume (Vt) = 6 cc/kg (4-8 cc/kg acceptable, favor lower)
    - Favor higher PEEP if patient PEEP responsive
    - Permissive hypercapnia tolerable to pH 7.20

FiO_2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5
PEEP	5	8	10	12	14	14	16	16

FiO_2	0.5	0.5-0.8	0.8	0.9	1.0	1.0
PEEP	18	20	22	22	22	24

- Decrease Vt by 1cc/kg increments to achieve target plateau pressures < 30 cm H_2O
- In case of refractory hypoxemia or unable to achieve $P_{plateau}$ < 30 cm H_2O consider prone positioning, inhaled Flolan, or transition to APRV
- Consider intermittent dosing of NMB for severe ARDS (P:F < 150): discontinue after 48 hours to reassess ongoing need for NMB
- Prone positioning (in P:F < 150) if resources available: 12-16 hours increments at a time
- If patient is requiring high levels of sedation to tolerate low Vt ventilation, transition to APRV could be considered – but only under direction of an experienced user/intensivist
- In-line suction catheters should be used, clamp ETT if disconnect is required
- Use of inhaled nitric oxide is strongly discouraged
- Staircase recruitment maneuvers are strongly discouraged
- VV ECMO on case by case basis. Referral criteria: P/F < 100 on FiO2 >90% x 12hrs, P/F < 80 on FiO2 >90% x6hrs, P/F < 50 on FiO2 >90% for 3 hours, pH < 7.20 with RR > 35, inability to maintain plateau pressures < 30, no other vent optimizations available

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Cardiac

- Observe conservative fluid resuscitation strategy:
  - Target even to net-negative fluid balance; particularly if hemodynamically stable
  - Consider periodic POC US assessment of intravascular volume to confirm ongoing safety of conservative fluid strategy
  - Early utilization of low dose vasopressors when POCUS supports euvolemia
- Target even to net-negative fluid balance; particularly in hemodynamically stable patients
- Pressor escalation:
  - First line: Norepinephrine
  - Second line: Vasopressin
  - Consider 50 mg hydrocortisone (mineralocorticoid) q6h after 2nd vasopressor, in addition to dexamethasone (glucocorticoid) for treatment of COVID
  - Dobutamine if cardiac dysfunction noted, epinephrine alternatively

GI/Nutrition

- Enteral nutrition is appropriate – consider gravity or bolus feeds if supply of pumps is low
- Stress ulcer prophylaxis with H2 blocker for intubated patients

Renal

- Avoid nephrotoxins, particularly Vancomycin and NSAIDs
- Balanced/buffered crystalloids should be used
- Do not use colloids, gelatins, dextrans or hydroxyethyl starches
- 15-20% of critically ill patients may require RRT (renal replacement therapy)

Infectious Disease

- Please consult the UVMMC Adult COVID-19 Therapeutics guide for most recent guidelines on antiviral and / or anti-inflammatory therapy in patients with COVID-19 pneumonia
- Empiric antibiotics if bacterial pneumonia or sepsis is suspected
- Trend procalcitonin on patients receiving antibiotics to assist with stewardship

Endocrine

- Daily screening glucose for non-diabetics, do not order q6h FSBG unless clinically indicated
- Attempt to manage hyperglycemia with basal / bolus subcutaneous insulin and avoid continuous insulin infusion whenever possible to minimize need for frequent glucose monitoring
- Corticosteroid therapy (oral or IV) is recommended in the treatment of COVID and severe COVID

Heme

- DVT prophylaxis should be held for platelet count < 30K
- COVID-19 appears to favor pro-coagulable DIC even with thrombocytopenic
- Transfusion for goal Hgb > 7, consider concurrent diuresis if blood transfusion required

Lines/Tubes

- OG tube for gastric decompression +/- small bowel feeding tube
- Suggest left IJ CVC placement given high incidence of need for RRT (and need for right IJ)

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Intubation Procedure Mini-Guide

Patient
- COVID-19 Patient or PUI with respiratory failure requiring intubation
- Discuss goals of care and code status
- Assess likelihood of benefit

Place
- Ideally procedure will take place in a negative pressure room with the door closed
- Intubation may take place on the floor at the critical care attending's discretion.

PPE
- Hair cover or hood
- Eye protection with side shields, goggles, full-face shield or PAPR
- Fit-tested N95 respiratory or PAPR
- Fluid-resistant gown or full coveralls
- Gloves that cover cuffs of gown

People
- Minimal number of staff in the room - operator, RT, RN
- Have a second airway manager available and donned outside the room in case of difficulty
- Intubation should be performed by the most skilled operator available

Equipment
- Have all needed equipment in the room prior to starting the intubation procedure including backups
- Use video laryngoscopy and disposable blades (non-hyperangulated are available and may facilitate quicker tube insertion)
- Favor bronchoscopic intubation if difficult airway is anticipated; bougie or LMA acceptable.
- Insert viral filters into the vent circuits and bag-valve mask (see graphic below)
- Ensure PEEP valve is on Ambu-bag

Oxygen
- Use a Hudson nasal cannula, Oxymizer or NRB (with surgical mask) with 15LPM flow to pre-oxygenate at least 5 minutes to avoid needing BVM ventilation
- May cautiously consider NIV for preoxygenation in refractory hypoxemia
- If you need to bag, hold a tight seal and allow oxygen to flow passively without bagging at all; otherwise deliver small, frequent volumes
- Patients with ARDS, pregnant and obese patients will desaturate quickly

Hemodynamics
- Have norepinephrine hanging and ready in case of hypotension

Meds
- Ensure adequate sedation – consider ketamine bolus or propofol
- Ensure faster, more complete apnea and no residual cough with high-dose neuromuscular blocking agents - consider rocuronium 1.2 mg/kg IV
- Honor medication onset time

Intubate
- Use RSI, minimizing use of the BVM
- Inflate endotracheal tube cuff before insufflation of lungs by Ambu-bag or ventilator
- Check for appropriate ET tube placement by observing chest-rise and end-tidal CO2 - do not use a stethoscope

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