



Indications for Procedural Sedation
 Any procedure that cannot be accomplished with patient's current level of cooperation or pain tolerance.

Examples:

- Nonemergent chest tube placement
- Cardioversion
- I&D
- Laceration repair
- Fracture or joint dislocation reduction
- Pediatric foreign body removal
- Imaging

Airway Risk Assessment
 See [Intubation guideline](#) for resources.

High-Risk History

- Stridor
- Obstructive sleep apnea
- Hx Trisomy 21
- Dysmorphic facial features
- Active respiratory tract infection
- Hx of difficult intubation
- Hx of cervical spine pathology

Exam

- Check that patient can open mouth fully and that TMJ function is normal.
- Look for micrognathia, loose teeth, dental appliance, and craniofacial abnormalities.
- Check that patient is able to extend neck >70°.
- Determine Mallampati Score and check 3-3-2 rule (in adults).

Expected Sedation Risk Level
 Airway Risk Assessment combined with expected depth of sedation should guide level of rescue preparation.

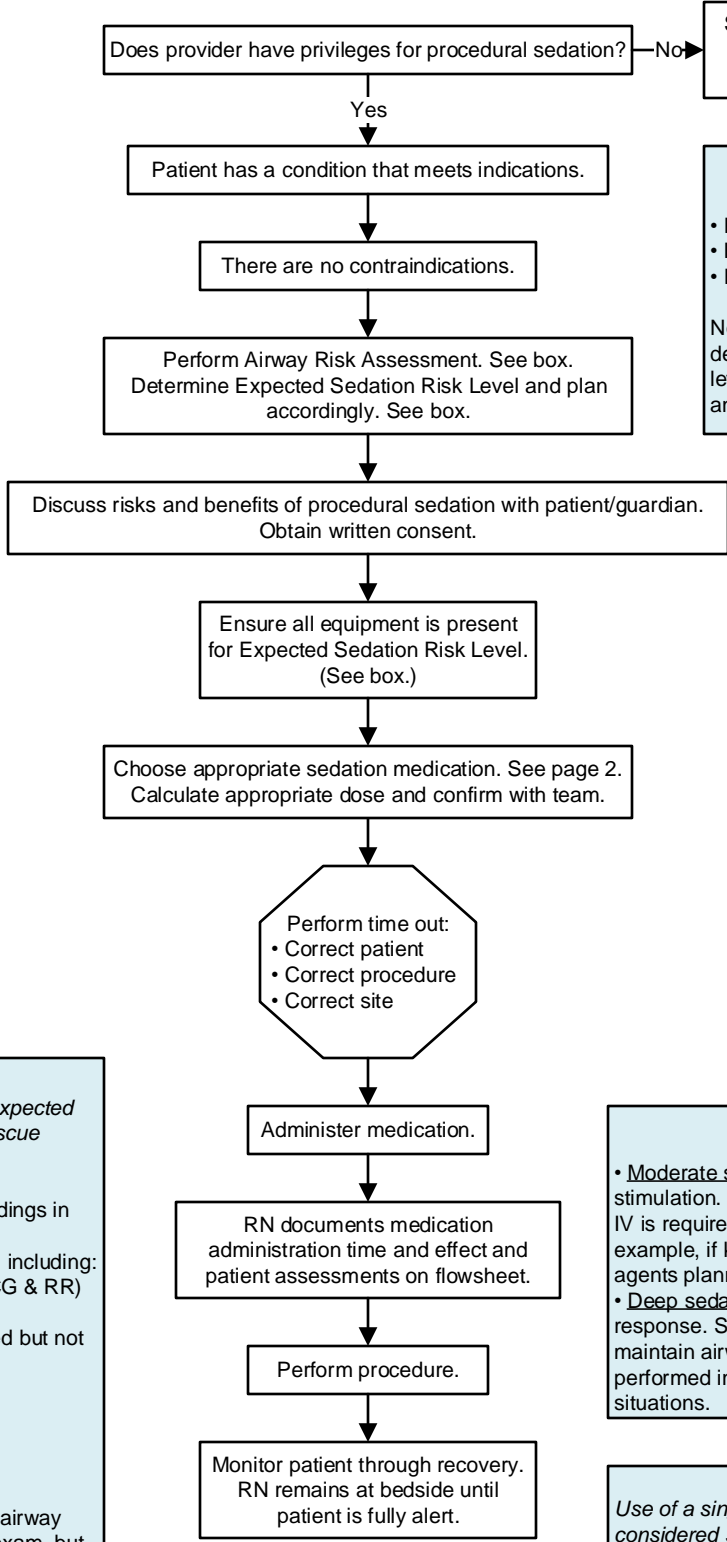
1. **No risk factors present:** No high risk findings in airway assessment and exam, ASA I-II.
 Plan: standard monitoring and equipment, including:

- Cardiopulmonary monitor (three lead ECG & RR)
- Pulse-oximetry
- Supplemental oxygen should be prepared but not given unless otherwise indicated.
- BVM in room.
- Suction.
- End-tidal CO₂ monitor
- Reversal agents in room.

2. **Risk factors present:** some concern for airway status based on airway assessment and exam, but patient not expected to decompensate, and benefits of sedation outweigh risks.
 Plan: discuss risks with patient/caregiver.
 In addition to standard monitoring and personnel, the following must also be present:

- A healthcare provider dedicated to airway management (preferably an RT)
- Oral airway – correct size open and at bedside
- Nasal trumpet – correct size open and at bedside
- BVM with appropriately-sized mask should be open and prepared at bedside

Note: Consider CRNA at bedside.



Seek out colleague with privileges or Page CRNA on call.

Contraindications

- Patient or caregiver refusal
- Hemodynamic instability
- Respiratory distress

Note: if benefits of procedure outweigh risk despite contraindications, refer to higher level of care or consult a local airway expert and discuss risks with patient/caregiver.

Note: Per ACEP, NPO times should not affect decision-making about procedural sedation.

Levels of Sedation

- **Moderate sedation:** patient responds to light tactile stimulation. Spontaneous ventilation is adequate. An IV is required only if IV medication is to be given. (For example, if ketamine is to be given IM with no IV agents planned, an IV is not necessary.)
- **Deep sedation:** noxious stimuli are required to elicit a response. Spontaneous ventilation and ability to maintain airway may be impaired. Not routinely performed in the ED outside of life-threatening situations.

Other Scenarios
 Use of a single, non-dissociative agent is not considered sedation. This protocol does not apply to the following:

- Anxiolysis with a benzodiazepine: patient may be drowsy but responds appropriately to verbal commands.
- Analgesia with opioids: pain control with intact decision-making.

This guideline is designed for the general use of most patients but may need to be adapted to meet the special needs of a specific patient as determined by the medical practitioner. Approved by MSEC 4/6/21. Click [here](#) to see the supplemental resources for this guideline. If comments about this guideline, please contact Tara_Lathrop@ykhc.org.



Agent	Bolus Dose	Titration Dose	Onset	Duration	Reversal Agent	Comments
Etomidate	<p><u>Patients >10 years:</u> 0.2 mg/kg</p> <p><u>Patients ≤10 years:</u> 0.2 mg/kg (0.1-0.3 mg/kg) Slow IV push over 30-60 seconds.</p>	<p>0.05 mg/kg Q3-5 min</p> <p>0.05 mg/kg Q3-5 min</p>	<p>30-60 seconds</p> <p>30 seconds</p>	<p>3-5 minutes</p> <p>2-10 minutes</p>	Time	<ul style="list-style-type: none"> No analgesic effect. Use IBW if BMI>30. Consider lower dose (0.1 mg/kg) for age >60 years, concurrent opioids, or if recent alcohol use. Administer via larger vessel. (antecubital or larger). Precautions: 30% have myoclonus with transient skeletal/eye movements.
Ketamine	<p><u>Adults:</u> 1-2 mg/kg IV over 1-2 min</p> <p>4-5 mg/kg IM</p> <p><u>Children >3 mo:</u> 1-2 mg/kg IV over 1 min</p> <p>4-5 mg/kg IM</p> <p>5 mg/kg PO</p>		<p>30 seconds</p> <p>3-4 min</p> <p>30-120 seconds</p> <p>5-10 min</p> <p>20-45 min</p>	<p>10-20 min</p> <p>20-30 min</p> <p>20-60 min</p> <p>30-90 min</p> <p>60-120 min</p>	<p>Time</p> <p>• For laryngospasm: Succinylcholine 0.25-0.5 mg/kg IV or 3-4 mg/kg IM</p>	<ul style="list-style-type: none"> Local anesthetic (eg. lidocaine) can increase effective duration. Consider lower dose range for >60 years, concurrent opioids/alcohol. Consider dosing by adjusted body weight if BMI>30. Precautions: emergence reactions (treat with benzodiazepines), nausea/vomiting (pre-treat with ondansetron), transient increase in salivation. Contraindications: pregnancy, age <3 months.
Propofol	<p><u>Patients >2 yrs:</u> IV load 0.5-1 mg/kg</p> <p><u>Children 6 mos – 2 yrs:</u> IV load 1-2 mg/kg</p>	<p>Repeat 0.1-0.3 mg/kg Q30-60 seconds</p> <p>Repeat 0.1-0.3 mg/kg Q30-60 seconds</p> <p>Max cumulative dose 3 mg/kg</p>	<p>30-60 seconds</p>	<p>3-10 min</p>	Time	<ul style="list-style-type: none"> No analgesia. Consider low dose for age >60, concurrent opioids/alcohol. Consider dosing by adjusted body weight if BMI>30. Separate administration of opioid and propofol by >20 minutes to decrease respiratory depression. Pre-oxygenate with high flow supplemental oxygen at least 3 minutes prior to procedure. Precautions: burning sensation during administration, hypotension, ↓CO, or bradyarrhythmias. High risk of respiratory depression/failure. Contraindications: allergies to egg, soybean, fat emulsion.
Morphine	<p><u>Adults:</u> 1-4 mg IV</p> <p>10 mg PO</p> <p><u>Pediatrics:</u> 0.05-0.1 mg/kg IV Max 4 mg</p>		<p>5-10 min IV</p> <p>30 min PO</p> <p>5-10 min</p>	<p>3-5 hours</p> <p>2-3 hours</p>	<p>Naloxone 0.1 mg/kg IV. May repeat Q2 minutes.</p>	<ul style="list-style-type: none"> Reduce dose when combining with a benzodiazepine. As opioids provide sedation and analgesia, administer them prior to benzodiazepines.
Fentanyl	<p><u>Adults:</u> 0.5 mcg/kg if given with other sedatives</p> <p>0.5-1 mcg/kg Max 100 mg</p> <p><u>Pediatrics:</u> 1 mcg/kg IV up to 50 mcg/dose</p>	<p>May repeat dose Q2min until desired sedation and analgesia achieved</p>	<p><1 min</p> <p>3-5 min</p>	<p>30-60 min</p>	<p>Naloxone 0.1 mg/kg IV. May repeat Q2 minutes.</p>	<ul style="list-style-type: none"> Reduce dose when combining with a benzodiazepine. As opioids provide sedation and analgesia, administer them prior to benzodiazepines.
Midazolam	<p><u>Adults:</u> 2-5 mg IV</p> <p><u>Pediatrics (6 mos - 12 yrs):</u> 0.2-0.3 mg/kg/dose IN</p> <p>0.05 mg/kg IV</p>	<p>May repeat dose Q2min until adequate sedation. Max 0.3 mg/kg.</p> <p>May repeat dose Q5min until max dose of 0.5 mg/kg is reached. Age <5 max 6 mg; age >5 max 10 mg.</p>	<p>3-5 min</p>	<p>15-20 min</p>	<p>Flumazenil 0.01 mg/kg (up to 0.2 mg) IV over 15 seconds. May repeat Q1 minute.</p>	<ul style="list-style-type: none"> No analgesia. Consider lower dose range for >60 years, concurrent opioids/alcohol. Watch for dose-related hypotension.

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