Propofol Continuous Infusion Protocol

Scope: Prescribers, Nurses and Pharmacists

Population: Intubated /trached and mechanically ventilated patients

Outcome: Safe administration (boluses/continuous infusion/dose titration), documentation of associated monitoring and response to propofol therapy (RASS)

Protocol:
Criteria for use/indication
Propofol infusion is to be used per protocol for:
1. Sedation in INTUBATED patients who ARE candidates for daily sedation interruption or frequent awakening for neurological assessment.
2. Short term sedation in any other INTUBATED patients who demonstrate agitation or continued bronchospasm.

If propofol is intended for emergency airway management; bolus doses may be administered by an RN outside of this protocol as prescribed under the direct supervision of a provider who is credentialed in advanced airway management/intubation.

Note: Propofol should not be used as a single agent for acute agitation. When a patient is agitated, identify and treat underlying physiological disturbances, such as pain/discomfort, anxiety, delirium, hypoxemia, hypoglycemia, hypotension, and withdrawal from alcohol and other drugs.

Propofol should not be used as an antihypertensive agent.

Contraindications/Precautions:
1. Absolute Contraindication: Known allergy to propofol emulsion or any of its components (ex: soybean oil, glycerol, egg lecithin, disodium edetate) and patients whose airways are not protected by tracheostomy or endotracheal tube (ETT) connected to mechanical ventilator except as noted above for emergency airway management.
2. Relative Contraindication: Hyperlipidemia [baseline triglyceride (TG) > 500 mg/dL] and acute pancreatitis.
3. Precautions:
   a. In patients with status epilepticus or history of epilepsy, convulsive seizure-like activities may occur during withdrawal of propofol.
   b. Patients with head injuries on long-term sedation with propofol at doses higher than 5 mg/kg/hr (approximately 80 mcg/kg/min) may be at increased risk for propofol infusion syndrome {unexplained metabolic acidosis, increased lactate, creatinine kinase (CK) or vasopressor need, renal dysfunction, and cardiovascular collapse}

Prescriber Responsibilities:
1. Determine the depth/level of sedation that is required based on the patient’s clinical condition using Richmond Agitation-Sedation Scale (RASS).
2. Order baseline triglyceride level within 24 hours of initiation of propofol infusion, followed by levels once weekly for TG level < 265 mg/dL and twice weekly for TG level 265 – 500 mg/dL.
3. Order propofol protocol:
   a. Choose a starting dose between 2.5 and 20 mcg/kg/min based on total body weight or continuation of current dose on admission
   b. Choose a reason for use (Sedation)
   c. Choose the titration parameter (RASS)
   d. Choose the RASS range for titration (provider selects this based on patient condition)
   e. Choose a maximum dose for titration (maximum dose is 75 mcg/kg/min except for neurotrauma patients who may require up to 100 mcg/kg/min)
4. Assess patients for Sedation Hold/Interruption and Weaning Protocol (“Wake-up and Breathe”) at least once daily. Patient requiring frequent neurological assessment should be awakened and assessed per the specific ICU order.
5. Order additional medications as needed to treat physiologic cause of agitation, i.e. opioid analgesics for pain/discomfort, low dose midazolam or lorazepam for anxiety and neuroleptics for delirium.

Nursing Responsibilities:
1. Disinfect the bottle’s rubber stopper with 70% isopropyl alcohol prior to spiking it with the IV tubing. Use sterile vented tubing (do not add needle to vent the bottle).
2. Infuse via a dedicated, new IV site whenever possible
3. Initiate the propofol protocol:
   a. Start continuous IV infusion at the prescribed dose
   b. If the RASS is higher than the range that’s ordered 5 minutes after the initiation, titrate the infusion up by 5 mcg/kg/min for ≤ 70 kg or 10 mcg/kg/min for ≥ 71 kg
   c. Continue to titrate up no more frequent than every 5 minutes until the ordered RASS is achieved.
d. If bolus dose is required to calm patient until agitation can be assessed (Rapid Tranquilization) or for respiratory or ventilation difficulties, administer ordered propofol bolus 10 mg (1 mL) for moderate (RASS $\geq +1$) agitation/respiratory difficulties or 20 mg (2 mL) for severe (RASS $\geq +2$) agitation/respiratory difficulties every 5 minutes until desired effect is achieved.

e. Administer bolus of propofol via the pump only and not directly from the propofol bottle.

f. Assess the need for analgesia and other sedatives as adjuncts to improve sedation level.

g. If the ordered maximum dose is reached and ordered RASS is not achieved, notify prescriber.

h. Monitor the patient’s respiratory and hemodynamic status after initiation and during titration. Notify prescriber for changes in patient condition.

i. Maximum dose is 75 mcg/kg/min for all patients except neurotrauma patients for whom a maximum dose of 100 mcg/kg/min may be ordered.

4. Document RASS score and the propofol dose every four hours on the critical care flow sheet.

5. Document RASS score before and after bolus doses and titration of dose up or down.

6. Change tubing and bottle every 12 hours or more frequently to prevent bacterial growth.

7. If a patient’s RASS is less than ordered, titrate infusion down to achieve/maintain the ordered RASS score. For post-operative patients admitted to unit with propofol infusing, dose adjustments should not be made until evidence of emergence from general anesthesia is evident.

8. Draw triglyceride level as prescribed

9. Monitor patients closely for rebound agitation, confusion, jitteriness, hallucinations, tremors, twitching and seizures (especially during initiation or weaning) and notify prescriber.

**Pharmacist Responsibilities**

1. Monitor weekly TG levels. Recommend twice weekly levels for patients with TG level $\geq 265$ mg/dL. Recommend discontinuation of propofol for patients with TG level $> 500$ mg/dL.

**Weaning of Propofol:**

1. Patients continuously administered propofol for less than 7 days may have propofol discontinued without a taper or weaned off over a few hours.

2. Patients on propofol and who meet the inclusion criteria for Sedation Hold/Interruption and Weaning Protocol (“Wake-up and Breathe”) should be weaned per the protocol.

3. Patients who require frequent awakening for neurological assessment may have their propofol infusion interrupted without a taper.
4. Patients who did not meet inclusion criteria for Wake-up and Breathe and were administered low to moderate doses (< 50 mcg/kg/min) of propofol for ≥ 7 days require a slow weaning over a few hours.
   a. When ready to actively awaken and wean the patient, decrease dose by up to a maximum of 10 mcg/kg/min every 60 minutes or as specified by ICU prescriber until patient awakens to desired RASS score or discontinuation of propofol infusion.
   b. Propofol may be discontinued once at 5 mcg/kg/min.

5. Patients administered high doses of propofol (>50 mcg/kg/min) for ≥ 7 days require a weaning over 24 hours.
   a. When ready to actively awaken and wean the patient, decrease dose by up to a maximum of 10 mcg/kg/min every 3 hours.
   b. Propofol may be discontinued once at 5 mcg/kg/min.

Indication for discontinuation of propofol:
1. Triglyceride is > 500 mg/dL
2. New onset pancreatitis with hyperlipidemia
3. Propofol infusion syndrome (see page 2)

Nutritional Consideration:
1. Calorie load of 1.1 kcal/mL and lipid load should be taken into account in patients receiving nutritional support (TPN & enteral feeding).

Key Word Search: Diprivan, Propofol, Sedation, ED/ICU sedation, RASS, agitation
Appendix 1

**Richmond Agitation Sedation Scale (RASS)**

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
<td>Overtly combative or violent; immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very agitated</td>
<td>Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Frequent non-purposeful movement or patient-ventilator dyssynchrony</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious or apprehensive but movements not aggressive or vigorous</td>
</tr>
<tr>
<td>0</td>
<td>Alert and calm</td>
<td>Calm, awakens easily, follows command</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice</td>
</tr>
<tr>
<td>-2</td>
<td>Light sedation</td>
<td>Briefly (less than 10 seconds) awakens with eye contact to voice</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate sedation</td>
<td>Any movement (but no eye contact) to voice</td>
</tr>
<tr>
<td>-4</td>
<td>Deep sedation</td>
<td>No response to voice, but any movement to physical stimulation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td>No response to voice or physical stimulation</td>
</tr>
</tbody>
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**Sedation Assessment with RASS “3 steps, 30-60 seconds”**

1. Observe patient
   - Is patient calm and alert? (Score 0)
   - Is patient restless or agitated (Score +1 to +4)
     - Overtly combative, violent, immediate danger to self & staff (+4)
     - Pulls or removes tubes/catheters, or aggressive behavior towards staff (+3)
     - Frequently non-purposeful movement, or fights ventilator (+2)
     - Anxious, apprehensive but movements not aggressive or vigorous (+1)

2. If patient is not alert, in a loud voice state patients’ name and direct patient to open eyes and look at the speaker. Repeat once if necessary and prompt patient to continue looking at the speaker (Score -1 to -5)
   - Eye opening + eye contact for > 10 sec (Score -1)
   - Eye opening + eye contact for < 10 sec (Score -2)
   - Any movement but no eye contact (Score -3)

3. If no response to voice, physically stimulate patient by shaking shoulder, then rub sternum if no response to shaking of shoulder
   - Any movement to physical stimulation (Score -4)

No response to voice or physical stimulation (Score -5)