



PROCEDURAL SEDATION: PEDIATRIC AND NEONATAL

Clinical Procedure	
Approved: February 2011	Next Review: February 2014
Clinical Area: All clinical areas	
Population Covered: All pediatric patients up to 18 years of age receiving procedural sedation	

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[Definitions](#)

Related Procedures:

[Procedural Sedation: Adult](#)
[Ketamine Use for Pediatric Procedural Sedation](#)

Purpose

To provide clinical management guidelines for the purpose of ensuring uniformity of care provided to patients receiving procedural sedation.

Policy Statement

The use of pharmacologic agents for procedural sedation at Swedish Medical Center (SMC) is standardized in accordance with guidelines from the American Society of Anesthesiologists, [Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists](#). ALL pediatric patients with ASA classification level 3 or greater require Pediatric Critical Care or Anesthesiology consultation.

Procedures and treatments that use sedation require a review of the patient's pertinent medical history, informed consent from the patient or parent/guardian, monitoring of the patient, and provision for immediate response to emergent situations. The monitoring occurs prior to the procedure, during the procedure, and through the recovery process. At a minimum, the monitored parameters include level of sedation, ventilatory function, and hemodynamics.

Individuals administering moderate or deep sedation (see [Definitions](#)) are qualified and have the appropriate credentials to manage patients at whatever level of sedation or anesthesia is achieved, either intentionally or unintentionally. Individuals responsible for patients receiving procedural sedation medications understand the dose, side effects, and reversal agents.

Licensed independent practitioners (LIP) (see [Definitions](#)) intending to induce *moderate* sedation are competent as evidenced by medical credential in anesthesiology, emergency medicine, critical care and verification of education, training, and experience supporting the granting of these privileges; or completion of the SMC moderate sedation self-learning module (adult or pediatric, whichever is applicable to their practice) and upon renewal of medical credentials to:

- Evaluate patients prior to performing moderate sedation.

- Manage a compromised airway.
- Provide adequate oxygenation and ventilation.
- Recover patients from deep sedation.

Those physicians permitted to administer *deep* sedation are competent as evidenced by credential in anesthesiology, emergency medicine, critical care, or pediatric or neonatal critical care to:

- Evaluate patients prior to performing deep sedation.
- Manage an unstable cardiovascular system as well as a compromised airway and inadequate oxygenation and ventilation.
- Recover patients from general anesthesia.

Sufficient numbers of qualified personnel are present during procedures using *moderate* or *deep* sedation to:

- Appropriately evaluate the patient prior to beginning moderate or deep sedation.
- Provide the moderate or deep sedation.
- Perform the procedure.
- Monitor the patient.
- Recover and discharge the patient either from the post-sedation or post-anesthesia recovery area or from the organization.

The minimal necessary qualified personnel are defined as follows:

- During procedures requiring *moderate* sedation, in addition to the LIP, one qualified registered nurse (RN) is present to monitor the patient and assist with minor, interruptible tasks which do not interfere with the ability to monitor the patient.
- When the intent is to provide *deep* sedation, the following health care providers are present:
 - The privileged physician, credentialed in anesthesiology, emergency medicine, or critical care, who orders the medication is present during the procedure and administration of the medications.
 - The qualified registered nurse (see [Definitions](#)) may monitor depth of sedation and cardiopulmonary status and administer the medications *only* if the prescribing privileged physician is present in the room, and there is verbal confirmation between physician and nurse to administer the medication. A second physician, RN, or a certified respiratory care practitioner assists with airway management. If the second physician is privileged, he or she may administer the medications and monitor.

Personnel monitoring the patient receiving sedation do not have responsibility for the care of other patients during or post procedure until vital signs are stable and the patient has recovered to a pre-procedure state.

LIP Order Requirement

Elements of this procedure require a licensed independent practitioner's (LIP) order.

Responsible Persons

Qualified LIPs, CRNAs, registered nurses (RN), and certified respiratory care practitioner (RCP).
Involve the child life specialist, if available, to help prepare the child and family for the procedure.

Prerequisite Information

None.

PROCEDURE

▶ *Requires an LIP order*

Responsible Person	Steps
RN	<p>PRIOR TO PROCEDURAL SEDATION ADMINISTRATION</p> <ol style="list-style-type: none"> 1. Verify the following prior to giving sedation for planned and unplanned procedures: <ul style="list-style-type: none"> • The correct patient using two patient identifiers from two sources • Type of procedure to be performed ▶ 2. Perform a Point of Care (POC) urine dip stick test on all female patients of childbearing age (9 years old or has started menses) prior to any procedure and procedural sedation. The following are exceptions: currently pregnant, history of hysterectomy or tubal ligation, history of menopause (12 months without menses). 3. For planned procedures, verify the following. For emergent procedures, verify as many as possible. <ul style="list-style-type: none"> • Written consent for the procedure or treatment • Allergies • NPO status <ul style="list-style-type: none"> ▪ American Society of Anesthesiologists (ASA) fasting guideline compliance is expected for patients undergoing planned procedures. ▪ ASA fasting guidelines are considered for patients undergoing unplanned procedures. NPO status should not delay sedation for emergently necessary procedures. • How to report any symptoms during and after procedure • Patient/parent/guardian understands effects of sedation and the precautions to take for 24 hours after receiving sedation, including: <ul style="list-style-type: none"> ▪ Feeding: Do not give anything to drink or eat until fully awake. Start with small amounts of clear liquids and advance slowly. ▪ Some post sedation nausea and vomiting is common. Your child may not have a normal appetite for the first 24 hours after sedation. ▪ Observe your child closely, encourage rest and quiet activities. ▪ Do not allow your child to play outside, ride a bike, swim, participate in sports, return to work or drive a car for 24 hours. ▪ Do not allow your child to bath unsupervised for the rest of the day. ▪ Your child should not be left unsupervised by an adult until 24 hours after sedation. ▪ Alcohol should be avoided for a period of 24 hours. ▪ Conditions under which immediate emergency care should be sought.
RN, RCP	<p>Pediatric and neonatal patients being discharged less than 24 hours after receiving sedation are discharged to a parent or assigned guardian to drive or accompany them home and will have someone available in case of an emergency.</p> <ol style="list-style-type: none"> 4. Check that the following is available for immediate use prior to procedure: <ul style="list-style-type: none"> • Oxygen delivery system • Suction equipment

	<ul style="list-style-type: none"> • Blood pressure device • Pulse oximeter • End-tidal CO₂ monitor during deep sedation procedures • Emergency Pediatric Code Blue cart • Cardiac monitor (EKG is monitored on patients with significant cardiovascular disease or when dysrhythmias are anticipated or detected as determined by the prescribing LIP.) • Medications and reversal agents • Printed Emergency Drug List based on patient's weight (where available, for example, Pediatrics, PICU) 										
LIP ordering sedation	<ol style="list-style-type: none"> 5. Update the History & Physical in accordance with the Medical Staff Rules & Regulations. 6. Assess and document the patient's suitability for sedation prior to any medication administration, including a minimum of: <ul style="list-style-type: none"> • ASA classification • Evaluate for obstructive sleep apnea (OSA). See Algorithm: Preprocedure Assessment for Sleep Apnea, Pediatric Patients Undergoing Procedural Sedation. • The time of last oral intake. • Personal and family history of anesthesia complications including malignant hyperthermia • OSA risk assessment (see addendum) • Airway assessment 7. Discuss the plan, risks, alternatives and benefits of sedation and the procedure with the patient. 8. Document target sedation level 9. Document planned procedure 10. Mark site of procedure, according to Site Marking policy. 										
RN	<ol style="list-style-type: none"> 11. Obtain baseline vital signs, including: <ul style="list-style-type: none"> • Temperature • Height, weight, and Body Mass Index (BMI) • Respiratory rate • Blood pressure • End tidal CO₂ for deep sedation procedures (anesthesiologist or CRNA responsible) • Oxygen saturation • Heart rate • Level of sedation • Patient's baseline pain level <ul style="list-style-type: none"> ▪ NPASS for neonatal patients ▪ 0-10 numeric scale or FLACC scale for pediatric patients ▪ 0-10 numeric scale, FLACC scale or PABS scale for adolescents • Baseline Aldrete score <table border="1" data-bbox="560 1780 1349 1953" style="margin-left: 40px;"> <thead> <tr> <th colspan="2" style="text-align: center;">ALDRETE SCORE</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;"><i>Movement</i></td> <td></td> </tr> <tr> <td>▪ Can move 4 extremities</td> <td style="text-align: center;">2</td> </tr> <tr> <td>▪ Can move 2 extremities</td> <td style="text-align: center;">1</td> </tr> <tr> <td>▪ Can move 0 extremities</td> <td style="text-align: center;">0</td> </tr> </tbody> </table> 	ALDRETE SCORE		<i>Movement</i>		▪ Can move 4 extremities	2	▪ Can move 2 extremities	1	▪ Can move 0 extremities	0
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		<p><u>Respiratory Effort</u></p> <ul style="list-style-type: none"> ▪ Can deep breathe & cough ▪ Dyspnea/Impaired breathing ▪ Apnea <p><u>Blood Pressure</u></p> <ul style="list-style-type: none"> ▪ +/- 20%of baseline ▪ +/- 20-50% of baseline ▪ +/- 50% of baseline <p><u>Sedation Level</u></p> <ul style="list-style-type: none"> ▪ Awake and responding ▪ Sedated, but responds to normal voice ▪ Sedated, but responds to loud voice or movement ▪ Deeply sedated, unable to respond <p><u>Oxygen Saturation</u></p> <ul style="list-style-type: none"> ▪ Able to maintain O₂ saturation greater than 94% on room air (or pre-procedure baseline) ▪ Needs supplemental O₂ to maintain O₂ saturation greater than 90% ▪ O₂ saturation less than 90% even with supplemental oxygen <p style="text-align: center;">TOTAL SCORE:</p>	<p>2 1 0</p> <p>2 1 0</p> <p>3 2 1 0</p> <p>2 1 0</p>	
RN, LIP	12.	<p>Perform safety pause, including:</p> <ul style="list-style-type: none"> • Identify and verify correct patient using two identifiers from two sources. • Verify site marking and procedure • Verify that airway evaluation was completed • Verify the presence or absence of sleep apnea symptoms 		
	13.	Document time of safety pause on the Pediatric Procedural Sedation Flow Sheet .		
RN		<p>ADMINISTRATION, ONGOING ASSESSMENT, AND MONITORING</p> <p>▶ 1. All drugs used for the purpose of sedation are administered according to individual drug/dosing protocols as defined in the ordersets in the electronic medical record. The procedure Ketamine Use for Pediatric Procedural Sedation may be used according to the conditions in that procedure.</p>		
RN, RCP		<p>2. All patients receiving sedation, either inpatients or outpatients, are assessed and monitored as outlined below.</p> <p>3. Report to LIP immediately any adverse reactions, complications, or side effects such as respiratory depression or hypotension.</p> <p>4. At the time sedation drugs are being given and during the procedure, monitor the following, recorded every five minutes in the Pediatric Procedural Sedation Flow Sheet:</p> <ul style="list-style-type: none"> • Respiratory rate • Blood pressure • End tidal CO₂ for deep sedation procedures • Oxygen saturation • Heart rate • Level of sedation • Pain level <ul style="list-style-type: none"> ▪ NPASS for neonatal patients ▪ 0-10 numeric scale or FLACC scale for pediatric patients ▪ 0-10 numeric scale, FLACC scale or PABS scale for adolescents 		

- Any abnormal baseline parameters (such as cardiac rhythm or breathing)
5. After the procedure or test, monitor the following, recorded every five minutes until stable for three readings in a row. Then, monitor every 15 minutes. Record in the [Pediatric Procedural Sedation Flow Sheet](#):
- Respiratory rate
 - Blood pressure
 - End tidal CO₂ for deep sedation procedures
 - Oxygen saturation
 - Heart rate
 - Level of sedation
 - Pain level
 - NPASS for neonatal patients
 - 0-10 numeric scale or FLACC scale for pediatric patients
 - 0-10 numeric scale, FLACC scale or PABS scale for adolescents
 - Any abnormal baseline parameters (such as cardiac rhythm or breathing)
6. **Inpatients:** The patient cannot be transferred to another unit or to the care of another RN until:
- The patient's Aldrete score is 8 or greater or returned to pre-procedure vital signs; AND
 - Vital signs are stable for a minimum of 15 minutes.
- ▶ **Resuming pre-procedure monitoring or being transferred back to the unit without meeting these requirements requires a physician/LIP order.**
7. **Outpatients:** May be discharged from the hospital when *all* of the following discharge criteria are met:
- Minimal to no nausea
 - No need for parenteral medications
 - Aldrete score of 8 or greater, or have returned to the pre-procedure level
 - Vital signs stable for a minimum of 15 minutes.
 - A minimum of one hour has elapsed after the last administration of reversal agents (naloxone, flumazenil) to ensure that patients do not become re-sedated after reversal effects have worn off.
 - Patient and parent/guardian have been educated on effects of procedure, sedation, symptoms to report, and how to seek emergency care, and the importance of having someone available to provide help with his or her care for 24 hours following the procedure.
8. **Infants:** The following patients are monitored for 12 hours post procedure and may be discharged from the hospital when all of the above discharge criteria are met and are without any apneic events:
- Term infants less than 44 weeks post conceptual age (a newborn less than one month of age) at time of procedure.
 - Premature infants (at birth) less than 52 weeks post conceptual age at time of procedure.
 - If any apnea occurs during initial monitoring, the patient must continue to be monitored until apnea free for 12 hours.

Definitions

Pain management. An analgesic administered *only* for the purpose of managing either existing pain or anticipated pain from a procedure in a patient who has previously received analgesics, e.g., morphine sulfate 2 mg IV for the removal of a chest tube 5-15 minutes prior to procedure; the patient has been receiving 1-2 mg morphine IV every three hours as needed for pain.

Procedural sedation. A technique of administering sedatives or dissociative agents with or without analgesics to induce a state that allows the patient to tolerate unpleasant procedures while maintaining cardiorespiratory function. Procedural sedation is intended to result in a depressed level of consciousness that allows the patient to maintain oxygenation and airway control independently.

Following are the American Society of Anesthesiologists definitions of levels of sedation. In preverbal children and infants, as well as those who are developmentally impaired, response to verbal commands is not helpful in assessment of level of sedation. Gentle touch and vigorous tactile stimulation may be substituted to assess responsiveness, but may rouse the child and interfere with the procedure. Infants and children can pass rapidly from one level of sedation into a deeper level, and the distinction between levels may be unclear.

Minimal sedation (anxiolysis). A drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected.

Moderate sedation/analgesia (conscious sedation). A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

Deep sedation/analgesia. A drug-induced depression of consciousness during which patients cannot be easily aroused but can respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

Anesthesia. Consists of general anesthesia and spinal or major regional anesthesia. It does *not* include local anesthesia. General anesthesia is a drug-induced loss of consciousness during which patients cannot be aroused, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Sleep apnea. Characterized by recurrent episodes of lack of breathing during sleep, resulting in oxygen desaturation. With the use of opioids and benzodiazepines, untreated sleep apnea patients are at increased risk for developing respiratory failure and respiratory arrest.

Obstructive sleep apnea (OSA). Repeated episodes of complete or partial cessation in air flow during sleep secondary to upper airway obstruction, resulting in drop in oxygen. With the use of opioids and benzodiazepines, untreated sleep apnea patients are at increased risk for developing respiratory failure and respiratory arrest.

Procedure pause or safety pause. The moment immediately prior to the incision or insertion of instruments when the nurse states the patient's name, the procedure, and, when applicable, the operative side, and receives verbal agreement from all members of the team. Correct patient position and the availability of correct implants and any special equipment or special requirements are also verified during the pause.

Licensed independent practitioner (LIP). Physician or allied health professional with appropriate credentials as defined by medical staff bylaws and allied health manual, i.e., physician, certified registered nurse anesthetist (CRNA), and advanced registered nurse practitioner (ARNP).

Qualified personnel. Registered nurse who has successfully completed the SMC procedural sedation self-learning module annually and is a current ACLS certified provider, a PALS certified provider for pediatrics. When the intent is *deep* sedation, a certified respiratory therapist may serve as qualified personnel to assist with airway management.

Body Mass Index (BMI): a measure of someone's weight in relation to height; to calculate one's BMI, take one's weight in kilograms and divide that by the square of one's height in meters (kg/m²); overweight is a BMI greater than 25; obese is a BMI greater than 30.

Sedation level.

LEVEL OF SEDATION	ANTICIPATED RESPONSE
3	Awake and responding.
2	Sedated, but responds to normal voice.
1	Sedated, but responds to loud voice or movement.
0	Deeply sedated, unable to respond.

Pain scales. See the [Pain Management](#) protocol for appropriate description of pain scales.

Forms

None.

Supplemental Information

All patients are screened for sleep apnea according to the [Algorithm: Pre-Procedure Assessment for Sleep Apnea, Pediatric Patients Undergoing Procedural Sedation](#). Patients assessed to be at moderate or severe risk for OSA require Pediatric Critical Care or Anesthesiology consultation.

When providing discharge teaching to patients with previously diagnosed OSA, encourage them to use their home CPAP machine when taking a nap or sleeping after receiving procedural sedation medication.

Regulatory Requirement

The Joint Commission. TJC. 2010 CAMH – PC 03.01.01, PC 03.01.03, PC 03.01.05, PC 03.01.07, RC02.01.03.

CMS. Conditions of Participation 482.52(b)(1); 482.52 (b)(3).

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Addenda

[Recommended Moderate Sedation Drugs and Doses: Pediatric and Neonatal](#)
[Recommended Deep Sedation Drugs and Doses: Pediatric and Neonatal](#)
[Algorithm: Pre-Procedure Assessment for Sleep Apnea, Pediatric Patients Undergoing Procedural Sedation](#)
[Pediatric Procedural Sedation Flow Sheet](#) (Form 37358)

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