Procedural Sedation
Self Study Module
1. Introduction

This self-study module is designed to increase and reinforce with the professional nurse, the knowledge, responsibilities, skills, and competency associated with the care of individuals requiring procedural sedation.

The procedural sedation internal policy and procedure (IPP) addresses the administration and care of patients receiving procedural sedation, including the definitions of the levels of sedation and monitoring requirements.

Procedural sedation has four levels: minimal, moderate, deep, and anesthesia. Minimal and moderate sedation is the focus of this self-study module. Sedative and analgesic medications are administered for moderate sedation to achieve an altered state of consciousness.

Benzodiazepines, such as midazolam (Versed) and diazepam (Valium), and opioids, such as morphine and fentanyl (Sublimaze), produce a minimal to moderate depressed level of consciousness, anxiolysis (a reduced anxiety level), and analgesia.

Learner Outcomes

After completing this self-study module, the learner will be better able to:

1. Explain the concepts and principles of procedural sedation.
2. Distinguish between the indications for and the goals of the various levels of procedural sedation.
3. Conduct a physiological and psychological assessment of each patient receiving procedural sedation.
4. Apply clinical knowledge and skills in the management of nursing care for the patient receiving procedural sedation (pre-procedure, intra-procedure, post procedure, and discharge).
5. Identify and explain the actions, side effects, and complications associated with the sedating agents used for pediatric and adult patients.
6. Select and demonstrate proficient use of emergency equipment to manage complications of procedural sedation.
7. Utilizing the nursing process (assess, plan, implement, evaluate) to document patient care on the procedural sedation flow sheet.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>II.</td>
<td>Learner Outcomes</td>
<td>3</td>
</tr>
<tr>
<td>III.</td>
<td>Table of Contents</td>
<td>4</td>
</tr>
<tr>
<td>IV.</td>
<td>Definition, Goals, Objectives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Definition of procedural sedation by levels</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>- Pharmacological concepts</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>- Pharmacological and systemic differences in children and elderly</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>- Pre procedural goals</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>- Procedural sedation administered locations</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>- Pre-procedure Admission</td>
<td>10</td>
</tr>
<tr>
<td>V.</td>
<td>Pre Procedure Assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Patient Assessment - Pre sedation</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>- Guidelines for NPO status</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>- Practitioner Responsibilities</td>
<td>17</td>
</tr>
<tr>
<td>VI.</td>
<td>Intra-Procedure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Equipment</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>- Emergency Resuscitative Equipment</td>
<td>22</td>
</tr>
<tr>
<td>VII.</td>
<td>Post Procedure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Nursing Responsibilities</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>- Patient Monitoring</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>- Post Anesthesia Recovery Sedation for Ambulatory Patients (PARSAP)</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>- Discharge Criteria</td>
<td>32</td>
</tr>
<tr>
<td>VIII</td>
<td>Answers to test questions</td>
<td>35</td>
</tr>
<tr>
<td>IX.</td>
<td>References</td>
<td>36</td>
</tr>
</tbody>
</table>
# Levels of Procedural Sedation: Defined

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimal sedation (anxiolysis)</strong></td>
<td>A drug-induced state during which patients&lt;br&gt;- Respond normally to verbal commands&lt;br&gt;- May have impaired cognitive function and coordination,&lt;br&gt;- Respiratory and cardiovascular functions are unaffected.</td>
</tr>
<tr>
<td><strong>Conscious sedation of the patient</strong></td>
<td>Generally achieved when there is an onset of slurred speech.</td>
</tr>
<tr>
<td><strong>Moderate sedation (Conscious Sedation)</strong></td>
<td>A drug-induced depressed level of consciousness achieved with the administration of sedatives, hypnotics, and/or opioids.&lt;br&gt;- Patient retains protective airway reflexes,&lt;br&gt;- Independently and continuously maintains a patent airway and spontaneous ventilation,&lt;br&gt;- Can respond purposefully and appropriately to light tactile and verbal stimuli&lt;br&gt;- Cardiovascular function is usually maintained.</td>
</tr>
<tr>
<td><strong>Deep sedation analgesia</strong></td>
<td>A drug-induced depression of consciousness during which&lt;br&gt;- Patients cannot be easily aroused,&lt;br&gt;- May respond purposefully following repeated or painful stimulation&lt;br&gt;- Ability to independently maintain respiratory function may be impaired&lt;br&gt;- Patients may require assistance in maintaining a patent airway and spontaneous ventilation may be inadequate,&lt;br&gt;- Cardiovascular function is usually maintained. Note: Reflex withdrawal from a painful stimulus is <strong>NOT</strong> considered a purposeful response.</td>
</tr>
<tr>
<td><strong>Anesthesia</strong></td>
<td>General anesthesia and spinal or major regional anesthesia.&lt;br&gt;- Induced loss of consciousness, not arousable, even by painful stimulation&lt;br&gt;- Independently maintain respiratory function is impaired,&lt;br&gt;- Requires assistance in maintaining a patent airway,&lt;br&gt;- Positive pressure ventilation may be required,&lt;br&gt;- Neuromuscular function is impaired,&lt;br&gt;- Cardiovascular function may be impaired&lt;br&gt;Note: It does <strong>NOT</strong> include local anesthesia.</td>
</tr>
</tbody>
</table>
Pharmacological Concepts

Moderate Sedation is achieved by administering pharmacological agents.

What are the pharmacologic agents used in Procedural Sedation?

The most commonly used pharmacologic agents are:

<table>
<thead>
<tr>
<th>Narcotics</th>
<th>Benzodiazepines</th>
<th>Hypnotics</th>
<th>Anesthetic</th>
<th>Reversal agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demerol</td>
<td>Midazolam</td>
<td>Chloral Hydrate</td>
<td>Ketamine</td>
<td>Naloxone</td>
</tr>
<tr>
<td>Morphine</td>
<td>Valium</td>
<td></td>
<td></td>
<td>Anexate/Romazicon</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>Ativan</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What are the qualities these Pharmacologic agents possess?

- Rapid acting
- Limited cardiorespiratory effects
- Titratable
- Provides analgesia
- Quick onset of action 20-30 minutes
- Rapid elimination
- Reversible

Physicians and nurses who do not have privileges in anesthesiology should not administer drugs classified as anesthetic agents, including but not limited to:

- Ketamine
- Sodium pentothal
- Methohexital
- Propofol
- Etomidate

Are YOU “prepared” by education, licensure, training, and experience to render procedural sedation?
## Pharmacological and Systemic Differences in Children and the Elderly

<table>
<thead>
<tr>
<th>System Organs</th>
<th>Children</th>
<th>Elderly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>Children are at higher risk for respiratory depression 20 minutes after IV sedation</td>
<td>There is a decrease in laryngeal and pharyngeal reflexes, thus the patient is at increased risk for airway compromise.</td>
</tr>
</tbody>
</table>
| Opening the airway  | Sniffing position with jaw forward  
Child’s airway should be reassessed frequently | Most effective way to open the airway in adults is the head tilt-jaw lift.                                                            |
| Effect of procedural sedating agents on ...breathing effort | Less alveolar space for gas exchange | It is common for the elderly individual to have oxygen saturations approximately 93%-95%.                                               |
| Oxygen demands...   | Higher for children                                                       | Obese patients are at increased risk of respiratory insufficiency secondary to their high minute volumes.                             |
| Cardiovascular      | Keep child warm  
Controlled by increasing heart rate  
**Hypoxia is a primary cause of bradycardia in infants.** | Cardiac arrhythmias                                                                                                                                 |
| cardiac output      | Varies considerably depending upon age of infant/child. Infants less than 3 months metabolize morphine slowly and require 25% of the dose needed/kg than older infants and children. | is altered in the elderly patient.  
↑ protein bound drugs = ↑ concentration of circulating drugs = more profound drug affect = risk of over sedation. Elderly are at risk for cumulative drug effects. |
| Drug binding        | Immature, resulting in slower drug metabolism /clearance in infants       | Decrease renal/hepatic blood flow. Decrease in hepatic / renal function                                                                 |
| Hepatic and Renal   | Fluid differences and its distribution                                      |                                                                                                                                          |
| Neurologic          | not well developed until eight to ten years of age  
**Elderly:** laryngeal/pharyngeal reflexes are decreased | Increased sensitivity to sedation-Central Nervous System                                                                              |
Who is responsible for validating the physician’s order?

The nurse is responsible for validating the physician's order.

Staff Nurses and Physicians

Has your competency been reviewed and approved?

Are you authorized to do it?

Are you familiar with all official policy and procedures, standards and guidelines?
Pre Procedural Sedation: Goals

The pre procedural goal of procedural sedation is to rapidly return the patient to the pre sedation state with minimal risk for re-sedation.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain adequate sedation with minimal risk.</td>
<td>The patient’s ability to communicate is preserved. Physiologic functioning (cardiac, respiratory, neurologic) is employed, and emergency resuscitation is on hand.</td>
</tr>
<tr>
<td>Relieve anxiety and produce amnesia.</td>
<td>These objectives are accomplished by means of pre procedure communication, instruction, and low levels of visual and auditory stimuli.</td>
</tr>
<tr>
<td>Provide relief from pain and other noxious stimuli.</td>
<td>Opioids are given to supplement local or topical anesthetics and to block pain sensations remote from the procedure site.</td>
</tr>
</tbody>
</table>

These locations administer Procedural Sedation

- Critical Care Units
- Cardiology Clinic
- Department of Emergency
- Medicine
- Gastroenterology Clinic
- In Vitro Fertilization (IVF)
- Pediatric Units
- Inpatient Units
- Ophthalmology Clinic
- Oral Surgery (Dental) Clinic
- Orthopedic Clinic
- Neurophysiology
- Urology
- Radiology
- Oncology/Hematology Units
- Echolaboratory
Circle the letter that best describes your answer:

1. The objectives of procedural sedation include all of the following except:
   a. Adequate sedation with minimal risk
   b. Relief of anxiety and induce amnesia
   c. Provide unconsciousness
   d. Provide relief from painful stimuli

2. What is the important distinguishing feature of procedural sedation?
   a. Patient is snoring
   b. Patient have slurred speech
   c. Patient unable to move upper and lower extremities
   d. Patient comatose

3. Procedural sedation is done mostly in outpatient settings
   a. True
   b. False

4. How can we relieve the anxiety and promote cooperation to patients receiving procedural sedation?
   a. By explaining what the patient is going to receive
   b. By explaining the procedure
   c. By answering patient’s questions
   d. All of the above

Check Your Answers!

To check your answers, turn to page 35. If your answers are incorrect, please review pages 5-8 before you proceed to the next session.
1. Pre-Procedure

Operative or other procedures and/or the administration of moderate or deep sedation or anesthesia are planned. Is the procedure indicated? Is the environment prepared, safe and conducive to do it?
Patient Assessment - pre sedation

It is the nurse’s responsibility to review procedural sedation flow sheet to determine pre-sedation status.

Here are some major systems that are affected by sedating agents. Does the patient have any of these?

History/Psychosocial/Emotional
- Increased anxiety
- Panic Attacks
- Sleep apnea

Cardiovascular
- Chest pain, hypertension, or exercise in tolerance

Respiratory
- A smoking history, the presence of chronic obstructive, pulmonary disease, shortness of breath, or asthma that could lead to procedural hypoxia, hypercarbia, or hypoventilation
- Upper or lower structural airway abnormalities

Renal or hepatic
- Dysfunction that could affect the metabolism, elimination, and excretion of pharmacologic agents administered

Neurologic
- Cerebrovascular insufficiency, or intrinsic metabolic neurologic disease
- Primary neurologic disease associated with overproduction and underproduction of hormones, such as hyperthyroidism or hypothyroidism or alterations in the stress response

Endocrine
- Patients with a history of diabetes should have their blood glucose monitored frequently to identify hyperglycemia or hypoglycemic states
**Patient Assessment**

### Allergies

In the pre procedure, an assessment of patient’s **allergy status** is essential to avoid potential side effects of medications or the development of **anaphylactic symptoms of edema, hives, pruritus, wheezing, bronchospam, or circulatory collapse**.

A patient who is **allergic to codeine** may also have sensitivity to **morphine**. When this happens **Fentanyl** should be substituted for morphine.

What about the patient’s social history? Isn’t it important as well?

We should obtain the psychosocial, emotional, and **social history**, including smoking, Alcohol intake, illicit drugs use, and the **possibility of pregnancy**.

**What happens to people who smoke?**

They may have hyperactive airways, which predispose them to laryngospam, diminished oxygen saturation, coughing, and copious secretions during the procedure.

**Alcohol abuse predispose the patient to cirrhosis, elevated liver enzymes, esophageal varices, nutritional disorders, cardiac myopathy, benzodiazepine tolerance, and prolonged sedation recovery.**

**How about drug and alcohol abuse?**

History of long-term use of benzodiazepines and/or opioids may create tolerance for these drugs, influencing the sedative and analgesic used for procedural sedation as well as dosing intervals.
How does procedural sedation affect the pregnant patient?

During the first trimester, sedatives taken might cause fetal anomalies.

Pregnant patients require consultation with the anesthesia team before diagnostic or minor surgical procedures.

Other Considerations

Aspiration can occur during the administration of IV sedation in patients who progress to deep sedation and lose protective airway reflexes.

Has patient been NPO?

Aspiration of gastric contents can result in the development of anatomical, mechanical obstruction to gas flow or chemical pneumonitis with severe ventilatory perfusion.

GERD Patients
(Gastroesophageal reflux disease)

Before receiving sedation, patients should take nothing by mouth (NPO)

NPO in extreme obesity

Obese patients are at risk for regurgitation and aspiration. These patients may need longer NPO time periods prior to the procedure.

Is there previous adverse experience with sedation and analgesia

Do not Forget Intravenous access....

In the Echocardiology Laboratory, for pediatric patients receiving 100 mg/Kg or less of Chloral hydrate and have an ASA score 1 or 2 the following modifications to the policy apply:
• I.V access is not required
• The practitioner performing the procedural sedation is not required to complete the “Pre- sedation review and Assessment” section of the Procedural Sedation Assessment form, the nursing patient assessment documented on the nursing procedural sedation flowsheet is only required.
• A Physician is assigned to the Echocardiology Laboratory and must attend to the patient if required within 5-10 minutes.

**Guidelines for NPO Status**

Many patients scheduled for conscious sedation are undergoing a planned procedure.

Commencement of the NPO status depends upon the estimated time of the procedure being performed.

The purpose of the cessation of solid and fluid intake is to assure an empty stomach with minimal gastric contents.

**The NPO principle is to decrease the risk of gastric acid aspiration.**

What happens if patient aspirates?

Aspiration may occur during the administration of sedation in patients who enter into a state of deep sedation with resultant loss of protective airway reflexes.

Sequelae associated with aspiration of gastric contents depend on the character and volume of the aspirate.

- Aspiration of solid particulate results in an anatomic, mechanical obstruction to gas flow.
- Aspiration of acidic gastric fluid results in chemical burning of the alveoli with severe ventilatory perfusion mismatch.

**What is the significance and importance of NPO guidelines?**
The significance and importance of NPO guidelines associated with the administration of sedation are based on:

- Varied patient response
- Total dose of drug administered
- Possibility of patients entering a state of deep sedation

Additional factors that decrease gastric emptying or increase the risk of pulmonary aspiration include:

- Delayed gastric emptying
- Diabetes – do you check the blood sugar, or hold hypoglycemic agents prior to procedure?
- Esophageal motility disorders
- Fear
- Obesity
- Opioids
- Pain

For this reason, patients are instructed to have nothing to eat or drink after midnight or from the time, the procedure is scheduled.

The table below shows recommended guidelines for NPO status prior to procedure unless the physician has weighed the benefits for a shorter NPO period (IPP MCO-MC-ADM-07-003) (20March 2011).

**Adult**

- 6 hours solids and liquids

**Pediatric**

- 6 hours solids and non-human milk
- 6 hours Infant formula
- 6 hours light meal
- 4 hours human milk
- 2 hours clear liquids (small amounts)
# Examples of solids, clear and non-clear liquids

<table>
<thead>
<tr>
<th>Solids/Non-clear Liquids</th>
<th>Clear Fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk and all milk products</td>
<td>Water</td>
</tr>
<tr>
<td>Formula</td>
<td>Pedialyte</td>
</tr>
<tr>
<td>Orange/Grapefruit or pulp juices</td>
<td>Apple Juice other non-pulp juices</td>
</tr>
<tr>
<td>Creamy soup</td>
<td>Plain Coffee, tea</td>
</tr>
<tr>
<td>Breast Milk (4 hours)</td>
<td>Ice Popsicle</td>
</tr>
<tr>
<td></td>
<td>Clear soup broth</td>
</tr>
</tbody>
</table>

Anesthesiology April 2002; 96(4):1007
Practitioner Responsibilities

Does the patient meet criteria? Has valid informed consent (after explanation of risks and benefits) been obtained?

Physician Assessment Form

- The practitioner performing the pre-sedation review and assessment is responsible for reviewing the patient assessment, and documenting any new information on the procedural sedation assessment form within 15 minutes prior to the procedure.
- Initial risk classification assessment following ASA (American Society of Anesthesiology)
- The attending physician/designee shall obtain informed consent, assess the patient and complete the Procedural Sedation Assessment form within 24 hours prior to the procedure.
- Prior to the procedure, the practitioner shall write an order for procedural Sedation on the physician order form. Medication will be entered in ICIS as per policy
- Must be in the procedural area from the time sedation is administered until the procedure is completed.
- Remain in attendance for patients who have progressed into a state of deep sedation and provide the appropriate intervention.

What is the purpose of the American Society of Anesthesiologist’s (ASA) Physical Status (PS) System?

The American Society of Anesthesiologists (ASA) Physical Status classification system was initially created in 1941 by the American Society of Anesthetists, an organization that later became the ASA.

The purpose of the grading system is simply to assess the degree of a patient’s "sickness" or "physical state" prior to selecting the anesthetic or prior to performing surgery.

The goal of the ASA classification is to identify patients with severe systemic disease, which have the potential to de-compensate during sedation. (IPP MCO-MC-ADM-07-003)
The modern classification system consists of four categories, as described below.

### American Society of Anesthesiology Patient Classification Status

<table>
<thead>
<tr>
<th>ASA PS Classification</th>
<th>Definition</th>
<th>Description and Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA PS 1</td>
<td>Normal healthy patient</td>
<td>No physiologic, psychologic, biochemical, or organic disturbance</td>
</tr>
<tr>
<td>ASA PS 2</td>
<td>Patient with mild or well controlled systemic disease</td>
<td>Cardiovascular disease with minimal restrictions, asthma, chronic bronchitis, obesity, or diabetes mellitus</td>
</tr>
<tr>
<td>ASA PS 3</td>
<td>Patient with severe systemic disease that limits activity but is not incapacitating</td>
<td>Cardiovascular or pulmonary disease that limits activity; severe diabetes with systemic complications; history of myocardial infarction, angina pectoris, or poorly controlled hypertension.</td>
</tr>
<tr>
<td>ASA PS 4</td>
<td>Patient with severe systemic disease that is constant threat to life</td>
<td>Severe cardiac, pulmonary, renal, hepatic, or endocrine dysfunction</td>
</tr>
</tbody>
</table>

IPP MCO-MC-ADM-07-003 (20March 2011)
Circle the letter that best describes your answer:

1. All of the following are considered clear liquids **except**:
   a. Tea
   b. Breast milk
   c. Water
   d. Apple juice

2. It is a good idea to wait 3-4 hours prior to performing procedural sedation on a patient who has had cream soup within the last hour.
   a. True
   b. False

3. When admitting a patient for procedural sedation, which body systems are affected by the sedating agents?
   a. cardiac, respiratory, neurologic, hepatic, renal, endocrine
   b. cardiac, respiratory, neurologic,
   c. neurologic and endocrine only
   d. hepatic and renal only

4. Accurate pre procedural assessment for procedural sedation includes verifying patient for:
   a. Allergy status
   b. NPO status
   c. Social history including possibility of pregnancy
   d. All of the above

**Check Your Answers!**

*To check your answers, turn to page 35. If your answers are incorrect, please review pages 11-18 before you proceed to the next session.*
II. Intra Procedure

Because the response to procedures is not always predictable and sedation-to-anesthesia is a continuum, it is not always possible to predict how an individual patient will respond.

Remember, the patient is **always** listening. Amnesia may not occur.
Intra Procedure

Patients are monitored during the procedure and/or administration of procedural sedation. Appropriate methods are used to continuously monitor oxygenation, ventilation, and circulation during procedures that may affect the patient’s physiological status.

- Monitoring the patient **response to verbal commands** should be routine during moderate sedation, except in patients who are unable to respond appropriately. e.g. young children, mentally impaired or uncooperative patients.
- Patients should be monitored by **pulse oximetry** with appropriate alarms. Pulse oximeter is a standard clinical assessment tool utilized to decrease the incidence of unrecognized hypoxic events. The LED’s (light emitting diodes) which measures the intensity of transmitted light across the vascular bed determine hemoglobin saturation. During sedation procedures, it is important to understand the principles of pulse oximetry to recognize the development of hypoxic episodes and to take corrective action when required.
- **Blood pressure** should be measured at 15-minute intervals during the procedure.
- **EKG** should be used in patients with significant cardiovascular disease.
- **Patient’s** level of consciousness, ventilatory and oxygenation status, and hemodynamic variables should be assessed and recorded.

What is our main goal for the patient during moderate sedation?

Our main goal is to....

- Ensure the patient’s safety
- Maintain the patient in a relaxed, arousable and cooperative state within the limits of moderate sedation.

Other factors for patient’s safety

Please see table below...

- Administration of supplemental oxygen decreases the incidence of hypoxemia.
- Reversal agents must be available in each procedure room.
- IV must be maintained throughout the procedure and recovery period.
- Emergency equipment should be readily available in the unlikely event of respiratory or cardiac arrest.
### Emergency Resuscitative Equipment (adult & pediatric)

**Oxygen**
- System capable of delivering 100% at 10 L/min for at least 30 minutes

**Suction**
- Apparatus capable of producing continuous negative pressure

**Airway Management**
- Face masks (all sizes)
- Oral and Nasal airways
- Endotracheal Tubes
- Laryngoscopes
- Ambu bag

**Monitors**
- Bedside Cardiac Monitor
- Defibrillator with EKG recorder capabilities
- Automated Blood Pressure Device
- Pulse Oximeter with both visible and audible displays

**Medications**
- Emergency Drugs including Naloxone (Narcan), Flumazenil (Mazicon), Ephedrine and Epinephrine
- Emergency Algorithm card and ACLS Protocols
Throughout the sedation period, the nurse must remain with the patient at all times.

One nurse has primary responsibility for patient monitoring. The nurse responsible for monitoring cannot have any other duties or responsibilities.

Hemodynamics

Vital signs must be recorded at the following times:

1. Before the beginning of sedation
2. Following administration of each additional dose of sedative
3. At 15 minute intervals during the procedure
4. During initial recovery
5. Just before discharge

What if there is respiratory complications i.e.

1. Respiratory depression or hypoventilation, obstructed airway, apnea
2. Hypotension / hypertension
3. Unarousable sleep that approaches to general anesthesia
4. Agitation

INTERVENTIONS

1. Interventions for Respiratory depression or hypoventilation

1. Report any changes in patient condition promptly to physician
2. Maintain patent airway
   a. Head-tilt, chin-lift maneuver
   b. Place nasal airway if necessary
   c. Supplemental oxygen
   d. Manual ventilation if necessary
   e. Physician should consider administering a reversal agent

Factors that decrease oxygen affinity

- Fever
- Respiratory acidosis
- Metabolic acidosis
- Increased 2,3 –diphosphoglycerate
- Corticosteroid administration
- Hyperaldosteronism
- Hyperthyroidism
- Polycythemia
2. **Interventions for Hypotension**

Significant hypotension is defined as a decrease in systemic arterial blood pressure of 20% to 30%. Hypotension may be caused by a variety of factors:

- a. Hypovolemia
- b. Myocardial ischemia
- c. Myocardial depressant effects of pharmacologic agents
- d. Acidosis
- e. Parasympathetic stimulation (pain, vagal response)

**Treatment for Hypotension**

- a. Administration of oxygen
- b. Administration of fluid challenge (300 to 500 ml of crystalloid)
- c. Correction of acidosis or hypoxemia
- d. Relief of myocardial ischemia

---

**Interventions for Hypertension**

Hypertension is defined as a systolic blood pressure greater than 120 mm Hg or a diastolic blood pressure greater than 70 mm Hg.

To prevent complications, hypertension must be treated in a timely fashion.

<table>
<thead>
<tr>
<th>Hypertension:</th>
<th>Treatment for Hypertension</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Increases bleeding</td>
<td></td>
</tr>
<tr>
<td>* Predisposes the patient to hemorrhage</td>
<td></td>
</tr>
<tr>
<td>* May lead to cardiac dysrhythmias</td>
<td></td>
</tr>
<tr>
<td>* Increases myocardial oxygen consumption</td>
<td>♦ Fluid overload requires diuresis</td>
</tr>
<tr>
<td></td>
<td>♦ Noxious stimuli require analgesia or discontinuation of stimulation</td>
</tr>
<tr>
<td></td>
<td>♦ Sympathetic nervous stimulation activation may require alpha and/or beta blockade</td>
</tr>
<tr>
<td></td>
<td>♦ Myocardial ischemia may require nitrates and analgesia</td>
</tr>
</tbody>
</table>

---

*Are you prepared and equipped to deal with any adverse event that may occur?*
Emergency Drugs (included for reference only)

Emergency drugs such as ephedrine, atropine and epinephrine may be administered by the physician.

Do not administer emergency drugs without being ACLS/ PALS certified unless otherwise indicated (IPP)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **Ephedrine** | ▪ Sympathomimetic  
                  ▪ Used for hypotension  
                  ▪ Action may not be seen for several minutes |
| **Atropine** | ▪ Anticholinergic  
                     ▪ Used for significant bradycardia or Asystole |
| **Epinephrine** | ▪ True emergency medication  
                         ▪ Administration should be preceded by activation of a code. |

Will your documentation comply with all applicable standards?
Documentation of procedure must be reflected on the procedural sedation flow sheet. The sedation flow sheet should provide proof of continuous care reflective of medical and nursing care.

Just a Refresher!

Goals of Documentation

1. Communication
2. Legal and ethical purposes
3. Meet standards of care
4. Reflects hospital policy
5. Performance Improvement
6. Research
1. Which resuscitative emergency equipment should be prepared prior to beginning procedural sedation?
   a. Patient support equipment including oxygen and suction
   b. Airway management equipment including masks of all sizes, oral/nasal airway that are age appropriate
   c. Monitors including cardiac monitor, crash cart, Dinamap™
   d. All of the above

2. What are the agents used in procedural sedation?
   a. Benzodiazepines and narcotics
   b. Barbiturates and hypnotics
   c. a only
   d. a and b only

3. Having the knowledge of the pharmacological effect and systemic considerations for the pediatric and adult, the nurse taking care of patients under procedural sedation can anticipate and recognize potential complications.
   a. True
   b. False

4. During the intra-procedure phase, the sedating nurse noticed that the patient’s skin had become pale, almost translucent. What is the initial intervention of the nurse?
   a. Shake the patient
   b. Apply hot compress to the face
   c. Administer O2 @ 2-4 L/ min
   d. Encourage the patient to take deep breaths

Check Your Answers!

To check your answers, turn to page 35. If your answers are incorrect, please review pages 21-26 before you proceed to the next session.
III. Post Procedure

Because the response to procedures is not always predictable and sedation-to-anesthesia is a continuum, it is not always possible to predict how an individual patient will respond.
Post procedure

All patients who receive moderate sedation must be monitored immediately post procedure until established recovery criteria have been met using the Post Anesthesia Recovery Score for Ambulatory Patients (PARSAP).

The post procedure nurse must perform a complete systems assessment during the first few minutes of the recovery process.

Post sedation recovery management may be done either in a designated recovery area or in the procedure area as long as the management criteria are met.

Patients should be observed in an appropriately staffed and equipped area until they are near their baseline level of consciousness and are no longer at increased risk for cardiorespiratory depression.

Nursing Alert. .................................................................

REMEMBER YOUR EMERGENCY EQUIPMENT AT THIS PERIOD! Be wary of re-sedation.

What should you monitor?

1. The patient’s status is assessed on arrival in the recovery area
2. Provide a calm and unthreatening environment
3. Oxygenation should be monitored periodically until patients are no longer at risk for hypoxemia.
4. Continue to maintain physical and emotional comfort and provide privacy
5. Each physiological status, mental status, and pain level are monitored. Blood pressure, heart rate, respiratory rate and level of consciousness are assessed and documented at 15 minute intervals
6. Reassure and re-orient the patient frequently
7. Temperature shall be monitored in infants less than 1 year
8. Assess genitourinary status, voiding status
9. Assess presence of swallowing reflex
10. Assess ambulation
11. Monitoring shall continue until post sedation discharge criteria have been met
12. Assess and document data observed
What should you report when the patient is ready for transfer or discharge?

**Components of post procedure report**

- Name of the patient
- Diagnostic, therapeutic, or surgical procedure
- Pre sedation and procedural vital signs
- Level of consciousness
- Airway status
- Sedative, analgesic, hypnotic medications administered
- Total dose administered
- Antagonist administered (time)
- Response/reaction to medications
- Adverse response/reaction
- Complications
- Treatment
- Fluid balance
- Site and size of IV catheters
- IV solution infused if any
- Review of medical orders
- Location of responsible physician

The discharge component of post procedural sedation is derived from the baseline admission history.

**Now let us move to post sedation record and scoring**
Post sedation record and scoring

Aldrete and Kroulik introduced the post sedation recovery scoring mechanism into clinical practice in 1970. Through the evolution of anesthesia and surgery, variations of the Aldrete scoring system has evolved. Modifications of Aldrete’s scoring system came out to be applicable for Aldrete phase 11, which is now the Post Anesthesia Recovery System for Ambulatory Patients (PARSAP).

The PARSAP assigns a predetermined score to objective clinical criteria, which includes the following parameters.

**PARSAP Section I and II**

<table>
<thead>
<tr>
<th>Section I: (Aldrete Score)</th>
<th>Section II:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MOTOR ACTIVITY</strong></td>
<td></td>
</tr>
<tr>
<td>Able to move 4 extremities</td>
<td>2</td>
</tr>
<tr>
<td>Able to move 2 extremities</td>
<td>1</td>
</tr>
<tr>
<td>Unable to move extremities</td>
<td>0</td>
</tr>
<tr>
<td><strong>DRESSING</strong></td>
<td></td>
</tr>
<tr>
<td>Dry and clean</td>
<td>2</td>
</tr>
<tr>
<td>Wet but not increasing</td>
<td>1</td>
</tr>
<tr>
<td>Growing area of wetness</td>
<td>0</td>
</tr>
<tr>
<td><strong>RESPIRATION</strong></td>
<td></td>
</tr>
<tr>
<td>Able to deep breathe and cough freely</td>
<td>2</td>
</tr>
<tr>
<td>Dyspnea, splinting or tachypnea</td>
<td>1</td>
</tr>
<tr>
<td>Apneic or on mechanical ventilator</td>
<td>0</td>
</tr>
<tr>
<td><strong>PAIN</strong></td>
<td></td>
</tr>
<tr>
<td>Pain free</td>
<td>2</td>
</tr>
<tr>
<td>Mild pain handled by oral medication</td>
<td>1</td>
</tr>
<tr>
<td>Severe pain requiring parental medication</td>
<td>0</td>
</tr>
<tr>
<td><strong>CIRCULATION</strong></td>
<td></td>
</tr>
<tr>
<td>BP 20% of pre-sedation level</td>
<td>2</td>
</tr>
<tr>
<td>BP 20-50% of pre-sedation level</td>
<td>1</td>
</tr>
<tr>
<td>BP 50% of pre-sedation level</td>
<td>0</td>
</tr>
<tr>
<td><strong>AMBULATION</strong></td>
<td></td>
</tr>
<tr>
<td>Able to stand and walk straight</td>
<td>2</td>
</tr>
<tr>
<td>Vertigo when erect</td>
<td>1</td>
</tr>
<tr>
<td>Dizziness when supine</td>
<td>0</td>
</tr>
<tr>
<td><strong>CONSCIOUSNESS</strong></td>
<td></td>
</tr>
<tr>
<td>Awake/oriented</td>
<td>2</td>
</tr>
<tr>
<td>Arousable on calling</td>
<td>1</td>
</tr>
<tr>
<td>Not responsive</td>
<td>0</td>
</tr>
<tr>
<td><strong>FASTING-FEEDING</strong></td>
<td></td>
</tr>
<tr>
<td>Able to drink fluids</td>
<td>2</td>
</tr>
<tr>
<td>Nauseated</td>
<td>1</td>
</tr>
<tr>
<td>Nauseated and vomiting</td>
<td>0</td>
</tr>
<tr>
<td><strong>O2 SATURATION</strong></td>
<td></td>
</tr>
<tr>
<td>Able to maintain SaO₂ &gt; 92% on room air</td>
<td>2</td>
</tr>
<tr>
<td>Needs O₂ to maintain SaO₂ &gt; 90%</td>
<td>1</td>
</tr>
<tr>
<td>Unable to maintain SaO₂ &gt; 90% with O₂</td>
<td>0</td>
</tr>
<tr>
<td><strong>URINE OUTPUT</strong></td>
<td></td>
</tr>
<tr>
<td>Has voided</td>
<td>2</td>
</tr>
<tr>
<td>Unable to void but comfortable</td>
<td>1</td>
</tr>
<tr>
<td>Unable to void and uncomfortable</td>
<td>0</td>
</tr>
</tbody>
</table>
Once the patient has obtained an Aldrete score of greater than 8/10, the frequency of observation can decrease, and the patient is ready for transfer back to the nursing unit.

If the patient is discharged from the recovery area back to a hospital bed, Section I of PARSAP, the Aldrete Score must be completed and the patient must have a total score equal to eight or greater than 8/10.

If the patient is discharged from the recovery area to home; Section I and Section II have to be completed, and patient must score 18 or more out of 20 on the discharge scale listed above (PARSAP Score).

In addition, patients who are discharged should be in the care of responsible adult who is capable of:

- Assisting the patient
- Ensuring patient compliance with post procedure instruction
- Responsible for contact phone number in case of emergency

**Pediatric Patients- Post sedation teaching and instruction**

1. Discharge instructions for the pediatric population must be given to both the child and the caregiver. Dependent upon the age of the child, they may not be able to comprehend the need to adhere to these instructions.

2. It is common for children to vomit in the post sedation period. The caregiver should be aware of this risk and undertake measures to reduce the risk of aspiration.

3. In addition, the caregiver should be instructed that it is **not** common for the child to keep vomiting. If this were to occur, the child should be returned to the institution or a follow-up telephone call should be placed.
Adult - Post sedation teaching and instruction

Post sedation teaching **must** be conducted in the presence of the responsible adult assuming the care of the patient.

Written discharge instructions addressing ...

- Specific post sedation guidelines concerning medications used and its side effects to protect patient
- Diet and procedure specific information reviewed
- Use of written discharge instructions helps the patient and family to remember.
- Activity restrictions
- Possible complications and symptoms
- Access to nearest emergency room

Important points for both recovery and home discharge criteria *(MCO- MC-ADM-07-003)*

Transfer/Transport

Conditions for transporting patients who have undergone sedation are as follows:

1. A patient recovering from sedation may be transferred to another unit prior to discharge criteria being met, if the receiving unit can provide the same level of post-procedure care monitoring. (Recovery Room or ICU only.)

2. Post-procedure orders shall be written by the physician performing the procedure, including monitoring requirements.

3. During transport of a patient under sedation who has not met discharge criteria, the patient shall be accompanied by a minimum of two people, one of whom must be BLS certified, has appropriate qualifications and equipment for monitoring sedation enroute as defined in the Sedation Management section of the policy.
1. A patient had received 100 mg of Demerol for his colonoscopy. During the procedure his blood pressure went from 120/70 to 85/60. The physician ordered a 1000 ml normal saline to run quickly. What are the effects of Demerol on the body?
   a. Demerol causes urine retention
   b. Demerol causes the blood pressure to decrease
   c. Demerol causes dryness of the mouth
   d. Demerol is a narcotic

2. Which of the following information should be included in the discharge instructions provided to the patient prior to discharge?
   a. You might still feel sleepy/lethargic 24 hours from now
   b. You might not remember the entire procedure
   c. No driving and use of heavy equipment
   d. all of the above

3. You are calculating the patient’s Aldrete score to assess readiness for discharge from recovery area. The patient moves all his extremities, has normal respiratory effort of 18/min, BP of 100/60 (baseline 130/80), responds to verbal commands with shaking, and has normal color.

   What is the relationship of the level of consciousness of this patient to motor activity, respiration, circulation, and O2 saturation?
   a. Patient can be discharged with a (LOC) level of consciousness score of 9
   b. Patient cannot be discharged with a LOC score of 9 even though other indices have a score of 2
   c. Patient can be transferred out to the nursing unit
   d. Patient can be discharged to home

Check Your Answers!

To check your answers, turn to page 35. If your answers are incorrect, please review pages 29-33 before you proceed to the next session.
Check your ANSWERS

Answers from page 9

1- c
2- b
3- a
4- d

Answers from page 19

1- b
2- a
3- a
4- d

Answers from page 27

1- d
2- d
3- a
4- d

Answers from page 34

1- a
2- d
3- b
References


10. King Faisal Specialist Hospital & Research Centre Internal Policies and Procedure *MCO-MC-ADM-07-003* 20 March 2011