

APPENDIX C

SHADY GROVE ADVENTIST HOSPITAL MEDICAL STAFF POLICY MANUAL

SEDATION/ANALGESIA

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PURPOSE

To optimize patient safety by establishing uniform hospital-wide processes for the management of patients receiving procedural sedation by non-anesthesiologists. In general, non-anesthesiologists will administer sedative medications in doses intended to produce moderate levels of sedation.*

POLICY

Moderate sedation is intended to reduce a patient's pain and awareness during diagnostic or therapeutic procedures. The sedative medication dosages are not intended to result in loss of protective airway reflexes, significantly depress ventilation, or cause cardiovascular compromise. However, because sedation is a continuum and because there is wide variation in patient response to sedative agents, it is not always possible to predict how an individual patient will respond. Occasionally a patient who receives sedation medication in doses that typically produce moderate sedation will slip into a deeper level of sedation. The deeper level of sedation may be associated with potentially catastrophic airway obstruction, hypoventilation, or cardiovascular instability. At Shady Grove Adventist Hospital medical staff and nurses who participate in moderate sedation will have the skills and equipment necessary to recognize the different levels of sedation and then "rescue" patients who slip into deeper-than-intended levels of sedation. Pre-sedation evaluation will be designed to identify appropriate candidates for sedation by non-anesthesiologists and then optimize these patients prior to sedation. Intra-procedure monitoring and post-sedation care will insure that adverse physiologic changes are rapidly recognized and corrected. The processes included in this policy are based upon standards and guidelines developed by the American Society of Anesthesiologists, the American Academy of Pediatrics, and the Joint Commission on Accreditation of Healthcare Organizations. This policy applies to patients who receive sedation/analgesia in all locations within Shady Grove Adventist Hospital and Germantown Emergency Center (GEC). Moderate sedation may be performed in the following locations: Cardiac Cath Lab, Emergency Department, Intensive Care Unit, Radiology, Surgical Services, Endoscopy and any other area under emergent conditions at the discretion of the physician when appropriate staff and equipment are available. This policy does not apply to patients receiving analgesia on nursing units for control of pain. Also excluded are critical care patients who receive sedation for tolerance of mechanical ventilation and patients undergoing emergent intubation. Ketamine is not included in the moderate sedation protocol and guidelines for its administration by non-anesthesiologists may be found in the Ketamine Sedation Policy.

*Only specially-credentialed emergency medicine physicians and pediatric intensivists may administer sedation in doses intended to produce deep sedation. Please see Shady Grove Hospital policies on the use of propofol and ketamine by non-anesthesiologists for specific requirements.

Exceptions. The moderate sedation policy applies only when sedation is given under the direction of a non-anesthesiologist for patients undergoing diagnostic or therapeutic procedures. The policy specifically excludes the following:

1. Sedation/Analgesia for the control of pain, anxiety, seizures or insomnia.
2. Sedation of patients on ventilators.
3. Sedation/Analgesia used in obstetrical labor.
4. Patients requiring urgent intubation.
5. Sedation/Analgesia given by an anesthesiologist's order in the pre-operative or PACU areas.

Locations. This policy applies to moderate sedation in all locations within Shady Grove Adventist Hospital and the Germantown Emergency Center. This includes the Cardiovascular/Interventional Radiology Labs, Emergency Department, Critical Care areas, Surgical Services, GI endoscopy, and any other area at the discretion of the supervising physician where appropriate staff and equipment are available.

Staff. A physician and registered nurse must be involved in the care of each patient undergoing moderate sedation during the entire procedure:

1. A qualified physician who performs the diagnostic or therapeutic procedure supervises the administration of sedation. The physician must remain with the patient from the time of the first dose of sedation until the patient is accepted by a recovery room nurse.
2. A Registered Nurse with special training is responsible for administering sedation and monitoring the patient at the direction of the physician. The nurse should remain at the head of the bed whenever possible to facilitate direct observation of the airway.
3. If assistance is required with the procedure, then additional personnel (>2) must be utilized. The nurse monitoring the patient may not assist with the procedure.

Essential Equipment. The following equipment and supplies must be available wherever sedation is to be used:

1. Minimal monitoring equipment includes non-invasive blood pressure, continuous EKG, pulse oximeter, and end-tidal CO2 monitor. Whenever possible the monitor alarms will be set to indicate oxygen saturation less than 90% and apnea e 30 seconds. In addition, when available, the pulse oximeter will be set to have a variable-pitch tone that is audible to the supervising physician. When audible alarms are not available the sedation nurse will remain at the head of bed in continuous visual contact with both the patient and display of vital signs.
2. Resuscitation equipment for management of the airway (including ambu-bag and intubation tray) along with a fully assembled and functioning suction apparatus must be immediately available. Airway equipment must be of appropriate size for the patient.
3. A defibrillator and cardiac resuscitation drugs in accordance with ACLS standards must be readily available.
4. Reversal agents must be immediately available.
5. Wall oxygen source must be present and at least one full oxygen E-cylinder with regulator as back-up must be readily available.
6. Appropriate equipment to administer intravenous fluids and drugs must be immediately available.

DEFINITIONS

Definitions of four levels of sedation and anesthesia include the following:

1. 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.
2. Moderate sedation/analgesia (formerly conscious sedation)
A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. Note: reflex withdrawal from a painful stimulus is not considered a purposeful response). No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.
3. Deep Sedation
A drug-induced depression of consciousness during which patients cannot be easily aroused but 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. Deep sedation is restricted for use by anesthesiologists and specially-credentialed emergency medicine and pediatric critical care physicians.
4. 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 are not arousable, 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. Anesthesia is restricted to use by anesthesiologists.

5. Aldrete Score
Physiologic assessment scoring system used to evaluate patients' recovery from sedation or anesthesia (Appendix 1).
6. ASA Score
American Society of Anesthesiologists physical status classification system (Appendix 2).
7. Mallampati Classification
Airway evaluation technique that predicts difficult intubation using direct laryngoscopy (Appendix 3).
8. Motor Activity Assessment Scale
Scale used to assess level of sedation (Appendix 4)
9. Fasting Protocol
Nationally recognized guidelines that establish the safe length of time from intake of food or liquid until administration of sedation. It represents the time necessary to ensure gastric emptying and is intended to reduce the risk of catastrophic aspiration of gastric contents (Appendix 5)
10. Recommended Doses of Sedative Medications
Institution specific guidelines for drug dosages intended to produce a moderate level of sedation (Appendix 6)
11. Immediately available
Located at the bedside and obtainable within seconds.
12. Readily available
Located within the same suite and obtainable within one to two minutes.

CREDENTIALING REQUIREMENTS

Only physicians are qualified by specialized training will be permitted to supervise the administration of moderate sedation. Physicians must demonstrate competency in: (1) the safe administration of sedative and analgesic drugs used to establish a moderate level of sedation, (2) rescue of patients who exhibit adverse physiologic consequences of a deeper-than-intended level of sedation, and (3) awareness of the patient care processes outlined in this policy. The Chairman of the Department of Anesthesia is responsible for reviewing each application for privileges in moderate sedation and making a recommendation to the Credentials Committee regarding competency. Only specially credentialed pediatric physicians may supervise the administration of sedation to pediatric patients. Credentialing requirements are as follows:

Physician Adult Sedation Privileges. Physicians with adult sedation privileges may provide sedation care to patients twenty-one (21) years of age and older regardless of weight AND patients fifteen (15) years of age and older whose weight equal or exceeds thirty-six (36) kilograms.

1. Initial Competency Requirements.
 - a. Current ACLS certificate OR medical staff privileges in Emergency Medicine.
 - b. Completion of a residency/fellowship training program within the last two (2) years that includes a formalized education component on the safe administration of sedative drugs. (letter from the residency director required).

OR

Review of the Shady Grove self-education module on moderate sedation including:

- a) ASA Guidelines on Preoperative Fasting
 - b) ASA Guidelines for Administration of Moderate Sedation
 - c) ASA Video on Sedation and Analgesia by Non-Anesthesiologists
- c. Review of the Shady Grove Adventist Hospital Policy on Moderate Sedation.
 - d. Score of e 80% on the Shady Grove Adventist Hospital Moderate Sedation Competency Test.

2. Ongoing Competency Requirements. Recredentialing of sedation privileges will be evaluated on the same two year cycle as staff appointments.
 - a. Current ACLS certificate OR medical staff privileges in Emergency Medicine.
 - b. Review of the most recent revision of the Shady Grove Adventist Hospital Policy on Moderate Sedation.
 - c. A minimum of eight (8) sedations during the previous two years with satisfactory outcomes as documented in the physician's OPPE.

OR

Completion of the above Initial Competency Requirements in Moderate Sedation.

Pediatric Sedation Privileges. Emergency Medicine and Pediatric Critical Care Physicians who have fulfilled requirements for adult moderate sedation privileges may request pediatric moderate sedation privileges. Only physicians with pediatric moderate sedation privileges may provide sedation to patients less than fifteen (15) years of age and patients less than twenty-one (21) years of age who weigh less than thirty-six (36) kilograms.

1. Initial Competency Requirements
 - a. Successful completion of the medical staff credentialing requirements for adult moderate sedation privileges.
 - b. Medical staff privileges in Emergency Medicine or Pediatric Critical Care.
 - c. Documentation confirming completion of a training program in Pediatric Critical Care or Emergency Medicine within the last two (2) years.

OR

A letter from the Chairman of a previous department confirming that the physician has supervised a minimum of eight (8) pediatric sedations within the previous two (2) years with satisfactory outcomes.

- d. Physicians must attest that they have reviewed the Shady Grove Moderate Sedation Policy.
2. Ongoing Competency Requirements. Recredentialing of pediatric sedation privileges will be evaluated on the same two year cycle as staff appointments.
 1. A minimum of eight (8) pediatric sedations during the previous two years with satisfactory outcomes as documented in the physician's OPPE.
 2. Attestation of review of the most recent revision of the Shady Grove Moderate Sedation Policy

Competency Requirements for Nurses.

1. Only Registered Nurses who have completed the Shady Grove sedation competency module may assist in the administration of sedation.
2. Current ACLS certification or PALS certification (for those nurses who assist in the administration of sedation to patients less than fifteen years of age).

Special Considerations for Pediatric Sedation

Sedation of pediatric patients has serious associated risks such as hypoventilation, apnea, airway obstruction, laryngospasm, and cardiopulmonary impairment. Because pediatric patients have less physiologic reserve than adult patients, a more rapid deterioration in vital signs usually follows an adverse respiratory event. Therefore the presence of appropriate resuscitation equipment as well as a physician with advanced pediatric airway skills are essential. Younger children (less than six years of age) and those with developmental delays frequently require deep levels of sedation in order to cooperate with even relatively minor procedures (see the ketamine and propofol sedation Policies for details).

Patient Care Process

Pre-procedure Care.

1. RN Responsibilities. Nursing is responsible for collecting pertinent data and preparing the patient for the physician pre-sedation assessment. The nurse performs this task by completing The standard Pre-procedure Checklist which includes:
 - a. Confirmation that a valid history and physical exam is part of the medical record (the H&P must be performed within 30 days with updated heart and lung assessment within 7 days). The history and physical must be signed or co-signed by a credentialed member of the Shady Grove medical staff.
 - b. Most recent laboratory values.
 - c. Pregnancy tests should be considered for females greater than 12 years of age.
 - d. Point of care blood glucose measurement is performed for diabetic patients.
 - e. Consent signed by the performing physician and patient. The consent must include The name of the procedure, the side (for procedures that involve laterality), and designate that moderate sedation will be used.
 - f. Completed nursing assessment.
 - g. DNR status documented, if applicable
 - h. Up-to-date medication administration record.
 - i. Pre-procedure vital signs.
 - j. NPO status. The physician should be notified whenever a patient does not Meet the criteria set forth in the fasting protocol.
 - k. Confirmation that the anatomical site is marked by the physician.
2. Physician Responsibilities
 - a. Informed Consent. The physician performing the procedure and supervising the sedation must inform the patient/guardian about the risks, possible complications benefits and alternatives to sedation as a component of the planned procedure. Patients or their authorized representatives should agree to the administration of moderate sedation before the procedure begins.
 - b. The physician orders and reviews the results of pertinent laboratory testing. Pre-sedation testing should be guided by the patient's underlying medical condition and the likelihood that the results will affect the management of sedation.
 - c. The physician conducts and documents a pre-sedation assessment within 24 hours of the start of the procedure. The assessment may be documented on the standard "Pre-sedation Assessment Form" (appendix 6) and must include the following:
 - i. Physical Status Classification.
 - ii. Focused history documenting any interim changes in health or previous adverse reaction to sedation/anesthesia.
 - iii. Airway Examination.
 - iv. NPO status*.
 - v. Review of pertinent lab values (patients with end-stage renal disease must have a basic metabolic panel within 24 hours of sedation).
 - vi. Plan for sedation.
 - vii. Re-evaluation of the patient (including vital signs and mental status) just prior to sedation.

- d. The physician conducts a "Time-Out" according to the Shady Grove Policy# 25098 just prior to starting the procedure.
- e. For outpatients, the physician will confirm that appropriate arrangements have been made for a responsible adult to drive the patient home.
- f. The physician will consider consultation with an anesthesiologist for high-risk patients. The criteria listed in Appendix 7 may be used as guide to help determine when consultation is indicated.

*The NPO protocol should be observed whenever a delay will not jeopardize the well being of the patient. Emergent and urgent clinical situations are expected to arise that preclude strict adherence to these guidelines. In these cases the amount of sedation should be minimized and carefully titrated in order to prevent the loss of protective airway reflexes. The risk of aspiration pneumonitis may be further reduced by the use of a non-particulate antacid (bicitra), H2-blockers and/or metoclopramide prior to sedation.

Intra-Procedure Care.

1. RN responsibilities. The nurse is responsible for administering sedation at the order of the physician while continuously assessing the patient's physiologic status.
 - a. Documentation of the physiologic status of the patient.
 - i. Vital signs including blood pressure, heart rate, respiratory rate, oxygen saturation, and level of consciousness will be assessed and recorded prior to initiation of the procedure and on arrival to the recovery area.
 - ii. Blood pressure and heart rate will be assessed and documented every five minutes during the procedure. Cardiac rhythm, respiratory rate, level of consciousness, presence of EtCO₂ and oxygen saturation will be continuously monitored and recorded at least every fifteen minutes.
 - iii. Medication administration, including dose, route, and times.
 - iv. IV fluid replacement.
 - b. The nurse will be positioned at the head of the bed and assess the patient continuously for changes in condition or appearance. The nurse will report any of these changes to the responsible physician immediately and initiate the appropriate intervention.
 - c. Administer oxygen as needed. Typically oxygen via nasal cannula will be administered in order to maintain oxygen saturation above 92% with the following considerations:
 - i. The application of oxygen reduces the incidence and severity of hypoxemia during moderate sedation. However, it must be remembered that the use of S supplemental oxygen will delay the detection of apnea by the pulse oximeter. This emphasizes the importance of monitoring respiratory function by observation of chest excursion and EtCO₂ detection.
 - ii. Fire Safety: If electrocautery is to be used near the airway, then oxygen flow should be minimized to the lowest amount necessary to maintain acceptable hemoglobin saturation. Sedation providers must minimize the build-up of oxygen beneath drapes and in oropharynx and position drapes so that gases will not collect. If possible, supplemental oxygen should be stopped at least one minute before and during the activation of the electrosurgical unit.
2. Physician Responsibilities. The physician orders sedative medication, determines dosage, and responds to adverse physiologic effects.
 - a. The responsible physician selects and orders all sedative medication.
 - b. The physician is responsible for airway interventions, if necessary.
 - c. The physician orders the administration of reversal agents when indicated.

Note: Because reversal agents may have serious side-effects their use should be minimized and their dose titrated to effect (see recommended drug doses). Naloxone is relatively contraindicated in patients with a history of narcotic tolerance. Flumazenil is relatively contraindicated in patients with a history of alcohol abuse or long-standing benzodiazepine use.

Post-Procedure Care

1. RN Responsibilities. Nursing is responsible for monitoring the patient until their physiologic status has returned to a level at or close to their baseline. The following standards for monitoring and discharge criteria will be used:
 - a. Oxygen saturation and EKG will be continuously monitored. Vital signs including blood pressure, heart rate, oxygen saturation, level of consciousness and respiratory rate will be documented on arrival to the recovery area and every fifteen (15) minutes thereafter.
 - b. Significant changes in the patient's condition are reported to the physician immediately. These include:
 - i. Symptomatic changes in blood pressure.
 - ii. Oxygen saturation less than 90% with supplemental oxygen.
 - iii. Heart rate <45 or >110.
 - iv. Dyspnea, apnea, diaphoresis.
 - v. Inability to arouse.
 - vi. Need for mechanical airway support.
 - vii. Any other unexpected patient response
 - c. Pain level will be assessed every fifteen (15) minutes using a visual analog scale. Pain score greater than five (5) not easily controlled with ordered post-procedure analgesics will be reported to the responsible physician.
 - d. The nurse will assess the Aldrete score every fifteen minutes and discharge the patient according to the below criteria as approved by the Medical Staff.
2. Physician Responsibilities.
 - a. The procedural physician is responsible for all orders in the recovery phase including but not limited to: analgesics, oxygen therapy, hemodynamic medications and reversal agents.
 - b. The procedural physician signs the discharge order.
 - c. The procedural physician documents a post-procedure/sedation progress note immediately following the procedure.
3. Discharge Criteria.
 - a. Inpatients will be discharged from the recovery area to other inpatient areas when they have met the following criteria and after SBAR report is given to the receiving nurse. Inpatients will be transported via stretcher or wheelchair accompanied by a staff member. Patients will be instructed regarding post-procedure status and activities.
 - i. Aldrete score of ten (10). Patients with an Aldrete score less than ten may be discharged only by physician order.
 - ii. A minimum of thirty minutes from the last dose of sedation is required unless reversal agents are used. If reversal agents are used then the patient must be observed for two hours after the last dose of an antagonist to insure that respiratory depression does not recur.
 - iii. Stable vital signs over a period of at least fifteen minutes.
 - iv. Adequate ventilation and oxygenation as evidenced by a stable respiratory rate and oxygen saturation appropriate for the patient. (Patients with room air oxygen saturation of less than 90 percent will be transported with supplemental oxygen).
 - v. Ability to maintain/protect airway with level of alertness and orientation appropriate to pre-procedure status.
 - b. Outpatients will be discharged to home from the recovery area when they have met the following criteria:
 - i. All discharge criteria listed above for inpatients have been met.
 - ii. Patients who have received sedation are discharged in the company of a responsible adult. The patient will have arrangements for transportation home. Patients who have received sedation will not be allowed to drive themselves home.
 - iii. The patient has received written discharge instructions that have been reviewed with the patient and/or escort.

PERFORMANCE IMPROVEMENT

Data Collection.

1. Sedation P.I. Officer. Each procedural area (CVIR, ED, Endoscopy) will identify an individual who will be responsible for collecting data on adverse sedation-related events. The sedation P.I. Officer will also be responsible for tracking the total number of sedation cases for each physician.
2. Performance Improvement Indicators. The following adverse sedation-related events will be reported through the hospital's incident reporting system. Minor events will be forwarded to the Sedation P.I. Officer. Major events will be forwarded to Office of Medical Staff, the Sedation P.I. Officer, and the Chair of Anesthesia. Major events will be reviewed and scored by the respective department's Quality Assurance/Review Committee. Data on the total number of sedations, number of minor events, and category 3 and 4 major events will be reported on each physician's OPPE.
 - a. Minor events:
 - i. Use of a reversal agent.
 - ii. Respiratory depression or obstruction requiring ventilation via ambu-bag.
 - iii. Sustained SpO₂ < 88% (>3 minutes) with supplemental oxygen.
 - iv. Drug reaction (rash, SOB, agitation).
 - v. Prolonged unresponsiveness (>30 minutes).
 - b. Major Events:
 - i. Sedation related death.
 - ii. Sedation related cardiac/respiratory arrest.
 - iii. Aspiration pneumonia.
 - iv. Sedation related rapid response or "Anesthesia stat" call.

Appendix 1.

Aldrete Scoring System

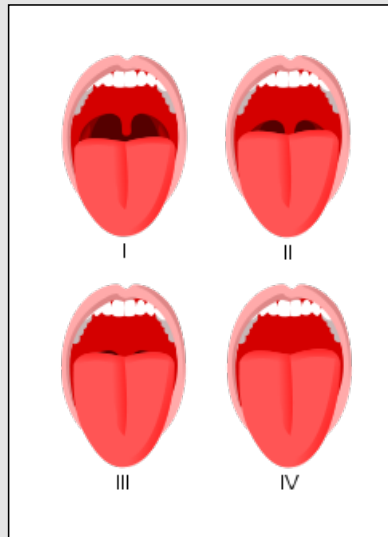
<u>Activity</u>	<u>Score</u>
Able to move four extremities voluntarily or on command	2
Able to move two extremities voluntarily or on command	1
Unable to move extremities voluntarily or on command	0
<u>Respiration</u>	
Able to breathe freely and cough deeply	2
Dyspnea or limited breathing	1
Apneic	0
<u>Circulation</u>	
BP within 20% of pre-sedation level	2
BP within 21 to 49% of pre-sedation level	1
BP more than 50% different from pre-sedation level	0
<u>Consciousness</u>	
Fully awake	2
Arousable on calling	1
No response	0
<u>Oxygen saturation</u>	
Able to maintain O2 saturation greater than 92% on room air	2
Needs O2 inhalation to maintain O2 saturation greater than 90%	1
O2 saturation 90% or less even with O2 supplementation	0

Appendix 2.

ASA Physical Status Classification

Status I	Normal healthy patient
Status II	Mild systemic disease
Status III	Severe systemic disease with definite functional impairment
Status IV	Severe systemic disease that is a constant threat to life
Status V	Moribund patient, not expected to survive

Appendix 3.
Mallampati Classification



The Mallampati classification is a tool used to predict the ease or difficulty of intubation. It is determined by looking at the anatomy of the oral cavity. A high classification score (class 3 or 4) is predictive of difficult intubation and sleep apnea.

Technique:

The patient sits upright with head tipped back, mouth opened and tongue protruded. Classifications are described below.

- Class I: Can visualize soft palate, all of uvula, tonsillar pillars
- Class II: Can visualize soft palate, tip of uvula is obscured
- Class III: Can visualize soft palate
- Class IV: Can visualize hard palate only

Appendix 4.

Motor Activity Assessment Scale

The MAAS is a standardized method for describing level of sedation. Target MAAS scores for patients under moderate sedation are 2 to 3.

Clinical Score	MAAS – Level of Sedation Achieved
0	Unresponsive - Does not move with noxious stimuli
1	Responsive only to noxious stimuli - Opens eyes, OR raises eyebrows, OR turns head toward stimulus, OR moves limbs with noxious stimuli
2	Responsive only to touch - Opens eyes, OR raises eyebrows, OR turns head toward stimulus, OR moves limbs when touched, OR when name loudly spoken
3	Calm & cooperative - No external stimulus required to elicit movement AND patient adjusts sheets or clothes purposefully and follows Commands
4	Restless & cooperative - No external stimulus required to elicit Movement AND patient picks at sheets or tubes uncovering self AND follows command
5	Agitated - No external stimulus required to elicit movement AND patient attempts to sit up or move limbs out of bed AND does not consistently follow commands
6	Dangerously agitated - No external stimulus required to elicit movement AND patient pulls at tubes or catheters, OR thrashes side to side, OR strikes at staff, OR tries to climb out of bed and does not calm down when asked

Appendix 5.
Fasting Protocol

The following is a summary of American Society of Anesthesiologists Pre-procedure Fasting Guidelines:

Ingested Material	Minimum Fasting Period
Clear liquids	2 hours
Breast milk	4 hours
Infant formula	6 hours
Non-human milk	6 hours
Light meal	6 hours
Full meal	8 hours

Please note:

1. These recommendations apply to healthy patients who are undergoing elective procedures. Following these guidelines does not guarantee that complete gastric emptying has occurred.
2. In emergency situations, when following the guidelines might result in patient harm, the physician providing sedation may proceed with the procedure while using precautions to minimize the risk of pulmonary aspiration.
3. Examples of clear liquids include water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee.
4. A light meal typically consists of toast and clear liquids.
5. Full meals include fried, fatty foods, or meats.

**SHADY GROVE ADVENTIST HOSPITAL MODERATE SEDATION
 ADULT DOSING SCHEDULE**

Generic Name (Trade Name)	Use	Dosing Guidelines	Onset, Peak, Duration of Action	Adverse Effects	Reversal
BENZODIAZEPINES					
Midazolam (Versed)	Sedation Amnesia Anxiolysis	Adults <60 years old: IV: 0.5mg to 2.5mg over 2 to 3 minutes. Wait 2 minutes to evaluate effect before giving additional doses. IM: 0.07 to 0.08mg/kg as one time dose Total Dose- 7.5 mg IV Adults ≥60 years old: IV: 0.5 to 1.5mg IV over 2 to 3 minutes. Titrated as above. IM: 0.02 to 0.05mg/kg Total Dose- 5mg IV	Onset: IV: 1-5 min IM: 15 min Peak: IV: 20-60 min IM: 30-60 min Duration: IV: 1-2 hours IM: 6 hours	Respiratory depression Paradoxical agitation Hypotension (especially With opioid) Arrhythmias Nausea/emesis/headache Hallucinations Hiccoughs	Flumazenil (Watch for rebound sedation)
Lorazepam (Ativan)	Sedation Amnesia	IV: 2-3 mg over 2-5 min IM: 0.025 to 0.05mg/kg PO: 2 to 4mg <u>Total Dose- 4mg</u>	Onset: IV: 1-5 min IM: 15 min PO: 30-60 minutes Peak: IV: 15-20 min IM: 2-3 hours PO: 2 hours Duration: 4-8 hours	See Midazolam	Flumazenil
Diazepam (Valium)	Sedation Amnesia	IV: 2-5 mg Administer at a rate less than 1.5mg/min to avoid phlebitis IM: 5-10 mg <u>Total Dose: 10mg</u>	Onset: IV: 1-5 min IM: 30 min Peak: IV: 10-30 min IM: 2-3 hours Duration: 2-6 hours	Venous thrombosis and phlebitis at injection site See Midazolam	Flumazenil

Comment [MC1]:

**SHADY GROVE ADVENTIST HOSPITAL MODERATE SEDATION
PEDIATRIC DOSING SCHEDULE**

Generic Name	Use	Dosing Guidelines	Onset and Duration of Action	Adverse Effects	Reversals	Comments
Chloral Hydrate	Pediatric Sedative/ Hypnotic NO Analgesia	25-100 mg/kg PO or PR Total Dose: 1 gram or 2 grams/ 24 hours	Onset: 45-60 min Duration: 4-9 hours	CNS Depression Resp Depression Arrhythmias Paradoxical Agitation Urticaria	None	Wide safety margin Not a good choice if attempt to titrate dose to effect

BENZODIAZEPINES

Generic Name	Use	Dosing Guidelines	Onset and Duration of Action	Adverse Effects	Reversals	Comments
Midazolam (Versed) Versed syrup (10 mg/2 cc)	Sedation Amnesia Anxiolytic	IV: 0.05-0.1 mg/kg/dose IV Total IV Dose: 0.2 mg/kg PO 0.5-0.75 mg/kg Total dose: 15 mg PO IM 0.1-0.2 mg/kg/dose IN: 0.3-0.4 mg/kg	Onset : IV: 1-5 min IN: 10-15 min PO: 15 min Duration: 20-60 min PO: up to 2 hours	Resp Depression Paradoxical agitation Hypotension (esp w opioid) Arrhythmias Nausea/ vomiting Headache Hallucinations Hiccoughs	Flumazenil:	Reduce dose by 25-50% when giving with narcotic (e.g Fentanyl) and wait 10 min for desired effect
Lorazepam (Ativan)	Sedation Amnesia	IV: 0.05-0.1 mg/kg PO: 0.05-0.2 mg/kg Max: 4 mg total	Onset: IV: 1-5 min Duration: 4-6 hours	See Midazolam	Flumazenil	Midazolam a better choice unless desire a long duration of action

**SHADY GROVE ADVENTIST HOSPITAL MODERATE SEDATION
PEDIATRIC DOSING SCHEDULE (con't)**

OPIOIDS

- Avoid repeat IM dosing
- If titrating to response, IV route is recommended

Generic Name (Trade Name)	Use	Dosing Guidelines	Onset and Duration of Action	Adverse Effects	Reversals	Comments
Fentanyl (Sublimaze)	Sedation Analgesia	0.7-1.0 mcg/kg/dose May repeat in 2-3 min Total dose:5 mcg/kg Total 2.5 mcg/kg if admin with Benzo (Versed)	Onset: 1 min IV Duration 30-60 min IV	Respiratory depression Hypotension Bradycardia Chest wall rigidity w/ rapid admin. Facial pruritis	Naloxone	Do NOT exceed rate of admin of 1 mcg/kg/min IV
Morphine sulfate	Sedation Analgesia	0.05-0.15 mg/kg/dose IV 0.1 mg/kg IM or SC Total dose: 0.2 mg/kg	Onset: 5 min IV 15-30 min IM or SC Duration: 1-5 hr	Resp depression Hypotension Bradycardia Nausea Pruritis Urinary retention Epileptogenic	Naloxone	Reduce dose by 50% if given with Benzodiazepine
Meperidine (Demerol)	Sedation Analgesia	0.5-1 mg/kg/dose IV 1-2 mg/kg IM Max total: 3 mg/kg or 150 mg	Onset 5 min IV 15-30 min IM Duration: 2-4 hours	Resp depression Hypotension Bradycardia Tachycardia Nausea Pruritis Urinary retention Epileptogenic	Naloxone	Avoid rapid IV push Better choices exist (Fentanyl/ MSO4)

**SHADY GROVE ADVENTIST HOSPITAL MODERATE SEDATION
PEDIATRIC DOSING SCHEDULE (con't)**

BARBITURATES

Generic name (Trade name)	Use	Dosing guidelines	Onset and Duration of Action	Adverse Effects	Reversals	Comments
Pentobarbital (Nembutal)	Sedation Amnesia	IV: 1-2 mg/kg IM: 2-6 mg/kg PO: 2-6 mg/kg PR: 2-6 mg/kg Total: 6 mg/kg= 100mg	Onset: IV: 1-5 min IM: 10-15 min PO/PR: 30-60 min Duration: IV: 15 min PO/PR: 1-4 hours	Resp depression Hypertension Painful injection Hyperactive after awakening	None	
Methohexital (Brevital)	Sedation	PR: 20-30 mg/kg Use 100mg/ml solution	Onset: 5-10 min Duration: PR: 1-1.5 hours	See Pentobarbital Also: Hiccups, laryngospasm Seizures Muscle twitching, tremors	None	Rectal only

REVERSAL AGENTS

Generic name (Trade name)	Use	Dosing Guidelines	Onset and Duration of Action	Adverse Effects	Comments
Naloxone (Narcan)	Reverses opioid induced analgesia & sedation May reverse chest wall rigidity	Apnea or arrest: 0.01-0.1 mg/kg; redose at 2 min intervals to effect Resp depression: 0.001 mg/kg/dose OR Narcan drip: 1-30 ug/kg/hour	IV: 1-2 min IM/ETT: 2-5 min Duration: < 45 min The duration of the opioid may be longer than the duration of the antagonist	Severe pain Excitement Hypertension Tachycardia Ventricular arrhythmia Pulmonary edema Myocardial Ischemia	Watch for return of respiratory depression
Flumazenil (Romazicon)	Complete or partial reversal of benzodiazepine Sedation	0.01 mg/kg IV q 1 min Total dose: 0.2 mg	Onset 1-3 min IV Duration: 45-60 min	May precipitate seizures	Use with extreme caution Watch for return of sedation/ respiratory depression

Guidelines for Determining Need for Anesthesia Consultation

This document is intended to serve as a guide for physicians when deciding on the need for consultation with an anesthesiologist prior to sedation. These recommendations have been developed by consensus opinion of the Department of Anesthesia and are based on the best available medical evidence. The incidence of adverse outcomes related to sedation is increased in the presence of multiple risk factors and is especially high when risk factors from multiple categories (medical, behavioral, procedure- related) are present. In general, consultation is usually only necessary for the highest risk patients.

Patient related medical risk factors:

- ASA status e3 (especially due to end-stage renal/liver disease, severe pulmonary disease, obstructive sleep apnea, morbid obesity, ejection fraction < 25%)
- History of drug reaction to sedative agent
- History of drug or alcohol abuse/dependence
- Orthopnea
- Pregnancy
- Difficult airway by history or exam (Mallampati score e3, rigid c-spine, mouth opening <3cm, prominent incisors)

Patient behavioral risk factors:

- Dementia
- Highly anxious
- Uncooperative/hostile
- Altered mental status/delirium
- Significant mental illness (schizophrenia, bipolar)
- Autism

Procedure related risk factors:

- Procedures with the potential for causing significant pain
- Prolonged procedures (> 2 hours)
- Procedures requiring unusual positioning (prone)

Anesthesia consultation should be considered whenever one of the above risk factors is present. Consultation is recommended whenever risk factors from more than one category are present. For emergency procedures the physician should weigh the risk of proceeding immediately against the risk of delay associated with obtaining consultation.