Hospital Directive No. 94

• Purpose:
  • To define those policies and practice guidelines applicable to all “Sedation and Anesthesia” administered at Little Company of Mary Hospital and Health Care Centers
Four Types of Sedation

- **Purpose:**
  - To define Sedation and Analgesia as administered at LCM

- **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.

- **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.
Continuum of Depth of Sedation: Definition of General Anesthesia* and Levels of Sedation/Analgesia

<table>
<thead>
<tr>
<th></th>
<th>Minimal Sedation Analgesia</th>
<th>Moderate Sedation/Analgesia “Conscious Sedation”</th>
<th>Deep Sedation/ Analgesia</th>
<th>General Anesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsiveness</td>
<td>Normal response to verbal stimulation</td>
<td>Purposeful** Response to verbal or tactile stimulation</td>
<td>Purposeful** Response following repeated or painful stimulation</td>
<td>Unarousable even with painful stimulus</td>
</tr>
<tr>
<td>Airway</td>
<td>Unaffected</td>
<td>No intervention required</td>
<td>Intervention may be required</td>
<td>Intervention often required</td>
</tr>
<tr>
<td>Spontaneous Ventilation</td>
<td>Unaffected</td>
<td>Adequate</td>
<td>May be adequate</td>
<td>Frequently inadequate</td>
</tr>
<tr>
<td>Cardiovascular Function</td>
<td>Unaffected</td>
<td>Usually maintained</td>
<td>Usually maintained</td>
<td>May be impaired</td>
</tr>
</tbody>
</table>

*Monitored Anesthesia Care does not describe the continuum of depth of sedation, rather it describes “a specific anesthesia service in which an anesthesiologist has been requested to participate in the care of a patient undergoing a diagnostic or therapeutic procedure.”

**Reflex withdrawal from a painful stimulus is NOT considered a purposeful response

Sedation/Analgesia sites at LCMH

- **Purpose**
  - To define the sedation and analgesia sites at LCM

- **Policy**
  - The following areas are considered sedation/analgesia sites at LCMH and are therefore appropriate areas for administration of sedation/analgesia
    - Main Operating Room/Minor Procedures/Cystoscopy
    - ICU Teams 1-2-3
    - Emergency Department
    - Radiology /Special Procedures
    - Endoscopy Suites
    - Obstetrics
    - Cardiac Catheterization Lab/Echo Lab
    - Pediatric Critical Care Unit
Patient Evaluation

• Purpose
  • To define the scope of an appropriate patient evaluation prior to sedation and analgesia administered at LCM

• Policy
  • A patient evaluation will be performed or authenticated by an independent, licensed practitioner with the appropriate clinical privileges as granted by the Board of Directors of Little Company of Mary Hospital.
    • Patient selection and the appropriateness of the proposed sedation and analgesia will be the responsibility of the individual physician.
  • The patient evaluation shall include at least the following information, and shall be documented on the medical record:
    • Past anesthetic history, past experience with sedation and analgesia and any complications

Patient Evaluation (cont.)

• Medical History
  • Pertinent review of systems
  • Current medications
  • Allergies
  • History of tobacco use
  • History of alcohol abuse
  • History of substance abuse

• Vital signs

• Focused physical examination of at least
  • Heart
  • Lungs
  • Airway
  • Neuro/mental status

• Any other information as required by Departmental Policy
  • Examples
    • Lab testing according to protocols

• Patients NPO status
  • No solids/non clear liquids for six (6) hours prior sedation/analgesia
  • No liquids for two (2) hours prior to sedation/analgesia
Patient Evaluation (cont.)

- The following types of patients are at increased risk of complications during routine intravenous sedation and analgesia. Hospital personnel should be aware of these risks and their implications when sedating the following types of patients:
  - Morbidly obese (greater than 200% of ideal body weight)
  - History of sleep apnea or other abnormal airway anatomy
  - Pregnancy
  - Current drug/alcohol abuser
  - Patients of extreme age (<10 or >90 years)
  - Severe cardiovascular, pulmonary, hepatic or renal disease
    - Examples:
      - Hypotension
      - Unstable angina
      - COPD Co2 retention
      - Resting dyspnea
      - Uncompensated cirrhosis
      - Dialysis patient
  - Acutely altered mental status or head trauma

Patient Evaluation (cont.)

- The plan for sedation/analgesia shall be clearly stated and documented in the medical record
- Immediately prior to the administration of sedation/analgesia
  - The patient will be reevaluated
    - Reevaluation will be documented in the medical record
  - The medical record will be reviewed
  - All equipment will be checked for readiness
Patient Evaluation (cont.)

- In the case of **EXTREME EMERGENCY**
  - Defined as a condition posing an immediate threat to life or limb
  - Assessment may be waived
    - By the attending physician when
      - The risks of any delay outweigh the benefits of compliance
  - Examples may include but are not limited to emergencies such as:
    - Trauma
    - Vascular injuries with hemorrhage
    - Obstetric emergencies
  - When there is not time to perform or record a patient evaluation, the attending physician administering the sedation/analgesia will
    - Document the patient’s condition in the record with a brief note including:
      - The patient’s diagnosis
      - The patient’s clinical condition

Patient Informed Consent

- **Purpose**
  - To insure patient informed consent

- **Policy**
  - Prior to administration of sedation/analgesia the attending physician will document in the medical record:
    - The risks and benefits of the proposed sedation/analgesia have been:
      - Thoroughly explained to the patient
      - All questions answered as completely as possible
      - Alternative options, other than the proposed sedation/analgesia (if any exist) have been discussed with the patients
Patient Informed Consent (cont.)

- Patients will sign informed consent for sedation/analgesia
- Prior to performing the sedation and procedure:
  - A time out will be documented verifying:
  - Patients identity
  - Consent
  - “Site initials” if appropriate
  - See nursing policy regarding site Universal Protocol/Site ID/Department of Surgery Policy and Procedure
  - Personnel will follow guidelines/policy if the patient refuses marking

Monitoring and Management

- Purpose
  - To define the requirements for monitoring and management of sedation/analgesia at LCMH
- Policy
  - During the administration of any sedation/analgesia, all patients will have at least the following documented on the medical record:
    - Blood Pressure
    - Pulse
    - Respiratory Rate
    - Level of Consciousness
    - EKG (if there is a history of cardiovascular disease)
  - All will be recorded
    - Five (5) minutes after each dose of intravenous agent
    - Then every fifteen (15)
Monitoring and Management (cont.)

- During the procedure the patient should be able to respond to verbal commands with:
  - Verbal Response
  - Thumbs Up
- Pulse Oximetry (arterial O2 Saturation) will be measured continuously and recorded every fifteen (15) minutes
- All Medications administered:
  - Time
  - Dose
  - Route
- Equipment should be available to administer supplemental oxygen if hypoxemia develops during sedation/analgesia

Personnel-Availability

- **Purpose**
  - To define the minimum number of personnel required for sedation/analgesia
- **Policy**
  - One health care provider “the monitor” should be designated as having primary responsibility for monitoring the patient’s condition and for recording hemodynamic/respiratory variables in the patient’s record. The monitor shall remain in attendance until the patient’s care can be transferred to a qualified recovery personnel
  - The monitor may assist the practitioner performing the procedure with tasks of short duration provided that adequate monitoring is maintained
Personnel-Training

• Purpose
  • To insure adequate training in health care providers who manage and monitor patients receiving sedation/analgesia during preoperative, intraoperative and post operative/recovery phases of care

• Policy
  • Practitioners responsible for the administration of drugs for sedation/analgesia will be appropriately trained:
    • Medical Staff
      • Each medical staff department will be responsible for developing criteria and credentialing its members for privileges in sedation/analgesia
    • Hospital personnel involved in the administration of sedation/analgesia will be serviced in the following areas and competency will be demonstrated by examination
      • Use of pulse oximetry and its interpretation

Personnel-Training (cont.)

• Basic airway management
  • Use of ambu bag
  • Use of oral/nasal airways
  • Oxygen administration
  • Nasal Cannulas
  • Oxygen Masks
• Review of commonly used agents for sedation/analgesia
  • Dosage
  • Pharmacokinetics
• Review of pharmacologic antagonists for
  • Narcotics
  • Benzodiazepines
• Use of Cardiac monitor and interpretation of common cardiac rhythms
Emergency Equipment

• **Purpose**
  - To insure availability of emergency equipment during administration of sedation/analgesia

• **Policy**
  - The following equipment will be available for use during administration of sedation/analgesia
    - Medical and nursing staff will insure the availability of age appropriate resuscitative equipment prior to administration of sedation/analgesia

Emergency Equipment (cont.)

• Blood pressure cuff or non invasive blood pressure monitor
• Pulse oximeter
• Oxygen source
• Ambu bag and masks
• Nasal and oral airways
• Lubricant
• Suction with canister
• Crash cart available in close proximity with:
  - Defibrillation equipment
  - Endotracheal intubation equipment
• Emergency drugs
  - Epinephrine
  - Atropine
  - Lidocaine
  - Benadryl
  - Hydrocortisone
• Intravenous equipment
  - Angiocath
  - Alcohol
  - IV tubing
  - IV fluids
  - Tourniquet
  - Tape
  - Various syringes and needles
• Antagonist:
  - Naloxone
  - Flumazenil
Multiple Sedative/Analgesic Agents

• Purpose
  • To provide guidelines for the appropriate use of combinations of sedation/analgesic agents

• Policy
  • Ideally, each component medication should be administered individually for the desired effect.
    • Additional analgesic to relieve pain
    • Additional sedation to decrease awareness and relieve anxiety
  • Combinations of sedatives and analgesics have the propensity to potentiate respiratory/cardiac depression, emphasizing the need to continually monitor cardio/respiratory function

Titration of Medication

• Purpose
  • To provide guidelines for the safe and effective administration of sedation/analgesic medication

• Policy
  • Sedation and analgesic medications should be administered in small incremental doses and titrated to the desired level of sedation/analgesia
  • Sufficient time, (generally at least five (5) minutes) must elapse between doses to allow the effect of prior doses to be assessed and thereby avoid unintended cumulative effects
Controlled Substance Waste

• **Purpose**
  • To provide accurate documentation of controlled substance waste

• **Policy**
  • 1. Waste documented on anesthesia record and witnessed by personnel authorized to handle medication
  • 2. Waste documented in the automated medication distribution machine. Witness must be authorized to handle medication

Intravenous Access

• **Purpose**
  • To provide and ensure adequate intravenous access for patients receiving sedation/analgesia

• **Policy**
  • Patients receiving IV sedation/analgesia, shall have vascular access maintained until the patient is ready for recovery room discharge.
Recovery Monitoring

• Purpose
  • To define the minimum monitoring required during recovery from all sedation/analgesia administered at LCMH

• Policy
  • During recovery from sedation/analgesia, all patients will have at least the following documented in the medical record:
    • Blood Pressure
    • Pulse
    • Respiratory Rate
    • Level of Consciousness
  • All will be monitored on:
    • Admission
    • Then every fifteen (15) minutes until stable
    • Immediately prior to the discharge from the recovery room
  • Pulse oximetry (arterial O2 saturation) will be measured continuously and recorded:
    • On admission
    • Then every fifteen (15) until stable
    • Immediately prior to discharge from the recovery room

Recovery Monitoring (cont.)

• All patients admitted to recovery room will have supplemental oxygen applied on admission:
  • For arterial saturation < 90% on room air
    • The nurse would administer O2 per nasal cannula
    • Notify the physician in charge
  • All medications administered:
    • Time
    • Dose
    • Route
  • Total IV fluids and Blood Components administered
  • Any complaints offered and their management
• All patients* who receive sedation/analgesia will be monitored in the appropriate recovery setting by a qualified Registered Nurse
  • *A patient may be taken directly from the anesthetizing site to the floor (or other setting) at the conclusion of the procedure when in the opinion of the attending physician the patient has already met the criteria for Recovery Room discharge.
    • In such an instance, the physician will document the patient’s condition or recovery score on the medical record prior to transfer.
Appropriate Recovery Settings

<table>
<thead>
<tr>
<th>Anesthetizing Sites</th>
<th>Recovery Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Operating Room/Minor Procedures/Cystoscopy</td>
<td>Main Recovery</td>
</tr>
<tr>
<td>ICU Teams 1-2-3</td>
<td>Main Recovery/ICU</td>
</tr>
<tr>
<td>Radiology/ Special Procedures</td>
<td>ODS</td>
</tr>
<tr>
<td></td>
<td>Main Recovery - patients receiving deeper sedation</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>Recovery/LDR/Labor Rooms</td>
</tr>
<tr>
<td>Endoscopy Suites</td>
<td>Endoscopy Recovery</td>
</tr>
<tr>
<td>Cardiac Cath Lab/Echo Lab</td>
<td>Main Recovery/ICU</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>Emergency Department</td>
</tr>
<tr>
<td>Pediatric Critical Care Unit</td>
<td>Pediatric Critical Care Unit</td>
</tr>
</tbody>
</table>

Discharge From Recovery

- **Purpose**
  - To outline criteria for discharge from post anesthesia recovery

- **Policy**
  - Patients will be discharged from recovery after meeting the following criteria:
    - They have at least met the following criteria according to the Modified Aldrete Scoring System:
      - Their Modified Aldrete is 14
      - Per physician order
      - Prior to discharge, compliance with scoring system criteria must be clearly documented in the record
Discharge From Recovery (cont.)

• They have been discharged by direct order from the attending physician who is a licensed independent practitioner with the appropriate clinical privileges as granted by the Board of Directors of Little Company of Mary Hospital and Health Care Centers
• The patient must be discharged from Recovery Room accompanied by a responsible adult capable of assuming care for the patient in the post op setting

Discharge From Recovery Adult Scoring System

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure</td>
<td>2</td>
<td>+/- 20% preanesthesia level</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>+/- 50% preanesthesia level</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>+/- &gt;50% preanesthesia level</td>
</tr>
<tr>
<td>Pulse</td>
<td>2</td>
<td>Regular &gt;60 or &lt;100 beats/min</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Irregular or &lt;60 or &gt;100</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Absent</td>
</tr>
</tbody>
</table>
### Discharge From Recovery Adult Scoring System (cont.)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiration</td>
<td>2</td>
<td>Easy full respirations, &lt;30/min.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Labored or dyspneic or &gt;30/min.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Apneic or controlled (ventilator)</td>
</tr>
<tr>
<td>Conscience</td>
<td>2</td>
<td>Fully awake and responds to command</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Drowsy, arousable on calling name</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Non-responsive to verbal stimulus</td>
</tr>
<tr>
<td>Activity</td>
<td>2</td>
<td>Moves 4 extremities on command</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Moves 2 extremities on command</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Moves 0 extremities on command</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Oximetry/Color</td>
<td>2</td>
<td>Saturation 90-100% - Pink (on room air)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Saturation 80-90% - Pale/Dusky</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Saturation &lt;80% /Cyanotic</td>
</tr>
<tr>
<td>Operative Site</td>
<td>2</td>
<td>None or small drainage</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Moderate drainage</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Large bloody drainage</td>
</tr>
</tbody>
</table>
### Discharge From Recovery Pediatric Scoring System

#### PARAMETER SCORE CRITERIA

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure</td>
<td>2</td>
<td>BP ± 20% of Pre-Sedation level, Age appropriate Pediatric Criteria</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>BP ± 20-50% of Pre-Sedation level, Age appropriate Pediatric Criteria</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>BP ± 50% of Pre-Sedation level, Age appropriate Pediatric Criteria</td>
</tr>
<tr>
<td>Pulse</td>
<td>2</td>
<td>Regular, strong; within pediatric parameters</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Irregular, bradycardia, tachycardia or weak</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Thready or absent</td>
</tr>
<tr>
<td>Respirations</td>
<td>2</td>
<td>Easy &amp; Full respirations; Within pediatric parameters</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Dyspnea, Rate &lt; or &gt; pediatric parameters</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Apneic or controlled (ventilator) Age appropriate Pediatric Criteria</td>
</tr>
<tr>
<td>Consciousness</td>
<td>2</td>
<td>Fully awake and responds to command</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Drowsy, arouses to verbal stimuli</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Non-responsive to verbal stimuli</td>
</tr>
</tbody>
</table>
Discharge From Recovery Pediatric Scoring System (cont.)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>2</td>
<td>Able to move 4 extremities on command</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Able to move 2 extremities on command</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Able to move 0 extremities on command</td>
</tr>
<tr>
<td>Pulse Oximetry/Color</td>
<td>2</td>
<td>Sat. &gt; 94% - Pink (on room air)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Sat. ≤ 93% pale - dusky</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Sat. &lt;90% /cyanotic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SCORE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative Site</td>
<td>2</td>
<td>None or small amount of discharge or N/A</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Moderate amount of drainage</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Large amount of drainage</td>
</tr>
</tbody>
</table>
Discharge From Hospital

**Purpose**
- To insure safe discharge of patients to post hospital setting

**Policy**
- A Patient is discharged to home
  - After a written/phone order from the physician for discharge or:
    - The following criteria is met:
      - Awake/alert (or consciousness returned to pre procedure level)
      - Tolerates fluids
      - Stable vital signs
      - Minimal pain
      - No unusual drainage, bleeding or swelling at the operative site
      - Ambulating (when appropriate)
      - Responsible person in attendance with the accompanying patient

Hospital Discharge Instructions

**Purpose**
- To insure safe post procedure continuity of care

**Policy**
- Each patient is provided with written post-operative care instructions
  - These instructions specifically address the patient’s activity level, diet, medication and special requirements pertinent to the patient’s post-procedure care.
  - The patient is given the attending physician's office/service telephone numbers to call in case of unforeseen problems or questions after discharge. The patients is also given an appointment date or instructions to follow-up with their physician.
  - A post-operative phone call is made to all One Day surgery patient’s the next day following surgery to determine the patient’s condition and to discuss any questions they may have.
Exceptions

• The Guidelines of Hospital Directive 94 specifically Exclude:
  • Minimal sedation
  • Deep sedation/analgesia (see department of anesthesia policy)
  • Anesthesia (see department of anesthesia policy)
  • Patients who are mechanically ventilated anywhere in the hospital and are therefore not at risk for drug induced respiratory depression.

Respiratory Depression

• Respiratory Depression
  ▪ Occurs in 0.2% of patients receiving opioids
  ▪ Increases with age
  ▪ Increases with higher doses
  ▪ Increases with underlying cardiopulmonary disorders
  ▪ Increases with those receiving supplements along with opioids

• According to LCMH policy
  ▪ Severe Respiratory depression is defined as:
    ▪ A decrease in respiratory rate to less than 10 per minute
    ▪ A marked decline in the level of consciousness
    ▪ An Oxygen saturation of <90%
Emergency Actions Initiated With Respiratory Depression

- PCS Policy 910
  - Emergency actions initiated for respiratory depression:
    - Naloxone (Narcan) dose: 0.2mg IV push every 5 minutes PRN up to 1mg
    - If respiratory rate is < 10/minute
    - Oxygen per nasal cannula
    - Stat arterial blood gases (ABGs)
    - Notify physician in charge immediately

It is important to remember: These are standing orders and there is no need to call the physician prior to giving the Naloxone. The physician is to be notified after you have given the Naloxone, started the oxygen and obtained stat arterial blood gases.

Guideline Dosages For Common Agents

**Diazepam (Valium)**

- **Class**
  - Is a long-acting benzodiazepine
  - Has a prolonged elimination half-life of 30-50 hours
- **Uses**
  - Alcohol withdrawal syndrome
  - Anxiety
  - Sedation
  - Premedication before surgery
  - Endoscopic procedures
  - Cardioversion
  - Seizure, Refractory, increased frequency
  - Seizure; Adjunct
  - Skeletal muscle spasm; Adjunct
  - Status epilepticus

- **Dosage**
  - Adults (18-65 years)
    - 0.07 – 0.15 mg/kg
    - Typical dose 5 – 10 mg
  - Elderly (Over 65)
    - 0.05 – 0.08 mg/kg
    - Typical dose 3 – 5 mg
  - Pediatrics (Under 18 years)
    - 0.01mg/kg
    - Typical dose 2 mg

- **Reversal agent**
  - Flumazenil (Romazicon)
    - Rarely indicated except for iatrogenic over sedation or respiratory depression
Guideline Dosages For Common Agents

**Morphine Sulfate**

- **Class**
  - Analgesic
  - Opioid
- **Uses**
  - Acute myocardial infarction – Pain
  - Anesthesia; Adjunct
  - Obstetric pain
  - Pain, chronic
  - Pain (Moderate to Severe)
  - Patient controlled analgesia
  - Postoperative pain
  - Premedication for anesthetic procedure
  - Pulmonary edema, acute; Adjunct

- **Dosage**
  - Adults (18-65 years)
    - 0.08 – 0.15 mg/kg
    - Typical dose 5 – 10 mg
  - Elderly (Over 65)
    - 0.03 – 0.08 mg/kg
    - Typical dose 2 – 5 mg
  - Pediatrics (Under 18)
    - 0.1mg/kg
    - Typical dose 2 mg
- **Reversal Agent**
  - Naloxone (Narcan)

Guideline Dosages For Common Agents

**Ketamine**

- **Class**
  - Anesthetic Adjunct
- **Uses**
  - General anesthesia; Adjunct
  - Procedural sedation
- **Dosage**
  - Pediatric Initial (Under 18 years)
    - 0.25 mg/kg
    - Typical dose 5 mg
- **Reversal agent**
  - None
**Guideline Dosages For Common Agents**

**Midazolam (Versed)**

- **Class**
  - Benzodiazepine
    - Short or Intermediate Acting Hypnotic
- **Uses**
  - Amnesia induction - Anxiety
  - Preoperative sedation
  - Induction of general anesthesia
  - Procedural sedation
  - Sedation for a mechanically ventilated patient
- **Dosage**
  - Adults (18-65 years)
    - 0.05 mg/kg
    - Initial dose 1 - 2 mg IV slowly
    - Typical Dose 1 - 7 mg
  - Elderly (Over 65)
    - 0.01 - 0.04 mg/kg
    - Typical dose 0.7 - 2.5 mg
  - Pediatrics (Under 18)
    - 0.05 mg/kg
    - Typical dose 1 mg
- **Reversal Agent**
  - Flumazenil (Romazicon)

**Fentanyl**

- **Class**
  - Analgesic
  - Anesthetic Adjunct
  - Opioid
- **Uses**
  - Anesthesia - Operation on heart
  - Anesthesia - Operation on nervous system
  - Cancer pain, breakthrough pain in opioid-tolerant patients
  - General anesthesia; Adjunct
  - Neuroleptanalgesia (An intense analgesic and amnesic state produced by the combination of narcotic analgesics and neuroleptic drugs) - Premedication for procedure
  - Postoperative pain
  - Premedication for procedure, Adjunct to anesthesia
  - Regional anesthesia; Adjunct
- **Dosage**
  - Adults (18-65 years)
    - 1-2 mcg/kg
    - Typical dose 75-150 mcg
  - Elderly (Over 65)
    - 0.5mcg/kg
    - Typical dose 35-75mcg
  - Pediatrics (Under 18 years)
    - 1-2mcg/kg
    - Typical dose 20-40mcg
- **Reversal Agent**
  - Naloxone (Narcan)
Guideline Dosages For Common Agents

Naloxone (Narcan)

- **Class**: Opioid Antagonist
- **Toxicology-Antidote Agent**
- **Uses**
  - Overdose of opiate, known or suspected
  - Reversal of opiate activity, respiratory depression, with therapeutic opioid use
  - Septic shock; Adjunct
- **Dosage**
  - **Adults**
    - Respiratory depression, with therapeutic opioid use:
      - 0.1 to 0.2 mg IV Repeat every 2 to 3 min as needed to desired degree of reversal
      - May repeat dose within 1 to 2 hours depending on amount and type of opioid and time interval since last opioid administration
  - **Pediatric**
    - Reversal of opiate activity, Respiratory depression, with therapeutic opioid use: (newborn infants)
      - 0.001 mg to 0.015 mg/kg IV/IM
      - Doses may be repeated as needed to maintain opiate reversal
    - Reversal of opiate activity, Respiratory depression, with therapeutic opioid use: (older infants/children)
      - 0.001 mg to 0.015 mg/kg IV/INTRAOSSEOUS/IM/SUBQ
      - Doses may be repeated as needed to maintain opiate reversal

Flumazenil (Romazicon)

- **Class**: Benzodiazepine Antagonist
- **Toxicology-Antidote Agent**
- **Uses**
  - Drug overdose, Benzodiazepine, known or suspected
  - Reversal of benzodiazepine activity
- **Dosage**
  - Flumazenil should be administered as a series of small injections and not as a single bolus dose, so that reversal of sedation can be controlled to the appropriate endpoint and so that the potential for adverse effects can be minimized
- **Adult**
  - For management of known or suspected benzodiazepine overdose
    - Initial dose of flumazenil is 0.2 milligram given intravenously over 30 seconds.
    - If the desired response is not obtained after waiting 30 additional seconds, a dose of 0.3 milligram can be administered over 30 seconds.
    - Additional doses of 0.5 milligram can be given over 30 seconds at one-minute intervals up to a total cumulative dose of 3 milligrams
  - **Pediatric**
    - Reversal of benzodiazepine activity: children 1 year or older
      - 0.01 mg/kg (up to 0.2 mg) IV over 15 seconds
      - If adequate sedation reversal does not occur after an additional 45 seconds
        - Further injections of 0.01 mg/kg (up to 0.2 mg)
        - May be repeated at 1- minute intervals, as needed up to 4 times
      - Maximum total dose 0.05 mg/kg or 1 mg, whichever is lower
### Guideline Dosages For Common Agents

#### Adults (18-65 years)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Typical Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thiopental (0.5-1 mg/kg)</td>
<td>35-70 mg.</td>
</tr>
<tr>
<td>2. Propofol - Single Dose (0.1-0.2 mg/kg)</td>
<td>7-15 mg.</td>
</tr>
<tr>
<td>3. Propofol Infusion (CH:100 mcg/kg/min)</td>
<td>1-4 mcg/ml/min.</td>
</tr>
<tr>
<td>4. Ketamine (0.2 mg/kg)</td>
<td>15 mcg</td>
</tr>
<tr>
<td>5. Midazolam (0.05 mg/kg)</td>
<td>1-7 mcg</td>
</tr>
<tr>
<td>6. Diazepam (0.07-0.15 mg/kg)</td>
<td>5-10 mg</td>
</tr>
<tr>
<td>7. Chloral hydrate (1-2 mg/kg)</td>
<td>75-150 mg</td>
</tr>
<tr>
<td>8. Morphine (0.005-0.05 mg/kg)</td>
<td>5-10 mcg</td>
</tr>
<tr>
<td>9. Naropin (0.0005-0.0015 mg/kg)</td>
<td>50-100 mcg</td>
</tr>
<tr>
<td>10. Sufentanil (0.007-0.15 mcg/kg)</td>
<td>5-10 mcg</td>
</tr>
<tr>
<td>11. Fentanyl (1-2 mcg/kg)</td>
<td>75-150 mcg</td>
</tr>
<tr>
<td>12. Alfentanil (3-7 mcg/kg)</td>
<td>250-500 mcg</td>
</tr>
<tr>
<td>13. Remifentanil</td>
<td>1 mcg</td>
</tr>
<tr>
<td>14. Hydromorphone</td>
<td>1 mg</td>
</tr>
<tr>
<td>15. Chloral Hydrate (20-40 mg/kg)</td>
<td>1500 mg</td>
</tr>
<tr>
<td><strong>IV/IM dose only</strong></td>
<td></td>
</tr>
<tr>
<td>16. Etomidate (0.3 mg/kg)</td>
<td>5-10 mg</td>
</tr>
</tbody>
</table>

#### Elderly (over 65 years)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Typical Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thiopental (0.25 - 0.5 mg/kg)</td>
<td>25-50 mg</td>
</tr>
<tr>
<td>2. Propofol - Single Dose (0.1-0.2 mg/kg)</td>
<td>7-15 mg</td>
</tr>
<tr>
<td>3. Propofol Infusion (CH:100 mcg/kg/min)</td>
<td>1-4 mcg/ml/min.</td>
</tr>
<tr>
<td>4. Ketamine (0.1-0.2 mg/kg)</td>
<td>7-15 mg</td>
</tr>
<tr>
<td>5. Midazolam (0.01-0.04 mg/kg)</td>
<td>8-2.5 mg</td>
</tr>
<tr>
<td>6. Diazepam (0.05-0.10 mg/kg)</td>
<td>3-5 mg</td>
</tr>
<tr>
<td>7. Chloral hydrate (0.5-1 mg/kg)</td>
<td>35-70 mg</td>
</tr>
<tr>
<td>8. Morphine (0.005-0.05 mg/kg)</td>
<td>2-5 mg</td>
</tr>
<tr>
<td>9. Naropin (0.0005-0.0015 mg/kg)</td>
<td>20-50 mcg</td>
</tr>
<tr>
<td>10. Sufentanil (0.007-0.017 mcg/kg)</td>
<td>2.5-5 mcg</td>
</tr>
<tr>
<td>11. Fentanyl (0.5-1 mcg/kg)</td>
<td>35-70 mcg</td>
</tr>
<tr>
<td>12. Alfentanil (1-3 mcg/kg)</td>
<td>70-200 mcg</td>
</tr>
<tr>
<td>13. Remifentanil</td>
<td>1 mcg</td>
</tr>
<tr>
<td>14. Hydromorphone</td>
<td>1 mcg</td>
</tr>
<tr>
<td>15. Chloral Hydrate (10-20 mg/kg)</td>
<td>700-1000 mg</td>
</tr>
<tr>
<td><strong>IV/IM dose only</strong></td>
<td></td>
</tr>
<tr>
<td>16. Etomidate</td>
<td>5 mg</td>
</tr>
</tbody>
</table>
Guideline Dosages For Common Agents Pediatrics (Under 18 years)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Typical Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiopental (1 mg/kg)</td>
<td>20 mg</td>
</tr>
<tr>
<td>Propofol Single Bolus (0.25 mg/kg)</td>
<td>5 mg</td>
</tr>
<tr>
<td>Propofol - Infusion (20-180 mcg/kg/min)</td>
<td>0.4-2 mcg/min</td>
</tr>
<tr>
<td>Ativan (0.25 mg/kg)</td>
<td>5 mcg</td>
</tr>
<tr>
<td>Midazolam (0.05 mg/kg)</td>
<td>1 mg</td>
</tr>
<tr>
<td>Diazepam (0.01 mg/kg)</td>
<td>2 mg</td>
</tr>
<tr>
<td>Chloral Hydrate (1 mg/kg)</td>
<td>20 mg</td>
</tr>
<tr>
<td>Morphine (0.1 mg/kg)</td>
<td>2 mg</td>
</tr>
<tr>
<td>Metoprolol (1 mg)</td>
<td>20 mg</td>
</tr>
<tr>
<td>Succinylcholine (0.087-0.15 mcg/kg)</td>
<td>1.5-3 mcg</td>
</tr>
<tr>
<td>Fentanyl (0.1-2 mcg/kg)</td>
<td>20-40 mcg</td>
</tr>
<tr>
<td>Alfentanil (0.1 mcg/kg)</td>
<td>100 mcg</td>
</tr>
<tr>
<td>Remifentanil (1 mcg/kg)</td>
<td>N/A</td>
</tr>
<tr>
<td>Chloral Hydrate (20-40 mg/kg)</td>
<td>N/A - N/A</td>
</tr>
</tbody>
</table>

References

- Little Company of Mary Hospital and Health Care Centers, Evergreen Park, IL (2010), Hospital Directive 94 & PCS Policy 910
- Thompson Reuters (2011) All drug information retrieved via log on to Micromedex 2.0Drugdex, Micromedex 2.0, January