

Midazolam

<u>Brand Names:</u>	Versed
<u>Indications:</u>	Anticonvulsant, Rapid Sequence Induction, Procedural/maintenance sedation, Acute behavioral emergencies, EtOH withdrawal, Uncontrolled Anxiety/Panic Attack
<u>Contraindications:</u>	Known drug class allergy, Shock/Hypotension, Coma, Closed Angle Glaucoma, open-angle glaucoma (untreated)
<u>Pregnancy:</u>	Weigh risk/benefit during pregnancy, especially in 3rd trimester if prolonged (>3h) or repeated administration for sedation/anesthesia use; possible risk of teratogenicity based on conflicting human data with benzodiazepine class; risk of neonatal withdrawal symptoms and floppy infant syndrome near term based on human data with benzodiazepine class. Former pregnancy category D.
<u>Drug Class:</u>	Benzodiazepine
<u>Mechanism of action:</u>	Binds to benzodiazepine receptors on the postsynaptic GABA neuron at several sites within the central nervous system, including the limbic system and reticular formation. Promotes relaxation by enhancing the inhibitory effect of GABA on neuronal excitability making the nerves more hyperpolarized and stable (increases seizure threshold). It has twice the affinity for benzodiazepine receptors as diazepam and is 3-4 times more potent than diazepam.
<u>Adverse Reactions:</u>	Minor: Nausea/Vomiting, Headache, Drowsiness, Lethargy, Amnesia of event Major: Respiratory depression/Apnea, Bradycardia, Hypotension, Anaphylaxis, Cardiac arrest
<u>Precautions:</u>	Interaction of midazolam and an opiate may potentiate the CNS depressant effects leading to apnea. Consider reducing the adult dose by half (50%) for elderly or those under the influence of another CNS depressant.

Onset of action	IV: 1-3 min IM: 10-15 min	Peak Effect	IV: 15 min IM: 20-30 min	Duration of action	1-2 hrs 1-2 hrs
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ADULT DOSING – Midazolam (5 mg/ml)

Indication	Route	Dose	Notes
Anticonvulsant/Grand Mal Seizure (Non-Pregnant)	IV/IO:	5 mg (1mL)	Repeat IV/IO doses q3-5min OMCP
Alcohol Withdrawal/Delirium Tremens	IM/IN:	10 mg (2 mL)	Repeat IM/IN doses q10-15min OMCP
Grand Mal Seizure (Pregnant) OMCP			
Procedural Sedation, Maintenance of Sedation, Acute Psychosis, Behavioral Emergencies OMCP	IV/IO:	2.5-5 mg (0.5-1 mL)	Maintain MAP > 65 mm hg
	IM/IN:	5-10 mg (1-2 mL)	
Rapid Sequence Intubation	IV/IO:	5-10 mg (1-2 mL)	Requires use of ET _{CO} ₂
Uncontrolled Anxiety/Panic Attack OMCP	IV/IO:	0.5-1 mg (0.1-0.2 mL)	

PEDIATRIC DOSING – Midazolam (5 mg/ml)

Indication	Route	Dose	Notes
Anti-convulsant	IV/IO/IM/IN	0.2 mg/kg Max single dose: 5 mg	Do not administer if under 5 kg Repeat PRN to desired effect OMCP
Procedural Sedation, Maintenance of sedation OMCP	IV/IO	0.05 mg/kg Max single dose: 5 mg	Requires use of ET _{CO} ₂ IV requires <i>slow</i> push IV route reserved for refractory seizures

Midazolam

PEDIATRIC DOSING - Midazolam										
3 kgs	4 kgs	5 kgs	6-7 kg	8-9 kgs	10-11 kgs	12-14 kgs	15-18 kgs	19-23 kgs	24-29 kgs	30-36 kgs
6.6 lbs	8.8 lbs	11 lbs	13-15 lbs	17-20 lbs	22-24 lbs	26-30 lbs	33-40 lbs	42-50 lbs	53-64 lbs	66-80 lbs
18.25-20.25 in	20.25-21.5 in	21.5-23.25 in	23.25-26.25 in	26.25-29.25 in	29.25-33 in	33-37.5 in	37.5-42.5 in	42.5-47.75 in	47.75-51.25 in	51.25-56.25 in
<u>Anticonvulsant</u> 0.2 mg/kg Midazolam for IV/IO/IM/IN Concentration = 5 mg/ml										
NA	NA	NA	0.25 mL	0.3 mL	0.4 mL	0.5 mL	0.65 mL	0.8 mL	1.0 mL	1.0 mL
<u>Sedation</u> 0.05 mg/kg Midazolam for IV/IO Concentration = 5 mg/ml										
NA	NA	NA	0.1 mL	0.1 mL	0.1 mL	0.15 mL	0.2 mL	0.25 mL	0.3 mL	0.35 mL
<u>Anticonvulsant</u> 0.2 mg/kg for IV/IO/IM/IN Concentration = 1 mg/ml (2mg/2ml vial)										
NA	NA	NA	1.2 mL	1.6 mL	2.0 mL	2.4 mL	3 mL	3.8 mL	4.8 mL	5 mL
<u>Sedation</u> 0.05 mg/kg for IV/IO Concentration = 1 mg/ml (2mg/2ml vial)										
NA	NA	NA	0.3 mL	0.45 mL	0.5 mL	0.7 mL	0.8 mL	1.0 mL	1.3 mL	1.65 mL

*Use formal Pedi-tape/Broselow tape for any discrepancies or concerns.

Protocols:

Seizure
Procedural Sedation, Adult and Pediatric
Agitated/Acute Delirium/Acute Psychosis/Behavioral Emergencies

Notes:

- **Non-Lead Paramedics are only authorized to administer midazolam for seizures/anticonvulsant. The additional listed indications are for lead paramedics only or require online medical consultation.**
- When performing procedural sedation, the end goal should be to achieve a *moderate sedation* (Diminished but purposeful response to verbal and light tactile stimulation and slurred speech).
- Midazolam during pregnancy is only permitted with Online Medical Control permission. **OMCP**