ICR-SED-035
Critical care
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CRITICAL CARE ORDER SET · INTUBATED ADULTS

Sedation & Analgesia

Analgesia-first, light-sedation-by-default management of the intubated ICU patient. Treat pain before reaching for a sedative, target the lightest safe RASS, screen for delirium, and lift sedation daily. Use BIS to confirm depth when RASS can't be assessed. Adapt every threshold to your protocol and the patient.

01 Goals & sedation strategy

ANALGESIA FIRST Assess and treat **pain first** (target NRS < 4 or CPOT < 3), then add a sedative only if still agitated. **Light sedation (RASS 0 to −2)** is preferred for most ventilated adults — it shortens ventilation and ICU stay. Nonbenzodiazepines (propofol, dexmedetomidine) are preferred over benzodiazepines.

PICK A DEPTH TARGET — AND ITS INDICATION

LIGHT · RASS 0 TO −2
Default for most patients. **Dexmedetomidine** preferred.

DEEP · RASS −3 TO −4
Vent dyssynchrony, high ventilator settings, elevated ICP.

DEEPEST · RASS −5
Status epilepticus, chemical paralysis, high ICP, acute neuro injury. **Propofol + fentanyl** preferred.

NON-PHARMACOLOGIC FIRST-LINE

- [ ] Position adjustment, massage, music, relaxation techniques; reorientation, sleep hygiene, family presence

02 Assessment tools

CPOT — CRITICAL-CARE PAIN OBSERVATION TOOL (target < 3)

Indicator	0	1	2
Facial expression	Relaxed, neutral	Tense	Grimacing
Body movements	Absence of movements	Protection	Restlessness
Muscle tension	Relaxed	Tense, rigid	Very tense / rigid
Ventilator compliance (or vocalization)	Tolerating	Coughing but tolerating	Fighting ventilator

RASS

+4	**Combative** — overtly violent
+3	Very agitated — pulls lines
+2	Agitated — fights vent
+1	Restless — anxious
0	**Alert & calm**
−1	Drowsy — >10 s eye contact
−2	Light — <10 s eye contact
−3	Moderate — no eye contact
−4	Deep — moves to physical stim
−5	Unarousable — no response

CAM-ICU

Feature 1 · Acute change / fluctuation in mental status
Different from baseline, or fluctuating over 24 h

Feature 2 · Inattention
Letters test "SAVEAHAART" — > 2 errors

Feature 3 · Altered LOC
RASS ≠ 0

Feature 4 · Disorganized thinking
Yes/no questions + commands — > 1 error

Delirium = Features 1 and 2, plus 3 or 4

- [ ] Document **pain (NRS/CPOT), RASS, and CAM-ICU** at least once per shift and with every titration

03 Sedation algorithm

Agitated patient

① **In pain?** (NRS > 3 or CPOT > 2)
Yes → PRN fentanyl ×3, titrate to NRS < 4 / CPOT < 3 (analgesia-first).
Persisting → fentanyl infusion (analgesia-based sedation) + adjuncts.

↓

Delirious?

② **CAM-ICU positive?**
Yes → delirium management (Section 08). Consider scheduled benzodiazepines / phenobarbital for **ETOH withdrawal**.

↓

Still agitated

RASS 0 TO −2

RASS −3 TO −5
Propofol, titrate to RASS target

Dexmedetomidine, titrate to RASS target

TARGET NOT MET Add propofol to dexmedetomidine → add **ketamine** to dexmedetomidine or propofol → intermittent lorazepam → **midazolam infusion only after max propofol / ketamine**. Then **daily SAT/SBT**.

04 BIS monitoring

ADJUNCT Use BIS when **RASS is not assessable** (neuromuscular blockade, severe encephalopathy) or when precise titration is desired during deep / prolonged sedation. BIS is an **adjunct** — RASS and clinical exam remain primary.

DEEP SEDATION	LIGHT–MODERATE (RASS primary)
40–60	**60–80**

ORDERS

- [ ] Apply BIS sensor and start continuous monitoring; document BIS **at least hourly** and with any major sedative titration
- [ ] Titrate to achieve **both** the clinical target (RASS, synchrony, hemodynamics) **and** the BIS range (when interpretable)

DISCORDANT? If BIS and clinical exam disagree — check sensor placement, EMG artifact, and EEG signal quality; then **prioritize the clinical exam** and overall context.

05 Baseline non-opioid analgesia

- [ ] **Acetaminophen** `325–1000 mg IV/PO/NG q6h` (max 3–4 g/day; **≤ 2–3 g/day** in liver disease / heavy alcohol use)
- [ ] **Gabapentin** `100–300 mg PO/NG q8h`, titrate up to 900–3600 mg/day divided (neuropathic pain; renal adjust; do not stop abruptly)
- [ ] **Ketamine** (intermittent adjunct) `0.1–0.3 mg/kg IV` over 5–10 min PRN severe pain
- [ ] **Ibuprofen** `200 mg PO q4h PRN` (max 3200 mg/day; don't crush) — if no renal / bleeding / GI contraindication

ENTERAL OPIOIDS — MODERATE–SEVERE PAIN IN PATIENTS TOLERATING PO/NG

- [ ] **Tramadol** `50–100 mg PO q6h PRN` severe pain (max 400 mg/day; 300 mg if ≥ 75 y)
- [ ] **Hydrocodone-acetaminophen** `5-325 mg, 1–2 tab PO q6h PRN`, or **oxycodone-acetaminophen** 1–2 tab PO q6h PRN (count toward acetaminophen max)

06 Opioid analgesia — choose one primary

Fentanyl · preferred first-line

- [ ] **PRN bolus** — `25–50 mcg IV q10–15 min` for pain / dyssynchrony; use first for up to **3 doses** to reach CPOT < 3
- [ ] **Infusion** (20 mcg/mL) — start `50 mcg/h`, titrate `25 mcg/h q15 min`; range `0–200 mcg/h`. When > 100 mcg/h to meet RASS, add a sedative
- [ ] **Hold / reduce** if RASS ≤ –3 without distress, `RR < 8/min`, or acute hypotension. Patient must remain intubated (or weaning post-extubation)

Hydromorphone · alternative

- [ ] Bolus `0.2–0.4 mg IV q2–4h PRN`; infusion start `0.2–0.6 mg/h`, titrate 0.1–0.2 mg/h. Caution in renal / hepatic impairment

Morphine · less preferred

- [ ] Bolus `2–4 mg IV q2–4h PRN`; infusion start `2–4 mg/h`, titrate 1–2 mg/h. Avoid in renal dysfunction / instability

Remifentanil · for frequent neuro checks or multiorgan failure

- [ ] Infusion `0.5–15 mcg/kg/h` (no bolus needed; use IBW in obesity). Ultra-short-acting, ester-metabolized — no accumulation in renal / hepatic impairment, prompt offset

07 Primary sedative infusions

Dexmedetomidine · preferred for light sedation, delirium, extubation

- [ ] **No bolus.** Start `0.2–0.3 mcg/kg/h`, increase `0.1–0.2 mcg/kg/h q15–30 min`; usual `0.2–1.2 mcg/kg/h` (max 1.4). Wean 0.1 mcg/kg/h q15 min to lowest effective rate
- [ ] Watch **bradycardia / hypotension**; caution in conduction disease. BIS less useful — expect higher BIS for a given RASS (patient arousable); **RASS primary**

Propofol · first-line if hemodynamics allow; deep sedation

- [ ] Start `20 mcg/kg/min`, titrate `5–10 mcg/kg/min q3–5 min`; usual `5–50` (up to **75 for RASS −5**). Bolus generally avoided in unstable patients (10–20 mg IV q1–2 min only if necessary)
- [ ] For deep sedation titrate to **BIS 40–60** + clinical target. Wean 5–10 mcg/kg/min q2h; after SBT restart at half prior rate. Change infusion / tubing / cap **q12h**
- [ ] Monitor BP/HR (vasopressor support PRN); **triglycerides q2–3 days**; watch **propofol infusion syndrome** (acidosis, rhabdo, cardiac failure) at high dose / prolonged use

Midazolam · deep / refractory agitation — minimize duration

- [ ] Bolus `1–2 mg IV q5–15 min PRN`; infusion start `1 mg/h`, increase 1 mg/h q15 min; usual `1–10 mg/h`. Deep sedation → BIS 40–60 + clinical target
- [ ] **Use only after maximizing other sedatives.** If ordered with propofol, **wean midazolam first**. Accumulates / deliriogenic — caution in elderly, hepatic / renal impairment

08 Second-line adjuncts & delirium

Ketamine infusion

- [ ] Optional bolus `0.1–0.5 mg/kg IV` over 5–10 min. Start `5 mcg/kg/min`, titrate 2.5 mcg/kg/min q15 min — analgesic `0.1–0.3 mg/kg/h`, sedative `0.3–1 mg/kg/h` (max ~20 mcg/kg/min)
- [ ] **May raise BIS** (EMG / cortical activation) — interpret cautiously. Watch hypertension, tachycardia, psychomimetic effects

ANTIPSYCHOTICS — HYPERACTIVE DELIRIUM (NOT PRIMARY SEDATIVES)

Haloperidol
`2–5 mg IV q4–6h PRN`; 1–2 mg q15–30 min for severe agitation. Monitor QTc

Quetiapine
`25–50 mg PO/NG qHS`, may add q8–12h

Olanzapine
`2.5–5 mg PO/NG qHS`, titrate to 5–10 mg/day

09 PRN rescue & titration logic

BREAKTHROUGH

- [ ] **Pain** — fentanyl **25–50 mcg IV q10–15 min PRN**; if ≥ 3 PRN in 1–2 h, increase basal by 25 mcg/h
- [ ] **Agitation** — midazolam **1–2 mg IV q15 min PRN** (max 10 mg/h); review RASS, pain, BIS, metabolic / respiratory status, reversible causes
- [ ] **Severe agitation / danger** — midazolam **2–4 mg IV once** and/or haloperidol **5–10 mg IV once**, then reassess and adjust the continuous regimen

BIS-based titration — deep sedation

- [ ] **BIS > 60** & deeply sedated / vent-unsafe — confirm signal quality, then ↑ propofol **5–10 mcg/kg/min** or midazolam **1–2 mg/h**
- [ ] **BIS < 40** & RASS ≤ −4, hemodynamics OK — ↓ propofol 5–10 mcg/kg/min or midazolam 1–2 mg/h
- [ ] **Discordant** (BIS low but agitated) — reassess electrode placement, EMG interference, neuro status; **prioritize the clinical picture**

10 Special situations

Alcohol / benzodiazepine withdrawal

- [ ] **Lorazepam** (symptom-triggered) **1–4 mg IV q15–30 min PRN** withdrawal signs; may add midazolam infusion and/or dexmedetomidine. Consider scheduled benzodiazepines / phenobarbital
- [ ] BIS unreliable — EMG / withdrawal movement may artifactually elevate BIS; **rely on clinical scoring**

Neuromuscular blockade

MANDATORY Do **not** start or continue NMB without active analgesia and **deep sedation**. BIS monitoring is **mandatory when RASS is not assessable** — target **BIS 40–60**.

- [ ] Before / during NMB — fentanyl typically **100–200 mcg/h** + propofol **20–50 mcg/kg/min** and/or midazolam infusion to deep sedation
- [ ] Check BIS **q15–30 min** during initiation / titration, then hourly; document BIS & sedative doses with each NMB dose / adjustment

11 Daily management, SAT & weaning

DAILY REVIEW

- [ ] Reassess pain, RASS, delirium, BIS trend, and drug doses; **reduce sedative** if RASS < −2 or BIS persistently < 40 without indication

SPONTANEOUS AWAKENING TRIAL (SAT)

- [ ] **Criteria** — hemodynamically stable, no active seizures, not requiring continuous deep sedation or NMB
- [ ] Hold sedative infusions (continue opioid at reduced dose if needed); continue BIS but prioritize RASS. If severely agitated / hypoxic / unstable — **restart at 50–75% prior rate**

PRE-EXTUBATION

- [ ] Aim for light sedation — consider bridging to **dexmedetomidine `0.2–0.7 mcg/kg/h`**; BIS may be discontinued when clinical exam is reliable and only light sedation targeted

12 Standard safety & monitoring orders

- [ ] Continuous cardiac monitoring & pulse oximetry
- [ ] Capnography when high-risk or deeply sedated, if available
- [ ] Periodic **ECG / QTc** on antipsychotics or other QT-prolonging agents
- [ ] BP **`q15 min`** during sedation changes, then per ICU standard
- [ ] Daily CMP, CBC; **triglycerides q2–3 days** on high-dose / long-term propofol
- [ ] Document **RASS, pain, delirium, and BIS** (if used) at defined intervals and with any titration