Policy for the Care of Patients Sedated for Procedures

Table of Contents

I. Sedation Policy

a. Purpose
b. Definitions
c. JCAHO Standard PC.13.20
d. JCAHO Standard PC.13.30
e. JCAHO Standard PC.13.40
f. Authority
g. Role of the Department of Anesthesia
h. Anesthesia Consultation
i. Equipment
j. Personnel
k. Pathway: Sedation Procedure
l. Quality Management & Process Improvement

II. Appendices

a. ASA Physical Status Classification
b. Airway Assessment for Sedation
c. Fasting Protocols for Elective Procedures
d. Factors Associated with Increased Risk of Aspiration
e. Suggested Drugs and Dosages for Sedation
f. Anesthetics
g. Sedation Record – Example
h. NYSSA Article
i. Bibliography

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Policy for the Care of Patients Sedated for Procedures

PURPOSE:

Those patients sedated for procedures are cared for:

- By providers who are properly trained and qualified per JCAHO standards PC.13.20, PC.13.30, and PC.13.40.
- In an environment designed and supplied to make the sedation & procedure safe.
- Via an intake, sedation, monitoring and disposition/discharge system that provides a uniform, safe standard of care.
Policy for the Care of Patients Sedated for Procedures

DEFINITIONS:

(Taken from Joint Commission Standards)

- 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 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 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.
Policy for the Care of Patients Sedated for Procedures

JCAHO Standard PC.13.20

Hospital

Provision of Care, Treatment, and Services

Standards for Operative or Other High-Risk Procedures and/or the Administration of Moderate or Deep Sedation or Anesthesia

Operative or other procedures and the administration of sedation or anesthesia often occur simultaneously. However, procedures do occur without sedation, and sedation or anesthesia is administered for noninvasive procedures (hyperbaric treatment, CT scan, MRI). Therefore, the following standards address both operative or other procedures and/or the administration of moderate or deep sedation or anesthesia.

Whenever an operative or other procedure is conducted, whether or not sedation or anesthesia is administered, appropriate staff must be involved in planning for and providing care to the patient. All procedures carry risk, but that risk is increased when sedation or anesthesia is administered.

The standards for anesthesia care apply when patients/clients/residents in any setting, receive, for any purpose, by any route, the following:

- General, spinal, or other major regional sedation and anesthesia
  or
- Moderate or deep sedation (with or without analgesia) that, in the manner used, may be reasonably expected to result in the loss of protective reflexes

Because sedation is a continuum, it is not always possible to predict how an individual patient/client/resident receiving sedation will respond. Therefore, each organization develops specific, appropriate protocols for the care of patients/clients/residents receiving sedation. These protocols are consistent with professional standards and address at least the following:

- Sufficient qualified individuals present to perform the procedure and to monitor the patient/client/resident throughout administration and recovery. The individuals providing moderate or deep sedation and anesthesia have at a minimum had competency-based education, training, and experience in the following:
  1. Evaluating patients/clients/residents before performing moderate or deep sedation and anesthesia.

Revised: 10/95, 7/97, 7/98, 7/00, 1/04
Page 4 of 33
Policy for the Care of Patients Sedated for Procedures

2. Performing the moderate or deep sedation and anesthesia, including rescuing patients/clients/residents who slip into a deeper-than-desired level of sedation or analgesia. These include the following:
   1. Moderate sedation—are qualified to rescue patients/clients/residents from deep sedation and are competent to manage a compromised airway and to provide adequate oxygenation and ventilation
   2. Deep sedation—are qualified to rescue patients/clients/residents from general anesthesia and are competent to manage an unstable cardiovascular system as well as a compromised airway and inadequate oxygenation and ventilation

• Appropriate equipment for care and resuscitation
• Appropriate monitoring of vital signs including, but not limited to—heart and respiratory rates and oxygenation using pulse oximetry equipment, respiratory frequency and adequacy of pulmonary ventilation, the monitoring of blood pressure at regular intervals, and cardiac monitoring (by EKG or use of continuous cardiac monitoring device) in patients/clients/residents with significant cardiovascular disease or when dysrhythmias are anticipated or detected
• Documentation of care
• Monitoring of outcomes

Definitions of four levels of sedation and anesthesia include the following: [Note, only the definition of one level is provided here as changes are only applicable to that definition.]

• Moderate sedation/analgesia (“conscious sedation”) A drug-induced depression of consciousness during which patients/clients/residents respond purposefully to verbal commands (note, reflex withdrawal from a painful stimulus is not considered a purposeful response)—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.

Standard PC.13.20
Operative or other procedures and/or the administration of moderate or deep sedation or anesthesia are planned.

Elements of Performance for PC.13.20

1. Sufficient numbers of qualified staff (in addition to the LIP performing the procedure) are present to evaluate the patient, assist with the procedure, provide the sedation and/or anesthesia, monitor, and recover the patient.
2. Individuals administering moderate or deep sedation and anesthesia are qualified and have the appropriate credentials to manage patients at whatever level of sedation or anesthesia is achieved, either intentionally or unintentionally.
Policy for the Care of Patients Sedated for Procedures

- For hospitals providing obstetric or emergency operative services, this means they can provide anesthesia services as required by law and regulation.

JCAHO Standard PC.13.30:

Patients are monitored during the procedure and/or administration of moderate or deep sedation or anesthesia.

Elements of Performance for PC.13.30

1. Appropriate methods are used to continuously monitor oxygenation, ventilation, and circulation during procedures that may affect the patient's physiological status.
2. The procedure and/or the administration of moderate or deep sedation or anesthesia for each are documented in the medical record.

JCAHO Standard PC.13.40:

Patients are monitored immediately after the procedure and/or administration of moderate or deep sedation or anesthesia.

Elements of Performance for PC.13.40

1. The patient's status is assessed on arrival in the recovery area.
2. Each patient's physiological status, mental status, and pain level are monitored.
3. Monitoring is at a level consistent with the potential effect of the procedure and/or sedation or anesthesia.
4. Patients are discharged from the recovery area and the hospital by a qualified LIP or according to rigorously applied criteria approved by the clinical leaders.
5. Patients who have received anesthesia in the outpatient setting are discharged in the company of a responsible, designated adult.
Policy for the Care of Patients Sedated for Procedures

AUTHORITY:

This policy promulgated and disseminated by the Department of Anesthesia has been reviewed and ratified by the Medical Board and the Board of Trustees via the Joint Conference and Professional Affairs Committee to ensure compliance with standards established by the New York State Department of Health and the Joint Commission (JCAHO).

ROLE OF THE DEPARTMENT OF ANESTHESIA:

- Development of guidelines for the training, supervision, credentialing and recredentialing of all individuals involved in the care of patients sedated for procedures undergoing intravenous sedation/analgesia (IVSA).
- Assist in the appropriate Department and/or Division where sedation is to occur throughout the hospital.
- Establish methods of patient evaluation and risk assessment including:
  - ASA physical status classification
  - Airway assessment
  - Fasting interval
  - Aspiration risk
  - Criteria for anesthesia consultation
- Establish designated Sedating Locations with mandatory staffing, equipment, monitoring, documentation, intake and discharge criteria and continuum of care.
- Appropriate drug doses, titration and techniques used during IVSA.
- Periodic inservice education and updates regarding medications - including problem recognition and response.
- Assist in development of monitoring and evaluation tools, adverse event reporting and process improvement via the Performance Improvement Coordinating Group.
Policy for the Care of Patients Sedated for Procedures

ANESTHESIA CONSULTATION:

- Formal consultation with the Department of Anesthesia should be requested when the physicians and nurses caring for the patient are uncertain about the patient's ability to undergo the planned procedure and sedation safely.

For patients with:

1. A significant risk of:
   - Airway compromise
   - Loss of protective reflexes or loss of consciousness
   - Cardiopulmonary or neurologic decompensation
   - Gastric content aspiration

2. A history of complications or failure of prior sedation:
   - Inability of patient to cooperate
   - Generally poor patient condition
   - History of sleep apnea.

3. Any questions related to appropriateness of the method of sedation.
Policy for the Care of Patients Sedated for Procedures

EQUIPMENT:

The Sedating Location must provide:

1. 50 PSI oxygen source. Supplemental oxygen is recommended for most patients being sedated.
2. Variable power vacuum suction apparatus.

* N.B: Wall oxygen and suction sources are most reliable and preferred. Where tank oxygen and/or portable suction machines are used, the attending physician must ascertain that the oxygen supply is sufficient and the suction apparatus is functioning properly before beginning the procedure.

3. Standard fully equipped cardiac arrest cart with equipment appropriate for the age of the patient being sedated including a self-inflating positive pressure oxygen delivery resuscitation bag, airways, laryngoscopes and endotracheal tubes.

   A full supply of resuscitation drugs must be available including narcotic and benzodiazepine antagonist drugs - naloxone and flumazenil. The Pharmacy Department is responsible for maintenance of the resuscitation drugs.

4. Pulse oximeter with alarm.
5. Noninvasive blood pressure measuring device.
6. An EKG monitor with alarm.
7. A patent intravenous infusion for the duration of the procedure and during recovery as deemed necessary.
8. Nitrous oxide:
   When inhalation sedation is provided with nitrous oxide (N20) it must be delivered with equipment that:
   - cannot provide a concentration of N20 in excess of 70% inspired;
   - will provide a maximum of 100% and never less than 21% oxygen;
   - is fitted with an oxygen analyzer to monitor the accuracy of delivered gases.
9. All equipment must be prepared and maintained according to existing Hospital protocol developed by the Department of Biomedical Engineering and the Cardiac Arrest Committee.
Policy for the Care of Patients Sedated for Procedures

PERSONNEL:

There must be a minimum of two people involved in the care of a patient sedated for a procedure.

1. **The Physician.** The sedative medication must be ordered by a physician and its administration, including additional doses, must be supervised by a physician. Careful titration of drugs is mandatory. The physician may be directly involved in the procedure, or may delegate aspects of the procedure to other practitioners – (i.e. Specifically trained technicians.)

2. **The Monitor.** The patient's vital signs, level of consciousness and condition must be continually monitored by a dedicated observer. The dedicated observer has the primary duty to monitor the patient and may be used for minor interruptible tasks and only if absolutely necessary. A monitor will be available to the patient from the time of administration of sedation/analgesia medication until recovery is judged adequate or the care of the patient is transferred to appropriate personnel performing recovery care.

Credentialing Practitioners qualified to sedate and monitor patients for procedures will be credentialed by their respective departments with the assistance of the Department of Anesthesia.

The credentials for each physician sedating patients for procedures will be maintained by the Departments. The credentials for nurses caring for and monitoring sedated patients will be maintained by the Department of Nursing.

The credentialing process will focus on the practitioner's relevant training and experience; the ability to assess the patient prior to the procedure; to know the appropriate doses and effect of drugs, to operate and document monitoring, to recognize airway compromise, loss of consciousness, cardiopulmonary decompensation and to be able to intervene in a timely fashion to rescue and begin resuscitation of the patient as needed.

All persons involved in the care of patients’ sedated for procedures: physicians, nurses, allied health professionals, physicians' assistants will be provided with:

- Current hospital Sedation Policy
- Adjunct general information on sedation/analgesia
- Bibliography
- Compact disc
- Unit specific information from Division Head and/or Unit Coordinator
- Information re: a BLS / ACLS Certification
- Competency test with answer sheet
- Inservice training in airway management
- Bi-annual medical staff recredentialing
- Yearly ongoing competency evaluations for nursing staff

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Policy for the Care of Patients Sedated for Procedures

PATHWAY - SEDATED PROCEDURE:

Prior to Procedure: Patient Preparation

Prior to the procedure the patient must have a pre-sedation evaluation completed by an MD; NP within 7 days prior to the procedure to include the following as appropriate:

1. Indication for the procedure
2. The patient's history including:
   o important medical conditions especially cardiopulmonary status;
   o allergies or adverse drug reactions;
   o prior sedative or anesthesia experiences;
   o potential for pregnancy
3. Physical assessment including:
   o ASA physical status;
   o baseline vital signs with baseline oxygen saturation;
   o weight;
   o airway status;
   o appropriate fasting interval for the elective case (NPO at least 6 hours) (see appendix #3);
   o aspiration risk factors; cardiac and pulmonary status
   o general neurologic status;
   o mental status;
   o level of consciousness
4. Appropriate laboratory tests
5. Informed consent by responsible adult
6. For children and adult out-patients - a responsible adult escort
7. An assessment of the need for blood and blood component transfusion when relevant
8. A plan for sedation
9. A plan for nursing care
10. Determination that the patient is suitable candidate for the procedure and sedation.

During the Procedure: Monitoring and Documentation

The following is required:

1. Physician order for all sedative medications
2. The time, route, dose and effect of all medications including oxygen therapy in liters/min. and by means delivered (e.g. nasal prongs)

Revised: 10/95, 7/97, 7/98, 7/00, 1/04
Policy for the Care of Patients Sedated for Procedures

3. All doses of drugs must be titrated to the desired effect, allowing sufficient time for circulation and observation of variable responses
4. Monitored continuously and recorded every five minutes as appropriate:
   o heart rate;
   o respiratory rate and adequacy of pulmonary ventilation;
   o SpO2 by pulse oximetry;
   o noninvasive blood pressure;
   o level of consciousness;
   o EKG monitoring should be available and utilized for patients with significant cardiopulmonary disease or when dysrhythmias are anticipated or detected.

Documentation on a specific "sedation record" is required. When the procedure is done in an ICU, use of the "sedation record" supersedes ICU, flowsheet documentation.

Recovery and Disposition:

During recovery from sedation:

1. An Aldrete scoring system must be used;
2. Vital signs must be taken every ten minutes x3 then every hour x2 (or until fully recovered);
3. The patient must be observed for a minimum of thirty minutes after the procedure;
4. If antagonist drugs (naloxone, flumazenil) have been used, the patient must be observed for a minimum of 2 hours after the procedure watching for resedation.

The patient may be transferred from the procedure area to a recovery area when:

1. Able to maintain a patent airway with intact reflexes (swallow, cough, gag);
2. Responsive to verbal and tactile stimuli as appropriate;
3. Vital signs are stable with satisfactory SpO2. If the recovery area is remote from the procedure area, the patient must be monitored in transit by the monitoring person with a pulse oximeter. If the patient is sedated in an area remote from the procedure area, the patient must be transported to the procedure area by a monitoring person with a pulse oximeter.

The patient may be discharged from the hospital when:

1. Fully awake with an Aldrete score of 8 or better;
2. Hydration is adequate;
3. Able to walk unassisted - where appropriate;
4. Accompanied by a responsible adult escort;
5. Advised regarding aftercare with written and verbal instructions;
Policy for the Care of Patients Sedated for Procedures

6. The responsible attending physician must write the discharge order and write a discharge note including patient status;
7. An RN may discharge the patient utilizing the above criteria;
8. Standard institutional Ambulatory Care protocols must be employed regarding follow-up and care of post discharge complications.

QUALITY MANAGEMENT & PROCESS IMPROVEMENT:

Every department and discipline sedating patients for procedures must submit quarterly reports of their experience to the Operative and Invasive Procedures Committee for review.

The report must include the number and types of procedures done, complications and results of quarterly Performance Improvement monitoring and activities.

Critical adverse events will be reported and reviewed in a timely manner.
Policy for the Care of Patients Sedated for Procedures

AMERICAN SOCIETY OF ANESTHESIOLOGISTS

Physical Status Classification:

CLASS I:
  o No organic, physiological, biochemical or psychiatric disturbance. The pathologic process for which operation is to be performed is localized and is not a systemic disturbance.

CLASS II:
  o Mild to moderate systemic disturbance caused either by the condition to be treated or by other pathophysiological processes.

CLASS III:
  o Severe systemic disturbance or disease from whatever cause, even though it may not be possible to define the degree of disability with finality.

CLASS IV:
  o Severe systemic disorder already life-threatening, not always correctable by the procedure.

CLASS V:
  o Moribund patient who has little chance of survival, but is submitted to the procedure in desperation.

CLASS VI:
  o Organ donor.
Policy for the Care of Patients Sedated for Procedures

AIRWAY ASSESSMENT PROCEDURES FOR SEDATION:

Positive pressure ventilation, without endotracheal intubation, may be necessary if respiratory compromise develops during sedation / analgesia. This may be more difficult in patients with atypical airway anatomy. Some airway abnormalities may increase the likelihood of airway obstruction during spontaneous ventilation.

Factors that may be associated with difficulty in airway management are:

HISTORY

- Previous problems with anesthesia or sedation;
- Stridor, snoring or sleep apnea;
- Dysmorphic facial features;
- Tumor in airway;
- Trauma to airway;
- Radiation therapy to head, neck;
- Advanced rheumatoid arthritis.

PHYSICAL EXAMINATION

- Habitus: Significant obesity (especially involving the face, neck and thorax)
- Head and Neck: Short neck, limited neck extension, decreased distance from the top of the mandible to the top of the thyroid cartilage (<3 cm in an adult); neck mass, cervical spine disease or trauma, tracheal deviation, decreased tissue compliance
- Mouth: Small opening (<3 cm in an adult); edentulous or protruding incisors; loose or capped teeth; high arched palate; macroglossia; tonsillar hypertrophy; nonvisible uvula
- Jaw: Micrognathia, retrognathia, trismus, significant malocclusion
Policy for the Care of Patients Sedated for Procedures

FASTING PROTOCOL FOR SEDATION AND ANALGESIA FOR ELECTIVE PROCEDURES:

The following guidelines are intended for patients with normal airway and gastroesophageal anatomy.

Several factors are associated with delayed gastric emptying and/or increased risk of aspiration (see Appendix 4: Factors Associated with Increased Risk of Aspiration).

When risk of aspiration is increased, a longer fasting interval is warranted and antacid prophylaxis or intubation may be indicated.

Adults:

- Solids & Nonclear Liquids*: 8 hrs or NPO after midnight
- Clear Liquids: 2-4 hrs

Children older than 36 months:

- Solids & Nonclear Liquids*: 6-8 hrs
- Clear Liquids: 2-4 hrs

Children aged 6-36 months:

- Solids & Nonclear Liquids*: 6 hrs
- Clear Liquids: 2-4 hrs

Children younger than 6 months:

- Solids & Nonclear Liquids*: 4 hrs (breast milk) 2 hrs
- Clear Liquids: 6 hrs (formula) 2 hrs

*This includes milk, formula and breast milk (high fat content may delay gastric emptying).

There are no data to establish whether a 6-8 hr fast is equivalent to an overnight fast before sedation / anesthesia.

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Policy for the Care of Patients Sedated for Procedures

FACTORS ASSOCIATED WITH INCREASED RISK OF ASPIRATION:

- Abnormal Airway;
- Morbid Obesity;
- Hiatus Hernia with Reflux;
- Abnormal Autonomic Function;
- Prior Gastric Surgery;
- Pregnancy;
- "Full Stomach" or Delayed Gastric Emptying;
- Altered Mental State;
- Spinal Cord Injury with Paraplegia or Quadraplegia;
- Narcotics;
- Pain.
Policy for the Care of Patients Sedated for Procedures

SUGGESTED DRUGS & DOSES FOR SEDATION:

SEDATIVES:

Midazolam (Versed)  
**Adult Dose:** .05 - .1 mg/kg IV  
**Adult Max:** 5 - 10 mg  
**Peds Dose:** .05 - .1 mg/kg IV,.5 - .7 mg/kg po  
**Peds Max:** 20 mg po  
**Comments:**  
• Additive depression with narcotics

Lorazepam (Ativan)  
**Adult Dose:** .05 mg/kg  
**Adult Max:** 4 mg  
**Comments:**  
• Long acting  
• Beware cumulative effect

Diazepam (Valium)  
**Adult Dose:** .05 - 1 mg/kg IV  
**Adult Max:** 10 mg  
**Comments:**  
• Pain on injection  
• Half as potent as Versed

Revised: 10/95, 7/97, 7/98, 7/00, 1/04
Page 18 of 33
Policy for the Care of Patients Sedated for Procedures

Chloral hydrate  
**Peds Dose:** 30 - 100 mg/kg po/pr  

**Peds Max:** 1 gm / dose total 2 gm

**Comments:**
- Must be given under supervision

Pentobarbital (Nembutal)  
**Adult Dose:** 2 - 4 mg/kg IV

Secobarbital (Seconal)

**Comments:**
- Deep sedation
- Long acting
- No reversal agent

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<td>Fentanyl (Sublimaze)</td>
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# Policy for the Care of Patients Sedated for Procedures

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<td>Meperidine (Demerol)</td>
<td><strong>Adult / Peds:</strong> 1 mg/kg IV</td>
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<td>• Less often used</td>
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<td>• Dangerous interaction with MAO inhibitors</td>
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<td>Naloxone (Narcan)</td>
<td><strong>Adult:</strong> 0.1-0.2 mg IV, q 2-3 min to desired effect</td>
<td><strong>Peds:</strong> 0.1 - 0.2 mg/kg IV, q 2-3 min</td>
<td>• Brief duration of action</td>
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<td>(for Narcotics)</td>
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<td>• 30 - 45 min</td>
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<td>• Potential for residual resedation</td>
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<td>Flumazenil (Romazicon)</td>
<td><strong>Adult Dose:</strong> 0.1 - 0.2 mg IV to desired effect</td>
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<td>(for Benzodiazepines)</td>
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<td><strong>Peds Dose:</strong> 0.01 mg/kg</td>
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<td><strong>Peds Max:</strong> .2 mg/dose .05 mg/kg</td>
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<td>• May precipitate seizures</td>
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<td>• Residual resedation</td>
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Policy for the Care of Patients Sedated for Procedures

ANESTHETICS:

1. Sodium Thiopental (Pentothal)
2. Methohexital (Brevital)
3. Propofol (Diprivan)
4. Ketamine
5. Etomidate (Amidate)

These medications are commonly used to induce and / or maintain general anesthesia where loss of protective airway reflexes is anticipated. Therefore, these medications are not suitable for conscious sedation/analgesia.

Their use is restricted to specifically credentialed practitioners.
Policy for the Care of Patients Sedated for Procedures

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<table>
<thead>
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<th>USE □ MARK</th>
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<td>ASLEEP</td>
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<td>UNRESPONSIVE</td>
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<table>
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<th>PAIN ASSESSMENT SCALE</th>
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Revised: 10/95, 7/97, 7/98, 7/00, 1/04
Page 22 of 33
## POST-PROCEDURE RECOVERY RECORD

### ALDRETE SCORE

<table>
<thead>
<tr>
<th>Score</th>
<th>0 → 2</th>
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<tbody>
<tr>
<td><strong>Activity:</strong></td>
<td></td>
</tr>
<tr>
<td>Able to move on command</td>
<td>2</td>
</tr>
<tr>
<td>Impaired movement</td>
<td>1</td>
</tr>
<tr>
<td>Not moving</td>
<td>0</td>
</tr>
<tr>
<td><strong>Respiration:</strong></td>
<td></td>
</tr>
<tr>
<td>Able to breathe freely</td>
<td>2</td>
</tr>
<tr>
<td>Dyspnea or limited breathing</td>
<td>1</td>
</tr>
<tr>
<td>Apneic</td>
<td>0</td>
</tr>
<tr>
<td><strong>Consciousness:</strong></td>
<td></td>
</tr>
<tr>
<td>Fully awake</td>
<td>2</td>
</tr>
<tr>
<td>Arousable on calling</td>
<td>1</td>
</tr>
<tr>
<td>Not responding</td>
<td>0</td>
</tr>
<tr>
<td><strong>Circulation:</strong></td>
<td></td>
</tr>
<tr>
<td>Within normal BP/pulse range</td>
<td>2</td>
</tr>
<tr>
<td>Impaired circulation</td>
<td>1</td>
</tr>
<tr>
<td>Unstable</td>
<td>0</td>
</tr>
<tr>
<td><strong>Oxygen Saturation (Pulse Oximetry):</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; 92% breathing room air</td>
<td>2</td>
</tr>
<tr>
<td>Needs supplemental oxygen</td>
<td>1</td>
</tr>
<tr>
<td>To maintain saturation &gt; 90%</td>
<td></td>
</tr>
<tr>
<td>&lt; 90% even with supplemental oxygen</td>
<td>0</td>
</tr>
</tbody>
</table>

### Total/Initials

### Transfer to Floor or ICU

- 1. Alert and responsive
- 2. Airway Reflexes present
- 3. Vital signs stable
- 4. Patient ambulatory
- 5. Adequate hydration
- 6. Written & verbal discharge instruction given
- 7. Responsible adult escort

### Discharge Home

Response to pain medication (if applicable):

### Patient Transferred to Floor or ICU

All seven discharge criteria met. Patient discharged home at __________ by _______.

Follow up phone call within 72 hours: □ Yes □ No ______ See Follow up form.

Nurses notes / Additional notes:

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**Revised:** 10/95, 7/97, 7/98, 7/00, 1/04

Page 23 of 33
The following information was prepared for the NY State Society of Anesthesiologists Journal, "The Sphere" Vol 49 # 4 October - December 1997, by Stephen K. Vitkun Associate Professor Department of Anesthesiology SUNY at Stony Brook. It is reproduced and distributed with his permission.

**Perspectives on Sedation and Analgesia: Pharmacology, Monitoring and Educational Materials to Supplement the Sedation and Analgesia Policy**

The Joint Commission on Accreditation for Hospitals has Guidelines for the use of drugs that trigger the use of anesthesia standards. The pharmacological classification of the drug is not the sole determinant. The dose and route of administration are also factors because this combination determines the risk for loss of the patient’s protective airway reflexes. Because sedation is a continuum, it is not always possible to predict how an individual patient receiving sedation will respond. Therefore, each institution has been asked to develop specific protocols for the care of patients receiving sedation which carries a reasonable risk of loss of protective reflexes. The protocol (policy attached, this educational material, quiz and credentials paperwork comprise the credentialing packet for “sedation and analgesia” by non-anesthesiologists.

Intravenous (IV) sedation and analgesia (a.k.a. conscious sedation) is produced by the administration of pharmacological agents which alone, or in combination, produce a depressed level of consciousness but the ability to independently and continuously, maintain a patent airway and respond appropriately to physical stimulation is retained. Our goal in providing the practitioner with this educational module (containing the hospital’s Policies and Procedures on Sedation and Analgesia by non-anesthesiologists for elective procedures, this overview of Perspectives on sedation and analgesia and the questions that follow) is to assure the same level of quality patient care by all individuals with delineated clinical privileges, within medical staff departments, and across all departments and services at the hospital. This perspective is a guideline for EDUCATIONAL PURPOSES ONLY. It is NOT designed to establish or reflect standards, nor is it intended to be used for legal purposes.

**The objectives for the patient include:**
- Alteration of Level of Consciousness / Mood
- Maintenance of Consciousness
- Cooperation
- Elevation of the Pain Threshold
- Minimal Variation of Vital Signs
- Rapid Degree of Amnesia
- Safe Return to Ambulation

**The desired effects include:**
- Relaxation
- Cooperation
- Purposeful Responses to Verbal Communication and Tactile Stimulation
- Early Arousal from Sleep

**Undesirable effects of sedation and analgesia are:**
- Deep Unconscious Sleep
- Hypotension
- Bradyarrhythmia
- Agitation and Combative
- Hypoventilation
- Respiratory Depression
- Airway Obstruction
- Agnoscia

**Sedation and Analgesia, as defined by the hospital’s policy and procedures is a minimally depressed level of consciousness that retains the patient’s protective reflexes and ability to maintain a patent airway independently and continuously. It must be distinguished from pre-medications which is defined as a single dose of medication, usually given either by mouth or intramuscularly, prior to a procedure and post-procedure or post-operative pain management including patient-controlled...**
Policy for the Care of Patients Sedated for Procedures

analgesia. Refer to the hospital’s Policy regarding Sedation and Analgesia for further information regarding pre-medication and post-procedure pain management. These items are not part of the policy regarding sedation and Analgesia. Pre-medication is not usually titrated to effect as are medications given for sedation and analgesia. Examples of pre-medication include IM valium, IM Demerol / vitacil or chloralhydrate given to a child. The dosages and/or routes of administration of drugs used for pre-medication, or for post-procedure (post-operative) pain management or patient-controlled analgesia (PCA) are not considered to have a reasonable risk of causing loss of the patient’s protective airway reflexes and therefore similar medication(s) used for these purposes are not part of the policy on sedation and analgesia by non-anesthesiologists. Sedation and analgesia, or "conscious sedation" must also be distinguished from deep sedation. Deep sedation is a controlled state of depressed consciousness or unconsciousness from which the patient is not easily aroused and is unable to respond purposefully to physical stimulation or verbal command. This may be accompanied by a partial or complete loss of protective reflexes and an inability to maintain a patent airway independently. Deep sedation should only be administered by an anesthesiologist (except in circumstances where a patient is already mechanically ventilated for medical reasons. Sedation of mechanically ventilated patients is not considered in this policy).

This perspective will consider the pharmacology of some of the drugs which may be used for sedation and analgesia, as defined above, as well as the personnel, monitoring and patient evaluation necessary for procedures requiring sedation and analgesia.

Pharmacological Principles of Sedation and Analgesia

Sedation and analgesia may be provided by a variety of drugs which differ significantly in their pharmacologic classification and effects. The most widely used include the benzodiazepines and the narcotics. Other intravenous anesthetic agents are sometimes used for conscious or deep sedation. These include pentothal, meperidine, ketamine and propofol. Due to the greater propensity for respiratory, depression and other reactions, they should not be routinely used by non-anesthesiologists for sedation and analgesia. While some practitioners have experience and are familiar with the use of these agents, they may be used provided specific protocols (to include procedure, route, dose and timing of administration) are submitted to, and approved by the anesthesiologist-in-chief regarding their use.

Benzodiazepines are widely used for sedation and analgesia. They are considered to be sedative-hypnotics or tranquilizers. They are used for anxiolysis, sedation and amnesia. The most widely used include diazepam (Valium®), midazolam (Versed®) and lorazepam (Ativan®). Midazolam use has overtaken that of diazepam due to a shorter duration of action and water solubility which helps to decrease the pain associated with injection.

The benzodiazepines produce a spectrum of effects, depending upon the dose, they range from tranquility and drowsiness to sedation, and ultimately, unconsciousness. Antegrade amnesia is associated with all of the benzodiazepines. The most significant side effect of any of the benzodiazepines is severe respiratory depression, particularly when used in combination with other CNS depressants. Benzodiazepines cause minimal cardiac depression when used alone. However, when combined with other anesthetic agents, including narcotics, which, by themselves are cardiotonic drugs, cardiovascular depression and even hemodynamic collapse may occur.

A sedating dose of diazepam is 0.05 to 0.1 mg/kg IV. For midazolam, 0.01 mg/kg IV as an initial dose may be used. Lorazepam has a much longer clinical duration than either diazepam or midazolam. It is most useful as a pre-medication, given intramuscularly at a dose of 0.05 mg/kg. These agents should be administered slowly due to the widely varied responses from patient to patient. The dose should be lowered in the elderly or debilitated patient. The patient must be monitored by qualified personnel after administration of these agents.

Flumazenil (Komazol®), a benzodiazepine antagonist can reverse the effects of the agents above. It should be used cautiously because it can precipitate acute withdrawal in patients who are chronically dependent on benzodiazepines. When given intravenously, the dose is 0.2 mg repeated at 1 minute intervals to a maximum of 1 mg. The onset of action is usually within 2 minutes. While flumazenil reliably antagonizes the sedative effects of benzodiazepines, its antagonism of respiratory depression is not as reliable and should not be depended upon. Respiratory depression should be initially treated with supplemental oxygen, and if needed, positive pressure ventilation by a bag/
Policy for the Care of Patients Sedated for Procedures

Valve/mask (Ambu) system. Furthermore, the duration of action of the benzodiazepine used may exceed that of flumazenil. Continued monitoring is essential even after flumazenil use.

Narcotics, which are routinely used for sedation and analgesia, act at a variety of different receptor sites. The use of narcotics serves to produce analgesia. In combination with a benzodiazepine, this provides sedation, anxiolysis and analgesia which is the goal. In addition, a local anesthetic injection or topical anesthetic may then be used to provide anesthesia for a specific indication such as catheterization of an artery, excision of skin lesion or introduction of an endoscope.

The narcotics can be divided into several classes. They include naturally occurring opioids, semi-synthetic opioids and synthetic opioids. The potency and duration of action between these different classes varies considerably.

For analgesia, a mu receptor agonist is ideal. It acts centrally in pain-suppressing areas of the brain and spinal cord. These areas include the periaqueductal gray, medial thalamus, substantia gelatinosa and lamina I and II of the spinal cord. Sufentanil is the clinical, standard for efficacy. While it can render a patient apneic, and completely unresponsive to noxious stimulation, the patient may retain enough residual awareness to later recall the procedural events. For this reason, a narcotic is rarely given alone. A combination with a benzodiazepine produces more reliable anesthesia.

Anxiety and discomfort from a procedure can produce stress which, causes large swings in hemodynamic variables, as well as increased catechol metabolism. This stress may also cause abrupt release of epinephrine, norepinephrine, glucagon, cortisol, growth hormone and antidiuretic hormone which increases the cardiovascular stress. These considerations are of major importance to patients with marginal hemodynamic and metabolic reserves, such as patients with advanced cardiac, vascular or renal disease.

Widely recognized mu agonists include morphine sulfate, methadone hydrochloride, meperidine hydrochloride, pentazocine hydrochloride, sufentanil citrate, alfentanil hydrochloride. Agonist-antagonist opioids are also used. They have different actions at different receptor sites, resulting in diverse pharmacologic effects. They may also precipitate withdrawal in narcotic-addicted patients. Agents in this class include butorphanol tartrate (Stadol®) and nalbuphine (Nubain®).

The narcotic antagonists include naloxone hydrochloride and naltrexone. Both are nonselective. Naloxone is a pure antagonist of all opioid effects except those mediated by the sigma receptor. It is used primarily to antagonize respiratory depression and acute opioid overdose. The duration of action of naloxone is about 2q to 30 minutes. Repeat boluses or a continuous infusion are used to maintain adequate blood levels until the opioid antagonist is eliminated. Also, it is important to recognize that the opioid analgesia is antagonized like the respiratory depression. This antagonism can precipitate acute withdrawal in opioid-addicted patients. Rare, but potentially fatal reactions to naloxone include pulmonary edema, seizures, hypertension, arrhythmias, and cardiovascular collapse. Careful titration and close monitoring are essential. Naltrexone is also a pure antagonist. Clinically it is used for antagonism of opioids with long elimination half-lives such as norepinephrine or methadone. It has no use in the antagonism of medications used for sedation and analgesia.

Nitrous oxide is the first inhalational anesthetic to be used clinically. There are now over 150 years of clinical experience with this agent. Nitrous oxide is a weak anesthetic agent but it may be used in subanesthetic doses for analgesia or as a supplement to potent anesthetic agents to reduce the concentration required. Nitrous oxide is a myocardial depressant. However, it indirectly stimulates the sympathetic nervous system. Nitrous oxide is nonirritating to the upper airways. It lacks any direct bronchodilatory effects. The major toxic effects of nitrous oxide are associated with its inactivation of methionine synthase. This decreases the concentrations of methionine, a precursor to thymidine, which is incorporated into DNA. Nitrous oxide should be avoided in pregnant patients because of the potential effect on DNA. For sedation and analgesia, it should not exceed concentrations of 50% in oxygen.

Ketamine hydrochloride is a derivative of phencyclidine. It may be administered intravenously or intramuscularly to produce a pain-free cataleptic state. The patient may appear awake but is
dissociated from the environment. The cataleptic state produced by ketamine has been called “dissociative anesthesia”. Ketamine can increase intracranial pressure as it is a potent cerebral dilator. It also increases heart rate, cardiac output and systemic and pulmonary vascular resistance. Although laryngeal reflexes are only moderately depressed, an endotracheal tube is still necessary if there are full stomach considerations. The major disadvantage of ketamine is the propensity for psychic disturbances on emergence from anesthesia. These may manifest as unpleasant dreams or hallucinations that may progress to delirium. The incidence of emergence delirium from ketamine reportedly ranges from 5 to 30%. The sympathomimetic effects of ketamine make it a poor choice for patients with severe hypertension, significant coronary artery disease or aortic or cerebral aneurysms. For sedation and analgesia, ketamine may be administered in doses of 0.2 to 0.3 mg/kg IV or 2 to 3 mg/kg IM.

Pre-Procedural Evaluation

A physician administering sedation and analgesia should be familiar with relevant aspects of the patient’s medical history including: major organ system abnormalities, previous experiences with sedation, regional and general anesthesia, current medication and drug allergies, the time and nature of the last oral intake, history of alcohol, tobacco or substance abuse. The pre-procedural examination should include a focused evaluation of the airway, the heart and lungs. The practitioner should be alerted to the possibility of difficult tracheal intubation in patients with significant obesity, especially involving the neck and facial structures. Individuals with a short neck, a small jaw or a receding chin (micrognathia, retrognathia) may be difficult to intubate in an emergency. Medical conditions such as rheumatoid arthritis, or other conditions which limit the range of motion of the neck or jaw, or significant maxillary mandibular malocclusion may also present a challenge to tracheal intubation. Laboratory tests should be guided by the patient’s medical condition and how the results will affect the management of sedation.

Consultation for Sedation and Analgesia

The American Society of Anesthesiologists has established criteria by which a patient’s physical status is evaluated pre-operatively (or pre-procedure). It is a scale ranging from 1 to 5 and uses the additional designation of “A” for an emergency procedure. The description is as follows:

<table>
<thead>
<tr>
<th>ASA Physical Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Systemic Disease</td>
</tr>
<tr>
<td>2</td>
<td>Mild, or Well Controlled Systemic Disease. No Functional Limitations</td>
</tr>
<tr>
<td>3</td>
<td>Severe Systemic Disease. Definite Functional Limitations</td>
</tr>
<tr>
<td>4</td>
<td>Severe Systemic Disease. Constant Threat to Life</td>
</tr>
<tr>
<td>5</td>
<td>Moribund. Not Expected to Survive for 24 Hours. Irrespective of Operation</td>
</tr>
</tbody>
</table>

The patient with a physical status rating of ASA 3 or higher should alert the practitioner that a higher level of vigilance is required. In patients of ASA physical status 3, 4, or 5 (e.g. severe cardiac, pulmonary, hepatic, renal, CNS disease, morbid obesity, sleep apnea, others), or in certain selected classes of patients such as uncooperative patients, extremes of age (under 1 year or over 70 years of age), the pregnant patient, those with sleep apnea or drug/alcohol abusers there is an increased risk of developing complications related to sedation and analgesia unless special precautions are taken. This risk may be reduced by appropriate pre-procedure consultation with appropriate specialists including, but not limited to anesthesiologists, cardiologists, pulmonologists, nephrologists, obstetricians or pediatricians.

Whenever possible, appropriate medical specialists should be consulted before the administration of sedation and analgesia to a patient with significant underlying conditions. If it appears likely that sedation to the point of unresponsiveness or even general anesthesia may be necessary to obtain adequate conditions, an anesthesiologist should be consulted prior to planning the
Policy for the Care of Patients Sedated for Procedures

procedure. The Department of Anesthesiology may be contacted at xxx-xxxx (office) or in the operating room at xxx-xxxx and ask for the anesthesiology coordinator.

During the administration of sedation and analgesia, should a situation become unmanageable or life-threatening, the hospital operator should be instructed to page "Anesthesia, STAT to your location or phone number" or initiate a "CodeBlue" response by dialing the hospital's "Code Blue" phone number if these criteria are fulfilled.

Monitoring and Equipment for Sedation and Analgesia

The following equipment must be present and ready for use in any area where sedation and analgesia is administered:

- Oxygen
- Suction
- Bag and Mask (AMBU) in Appropriate Sizes (for Positive Pressure Ventilation)
- Airways (Oral/Nasopharyngeal) in Appropriate Sizes
- Intubation Equipment (ET Tubes, Laryngoscopes, Stylets)
- Pulse Oximeter
- Cardiac Monitor - ECG (when indicated)
- Non-Invasive Blood Pressure Monitor
- Code Cart/Defibrillator

The monitoring of the level of consciousness, respiratory function and hemodynamics reduces the risk of adverse outcomes. Patient's ventilatory status and level of oxygenation as well as hemodynamic variables should be recorded at a frequency determined by the type and amount of medication administered, duration of the procedure, and patient's general medical condition. At a minimum, this should be before the procedure, after administration of sedative or analgesic agents, upon completion of the procedure, during the initial recovery phase and at the time of discharge.

Documentation on the patient record during the administration of sedation and analgesia should include:

- Dose, Route, Time, Effects of Drugs Used
- Type/ Amount of IV Fluids/Blood/Blood Products Used
- Physiological Data (i.e., Recorded every 5 to 15 minutes)
- Level of Consciousness
- Unoward/Significant Reactions and Resolutions

A designated individual, other than the physician performing the procedure should be continuously present to monitor the patient throughout the procedure. This individual may assist with only minor interruptible tasks. This person should also have an understanding of the pharmacology of the agents administered as well as the role of antagonists. The person should also be able to recognize associated complications. This person should preferably be a registered nurse. At least one member of the care team should be capable of establishing a patent airway and providing positive pressure ventilation. There should also be a means for summoning additional assistance whenever sedation and analgesia is administered. Ideally, a person with advanced life-support skills is immediately available.

In addition to the drugs used for sedation, pharmacologic antagonists (flumazenil and naloxone) and emergency equipment should be immediately available. An example of the emergency equipment and drugs to be available during sedation and analgesia would include (this is a guide, which should be modified depending upon the individual practice circumstances):

**Intravenous Equipment**
- Gloves, Tourniquets, Alcohol wipes, Gauze Pads
- IV Catheters (20, 22, 24 Gauge) and IV Tubing, IV Fluids
- Three-Way Stopcocks, Assorted Needles, Syringes, Tape

**Airway Management Equipment**
- Oxygen Source (with regulator/流量meter, i.e., Positive Pressure)
- Suction, Suction Catheters (Soft and Yankauer Type)
- Face Masks (appropriate sizes)
Policy for the Care of Patients Sedated for Procedures

- Self-Inflating, Breathing Bag-Valve Set (Ambu Bag)
- Oral/Nasal Airways (appropriate sizes) and lubricant
- Laryngoscope Handle/Blades (Probed)
- Endotracheal Tubes (Sizes 6.0, 7.0, 8.6 for Adults) and/or
- Pediatric Endotracheal Tubes (Sizes 2.5 to 6.0) as Indicated
- Endotracheal Tube Styllets (appropriate sizes)

Pharmacological Antagonists of Narcotics / Benzodiazepines
- Naloxone
- Flumazenil

Emergency Medications
- Epinephrine
- Ephedrine
- Atropine
- Lidocaine
- Glucose, 50%
- Diphenhydramine
- Hydrocortisone, Methylprednisolone or Dexamethasone
- Diazepam or Midazolam (for treatment of Local Anesthetic Toxicity)
- Ammonia Spirits

The use of a combination of drugs (i.e.: a benzodiazepine and a narcotic) may be more effective in providing the desired sedation. However, literature also suggests that the combination of sedatives and analgesics may increase the likelihood of adverse outcomes such as ventilatory depression and hypoxemia. Fixed combinations of sedatives and analgesic agents may not meet the individual patient's needs for sedation and analgesia. Therefore, if a combination of agents is used, they should be administered separately and titrated to effect. Sufficient time must elapse between doses to observe the effect before subsequent drug administration. The propensity for combinations to produce respiratory depression emphasizes the need to reduce the dose of each drug accordingly and to continually monitor vital signs. If patients have received antagonists (flumazenil) and/or naloxone, they should be encouraged or stimulated to breathe deeply, receive positive pressure ventilation and receive supplemental oxygen. These patients must be monitored long enough after the administration of antagonists to ensure that cardiorespiratory depression does not recur. Generally, this should be considered to be 2 hours.

All patients receiving sedation and analgesia should have intravenous access maintained throughout the procedure and until such time that the patient is no longer at risk for cardiorespiratory depression. If a patient has received sedation by a non-intravenous route or if the IV has become dislodged or blocked, the practitioner should determine the advisability of establishing or re-establishing IV access. In any event, an individual with the skill to establish intravenous access (especially if an emergency arises) should be immediately available.

The Pulse Oximeter and Electrocardiogram

The pulse oximeter is a non-invasive device which measures a pulse and oxygen-hemoglobin saturation (%). The operating principle of a pulse oximeter involves absorption of different wavelengths of red and infrared light by oxygenated and deoxygenated hemoglobin as it is transmitted through, and reflected by a tissue bed. Pulse oximeters use the pulse to distinguish between blood and tissue absorptions (only arterial blood pulsates). The pulse oximeter uses two specific wavelengths of light: 660 nm (red light) and 940 nm (near-infrared light). The pulse oximeter is subject to signal artifacts which are usually related to ambient light, low perfusion and patient motion. It can also be affected by injected dye like methylene blue which have absorbance similar to deoxygenated hemoglobin and can cause brief artificial oxygen desaturation when administered by intravenous injection.

Oxygen saturation is not the same as oxygen partial pressure which is measured by blood gas analysis. Oxygen saturation will be 100% when the oxygen partial pressure is 100 mmHg or greater, while partial pressures of oxygen can be several hundred the oxygen saturation remains at 100 and oxygen is dissolved in the blood. Despite the differences, saturation is very useful because it is
Policy for the Care of Patients Sedated for Procedures

an early warning indicator of low-oxygen states. The partial pressure of oxygen and oxygen saturation can be approximated at lower oxygen levels.

<table>
<thead>
<tr>
<th>Partial Pressure of Oxygen (P\textsubscript{O\textsubscript{2}} Blood Gas)</th>
<th>Oxygen Saturation (S\textsubscript{O\textsubscript{2}} Pulse Oximeter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 mmHg</td>
<td>90% Saturation</td>
</tr>
<tr>
<td>50 mmHg</td>
<td>80% Saturation</td>
</tr>
<tr>
<td>40 mmHg</td>
<td>70% Saturation</td>
</tr>
</tbody>
</table>

When used in conjunction with the other required monitors, the non-invasive pulse oximeter represents a significant advance in patient safety. It provides important information about oxygenation on a beat-to-beat basis and confirms EKG pulse tracings. The pulse oximeter must be used routinely. Electrocardiographic monitoring should be used in those patients with a significant cardiovascular disease, as well as during procedures in which dysrhythmias are anticipated.

Recovery and Discharge after Sedation and Analgesia (Conscious Sedation)

Patients may continue to be at significant risk for complications after completion of a procedure. A lack of stimulation, prolonged drug absorption or post-procedural hemorrhage may contribute to cardiorespiratory depression. After administration of sedation and analgesia, the patient should be observed until they are no longer at an increased risk for cardiorespiratory depression. Vital signs and respiratory function should be monitored at regular intervals until a patient is ready for discharge. A patient should not be discharged until specific discharge criteria are met which are designed to minimize the risk of complications from central nervous system and/or cardiorespiratory depression.

The recovery area should be equipped in a similar fashion to the procedure room. It should have appropriate monitoring and resuscitation equipment. An R.N. or other trained individual should be in attendance until discharge criteria are fulfilled. An individual capable of providing or maintaining the airway and administering positive pressure ventilations should be immediately available. The vital signs, level of consciousness and respiratory function should be checked and recorded at regular intervals. The practitioner should be notified immediately if dramatic changes occur or if the parameters are not within the established limits for that patient.

The Aldrete score has been used for almost 25 years in postanesthesia care units to clinically assess the physical status of patients recovering from an anesthetic and follow their awakening process. This method of assessment has been adopted as the suggested criteria for discharge from the post-anesthesia care unit by the Joint Commission of Accreditation of Health Care Organizations. Since the initial description by Aldrete 27 years ago, there have been some improvements in monitoring which have been incorporated into the modified Aldrete score. For intra-hospital transfers after receiving conscious sedation, the patient should achieve an Aldrete score of 8 based upon criteria including activity, respiration, circulation, consciousness and oxygen saturation. For discharge home, in addition to these criteria patients must have satisfactory discharge criteria including dressing, pain, ambulation, fasting-feeding and urine output. For discharge the patient should achieve a Modified Aldrete score of 18 based upon all 10 criteria. The Aldrete scoring system is shown in the Table Attached.

Guidelines for discharge (many are incorporated into the Aldrete Score) may include:
- Patient is Alert and Oriented (Infants or Altered Mental Status Returned to Baseline)
- Patient has Eaten a Light Snack (i.e., crackers and juice), Voided, and Ambulated Without Difficulty (i.e., Elbows, Hands or Vomiting)
- Patient has NO or Minimal Pain from the Procedure
- Vital Signs and Respiratory Function Stable (pre-procedure range) and within Acceptable Limits
- Observation for 2 hours after the Last Administration of Antagonists (reversal agents)
- Discharged to the Care of A RESPONSIBLE ADULT who will accompany them home (i.e., drive them) and be able to report any post-procedure complications
- Patient has received WRITTEN instructions regarding diet, activity, medication and has an emergency phone number.
Policy for the Care of Patients Sedated for Procedures

- The Aldrete Score should be used for intra-hospital transfers, the Modified Aldrete Score for patients being Discharged Home after Sedation and Analgesia.

We hope this educational module has been useful. Please refer to it as you consider the questions on the following pages.

Bibliography


Policy for the Care of Patients Sedated for Procedures

BIBLIOGRAPHY:


Revised: 10/95, 7/97, 7/98, 7/00, 1/04
Page 32 of 33
Policy for the Care of Patients Sedated for Procedures


