



## 25. MIDAZOLAM (VERSED®)

### a) Pharmacology

- (1) Sedative
- (2) Hypnotic
- (3) Anticonvulsant

### b) Pharmacokinetics

- (1) A short-acting benzodiazepine with strong hypnotic, anticonvulsant activity, and amnestic properties
- (2) Onset of action is extremely rapid following IV administration; approximately 1.5 minutes, and for IM approximately 15 minutes.
- (3) Duration of effect is 1–4 hours with half-life of 1.5 to 3 hours in healthy adult.

### c) Indications

- (1) Sustained and/or recurrent seizures
- (2) Precardioversion to reduce anxiety
- (3) Awake patient requiring transcutaneous pacing (TCP)
- (4) Nasal Tracheal Intubation
- (5) Implanted Cardioverter Defibrillator (ICD) Malfunction
- (6) Nerve/organophosphate exposure
- (7) Bucking Endotracheal Intubated patient
- (8) Chemical Restraint
- (9) Moderate to severe stimulant toxicity
- (10) Excited Delirium Syndrome

### d) Contraindications

- (1) Hypotension (See below for ET bucking)
- (2) Known hypersensitivity to midazolam


### e) Adverse Effects

- (1) Respiratory depression or apnea
- (2) Hypotension

### f) Precautions

- (1) The effects of midazolam can be accentuated and significantly potentiated by CNS depressants, such as opioids or alcohol.
- (2) Midazolam is five times as potent per milligram as diazepam and there is an increased risk of respiratory depression.






- g)**  **Dosage** (paramedic and CRT-(I) may perform without consult for patients with active seizures.)

All indications in c) above, except for Bucking Endotracheal Intubated patient, Chemical Restraint, and Excited Delirium Syndrome

(1) Adult:



REDUCE THE BELOW IV/IO/IN/IM BY 50% FOR PATIENTS 69 YEARS OR OLDER.

- (a) 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg.
  - (b) If IV unavailable, 5 mg IN/IM may be administered.  
IN administration max 1 mL per nare
  - (c)  Additional doses up to a maximum total dose 10 mg require medical consultation for all clinicians.  
For seizures lasting greater than 10 minutes (status), consider IO administration of midazolam.
  - (d) If suspected severe nerve agent exposure, clinicians may administer midazolam 5 mg IM without medical consultation.
- (2) Pediatric:
- (a) 0.1 mg/kg in 2 mg increments. SLOW IVP over 1–2 minutes per increment to a maximum single dose of 5 mg.
  - (b) If IV unavailable, 0.2 mg/kg IN/IM  
IN administration max 1 mL per nare  
Maximum total dose 5 mg
  - (c)  Additional doses up to a maximum total dose 5 mg require medical consultation for all clinicians.  
For life-threatening conditions, consider IO administration of midazolam.
  - (d) If suspected severe nerve agent exposure, clinicians may administer midazolam as above without medical consultation.
- (3) Chemical Restraint
- (a) Patient 18–69 years: midazolam 5 mg IM/IV  
Patient greater than 69 years: midazolam 2.5 mg IM/IV  
 Repeat doses may be given with medical direction
  - (b) Pediatric: Not indicated



(4) Bucking Endotracheal Intubated patient

- (a) Adult: Administer 0.05 mg/kg SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 90 mmHg. STOP ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED. Maximum single dose is 5 mg.



Additional doses require medical consultation.

- (b) Pediatric: Administer 0.05 mg/kg SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 60 in neonates, 70 in infants,  $[70 + (2 \times \text{years}) = \text{systolic BP}]$  for patients greater than 1 year of age. Maximum total dose 5 mg.



ADMINISTER UP TO 0.05 MG/KG IV WHEN TREATING ENDOTRACHEAL TUBE BUCKING, STOPPING ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED.

(5) Excited Delirium Syndrome (ExDS)

- (a) If severe agitation persists after second dose of IV/IO ketamine, consider midazolam 2.5 mg IV/IO.
- (b) If IV/IO unavailable:
- (i) If severe agitation persists after IM ketamine dose, administer midazolam 5 mg IM.



- (c) Patients aged 13 to those who have not yet reached their 18<sup>th</sup> birthday:
- (i) If severe agitation persists after second dose of IV/IO ketamine, consider midazolam 0.1 mg/kg SLOW IVP/IO over 1–2 minutes. Maximum single dose 2.5 mg.
- (ii) If IV/IO unavailable:
- a. If severe agitation persists after IM ketamine dose, administer midazolam 2.5 mg IM.