VANDERBILT UNIVERSITY

MEDICAL CENTER

DIVISION OF ACUTE CARE SURGERY

Surgical Intensive Care Unit Pain, Agitation-Sedation, and Delirium Practice Management Guideline

I. Purpose

To provide appropriate analgesia and sedation to our critically ill patients while reducing the risk of and managing delirium.

II. Background

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.

III. Recommendation

The Society of Critical Care Medicine's (SCCM) Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption (PADIS) Guidelines[3] recommend a focus on analgesia and a reduction in use of sedative medications along with routine delirium monitoring.

IV. 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 and/or non-opioid analgesics

Medication	Mechanism of action	Recommend use	Caution(s)
Opioids (IV)			
Fentanyl	Mu opioid receptor	Intermittent dosing • 50mcg IV q2hours prn Continuous IV infusion • 0-400mcg/hr	• Tachyphylaxis • Accumulation in obese patients
Hydromorphone	Several opioid receptors	Intermittent dosing • 0.25-0.5 mg IV q2hr prn	• Over sedation
Morphine	Mu opioid receptor	Intermittent dosing • 2mg IV q2hr prn	• Histamine release causing flushing • Renal impairment
Opioids (Oral)			
Oxycodone	Mu opioid receptor	• 5-10mg PO q4-6hr prn	• Do not exceed 3g of acetaminophen per day with combination tablets
Hydromorphone	Mu opioid receptor	• 2-4 mg PO q4-6hr prn	

Non-Opioids (Oral)			
Acetaminophen	Selective COX-2 inhibitor	• 2-3g/day divided every 6-8hrs	• Hepatotoxic – use caution in liver impairment
Robaxin	Unknown, CNS depression	• 500-1000mg IV/PO q8hr prn	• IV formulation – limit use to ≤3 days in mild renal impairment. Contraindicated in severe renal impairment.
Flexeril	Nicotinic receptors	• 5-10mg PO TID	• Over sedation
Gabapentin	Inhibits Ca channel a2d-1 subunit	• 100-900mg PO TID	• Renal dose adjustments
Ketorolac	Non-selective COX-1 and COX-2 inhibitor	• 15-30mg IV q6hr for max of 5 days	• Thrombocytopenia • Bleeding • AKI

V. 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 24 hours
3. If patients are under sedated despite an analgesia first approach, consider a nonbenzodiazepine sedative (e.g. propofol, dexmedetomidine)
4. Midazolam may 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
6. If a patient passes the safety screen, pause pain and sedation infusions to perform coupled awakening and breathing trials
6. If a patient fails the SAT/SBT, resume the pain and sedation infusions at half of the prior rate

VI. Management of Delirium[3]

1. Assess for delirium at least every 4 hours with the Confusion Assessment Method for the ICU (CAM-ICU)
2. Treat pain since pain itself can predispose patients for delirium.

<u>Non-pharmacological approach (utilize first):</u>

a. Re-orient 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

<u>Pharmacological approach:</u>

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 hyperactive delirium[4]
d. For hypoactive delirium (CAM-ICU positive and RASS 0 to -3): consider reducing sedative and other deliriogenic medication

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. https://www.sccm.org/iculiberation/guidelines
4. Reade MC, Eastwood GM, Bellomo R, Bailey M, Bersten A, Cheung B, Davies A, Delaney A, Ghosh A, van Haren F, Harley N, Knight D, McGuiness S, Mulder J, O'Donoghue S, Simpson N, Young P; DahLIA Investigators; Australian and New Zealand Intensive Care Society Clinical Trials Group. Effect of Dexmedetomidine Added to Standard Care on Ventilator-Free Time in Patients With Agitated Delirium: A Randomized Clinical Trial. JAMA. 2016 Apr 12;315(14):1460-8. doi: 10.1001/jama.2016.2707. Erratum in: JAMA. 2016 Aug 16;316(7):775. PMID: 26975647.

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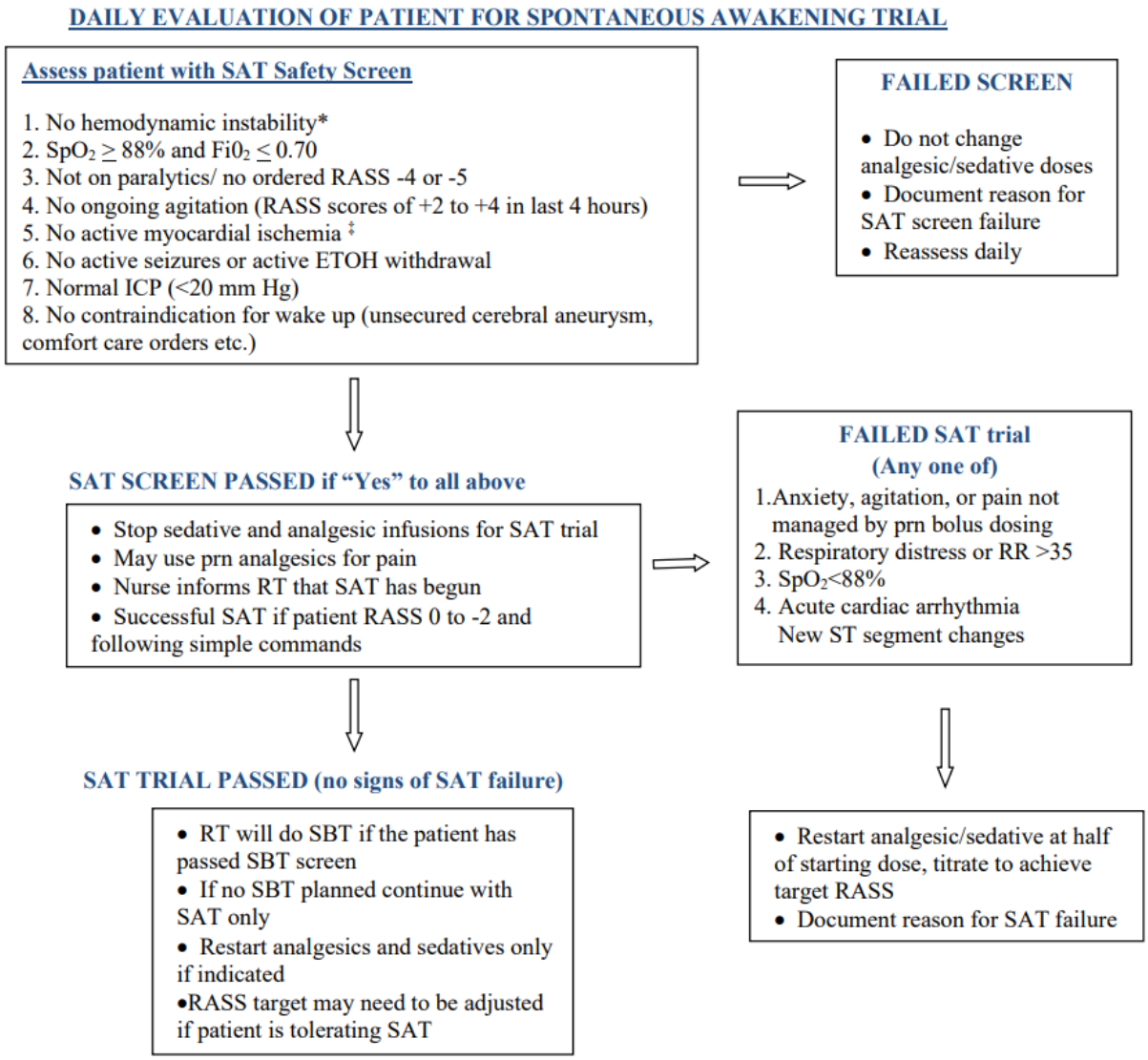
Revised July 25, 2023

Appendix

SAT/SBT Pathway



ICU Sedation Order Set