VANDERBILT UNIVERSITY MEDICAL CENTER

PAIN, AGITATION-SEDATION, DELIRIUM PROTOCOL

RATIONALE: Critically ill mechanically ventilated patients require analgesia and frequently sedation, to tolerate mechanical ventilation, medical procedures, reduce stress response and decrease oxygen consumption.[1] Unfortunately continuous sedative use is also associated with worsened patient outcomes including longer duration of mechanical ventilation, ICU LOS and higher rates of delirium.[2] 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[3] recommend a focus on analgesia and a reduction in use of sedative medications along with routine delirium monitoring.

Management of Pain[3]

1. Assess for pain with the Critical Care Pain Observation Tool (CPOT) in non-verbal patients and with a numeric scale in verbal patients at least every two hours.
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)[3]

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 an analgesia first approach, consider a non-benzodiazepine sedative (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[3]

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*

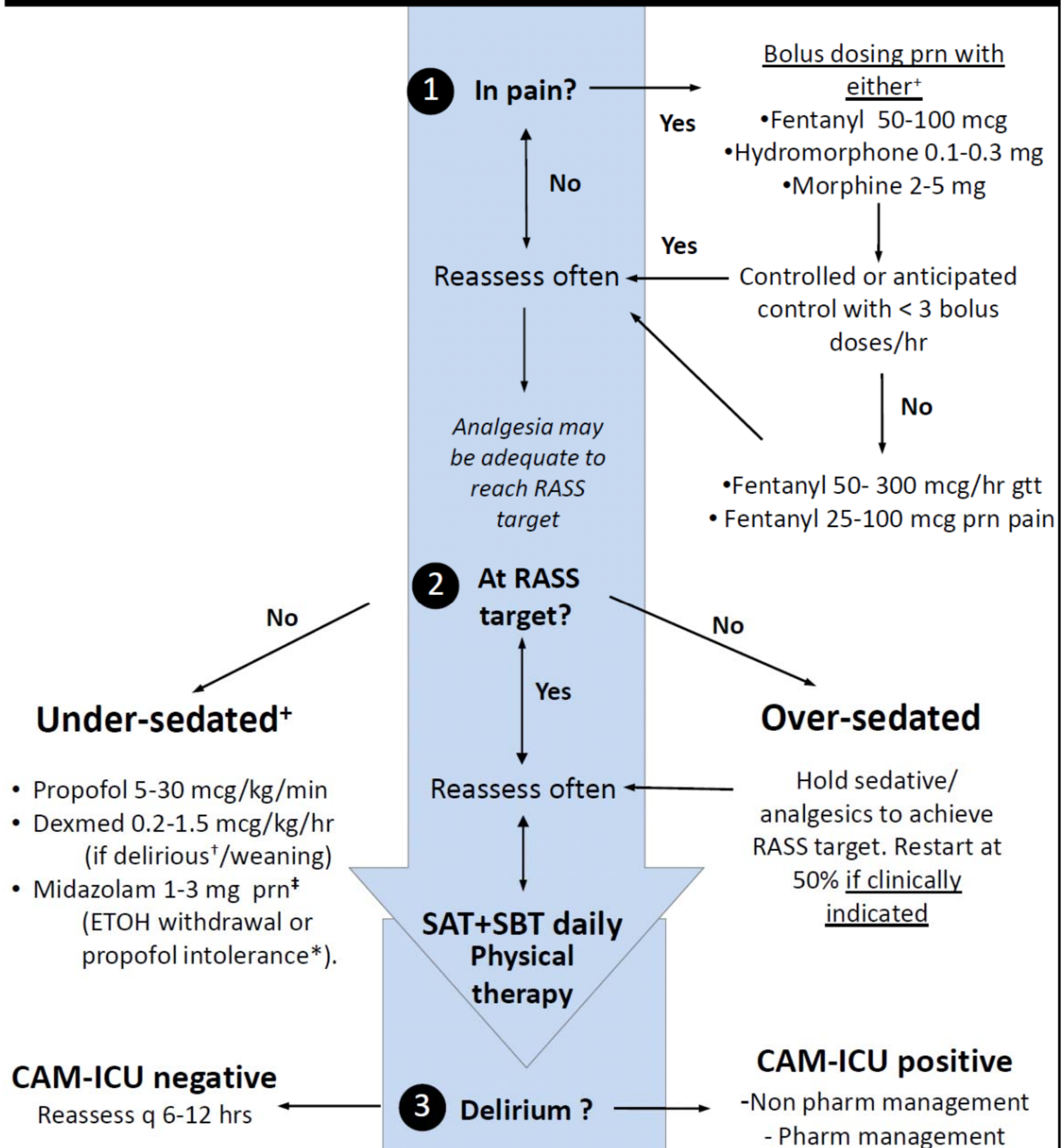
a. for severe hyperactive delirium (CAM-ICU positive and RASS +3 or +4): consider bolus propofol (if mechanically ventilated) or intravenous haloperidol to control delirium that would endanger the patient

b. for hyperactive delirium (CAM-ICU positive and RASS +1 or +2): consider scheduled or as needed (prn) intravenous haloperidol. If enteral access is appropriate, consider oral or per tube olanzapine or quetiapine and if one does not work, consider the other.

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



‡ 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.

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ICU Sedation Protocol for Ventilated Patients

Patient:ZTRAINSSS9T3 , SUSAN

Select RASS goal

Target RASS Value	RASS Description
0 Alert and Calm	
- 1 Drowsy	Not fully alert, but has sustained awakening to voice (eye opening/contact > 10 seconds)
- 2 Light Sedation	Briefly awakens to voice (eye opening/contact < 10 seconds)
- 3 Moderate Sedation	Movement or eye opening to voice (but no eye contact)
- 4 Deep Sedation	No response to voice, but movement or eye opening to physical stimulation
- 5 Unarousable	No response to voice or physical stimulation

Current Active Medications of Interest

1 Pain

Drug	Dosage
Fentanyl Intermittent	50-100mcg IVP q15 min to goal then 50-100mcg q2h prn
Hydromorphone Intermittent	0.1-0.3mg IVP q15 min to goal, then 0.1mg-1mg q2h prn
Morphine Intermittent	2-5mg IVP q15 min to goal, then 2-5mg q2h prn
If anticipating or requiring greater than 3 boluses per hour:	
Fentanyl Infusion	50-300 mcg/hr
Morphine Infusion	1-4mg/hr (avoid in patients with renal failure and hemodynamic instability)
None	

2 Sedation/Agitation

None (if RASS at goal with analgesia-based regimen)

Drug	Dosage
Propofol Infusion	10-25mg bolus, then 5-30mcg/kg/min
Dexmedetomidine Infusion	0.2-1.5 mcg/kg/hr IV x 24 hrs (if delirious/weaning)

For propofol intolerance consider one of the following:

Midazolam Intermittent	1-3mg IVP q2hrs prn
Midazolam Infusion	0.5-3 mg/hr

(Propofol intolerance refers to propofol infusion syndrome, hemodynamic instability precluding propofol use, elevated creatinine phosphokinase(CPK) > 5000 IU/L, triglycerides > 500 mg/dl, or propofol use > 96 hours)

3 Delirium (CAM-ICU+)

Drug	Dosage
CAM-ICU positive AND RASS +3 or+4	
Propofol Intermittent	15-50mg IV q 10 min prn severe agitation/combativeness
Haloperidol (prn)	1 mg IM/IV q15min prn agitation
CAM-ICU positive AND RASS +1 or +2	
Haloperidol (prn)	1 mg IM/IV q 4 hours prn
Haloperidol (scheduled)	1 mg IM/IV q6 hours (scheduled)
Olanzapine	5 mg PO/PT/SL q6 hours
Dexmedetomidine Infusion	0.2-1.5 mcg/kg/hr IV x 24 hrs

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References

1. Kress JP, O'Connor MF, Pohlman AS, et al. Sedation of critically ill patients during mechanical ventilation. A comparison of propofol and midazolam. Am J Respir Crit Care Med 1996;153:1012-8.

2. Kollef MH, Levy NT, Ahrens TS, Schaiff R, Prentice D, Sherman G. The use of continuous i.v. sedation is associated with prolongation of mechanical ventilation. Chest 1998;114:541-8.

3. Barr J, Fraser G, Ely EW, et al. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Crit Care Med. 2013 Jan;41(1):263-306

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