A Quick Reference to the Advocate System Sedation Policy
*This information is meant as a guideline only and not a substitute for physician order or clinical judgment

Introduction:
This Pediatric Emergency Medicine guideline serves as a quick reference to Advocate’s System Sedation Policy. The purpose of sedation in the ER is to manage pain, anxiety and limit excessive movement. It is important to utilize non-pharmacologic approaches such as child life, swaddling, distraction as well as topical anesthetics when performing a sedation. By employing non-pharmacologic adjuvants with sedation medication, you can minimize side effects by utilizing the lowest effective dose.

The Advocate System Sedation Policy, as well as all appropriate references, can be found here: https://advocatedocumentsystem.policymedical.net/policymed/anonymous/docViewer?stoken=d297d8fc-9d67-4cc2-879a-7c51fd49834e&dtoken=56934db0-715e-4dae-87d9-0eddcde863eb

History:
The general health of each patient undergoing sedation needs to be considered. With special consideration of past personal and family history of adverse events related to sedation. When possible clinician to should obtain the following histories:

- Adverse events with anesthesia or sedation
- Allergies
- Current medications
- History of upper airway problems, snoring, or OSA
- Heart or lung diagnoses including asthma
- Current or recent viral illness
- ROS focused on pulmonary, cardiac, renal and hepatic function
- Developmental delays
- Craniofacial abnormalities
- Last oral intake
PHYSICAL STATUS CLASSIFICATION OF THE AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA)

<table>
<thead>
<tr>
<th>Status</th>
<th>Disease State</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>No organic, physiologic, biochemical, or psychiatric disturbance</td>
</tr>
<tr>
<td>II</td>
<td>Mild to moderate systemic disturbance that may or may not be related to the reason for surgery. <em>(Examples include Mild asthma, well-controlled diabetes)</em></td>
</tr>
<tr>
<td>III*</td>
<td>Severe systemic disturbance that may or may not be related to the reason for surgery. <em>(Examples include heart disease that limits activity, poorly controlled essential hypertension, diabetes mellitus with complications, chronic pulmonary disease that limits activity)</em></td>
</tr>
<tr>
<td>IV*</td>
<td>Severe systemic disturbance that is life-threatening with or without surgery. <em>(Examples include congestive heart failure, advanced pulmonary, renal or hepatic dysfunction)</em></td>
</tr>
<tr>
<td>V*</td>
<td>Moribund patient who has little chance of survival but is submitted to surgery as a last resort (resuscitative effort). <em>(Examples include cerebral trauma, pulmonary embolus)</em></td>
</tr>
</tbody>
</table>

*Anesthesia consultation recommended for ASA Class III or above.*

**Physical Examination:**
Physical exam should be focus on upper airway, lungs cardiovascular system and baseline neurologic exam

1. Upper airway- assess Mallampati classification, dentition, neck mobility, tonsillar hypertrophy and craniofacial abnormalities
   - Habitus- body mass index >35, micrognathia
   - Head and Neck- short neck, limited neck extension, decreased hyoid-mental distance (<3 fingers in an adult size patient), tracheal deviation or dysmorphic facial features
   - Mouth- decreased mouth opening, loose teeth, high arch palate, macroglossia, tonsillar hypertrophy
     - 0: Tonsils fit within the tonsillar fossa (not depicted in picture below)
     - 1+: Tonsils <25% of the pharyngeal space
     - 2+: Tonsils <50% of the pharyngeal space
     - 3+ Tonsils <75% of the pharyngeal space
     - 4+ Tonsils > 75 % of the pharyngeal space, “kissing tonsils”

*Tonsillar hypertrophy greater than 2+ has been associated with increased risk of airway obstruction*
2. Jaw: micrognathia, retrognathia, trismus

3. Mallampati classification:

- Class I – the entire tonsillar pillars are visualized
- Class II- the uvula but not the tonsillar pillars are visualized
- Class III- only part of the uvula and soft palate are visualized
- Class IV- only the hard palate is visualized
For patient is a Mallampati of 3 or greater may consider consultation for anesthesia or decrease level of intended sedation

- Lungs: work of breathing, lung sounds
- Heart: heart tones and peripheral perfusion
- Neurologic status- baseline mental status, ability to control airway, muscle tone and signs of focal neurologic problems

NPO Status:

- The ED physician will utilize ACEP guidelines for NPO after carefully assessing the risk to benefit based on each individual patient and type of procedure to be performed as well as the depth of sedation to be achieved. NPO status is documented on the ED sedation record by the RN. References for ACEP guidelines for Sedation and NPO status are provided at the end of this guideline for ease of access.

Pre-Procedure:

- Informed consent – please note for deep sedation a second page, the anesthesia consent is required
  - For infants in a backward facing car seat the recommendation is for there to be two responsible adults for the drive home. One adult to drive and one to sit in the backseat with patient
- Urine Pregnancy Test for all patients ≥10 years of age
- Obstructive Sleep Apnea screening for all patients ≥ 2 years of age
- Equipment, SOAPME:
  - S Suction- size appropriate suction catheters, and functioning suction apparatus
  - O Oxygen- adequate oxygen supply, and functioning flow meters or other devices to allow for its delivery
  - A Airway – size appropriate airway equipment, nasopharyngeal and oropharyngeal airways, laryngoscope blades, endotracheal tubes, stylets, facemask, bag-valve-mask
  - P Pharmacy- sedation medications, sedative antagonist, medication for emergency resuscitation
  - M Monitors – ECG, Pulse Ox, B/P, ETCO2
  - E Extra equipment – special equipment or medications for a particular case (e.g., defibrillator)
- Sedation Record- the physician will sign the top of the form and mark off all the appropriate areas including ASA classification, sedation plan and affirmation that patient is suitable for sedation
- It is important to utilize non-pharmacologic approaches such as child life, swaddling, distraction, as well as topical anesthetics when performing a sedation. By employing non-pharmacologic adjuvants with sedation medication, you can minimize side effects by using the lowest effective dose.
Intra-procedure:
- Monitoring should be continuous and documented on the procedural sedation short form every 5 mins

Post-procedure:
- Monitoring every 15 minutes for minimum of 30 minutes and until patient returns to baseline
- For deep sedation, a post-procedure note is required by CMS guidelines. It should be clearly documented as post sedation note. Requirements include but not limited to:
  - Respiratory function, including respiratory rate, airway patency, and oxygen saturation
  - Cardiovascular function, including pulse rate and blood pressure
  - Mental status
  - Temperature
  - Pain
  - Nausea and vomiting
  - Postoperative hydration
- Intraservice time (billable time) should be documented on the procedure record. This represents physician face to face time only.

Discharge Criteria:
- It is important to ensure that a patient is not under the effects of any sedating medications prior to discharge as to avoid an adverse event. As such, the child should be alert and their vital signs should be at baseline. Further, they should be able to talk and sit upright without issue. Ambulatory children should be able walk with assistance without dizziness. Medication induced vomiting should be controlled and a child should be able to tolerate oral liquids. They should be discharged into the care of a responsible adult. Finally, clear discharge instructions should be given to facilitate anticipatory guidance for care at home.
**Overview of Medications:**
Please note when choosing sedation medication physician should consider the length of procedure and the degree of discomfort/pain with the procedure

**Sedative Anxiolytic Drugs**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Route</th>
<th>Dose</th>
<th>Onset</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>Midazolam (Versed®)</td>
<td>IV</td>
<td>0.05-0.1mg/kg Max 2mg</td>
<td>&lt; 60 secs</td>
<td>Sedative agent without analgesic properties. Short-acting benzodiazepine (15-30 minutes)</td>
</tr>
<tr>
<td>Midazolam (Versed®)</td>
<td>PO</td>
<td>0.25-0.5 mg/kg Max 10mg</td>
<td>15-30 mins</td>
<td>Sedative agent without analgesic properties. It has a bitter taste and may be difficult to administer</td>
</tr>
<tr>
<td>Midazolam (Versed®)</td>
<td>IN</td>
<td>0.2-0.4 mg/kg Max 10mg</td>
<td>10-15 mins</td>
<td>Sedative agent without analgesic properties. Due to the Ph of preparation recommend utilizing a MAD device for administration</td>
</tr>
<tr>
<td>Lorazepam (Ativan®)</td>
<td>IV/PO</td>
<td>0.05mg/kg Max 2mg</td>
<td>2-3 mins</td>
<td>Sedative agent without analgesic properties. Longer duration as compared to midazolam lasts 1-2 hours. Not ideal choice for short procedures</td>
</tr>
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## Selective Hypnotic Drugs

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<tr>
<td>Pentobarbital (Nembutal®)</td>
<td>IV</td>
<td>1-3mg/kg initial dose 1-2mg/kg repeat dosing Max dose 100mg</td>
<td>1-2 mins</td>
<td>Barbiturate with potent sedative and hypnotic properties. Does not have analgesic properties. Prolonged recovery due to the delayed excitation phase</td>
</tr>
<tr>
<td>Pentobarbital (Nembutal®)</td>
<td>IM</td>
<td>2-6 mg/kg Max dose 100mg</td>
<td>20-30 mins</td>
<td>Barbiturate with potent sedative and hypnotic properties. Does not have analgesic properties. Prolonged recovery due to the delayed excitation phase. Patients do become confused and agitated as the pentobarbital begins to take effect. Patients become a fall risk. Parents should be made aware.</td>
</tr>
<tr>
<td>Dexmedetomidine (Precedex®)</td>
<td>IV</td>
<td>1-2 mcg/kg-infuse over 10-15mins</td>
<td>10 mins</td>
<td>Central alpha 2 adrenergic agonist that produces a cooperative sleep with little risk of respiratory depression when utilized as a sole agent. May cause hypotension and bradycardia. For longer procedures like MRI may need to maintain sedation with drip at 1-2mcg/kg/hour. Does have a prolonged recovery phase</td>
</tr>
<tr>
<td>Propofol (Diprivin®) DEEP SEDATION AGENT</td>
<td>IV</td>
<td>0.5-1mg/kg</td>
<td>20 sec-1min</td>
<td>Works through GABA a receptor. Propofol is an antiemetic, anxiolytic, amnestic, hypnotic and anesthetic medication. It does NOT have any analgesia properties. Short duration of action. For a procedure lasting longer than 15-20mins a drip may be best to maintain sedation. Can cause significant respiratory depression or apnea and a dose dependent decrease in ventilatory response to carbon dioxide that is accompanied by a decrease in tidal volume. Can cause laryngospasm. Causes pain at the infusion site if not combined with lidocaine. Contraindicated with soy allergy</td>
</tr>
<tr>
<td>Ketamine (Ketalar®)</td>
<td>IV</td>
<td>0.5-1 mg/kg Max 50mg as single IVP dose Repeat dose at 0.5mg/kg</td>
<td>1 min</td>
<td>Phencyclidine derivative which causes a dissociative sedative state. It is also a powerful analgesic and amnestic. Rapid onset and short duration 10-15 mins when repeated doses are not given. Caution should be used in patient with psychiatric illness, patient with open globe injuries or suspected increase in ICP. Patient may experience tachycardia, hypertension and tachypnea. Emergence phenomena is best treated with low stimulation or preparing the child for the hallucinations prior to administration. In extreme cases benzodiazepines may be warranted. Most severe adverse event is apnea or laryngospasm. Consider antiemetic use when not combined with midazolam or Propofol or if higher doses are required to achieve desired level of sedation</td>
</tr>
<tr>
<td>Ketamine (Ketalar®)</td>
<td>PO</td>
<td>4-10mg/kg</td>
<td>15-30 mins</td>
<td>Long duration of action, may last up to 3-4 hours</td>
</tr>
<tr>
<td>Ketamine (Ketalar®)</td>
<td>IM</td>
<td>2-4mg/kg</td>
<td>5 mins</td>
<td>Long duration of action 30-120mins</td>
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## Sedative Analgesic Agents

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<tr>
<td>Fentanyl (Sublimaze ®)</td>
<td>IV</td>
<td>0.5-1mcg/kg Max 50mcg single IVP</td>
<td>1-2 mins</td>
<td>Short acting opioid may cause apnea, or stiff chest syndrome especially if given rapidly IV push.</td>
</tr>
<tr>
<td>Fentanyl (Sublimaze ®)</td>
<td>IN</td>
<td>1-2mcg/kg Max 100mcg</td>
<td>1-2 mins</td>
<td></td>
</tr>
<tr>
<td>Ketamine (Ketalar®)</td>
<td>IV</td>
<td>0.5-1 mg/kg Max 50mg as single IVP dose Repeat dose at 0.5mg/kg</td>
<td>1 min</td>
<td>Phencyclidine derivative which causes a dissociative sedative state It is also a powerful analgesic and amnestic. Rapid onset and short duration 10-15 mins when repeated doses are not given. Caution should be used in patient with psychiatric illness, patient with open globe injuries or suspected increase in ICP. Patient may experience tachycardia, hypertension and tachypnea. Emergence phenomena is best treated with low stimulation or preparing the child for the hallucinations prior to administration. In extreme cases benzodiazepines may be warranted. Most severe adverse event is apnea or laryngospasm. Consider antiemetic use when not combined with midazolam or Propofol or if higher doses are required to achieve desired level of sedation</td>
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## Sedation Reversal Medications

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<tr>
<td>Flumenzil (Romazicon®)</td>
<td>IV</td>
<td>0.01mg/kg Max dose 0.2mg Repeat dose 0.005-0.01mg/kg</td>
<td>Useful only for benzodiazepine induced over sedation. Extreme caution in patient with seizure disorder, administration may cause patient to go into status epileptics. Duration of action 60mins. Repeat doses may be required</td>
</tr>
<tr>
<td>Naloxone (Narcan®)</td>
<td>IV</td>
<td>0.001-0.015mg/kg Max dose 0.1-0.2mg</td>
<td>Useful only for opioid induced over sedation. Duration 20-60mins repeat dosing may be needed.</td>
</tr>
<tr>
<td>Naloxone (Narcan®)</td>
<td>IV</td>
<td>0.01mg/kg Max dose 2mg</td>
<td>Useful only for opioid induced over sedation. Duration 20-60mins repeat dosing may be needed.</td>
</tr>
</tbody>
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References

5. Society for Pediatric Sedation, Sedation Provider Course 2010