UMMC PAIN, SEDATION, AND DELIRIUM GUIDELINES FOR VENTILATED PATIENTS

All benzodiazepine continuous infusions must be approved by the Attending Physician and/or Fellow

- Initiate ABCDE approach for mechanically ventilated patients[a]
- Optimize environment and treat pain first
- Assess pain using an objective assessment tool
- Include **RASS endpoint** in sedation orders (physician only)
- Titrate sedation to appropriate RASS score (RASS zero to – 2)
- Reassess sedation goal daily
- Implement delirium prevention protocol
- Assess delirium using CAM-ICU at least twice daily
- AVOID medications that may alter mental status (e.g., diphenhydramine, anticholinergics)

Is patient comfortable and sedation at goal?

NO

- Rule out and correct reversible causes
  (e.g. re-orientation, optimize environment, patient positioning)

YES

- Perform SAT and SBT trials daily (refer to SAT and SBT protocol)
- Reassess sedation and analgesic requirements
- Maintain sedation goal with **minimal effective** dose of medications

Pain[b] — YES

Analgesic Management

First line: Fentanyl OR Hydromorphone OR Oxycodone (if enteral route available)
- Consider patient-controlled analgesia (PCA) after 48 hours of mechanical ventilation

Agitation[b] (RASS > + 1) — YES

Sedation Management

First-line: Optimize pain management (i.e., analgosedation)
First-line for severe agitation (RASS ≥ +2): Propofol[d]
- Dexmedetomidine for the following appropriate indications:
  1) Adjuvant therapy for patients when clinicians are unable to maintain RASS between zero to – 2 on propofol
  2) For patients who continue to require sedation when propofol inhibits progress toward extubation
- If agitation still not controlled, can use diazepam as needed for rescue therapy
- Avoid benzodiazepines EXCEPT in alcohol or benzodiazepine withdrawal management

Delirium[b] (CAM-ICU positive) — YES

Acute Delirium Management
- Identify causes & eliminate factors
- Consider Haloperidol[c] IV or IM or Ziprasidone IM or PO until agitation controlled (if QTc < 500 msec)

Maintenance Delirium Management[c]
- Optimize delirium prevention and use non-pharmacological therapies
  1) Intravenous (IV) option: Haloperidol (if QTc < 500 msec)
  2) Oral (PO) options: Quetiapine or Ziprasidone
  3) Intramuscular (IM) options: Haloperidol or Ziprasidone

Sleep Disturbance[b] — YES

Sleep Management
- Minimize ambient light, noise, and patient interruptions at night time (see other side for other strategies)
- If still not controlled, consider quetiapine

General Information

[a] ABCDE: awakening and breathing coordination of daily sedation and ventilator removal trials, choice of sedative or analgesic exposure, delirium monitoring, and early mobility and exercise
[b] Refer to other side for initial medication dosing recommendations. In presence of hepatic and/or renal impairment, dose adjustment should be considered
[c] Obtain baseline QTc, then daily; Use lower doses in patients > 65 years old
[d] Monitor triglyceride levels in patients receiving propofol for > 72 hours

Doses listed on prot[illegible] are for initial recommendations. Doses should be individualized per patient's clinical status.

Approved/Developed by: UMMC Sedation Comm[illegible] (Updated 7/22/12)

Initial Medication Dosing Recommendations

Pain Therapy

- Fentanyl 25 – 50 mcg IV q 1 hr PRN or Scheduled or continuous infusion 25 – 300 mcg/hr
- Hydromorphone 0.5 – 1 mg q 2 hr IV PRN or Scheduled
- Oxycodone 5 – 10 mg q 4 to 6 hr PO PRN or Scheduled
- Acetaminophen 650 – 1000 mg q 4 to 6 hr PO PRN or Scheduled (max 4000 mg/day); monitor hepatic function

Agitation Therapy

- First line: Propofol 5 – 60 mcg/kg/min infusion (no loading dose or bolus)
- Second line: Dexmedetomidine 0.2 – 1.5 mcg/kg/hr infusion (no loading dose or bolus due to concern for hypotension or bradycardia); should not be used for deep sedation
- If no response to propofol or dexmedetomidine:
  - Diazepam 2 – 10 mg IV q 15 minutes until controlled for acute agitation
  - Midazolam 2 – 5 mg IV q 15 minutes until controlled for acute agitation or 1 – 2 mg IV q 1 to 2 hr for maintenance sedation
  - Lorazepam 1 – 4 mg IV q 2 to 4 hr PRN or ATC for maintenance sedation

Delirium Therapy

- Haloperidol 1 – 10 mg IV q 2 to 6 hr; consider starting at 1 – 2.5 mg/dose for elderly patients (age > 65 years)
- Quetiapine 25 – 50 mg PO q 12 hr (max 200 mg/day)
- Ziprasidone 20 – 80 mg PO q 12 hr (max 160 mg/day) or 10 mg IM q 2 to 4 hr (max 40 mg/day)
- When appropriate, please taper and discontinue antipsychotic therapy once delirium has resolved

Sleep Non-Pharmacologic Therapy

- Normalize sleep wake cycle: open blinds, use clocks, eyeglasses/ hearing aids, reorientation, decrease ambient noise
- Aim for uninterrupted period of sleep at night
- Discourage naps

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description	
+4	Combative	Overtly combative, violent, immediate danger to staff/self	
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive	
+2	Agitated	Frequent non-purposeful movement, fights ventilator	
+1	Restless	Anxious but movements not aggressive vigorous	
0	Alert and calm		
−1	Drowsy	Not fully alert, but has sustained awakening (eye opening/eye contact) to voice (≥ 10 seconds)	Verbal Stimulation
−2	Light sedation	Briefly awakens with eye contact to voice (< 10 seconds)	Verbal Stimulation
−3	Moderate sedation	Movement or eye opening to voice (but no eye contact)	Verbal Stimulation
−4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation	Physical Stimulation
−5	Unarousable	No response to voice or physical stimulation	Physical Stimulation

Procedure for RASS Assessment

1. Observe patient
   a. Patient is alert, restless, or agitated. (score 0 to +4)
2. If not alert, state patient's name and *say* to open eyes and look at speaker.
   b. Patient awakens with sustained eye opening and eye contact. (score –1)
   c. Patient awakens with eye opening and eye contact, but not sustained. (score –2)
   d. Patient has any movement in response to voice but no eye contact. (score –3)
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.
   e. Patient has any movement to physical stimulation. (score –4)
   f. Patient has no response to any stimulation. (score –5)