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**Analgesia & Sedation in COVID-19: A Stepwise Approach for MGH**

*COVID-19 related ARDS requires low-tidal volume ventilation (LTVV). As with normal ARDS and LTVV, higher levels of sedation are typically required to maintain ventilator synchrony and patients may also require paralysis to achieve this effect. These recommendations should be utilized to guide sedation & mitigate potential shortages during the COVID19 severe ARDS surge.*

**Initial Assessment:**
Choose appropriate goals
- Ventilatory Synchrony
- Pain: CPOT <3, VAS <4
- RASS 0 to -1 (light sedation)
- RASS -4 to -5 (heavy sedation)
- BIS 40-60% (when paralyzed)

1. **Analgesia**
   - Treat pain first
   - Start scheduled aggressive bowel regimen when using opioids
   - Multimodal pain agents may be required

2. **Sedation**
   - Titrate to lowest level of sedation that allows for ventilatory synchrony
   - May require use of multiple agents at once to achieve deep sedation
   - Perform daily SAT for patients who qualify via SAT safety screen

3. **NMBAs**
   - Titrate to ventilatory synchrony or Train of Four
   - Requires deep sedation (eg: RASS -4 to -5 prior to paralytic, or BIS 40-60)
   - Initiate lubricating eye drops or ointment

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**First Line**

- **Hydromorphone**
  - Initial Dosing, Titrate to Effect
  - Bolus: 0.2mg q1h prn
  - Infusion: 0-4mg/hr (may require higher doses)
  - Least affected by end organ dysfunction

**Second Line**

- **Fentanyl**
  - Initial Dosing, Titrate to Effect
  - Bolus: 25-100 mcg q30min prn
  - Infusion: 0-300 mcg/hr
  - Highly lipophilic, heparically metabolized, half-life increases w/ continued prolonged use & obese patients

**Third Line**

- **Morphine**
  - Initial Dosing, Titrate to Effect
  - Bolus: 2-4mg q1h prn
  - Infusion: 0-10 mg/hr
  - May cause hypotension, avoid in renal dysfunction

**Adjunctive Agents for refractory agitation**
- Discuss w/ pharmacy prior to use as these agents may have interactions with current COVID treatment options. Follow QTC
- Dexamethasone
- Phenoobarbital (IV, IM, PO)
- Quetiapine (PO)
- Olanzapine (PO, SL, IM, IV)
- Clonidine (PO, patch)
- Propranolol (PO, IV)
- Valproic Acid (PO, IV)
- Chlorpromazine (PO, IM, IV)

**Pharmacologic strategies**
- Quetiapine: 25 mg q6-12h
- Olanzapine: 2.5-5 mg daily

**Delirium Management**
- Pharmacologic strategies
- Non-pharmacologic strategies
  - Ensure daily SAT
  - Reorient patient frequently
  - Early mobilization
  - Promote sleep/wake cycles
  - Timely removal of catheters/restraints
  - Ensure use of glasses/hearing aids
  - Minimize noise/stimulation at night

**Weaning Strategies**
- If continuous infusions are on for >/= 7 days, wean by 25% per day
- Utilize dexamethasone when weaning ventilator for lighter sedation goals: 0.1-0.25 mg/kg/hr
- Consider addition of long acting agents to facilitate faster weaning from infusions:
  - Dexamethasone
  - Midazolam: lorazepam
  - Opioid infusions: Consider standing methadone after day 5