RATIONALE: Critically ill mechanically ventilated patients require analgesia and frequently sedation, to tolerate mechanical ventilation, medical procedures, reduce stress response and decrease oxygen consumption. Unfortunately continuous sedative use is also associated with worsened patient outcomes including longer duration of mechanical ventilation, ICU LOS and higher rates of delirium. Delirium is a manifestation of brain organ dysfunction and is associated with worse clinical outcomes including risk of death and cognitive impairment. The Society of Critical Care Medicine’s (SCCM) Pain, Agitation and Delirium (PAD) Guidelines recommend a focus on analgesia and a reduction in use of sedative medications along with routine delirium monitoring.

Management of Pain

1. Assess for pain frequently
2. Use opioid analgesics (fentanyl, hydromorphone or morphine) and/or non-opioid (e.g. acetaminophen)
3. Consider gabapentin for neuropathic pain

Management of Agitation and Sedation (when mechanically ventilated)

1. Assess for level of agitation-sedation with the Richmond Agitation-Sedation Scale at least every 4 hours
2. Reassess RASS target level at least once every 12 hours
3. If patients are undersedated despite a analgesia first approach, consider a non-benzodiazepine sedatives (e.g. propofol, dexmedetomidine)
4. Midazolam should be considered for patients who do not tolerate propofol/dexmedetomidine, those with active seizures and those with alcohol withdrawal symptoms
5. Screen patients daily for readiness for spontaneous awakening trials and perform coupled awakening and breathing trials on patients that pass the respective safety screens

Management of Delirium

1. Assess for delirium at least every 12 hours with the Confusion Assessment Method for the ICU (CAM-ICU)
2. Treat pain since pain itself can predispose patients for delirium
3. Try non-pharmacological methods first for treating delirium
   a. reorient patient
   b. provide reading glasses, hearing aids if applicable
   c. improve sleep architecture
   d. encourage early mobilization
   e. remove restraints, Foley catheters etc. if possible
   f. reduce exposure to deliriogenic medications such as benzodiazepines, anticholinergic medications, steroids when applicable
4. Pharmacological approach
   a. for severe hyperactive delirium (CAM-ICU positive and RASS +3 or +4): consider bolus propofol (if mechanically ventilated) or intravenous haloperidol to control delirium that would endanger the patient
   b. for hyperactive delirium (CAM-ICU positive and RASS +1 or +2): consider scheduled or as needed (prn) intravenous haloperidol. Oral or per tube olanzapine should be first atypical drug of choice. If no resolution of delirium with olanzapine, consider switching to quetiapine
   c. dexmedetomidine should be considered for patients requiring sedation in whom weaning from mechanical ventilation is hampered by delirium
   d. for hypoactive delirium (CAM-ICU positive and RASS 0 to -3): consider reducing sedative and other deliriogenic medications
**Analgesia/Sedation Protocol for Mechanically Ventilated Patients**

1. **In pain?**
   - Yes: **Bolus dosing prn with either**
     - Fentanyl 50-100 mcg
     - Hydromorphone 0.1-0.3 mg
     - Morphine 2-5 mg
   - No: Controlled or anticipated control with < 3 bolus doses/hr
     - Fentanyl 50-300 mcg/hr gtt
     - Fentanyl 25-100 mcg prn pain

2. **At RASS target?**
   - Yes: Reassess often
     - **Analgesia may be adequate to reach RASS target**
   - No: **Under-sedated**
     - Propofol 5-30 mcg/kg/min
     - Dexmed 0.2-1.5 mcg/kg/hr (if delirious/weaning)
     - Midazolam 1-3 mg prn
       - (ETOH withdrawal or propofol intolerance).

3. **Delirium?**
   - CAM-ICU negative
     - Reassess q 6-12 hrs
   - CAM-ICU positive
     - Non pharm management
     - Pharm management

**Over-sedated**
- Hold sedative/analgesics to achieve RASS target. Restart at 50% if clinically indicated

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*Midazolam 1-3 mg/hr gtt rarely if > 2 midaz boluses/hr and propofol intolerance
*Propofol intolerance refers to propofol infusion syndrome, hemodynamic instability, increasing CPK >5000 IU/L, triglycerides >500 mg/dl or use >96 hrs
*Start analgesics and sedatives at lowest dose and titrate in increments of 50% to achieve target pain and sedation goals respectively.*
References


