DUNCAN REGIONAL HOSPITAL			
Manual:	Patient Care Policy and Procedure	Origination Date:	01/01/2003
		Approval Date	11/08/2021
Title:	Moderate Sedation	Next Periodic Review:	11/08/2024
		Owner:	Kristen Webb

POLICY

The following are guidelines for the utilization of moderate sedation by non-anesthesia providers as approved by medical staff guidelines. The objective of the Moderate Sedation Policy and Procedure is to ensure that patients receiving this service have the same level quality of care regardless of the location of the procedure. These guidelines are to be implemented in areas of the hospital where patients receive medications for diagnostic/medical/invasive procedures for the purpose of moderate sedation. This policy is not intended for use in patient care situations such as pain control, sleep or sedation of patients on ventilators. This policy does not pertain to sedation for rapid sequence intubation.

Because sedation-to-anesthesia is a continuum, it is not always possible to predict how an individual patient receiving medication with the intent to achieve moderate sedation will respond. Therefore, sedation should be limited to the following areas:

1. Surgery
2. Emergency Department
3. Radiology
4. Intensive Care Unit
5. ACU (Ambulatory Care Unit)
6. Cath Lab

List of procedures most likely to have sedation:

- Arteriograms/angioplasties
- Thoracentesis
- Wound incision/drainage
- Laceration repair
- Endoscopies
- Chest Tubes
- Cardioversion
- Evacuation of Hematoma
- Reduction of fracture
- Pediatric diagnostic procedures

PURPOSE

The use of sedation/analgesia allows patients to tolerate unpleasant procedures while maintaining adequate cardio-respiratory function, protective reflexes, and the ability to respond purposefully to verbal and/or tactile stimulation. The possibility that a patient may enter a deeper state, such as general anesthesia, must be considered, and rescue measure by credentialed anesthesia care

providers should be available.

SEDATION AND ANALGESIA DEFINITIONS

1. **Minimal Sedation** - Minimal sedation is defined as a medication-induced state during which patients respond normally to verbal commands. Cognitive function and coordination may be impaired, but ventilatory and cardiovascular functions generally are unaffected.

2. **Moderate sedation/analgesia (i.e. conscious sedation)** - Moderate sedation/analgesia is defined as a medication-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 the patient's airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

3. **Deep sedation/analgesia** - Deep sedation is a medication-induced depression of consciousness during which patients cannot be aroused easily; however, they do respond purposefully to repeated or painful stimulation. Patients' ability to independently maintain ventilatory function may be impaired. Patients may need assistance to maintain an airway, and spontaneous ventilation may be inadequate. Cardiovascular function usually is maintained.

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

CONTINUUM OF DEPTH OF SEDATION

	MINIMAL SEDATION	MODERATE SEDATION/ ANALGESIA	DEEP SEDATION/ ANALGESIA	GENERAL ANESTHESIA
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation*	Purposeful response following repeated or painful stimulation*	Unarousable even with painful stimulus

Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
	MINIMAL SEDATION	**MODERATE SEDATION/ ANALGESIA**	**DEEP SEDATION/ ANALGESIA**	**GENERAL ANESTHESIA**
Spontaneous ventilation	Unaffected	Adequate	Intervention may be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

- Reflex withdrawal from a painful stimulus is not considered a purposeful response.

OTHER DEFINITIONS

1. **Pediatric patient**. All patients up to 18 years of age.

2. **Licensed Independent Practitioner (LIP**). A physician or dentist who has a current license to practice and is approved to administer sedation. This does not include Physician Assistants.

3. **Diagnostic procedure**. This includes, but is not limited to diagnostic radiology, including computerized tomography and nuclear magnetic resonance imaging.

4. **Therapeutic procedure**. This includes, but is not limited to orthopedic manipulations and other therapies.

5. **Invasive procedure**. A procedure involving puncture or incision of the skin or insertion of an instrument or foreign material into the body including, but not limited to percutaneous aspiration and/or biopsy, diagnostic catheterization, endoscopy, central venous catheter placement or percutaneous placement of long-term intravenous catheters.

PRE-SEDATION PROTOCOL

1. Factors affecting candidacy for sedation.

    a. Candidates for sedation and analgesia shall be in good general medical health and have adequate ventilatory reserve. For patients who have significant medical problems (e.g., severe systemic disease, morbid obesity, sleep apnea, upper or lower structural airway abnormalities) consideration should be given from the physician either specializing in the primary disease process, or LIP caring for the

patient.

b. Patients should not receive sedation and analgesia unless they can be reasonably expected to meet pre-selected discharge criteria specified below.

c. Satisfactory arrangements for transportation after the procedure (when applicable) must be made before the patient is sedated.

PRE-SEDATION ASSESSMENT

1. A pre-sedation assessment should be performed for each patient to select and plan sedation before the induction of the sedation. The pre-sedation assessment should be documented in the patient's medical record.

2. A reassessment of the patient, with respect to the patient's condition is completed immediately prior to administration of sedation and analgesia. At a minimum, this reassessment should include current vital signs.

3. A history and physical (H&P) is required prior to administration of the sedation and analgesia. The Emergency Department record may be used as the H&P.

4. A sedation or anesthesia plan is developed to meet patient needs identified through the pre-sedation assessment. If there is any doubt about the individual's ability to tolerate moderate sedation, consultation with LIP may be necessary.

5. The pre-sedation assessment by the physician includes, but is not limited to:

    a. Physical status assessment (review of systems, vital signs, airway assessment, cardiopulmonary reserve), including breathing pattern, breath sounds and oxygenation

    b. ASA risk assessment

        - ASA I – normal (managed by RN)
        - ASA II – mild systemic disease (managed by RN)
        - ASA III – moderate systemic disease, not incapacitating (Should consider patient condition and management by a Nurse Anesthetist or LIP)

- ASA IV – severe systemic disease, threat to life (consider Nurse Anesthetist or LIP.)

c. Plan for sedation

6. Multiple administrations of sedation and analgesia. In patients who are undergoing procedures that require sedation and analgesia multiple times per day or single/multiple times on successive days, the initial pre-anesthesia assessment is sufficient as long as the physician performing the procedure determines through subsequent evaluation of the patient that no change has occurred in patient's clinical status that would alter the outcome of administration of sedation and/or analgesia. A short note should be placed in the patient's medical record stating that an evaluation of the patient's clinical status was performed prior to subsequent administration of sedation and analgesia.

CONSENT FOR SEDATION

1. The patient or patient's parent/legal representative should be informed and educated about the options and risks/benefits and consent to the proposed sedation plan.

2. Documentation of informed consent should be included in the medical record. This may be included with the consent for the procedure.

ADDITIONAL PHYSICIAN GUIDELINES

1. Moderate sedation medication should be selected, ordered and supervised by a physician with clinical privileges for moderate sedation.

2. The physician is responsible for pre-procedure evaluation of the patient, and for the intraprocedural management of the patient with the assistance of a registered nurse whose responsibility is to manage and monitor the patient and administer the medication as directed by the physician.

3. Physician requesting the use of reversal agents should be familiar with the possible serious side effects involving the potential for re-sedation after effects of the reversal agent have subsided.

NURSING GUIDELINES

RN

1. A Registered Nurse, under direction of the physician, is responsible for the nursing management of the patient receiving moderate sedation. RNs involved in the nursing

   management of the patient receiving moderate sedation are responsible for maintaining proficient skills necessary to provide quality patient care. These skills should include but are not limited to:

   a. Basic Life Support (BLS) training

   b. Advanced Cardiac Life Support (ACLS) training which includes dysrhythmia recognition

   c. Initial competency followed by at least biennial competency assessment of skills necessary for moderate sedation. *

      i. Knowledge of basic anatomy and physiology related to cardiac and respiratory systems

      ii. Knowledge of the principles of oxygen therapy to include use of basic equipment

      iii. Demonstration of skills in airway management and resuscitation

      iv. Knowledge of the pharmacology of sedative medications and reversal agents to include proper action, dose ranges, preparations, administration, duration precautions and side effects

      v. Ability to recognize the potential complications of moderate sedation and intervene in the event of undesired outcomes

      vi. Measurement of physiologic parameters to include respiratory rate, oxygen saturation, blood pressure, cardiac rate and rhythm, and level of consciousness

2. The RN involved in the nursing management of the patient receiving moderate sedation

should have no other responsibilities during the procedure that would leave the patient unattended or compromised.

* Measured by review of Moderate Sedation Policy and Procedure and a satisfactory minimum score of 80% on a knowledge test.

EQUIPMENT AND SUPPLIES

Equipment should be available that is appropriate for the size of the child or adult being sedated and should be checked before sedation and analgesia are given. Minimum equipment in the area of the sedation patient **should include**:

1. Patent IV site
2. A self-inflating positive-pressure oxygen delivery system capable of administering oxygen at a 10 liter/minute flow rate for at least 60 minutes or a flow-inflating resuscitation bag system.
3. Appropriate sizes of airway management equipment (e.g., masks, oral airways, endotracheal tubes, and laryngoscopes). Note: on crash carts
4. A suction apparatus with catheters and Yankauer-type rigid suction device
5. Monitors including those capable of measuring:
    a. Oxygenation (pulse oximeter)
    b. Blood Pressure (automated or manual device)
    c. Heart Rate
    d. Cardiac Monitor
    e. Capnography (End-tidal CO2)
6. Drugs for reversal to include Narcan and Romazicon
7. Atropine for side effects
8. Telephone or button access for activation of code blue

9. Moderate Sedation record

AGENTS

Information about specific moderate sedation agents including classification, dose, onset and duration of action, dosage considerations, precautions/contraindications, and potential undesirable (adverse) effects are outlined in the Appendix.

When used in moderate sedation, any and all drugs whereby the drug manufacturers general warnings advises the drug should be administered by persons experienced in the use of general anesthesia who are not involved in the conduct of the surgical and/or diagnostic procedures shall not be administered by a licensed nurse who is not a CRNA.

In the Emergency Department Ketamine, Propofol, and Etomidate may be administered by physicians with moderate sedation privileges who are trained and available to manage complications should they arise.

PREPROCEDURE, INTRAPROCEDURE & POST-PROCEDURE SEDATION

PREPROCEDURE

The RN responsible for moderate sedation will do the following:

1. Review of:
    a. Pre-op check list for moderate sedation patients being transferred to ACU or the Operating Room
    b. H&P by physician and airway assessment, ASA classification 3.
    c. Laboratory values as available and/or ordered and assessed by physician
    d. Invasive procedure or medical procedure consent form
2. Assessment and documentation of the following:
    a. Vital signs to include heart rate, blood pressure, respiratory rate & pre-procedural oxygen saturation.
    b. Level of consciousness

c. Baseline Ramsay Score

d. NPO status

e. Weight

f. Allergies to medications

g. Current medications

h. Pain Level

i. Verification of responsible adult caregiver to escort patient home (if an outpatient procedure)

INTRAPROCEDURE

1. Medication administration

    a. An order for the medication(s) should be Available.

    b. After a baseline assessment, the physician or RN may begin to administer the medications as prescribed.

    c. Drug dosage should be individualized and titrated in a fractional manner taking into consideration the patient's age, body weight, physical status, underlying pathological conditions, use of other drugs, scope and duration of the procedure and response to medication/procedure

    d. In case of unanticipated reactions or serious changes in the patient's status, the physician should be informed immediately and proper consultations obtained as indicated.

2. Sedation Management - Monitoring and documentation of the procedure

    a. Monitoring and documentation of the procedure

        i. Baseline vital signs should be recorded in the sedation record before administering sedation and analgesia

ii. During sedation, the following vital signs should be monitored and documented in the sedation record at **5 minute** intervals.

- Heart rate via cardiac monitor.
- Respiratory rate
- Oxygen saturation (pulse oximeter) – continuous monitor
- Blood pressure
- Sedation Scale

3. Patient's response to stimulation should be assessed and documented every 5 minutes using the Ramsey sedation scale.

   a. Anxious or restless or both

   b. Cooperative, orientated and tranquil

   c. Responding to commands

   d. Brisk response to stimulus

   e. Sluggish response to stimulus

   f. No response to stimulus

4. Alternative monitors may be used and alternative vital signs measured in situations when:

   a. The use of conventional monitors would be unsafe, as in MRI

   b. The use of conventional monitors would preclude imaging procedures because they would distort the image or stimulate movement and produce artifact (e.g. BP cuffs in children, verbal stimulation or responses during head CT or MRI).

   c. In these situations, alternative vital sign(s) should be measured and documented in the sedation record.

POST-PROCEDURE

Post-sedation recovery management may be done either in a designated special care area or an inpatient unit as long as the following criteria are met.

1. Equipment
    a. Suction
    b. Positive-pressure oxygen delivery system
    c. Airway management equipment
    d. Monitoring equipment
    e. Resuscitation equipment equivalent to that used in the sedation area should be immediately available
2. Monitoring and Assessment
    a. A post procedure assessment should be performed by the RN who managed the sedation prior to transferring recovery care to another nurse.
    b. Monitoring and assessment of the following should be done at least every 10 minutes:
        i. Ramsay Sedation Score
        ii. Respirations
        iii. Blood pressure
        iv. Heart rate
        v. Oxygen saturation
        vi. Pain assessment – done with vital signs
    c. Monitoring and assessment should be done for a **minimum** of **thirty (30) minutes** following the last dose of medication **when NO reversal agent** has been used. **When a reversal agent has been used**, a minimum monitoring period of **sixty**

(60) minutes should occur following the last dose of medication and the patient should be observed for an additional sixty (60) minutes prior to discharge from facility.

d. Documentation should be at least **every 10 minutes** or more frequently as the patient's condition indicates.

e. Additional assessment may include but not be limited to the following:

i. Dressing at a procedure site, if applicable

ii. Nausea

iii. Neurovascular checks (if applicable i.e. post closed reduction with cast application)

f. Assessment should be continued until post-sedation discharge criteria has been met. See "criteria for discharge".

3. Transfer/Transport. Conditions for transporting patients who have undergone sedation and analgesia are as follows:

a. A patient recovering from moderate sedation and analgesia may be transferred to another unit prior to discharge criteria being met, ***if*** the unit receiving the patient provides the same level of post-procedure care monitoring, ***and*** arrangements have been made with the nursing team members.

b. Report should be communicated to the nursing staff including any significant complications, which occurred during or following the sedation.

c. During transport of a patient **under sedation**, the patient should be accompanied by a person who can initiate cardiopulmonary resuscitation and has appropriate qualifications and equipment for monitoring sedation in route as outlined above.

DISCHARGE CRITERIA

1. All of the following criteria should be met prior to discontinuation of post-procedure monitoring or discharge from the facility with a responsible person.

Definition: A responsible person is someone who can receive and understand instructions, stay with the patient, and call for assistance as instructed.

2. General discharge criteria to another nursing unit.

    a. Patient is easily awakened by normal or softly spoken verbal commands.

    b. returns to the pre-procedure sedation level (Ramsay Score)

    c. Patient is oriented when awake as appropriate for age.

    d. All vital signs are stable (compared to baseline pre-procedure readings).

    e. There is no significant risk of losing protective reflexes.

    f. Patient is able to maintain pre-procedure mobility with minimal assistance as appropriate for the procedure.

    g. Minimal nausea and/or dizziness.

    h. Pain controlled with prescribed pain medication.

3. For patients to be discharged from the facility the following criteria should be met prior to discharge.

    a. Patient is awake and oriented as appropriate for age.

    b. All vital signs are stable.

    c. Patient is able to maintain pre-procedure mobility with minimal assistance.

    d. No nausea and/or dizziness

    e. There is no significant risk of losing protective reflexes.

    f. Satisfactory transportation arrangements have been indicated by the patient that does not require the patient to operate a motor vehicle.

    g. Pain controlled with prescribed pain medication to be administered post-discharge.

4. The person responsible for the patient should receive written instructions prior to discharge from the facility that include:

a. Information about expected behavior following sedation.

b. Instructions for eating and activity.

c. Warning signs of complications

d. Special instructions in case of emergency

e. Pain not controlled by discharge medications and/or over-the-counter medications.

f. A telephone number to contact the medical service responsible for the patient's care that is available 24 hours per day

g. Follow-up care and/or appointments.

5. Discharge Instructions should be based on the individual patient's needs.

a. Written discharge instructions should be given to the party responsible for the patient's well-being post procedurally. The responsible person should sign that instructions have been received and a copy of discharge instructions should be maintained with the patient's medical record.

b. Discharge instructions should include, but not be limited to:

i. Patient instructions/ Sedation (child or adult)

ii. Care specific to the procedure performed

iii. Medications prescribed for post-procedural care

iv. Any follow-up visits required

v. Phone number of contacts for additional questions in reference to procedure or outcomes related to procedure.

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Moderate Sedation Addendum

Guidelines for Sedation Medication Administration

The following are guidelines only. The health status, medical history, routine medications, and physical characteristics of each patient must be taken into account and adjustments made as necessary. Consult the physician for any questions regarding the appropriate administration criteria for an individual patient. Higher than recommended doses may be indicated and necessary for some patients.

Benzodiazepines for Procedural Sedation					
Drug	**Pediatrics**	**Adults**	**Onset**	**Peak**	**Duration**
Midazolam (Versed®) 3-4 x more potent than diazepam	**IV:** 6 mo-5 yrs: 0.05-0.1 mg/kg over 2-3 min. Up to 0.6 mg/kg or 6 mg total 6-12 yrs: 0.025-0.05 mg/kg over 2-3 min. Up to 0.4 mg/kg or 10 mg total >12 yrs: should be dosed as adult up to 10 mg total.	**IV Initial <60 yrs:** 0.5-2 mg **IV Initial >60 yrs or chronically ill:** 0.5-1.5 mg **IV Titrate:** 0.5-2 mg q 5 min	2-3 min	3-5 min	<2hr
	IM: > 6 mo: 0.1-0.15 mg/kg (up to 10 mg total)	0.1-0.15 mg/kg (up to 10 mg total)	5-10 min		
PO:	> 6 mo: 0.25 – 0.5 mg/kg/dose. Max 20 mg < 6 yrs: May require up to 1 mg/kg/dose	0.25 – 0.5 mg/kg/dose. Max 20 mg 10-20 min	20-50 min		
Nasal:	1 – 5 mo: 0.2 mg/kg/dose > 6 mo: 0.2-0.3 mg/kg/dose. Max 10mg	0.1 mg/kg/dose 5-10 min		30-60 min	
Diazepam (Valium®)	**Not recommended for pediatrics due to long duration**	**IV Initial:** 5-15 mg slowly **IV Titrate:** 2mg q 5-10 min	3-5 min	8 min	6-8 hr
		PO: 5-10 mg	30-60 min	30-90 min	6-8 hr

Alprazolam (Xanax®)	Not recommended	**PO:** 0.25-2 mg	30 min	1-2 hr	>6 hr
Lorazepam (Ativan®)	Not recommended	**IV:** Initially 0.044 mg/kg, or 2 mg, (whichever is less) Max: 0.05 mg/kg, or 4 mg (whichever is less) **PO:** 2-4 mg	***2-3 min*** 20-30 min	15-20 min 60-90 min	6-8 hr 6-8 hr

Notes of Caution:

1. All have potential for hypotension, bradycardia, respiratory depression.
2. When combined with other sedatives or opioids, sedation and respiratory depression are synergistic.
3. Benzodiazepines do not provide analgesia. Titrate opioid first for painful procedures because the addition of a benzodiazepine will limit the amount of opioid one can give.
4. Debilitated or elderly patients may be more sensitive to the effects.
5. Diazepam (Valium), Alprazolam (Xanax), and Lorazepam (Ativan) have potential for extremely long duration of action, and may not be suitable for outpatients.
6. All benzodiazepines undergo hepatic metabolism and should be used with caution in patients with liver dysfunction.

***Reversal agent is flumazenil (Romazicon)**

Drug	IV Dosing		Onset	Peak	Duration	Potency
	Pediatrics	**Adults**				
Morphine	**Initial**: 0.05 – 0.1 mg/kg slowly **Titrate**: 0.02-0.05 mg/kg q 5-10 min	**Initia**l: 2-4 mg slowly **Titrate**: 1-2 mg q 5-10 min	5 min	20 min	3-4 hr	1
Fentanyl	**Initial**: 0.5 mcg/kg slowly **Titrate**: 0.25-0.5 mcg/kg q 5 min	**Initial**: 0.5-1 mcg/kg slowly **Titrate**: 0.25 - 0.5 mcg/kg q 5 min	30-60 sec	3-5 min	30-60 min Multiple doses increase likelihood of long duration and prolonged depression of ventilation	100 x morphine
Hydromorphone (Dilaudid®)	**Initial**: 0.005 mg/kg slowly (5 mcg/kg) **Titrate**: 0.002-0.005 mg/kg (2-5 mcg /kg) q 5-10 min	**Initial**: 0.5-1 mg slowly **Titrate**: 0.1-0.2 mg q 5-10 min	5 min	30 min	3-5 hr	10 x morphine
Meperidine (Demerol®)	**Initial**: 0.5 mg/kg slowly **Titrate**: 0.25-0.5 mg/kg q 5-10 min	**Initial**: 12.5-25 mg slowly **Titrate**: 10 mg q 5-10 min	5 min	20 min	2-4 hr	1/10 of morphine

Notes of Caution:

1. Analgesia and respiratory depression occur concurrently
2. When opioids are combined with other sedatives, the sedating and respiratory depressant effects become synergistic
3. Debilitated patients may be more sensitive to the actions of opioids
4. Respiratory depression may become more pronounced after stimulation from the procedure has ended
5. There can be significant variability in patient responses and dosing should be individualized
6. All opioid doses should be titrated to effect or until respiratory depression or hypotension occur
7. Meperidine is contraindicated in patients taking MAO inhibitors or selegiline (Eldepryl)

***Reversal agent is naloxone (Narcan).**

Anesthetic for Procedural Sedation (Physician administration only!!!)

Drug	Pediatrics	Adults	Onset	Peak	Duration
Etomidate	**IV > 10 yrs:** 0.1 to 0.3 mg/kg	**IV:** 0.1 to 0.2 mg/kg (range 0.2-0.6 mg/kg/dose) **Subsequent dosing:** 0.05 mg/kg every 3-5 min prn	1 min	1 min	3-5 min
Propofol	**IV:** 1 mg/kg/dose, then 0.5 mg/kg/dose **Max:** 40 mg initial dose then 20mg/dose	**IV < 55 yrs:** 100 to 150 mcg/kg/min over 3-5 min **IV Maintenance:** 25-75 mcg/kg/min or incremental bolus doses of 10-20mg	Rapid < 1 min	Unk	10 min
Ketamine	**IV > 3 mo:** 0.5-1.5 mg/kg/dose. Max 2 mg/kg/dose	**IV:** 1-2 mg/kg **Subsequent doses**: 0.25 – 1 mg/kg every 5-10 min **IM:** 3-5 mg/kg	Rapid < 1 min	Unk	**IV:** 5-10 min
	IM > 3 mo: 2-5 mg/kg/dose. Max 6 mg/kg/dose				**IM:** 25 min
	PO > 3 mo: 5-10 mg/kg/dose				**PO:** 45 min

Notes of Caution:

1. These medications are only to be administered by the physician.
2. Propofol and Etomidate provides **no** analgesia and can cause pain during injection through an intravenous catheter
3. Respiratory depression usually manifests as a mild oxygen desaturation. Coadministration with other sedatives or analgesics (e.g., fentanyl) can exacerbate respiratory problems
4. Propofol can induce deep sedation rapidly and must be given with careful attention to dosing and monitoring.

***No Reversal agent is available for propofol, etomidate, or ketamine.**

Reversal Agents for Opioids and Benzodiazepines

Drug	IV Dosing		Onset	Peak	Duration
	Pediatrics	Adults			
Naloxone (opioid reversal)	0.01mg/kg q 2-3 minutes prn	0.1-0.2 mg q 2-3 minutes prn	< 2 min	5-15 min	20-60 min
Flumazenil (benzodiazepine reversal)	0.01 mg/kg q 1 min up to 0.05 mg/kg or 1 mg, whichever is less.	0.2 mg q 1 min up to a maximum total dose of 1 mg.	1-3 min	6-10 min	<60 min

Notes of Caution:

1. For inadequate ventilation, start with naloxone at the low end of the dosing scale. For apnea, start with 0.1 mg increments.
2. The higher doses of naloxone may also reverse the analgesia, leading to an acute increase in pain, hypertension, and/or nausea.
3. Naloxone is stocked as either 0.4 mg/ml or 1 mg/ml. It may be easier to dilute 1 ml to a total of 10 ml with normal saline.
    - For 0.4 mg in 10 ml (conc = 0.04 mg/ml), dose is 1-2 ml prn.
    - For 1 mg in 10 ml (conc = 0.1 mg/ml), dose is 0.5-1ml prn.

Since the duration of action of both of these agents is shorter than that of the drug they are reversing, repeat doses may be needed and patients should continue to be monitored.