NiMBEX® INJECTION
cisatracurium besylate

DOSING GUIDE

A Nondepolarizing Neuromuscular Blocking (NMB) Agent

Easy to remember dosing for the 0.20 mg/kg adult intubating doses of NIMBEX[1]*:

- For every 10 kg, give 1 mL of NIMBEX (2 mg/mL concentration)
- Example, a 70 kg patient = 7 mL of NIMBEX (2 mg/mL concentration) for a total dose of 14 mg

* There are two recommended adult intubating doses for NIMBEX 0.15 mg/kg (3 x ED_{95}) and 0.20 mg/kg (4 x ED_{95}).

This is an initial dosing guide. Base subsequent doses on the patients' responses to the initial doses.

Indication[1]

NIMBEX® (cisatracurium besylate) is indicated as an adjunct to general anesthesia to facilitate tracheal intubation in adults and in pediatric patients 1 month to 12 years of age; to provide skeletal muscle relaxation in adults during surgical procedures or mechanical ventilation in the ICU; and to provide skeletal muscle relaxation during surgical procedures via infusion in pediatric patients 2 years and older. NIMBEX is not recommended for rapid sequence endotracheal intubation.

Safety Considerations[1]

NIMBEX is contraindicated in patients with known hypersensitivity to cisatracurium. Severe anaphylactic reactions to NIMBEX have been reported. Use of 10-mL NIMBEX multiple-dose vials is contraindicated for use in pediatric patients less than 1 month of age and low birth-weight infants because the formulation contains benzyl alcohol. NIMBEX has been associated with residual paralysis; patients with neuromuscular diseases and carcinomatosis may be at higher risk. Patients with renal or hepatic impairment receiving extended administration of NIMBEX may be at higher risk of seizures.

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NIMBEX Infusion Dosing for Adults and Pediatric Patients[1]

Initial Infusion Rate	Maintenance Rate[a]
3 mcg/kg/min	1 to 2 mcg/kg/min

- Confirm proper selection of intended product, avoid confusion with other injectable solutions, and ensure that the intended dose is clearly labelled and communicated.
- During extended surgical procedures, NIMBEX may be administered by continuous infusion to adults and pediatric patients ≥2 years old if patients have spontaneous recovery after the initial NIMBEX bolus dose.
- Use peripheral nerve stimulation and monitor the clinical signs of neuromuscular blockade to determine the adequacy of the level of neuromuscular blockage and the need to adjust the NIMBEX dosage.
- NIMBEX Injection is not compatible with propofol injection or ketorolac injection for Y-site administration. Do not dilute NIMBEX in Lactated Ringer's Injection, USP due to chemical instability.

[a] A rate of 1 to 2 mcg/kg/min should be adequate to maintain continuous neuromuscular block in the range of 89% to 99% in most pediatric and adult patients under opioid/N_2O/O_2 anesthesia.

NIMBEX Infusion for Adults in the Intensive Care Unit (ICU)[1]

Infusion Rate	Range
~3 mcg/kg/min	0.5 to 10.2 mcg/kg/min

- NIMBEX infusion in the ICU can be administered to adult patients to provide neuromuscular block.
- Following recovery from neuromuscular blockade, it may be necessary to re-administer a bolus dose to quickly re-establish neuromuscular blockade prior to starting the continuous infusion.
- The intravenous infusion rate depends upon the NIMBEX concentration, the desired dose, the patient's weight, and the contribution of the infusion solution to the fluid requirements of the patient.
- Adverse reactions occurred among the 68 ICU patients who received NIMBEX in conjunction with other drugs in US and European clinical studies. One out of 68 patients experienced bronchospasm. In one study, there were 2 reports of prolonged recovery among 28 patients administered NIMBEX compared with 13 reports among 30 patients administered vecuronium.

This is an initial dosing guide. Base subsequent doses on the patients' responses to the initial doses.

For additional information about NIMBEX, contact your local sales representative or call 1-800-255-5162.

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A Nondepolarizing Neuromuscular Blocking Agent

Intubation Dosing[1]

Maintenance Dosing[1]

ADULTS			PEDIATRIC PATIENTS (2-12 yrs)		INFANTS[a] (1-23 mos)		ADULTS	
Body Weight	Recommended Dose (mg/kg)		Body Weight	Recommended Dose (mg/kg)	Body Weight	Recommended Dose (mg/kg)	Body Weight	Recommended Dose (mg/kg)
	0.15	0.20		0.10-0.15		0.15		0.03
kg	Total Dose (mg)		kg	Total Dose (mg)	kg	Total Dose (mg)	kg	Total Dose (mg)
35	5.25	7	7	0.70 - 1.05	3	0.45	35	1.05
40	6.00	8	8	0.80 - 1.20	4	0.60	40	1.20
45	6.75	9	9	0.90 - 1.35	5	0.75	45	1.35
50	7.50	10	10	1.00 - 1.50	6	0.90	50	1.50
55	8.25	11	12	1.20 - 1.80	7	1.05	55	1.65
60	9.00	12	15	1.50 - 2.25	8	1.20	60	1.80
65	9.75	13	17	1.70 - 2.55	9	1.35	65	1.95
70	10.50	14	20	2.00 - 3.00	10	1.50	70	2.10
75	11.25	15	25	2.50 - 3.75	11	1.65	75	2.25
80	12.00	16	30	3.00 - 4.50	12	1.80	80	2.40
85	12.75	17	35	3.50 - 5.25	13	1.95	85	2.55
90	13.50	18	40	4.00 - 6.00	14	2.10	90	2.70
95	14.25	19	45	4.50 - 6.75	15	2.25	95	2.85
100	15.00	20	50	5.00 - 7.50			100	3.00
105	15.75	21	55	5.50 - 8.25			105	3.15
110	16.50	22	60	6.00 - 9.00			110	3.30

- The presence of co-induction agents (e.g., fentanyl and midazolam) and the depth of anesthesia are factors that may influence intubation conditions.
- The onset, duration of action, and recovery profiles of NIMBEX during propofol/O_2 or propofol/N_2O/O_2 anesthesia were similar to those during opioid/N_2O/O_2 anesthesia.

This is an initial dosing guide. Base subsequent doses on the patients' responses to the initial doses.

[a] The use of 10-mL NIMBEX multiple-dose vials is contraindicated for use in pediatric patients less than 1 month of age and low birth-weight infants because it contains benzyl alcohol.

NIMBEX is not recommended for rapid sequence endotracheal intubation.

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NIMBEX Profiles for Onset and Duration of Action[1]

	Time to Onset[a] (sec)	Time to 90% Block (min)	Time to Maximum Block (min)	Clinical Duration[b] (min)
ADULTS				
0.15 mg/kg[c,d]	120[d,e]	2.6 (range: 1.0-4.4)	3.5 (range: 1.6-6.8)	55 (range: 44-74)
0.20 mg/kg[c]	90[d,e]	2.4 (range: 1.5-4.5)	2.9 (range: 1.9-5.2)	65 (range: 43-103)
PEDIATRIC PATIENTS (2-12 yrs)				
0.10 mg/kg[c]		1.7 (range: 1.3-2.7)	2.8 (range: 1.8-6.7)	28 (range: 21-38)
0.15 mg/kg[f]		2.1 (range: 1.3-2.8)	3.0 (range: 1.5-8.0)	36 (range: 29-46)
INFANTS[g] (1-23 mos)				
0.15 mg/kg[f]		1.5 (range: 0.7-3.2)	2.0 (range: 1.3-4.3)	43 (range: 34-58)

- The presence of co-induction agents (e.g., fentanyl and midazolam) and the depth of anesthesia are factors that may influence intubation conditions.
- The onset, duration of action, and recovery profiles of NIMBEX during propofol/O_2 or propofol/N_2O/O_2 anesthesia were similar to those during opioid/N_2O/O_2 anesthesia.

Adult Maintenance Bolus Dose	Clinical Duration
0.03 mg/kg	20 minutes

This is an initial dosing guide. Base subsequent doses on the patients' responses to the initial doses.

[a] In a study at a dose of 0.1 mg/kg, time to maximum block was approximately 1 minute slower in elderly patients (≥65 years) than in healthy young adults; onset time was approximately 1 minute faster in patients with end-stage liver disease and time to 90% block was approximately 1 minute slower in patients with renal disease than in healthy adult control patients.

[b] Time to 25% spontaneous recovery.

[c] Opioid/N_2O/O_2 anesthesia.

[d] Propofol/N_2O/O_2 anesthesia.

[e] Co-induction agents: midazolam and fentanyl.

[f] Thiopentone/alfentanil/N_2O/O_2 anesthesia.

[g] The use of 10-mL NIMBEX multiple-dose vials is contraindicated for use in pediatric patients less than 1 month of age and low birth-weight infants because it contains benzyl alcohol.

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Indication[1]

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Important Safety Information[1]

- NIMBEX is contraindicated in patients with known hypersensitivity to cisatracurium; severe anaphylactic reactions have been reported. The use of 10-mL NIMBEX multiple-dose vials is contraindicated in pediatric patients less than 1 month of age and low birth-weight infants because the formulation contains benzyl alcohol.
- NIMBEX has been associated with residual paralysis; patients with neuromuscular disease and carcinomatosis may be at higher risk. A lower maximum initial bolus is recommended in these patients to prevent complications.
- Serious and fatal adverse reactions including "gasping syndrome," which is characterized by central nervous system depression, metabolic acidosis, and gasping respirations, can occur in neonates and infants treated with benzyl alcohol–preserved drugs, including NIMBEX 10-mL multiple-dose vials. Single-use vials (5-mL and 20-mL) of NIMBEX do not contain benzyl alcohol.
- Laudanosine, an active metabolite of NIMBEX, has been shown to cause seizures in animals. NIMBEX-treated patients with renal or hepatic impairment may have higher metabolite concentrations (including laudanosine) than patients with normal renal and hepatic function. Patients with renal or hepatic impairment receiving extended administration of NIMBEX may be at higher risk of seizures. The level of neuromuscular blockade during long-term NIMBEX administration should be monitored with a nerve stimulator to titrate NIMBEX administration to the patient's needs and limit exposure to toxic metabolites.
- Severe hypersensitivity reactions to NIMBEX have been reported, including life-threatening and fatal anaphylactic reactions. There have been reports of wheezing, laryngospasm, bronchospasm, rash, and itching following NIMBEX administration in pediatric patients. Precaution should be taken in those individuals who have had previous anaphylactic reactions to other neuromuscular blocking agents.
- Confirm proper selection of intended product, avoid confusion with other injectable solutions, and ensure that the intended dose is clearly labelled and communicated. Administration of NIMBEX results in paralysis, which may lead to respiratory arrest and death, a progression that may be more likely to occur in a patient for whom it is not intended.
- Neuromuscular blockade in the conscious patient can lead to distress. Use NIMBEX in the presence of appropriate sedation or general anesthesia. Monitor patients to ensure that the level of anesthesia is adequate.
- The 20-mL vial of NIMBEX is intended only for administration as an infusion for use in a single patient in the ICU. It should not be used multiple times because it does not contain a preservative, and there is a higher risk of infection.
- Certain drugs may enhance the neuromuscular blocking action of NIMBEX, including inhalational anesthetics, antibiotics, magnesium salts, lithium, local anesthetics, procainamide, and quinidine. Acid-base and/or serum electrolyte abnormalities may potentiate the action of neuromuscular blocking agents. Shorter durations of neuromuscular block may occur and NIMBEX infusion rate requirements may be higher in patients chronically administered phenytoin or carbamazepine. Use peripheral nerve stimulation and monitor clinical signs of neuromuscular blockade to determine adequacy of neuromuscular blockage and the need to adjust the NIMBEX dosage.
- NIMBEX has not been studied in patients susceptible to malignant hyperthermia (MH). Because MH can develop in the absence of established triggering agents, the clinician should be prepared to recognize and treat MH in any patient undergoing general anesthesia.
- The use of succinylcholine prior to NIMBEX may decrease the time to onset of maximum neuromuscular blockade but has no effect on the duration. Administration of inhalational anesthetics with nitrous oxide/oxygen for greater than 30 minutes to achieve 1.25 MAC may prolong the duration of action of initial and maintenance doses of NIMBEX. This may potentiate the neuromuscular blockade.
- Adverse reactions reported by <1% of the surgical patients treated with NIMBEX during clinical trials include bradycardia, hypotension, flushing, bronchospasm, and/or rash.
- Adverse reactions occurred among the 68 adult ICU patients who received NIMBEX in conjunction with other drugs in US and European clinical studies. One out of 68 patients experienced bronchospasm. In one study, there were 2 reports of prolonged recovery among 28 patients administered NIMBEX compared with 13 reports among 30 patients administered vecuronium.

Reference: 1. NIMBEX [package insert]. North Chicago, IL: AbbVie Inc.

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