



Medications Used for Sedation
by
Non-Anesthetist RNs:



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Agents Used For Moderate Sedation



- **Benzodiazepines**

- Most widely used drug for Sedation
- Probably work in limbic system and amygdala of the brain, where fear, anxiety and apprehension arise.
- When Benzodiazepines come to these receptors from the blood stream, they go into the receptor sites and cause specific effects:



Benzodiazepines

Effects

- anxiolysis ... reduction of anxiety
- amnesiac ... makes patient have antero-grade amnesia (not retrograde)
- anti-convulsive ... stops seizures
- skeletal muscle relaxation
- sedative - hypnotic in large doses
- patients who chronically take Cimetidine (Tagamet) or Ranitidine (Zantac) are especially susceptible to Benzodiazepine overdose these H-2 blocking drugs may dramatically increase the sedative of even small doses of Benzodiazepine.

BENZODIAZEPINES



- Sedative hypnotic
- No analgesic properties
- Useful for seizures

BENZODIAZEPINES(2)



- Little respiratory or cardiovascular depression when used alone, but synergistic effects seen when combined with other CNS depressants
- Avoid use in pregnancy, alcohol intoxication, glaucoma, other CNS depressants

MIDAZOLAM (VERSED)



- Most commonly used sedative used for conscious sedation
- 3-5 times more potent than diazepam
- Rarely precipitates or causes pain on injection (as valium will)



Midazolam (2)

Titrate to effect in 0.5 mg increments

Route	Onset of Action	Peak Effect	Duration of Action
IV	1 minute	3-5 minutes	15min. – 6hours
IM	5-15 minutes	15-60 minutes	2-6 hours
Oral	< 10 minutes	30 minutes	2-6 hours



Diazepam (Valium)

- Used less than Midazolam
- Titrate in 2.5mg increments
- Incompatible with other agents, easily precipitates



Diazepam (2)

- Painful on injection
- Peak effect in less than 10 minutes
- Long half-life due to metabolites

Route	Onset of Action	Peak Effect	Duration of Action
IV	1-5 minutes	3-5 minutes	15-60 minutes
Oral	15-60 minutes	60 minutes	3-6 hours



Reversal for Benzodiazepines

- **Flumazenil (Romazicon)** (Specific Benzodiazepine antagonist)
- **Initial Dose:** 0.2 mg
- **Administration Technique:**
 - Phase One: Initially 0.2 mg IV over 15 seconds. If patient does not reach desired level of consciousness after 45 seconds.
 - Phase Two: Repeat dose at one minute intervals until a cumulative dose of 1mg has been administered (this includes initial dose in phase one).



Reversal for Benzodiazepines

Peak effect:

- 6 to 10 minutes
- 80% of the maximum response is seen within 3 minutes.
- Anesthesia should be involved if there is no desired clinical response with the administration of the initial 1 mg dose.



Reversal for Benzodiazepines

- **Potential Adverse Reactions:**

- nausea, vomiting, sweating, hot flashes, agitation, headache, injection site pain
- do not use Flumazenil in patients who chronically take Benzodiazepines.

- **May precipitate:**

- tremors
- profuse sweating
- hypotension
- seizure activity



Flumazenil (Romazicon)

- Indications: reversal of benzodiazepines' effects - sedation, respiratory depression, amnesia
- Dose: 0.2 mg IV initially, titrate to effect
- Caution in patients with seizure disorders - may reverse effects of anti-seizure medications



Reversal Flumazenil (Romazicon)

Route	Onset of Action	Peak Effect	Duration of Action
IV bolus or infusion	1-2 minutes	6-10 minutes (but 80% of the maximum response is seen within 3 minutes.) Call anesthesia if there is no desired clinical response with the administration of the initial 1 mg.	45-90 minutes



Narcotics

- Narcotics
 - (commonly given along with Benzodiazepines)
 - are great potentiators of respiratory depression when mixed. (great synergistic effect)
- Most Common
 - Morphine
 - Fentanyl
 - Demerol

Opioids



- No amnestic effects
- Provide analgesia and sedation
- Adverse reactions:
 - Respiratory depression
 - Nausea and vomiting
 - Pruritis, urticaria
 - Urinary retention (young males)
 - Constipation



Morphine

- Dose is up to 0.15 mg/kg
- Peak effect in 5-20 minutes, onset time less than one minute, duration 2-7 hours.
- Possible histamine release, all of opioid side effects most possible with morphine.



Morphine

Route	Onset of Action	Peak Effect	Duration of Action
IV	<1 minute	5 - 20 minutes	4-7 hours
IM	5 – 10 minutes	30-60 minutes	4-7 hours
Oral	Within 1 hour	1-2 hours	6-12 hours



Meperidine (Demerol)

- One tenth the potency of morphine
- IV dose is 0.5-1.0 mg/kg
- Onset in less than one minute, peak effect in 5-20 minutes, duration 2-4 hours.
- Caution in patients with renal/hepatic impairment, Monoamine oxidase inhibitors (MAOIs) (used for depression, isoniazid (TB Treatment))



Meperidine (Demerol)

Route	Onset of Action	Peak Effect	Duration of Action
IV	1 minutes	5-20 minutes	2-4 hours
IM	1 – 5 minutes	30-50 minutes	2-4 hours
Oral	15-45 minutes	60 minutes	2-4 hours



Fentanyl (Sublimaze)

- 75-100 times more potent than morphine
- Dose 0.7-1mcg/kg
- Onset within 30 seconds, peak effect in 5-15 minutes, duration of effects 30-60 minutes
- Titrate in 25 mcg increments



Fentanyl (Sublimaze)

Route	Onset of Action	Peak Effect	Duration of Action
IV	<1 minute	5-15 minutes	30-60 minutes
IM	5-8 minutes	15-20 minutes	1-2 hours
Transmucosal	5-15 minutes	20 – 30 minutes	1-2 hours

Naloxone (Narcan)



- Dose: 0.5-1.0 mcg/kg
- All opioid effects, inclusive of analgesia, are reversed
- Titrate to effect
- Avoid rapid reversal - can lead to untoward sympathetic discharge, extreme pain, anxiety, pulmonary edema



Reversal Naloxone (Narcan)

Route	Onset of Action	Peak Effect	Duration of Action
IV	1-2 minutes	5-15 minutes	1-4 hours



Ketamine (Ketalar)

- Dissociative anesthetic/analgesic agent
- Derivative of phencyclidine(PCP)
- Excellent analgesic and amnestic

Ketamine (2)



- Indications: Short term procedures requiring intense analgesia
- Given IV by the operator, monitored by the monitor
- Contraindications: *many*

Ketamine (3)



Contraindications:

- Increased ICP (increases ICP)
- Corneal lacerations (increases intraocular pressure)
- Children with active URI (stimulates oral secretions), psychiatric disorders (may cause extreme mood alteration), compromised airways (may induce apnea/anesthesia)



Ketamine(4)

- Recommended dosages: 0.25-0.5 mg/kg IV, 1-2 mg/kg IM
- Onset of action IV <30 sec, IM 5-20 min; peak effect IV 1 min, IM 3-4 min; duration of action IV 5-15 min, IM 12-25 min

Route	Onset of Action	Peak Effect	Duration
IV	Immediate	15 to 30 seconds	5 to 10 minutes



Propofol

DIPRIVAN (Propofol) is an intravenous sedative-hypnotic agent commercially introduced in the United States in 1989 by Zeneca Pharmaceuticals. It was the first of a new class of intravenous anesthetic agents - the alkylphenols.

Route	Onset of Action	Peak Effect	Duration of Action
IV	40 seconds	1 minute	5-10 minutes



Propofol

- Dosage/Administration – **Adult dose:** 25 – 50mg (0.5 – 1 mg/kg) IV, administered in 10 mg increments over several minutes. Pain on injection is decreased with IV lidocaine, 0.1 mg/kg, added to the diprivan emulsion. Strict aseptic technique must be maintained in handling, as diprivan is preservative free and will support bacterial growth. Diprivan injection should be prepared for single patient use only, just prior to the initiation of each procedure. Discard after opened for 6 hours.
- **Pediatric dose:** 0.5 – 1.0mg/kg infused slowly and titrated to desired effect.



Adverse Reactions

- Respiratory effects – respiratory depression, apnea, hiccup, bronchospasm, laryngospasm
- Cardiovascular effects –hypotension, arrhythmia, tachycardia, bradycardia, hypertension
- CNS effects – headache, dizziness, euphoria, myoclonic/clonic movement, seizures, sexual illusions.

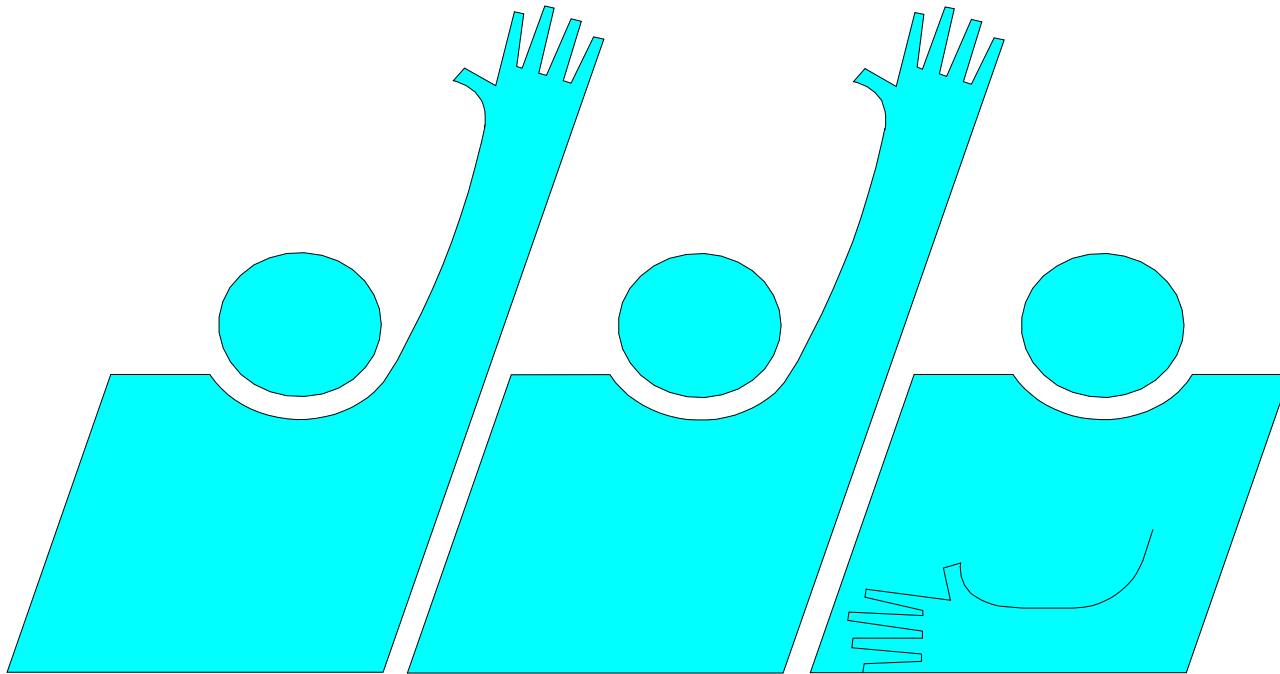


Emergency Medications

- Atropine: Increases heart rate by blocking vagal nerve stimulation. IV bolus 0.4-1.0 mg.
- Lidocaine: Drug of choice for ventricular dysrhythmias - decreases automaticity. IV bolus 50-100 mg.
- Ephedrine: Increases blood pressure and heart rate by indirect cardiac stimulation. IV bolus 5-10 mg.



Questions



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