

BENZODIAZEPINES (*DIAZEPAM, LORAZEPAM, MIDAZOLAM*)**Description**

Benzodiazepines are sedative-hypnotics that act by increasing GABA activity in the brain. GABA is the major inhibitory neurotransmitter, so increased GABA activity inhibits cellular excitation. Benzodiazepine effects include anticonvulsant, anxiolytic, sedative, amnestic and muscle relaxant properties. Each individual benzodiazepine has unique pharmacokinetics related to its relative lipid or water solubility.

Indications

- Status epilepticus
- Sedation of the severely agitated/combatative patient
- Sedation for cardioversion or transcutaneous pacing
- Adjunctive agent for treatment of severe pain (e.g. back spasms) in adults that is uncontrolled by maximum opioid dose – WITH CALL IN ONLY
- Hyperactive delirium with severe agitation

Contraindications

- Hypotension
- Respiratory depression

Adverse Reactions

- Respiratory depression, including apnea
- Hypotension
- Consider ½ dosing in the elderly for all benzodiazepines

Dosage and Administration**MIDAZOLAM (VERSED):****Seizure or sedation for cardioversion or transcutaneous pacing:****Adult**

- **IV/IO route: 2 mg**
 - Dose may be repeated x 1 after 5 minutes if still seizing.
 - Contact Base for more than 2 doses.
- **IN/IM route (intranasal preferred): 5 mg**
 - Dose may be repeated x 1 after 5 minutes if still seizing.
 - Contact Base for more than 2 doses.

Pediatric

- **IV/IO route: 0.1 mg/kg**
 - Maximum single dose is 2 mg IV.
 - Dose may be repeated x 1 after 5 minutes if still seizing.
 - Contact Base for more than 2 doses.
- **IN/IM route (intranasal preferred): 0.2 mg/kg**
 - Maximum single dose is 5mg IN or IM.
 - Dose may be repeated x 1 after 5 minutes if still seizing.
 - Contact Base for more than 2 doses.

Paramedic

LFD MEDICATIONS

EMT - I	Paramedic
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BENZODIAZEPINES (Continued)

MIDAZOLAM (VERSED):

Sedation of severely agitated or combative patient

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Adult

IV/IN/IM route: 5 mg

If patient still agitated and disruptive 5 minutes after first benzodiazepine dose, (IMCRASS +3 or +4), switch to butyrophenone. If additional sedation medication needed

CONTACT BASE.

Hyperactive delirium with severe agitation

IM route: 10 mg. Contact Base for additional sedation orders.

Pediatric

Contact Base before any consideration of sedation of severely agitated/combative child.

DIAZEPAM (VALIUM):

Seizure or sedation for cardioversion or transcutaneous pacing:

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Adult:

IV/IO route: 5 mg

Dose may be repeated x 1 after 5 minutes if still seizing.
Contact Base for more than 2 doses.

Pediatric:

IV/IO route:

* Neonate: Not indicated

* < 5 years old: 0.5 mg, dose may be repeated x 1 after 5 minutes. Contact Base for more than 2 doses.

* 5 – 12 years old: 1 mg, dose may be repeated x 1 after 5 minutes. Contact Base for more than 2 doses.

Sedation of severely agitated or combative patient:

Adult:

IV/IM route: 5 mg

If patient still agitated and disruptive 5 minutes after first benzodiazepine dose, (IMCRASS +3 or +4), switch to butyrophenone. If additional sedation medication needed **CONTACT BASE.**

Pediatric:

Contact Base before any consideration of sedation of severely agitated/combative child.

LORAZEPAM (ATIVAN):

Seizure or sedation for cardioversion or transcutaneous pacing:

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Adult:

IV/IO route: 1-2 mg

Dose may be repeated x 1 after 5 minutes if still seizing. Contact Base for more than 2 doses.

IN/IM route (intranasal preferred): 2 mg

Dose may be repeated x 1 after 5 minutes if still seizing. Contact Base for more than 2 doses.

BENZODIAZEPINES (*Continued*)**LORAZEPAM (ATIVAN):****Pediatric:****IV/IO route:** 0.05 mg/kg

Maximum single dose is 5 mg IV. Dose may be repeated x 1 after 5 minutes if still seizing. Contact Base for more than 2 doses.

IN/IM route (intranasal preferred): 0.1 mg/kg

Dose may be repeated x 1 after 5 minutes if still seizing. Contact Base for more than 2 doses.

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Sedation of severely agitated or combative patient:**Adult:****IV/IO route:** 2 mg**IN/IM route:** 2 mg

If patient still agitated and disruptive 5 minutes after first benzodiazepine dose, (IMCRASS +3 or +4), switch to butyrophenone. If additional sedation medication needed **CONTACT BASE.**

Pediatric:**Contact Base** before any consideration of sedation of severely agitated/combative child.**Onset & Duration**

- Any agent given IV will have the fastest onset of action, typical time of onset 2-3 minutes
- Intranasal administration has slower onset and is less predictable compared to IV administration, however, it may still be preferred if an IV cannot be safely or rapidly obtained. Intranasal route has faster onset compared to intramuscular route.
 - Diazepam should not be given intranasally as it is not well absorbed.
- IM administration has the slowest time of onset.

Protocol

- Synchronized Cardioversion
- Transcutaneous Pacing
- Seizure
- Agitated/Combative Patient
- Poisoning/Overdose

Special Considerations

- All patients receiving benzodiazepines must have cardiac, pulse oximetry monitoring during transport. Continuous waveform capnography recommended.
- Sedative effects of benzodiazepines are increased in combination with opioids, alcohol, or other CNS depressants.
- Co-administration of opioids and benzodiazepines can cause significant hemodynamic and ventilatory compromise. Co-administer only with a trustworthy IV/IO line established facilitating fluid administration to support BP if necessary; consider having IV fluids already hanging and ready. Obtain serial BP's before and after administration to ensure adequate monitoring of hemodynamics. Be prepared to support ventilation; consider ETCO₂ monitoring. Consider pre-mixing one of two forms of Epi pressers.

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- In elderly patients > 65 years old or small adults <50kg, lower doses may be sufficient and effective. Consider ½ dosing in these patients.