NEOSTIGMINE

Indication	• For reversal of non-depolarising neuromuscular blocker (e.g. vecuronium)[1] • Neonatal transient or congenital myasthenia gravis[1] when pyridostigmine is unsuitable[2]

INTRAVENOUS

Presentation	• Ampoule: 2.5 mg in 1 mL
Dosage (reversal agent)	• 0.05 mg/kg (50 microgram/kg)[3] o If further dose required, give 0.025 mg/kg (25 microgram/kg)[3] o Maximum total dose is 2.5 mg (2500 microgram)[3]
Preparation	• Draw up 2.5 mg and make up to 5 mL total volume with 0.9% sodium chloride o *Concentration now equal to 0.5 mg/mL*
Administration	• Draw up prescribed dose • Give atropine sulfate 0.02 mg/kg prior or concomitant with neostigmine[3] (in separate syringe) • IV injection over 1 minute[1]

IM

Presentation	• Ampoule: 2.5 mg in 1 mL
Dosage (myasthenia gravis)	• 0.05–0.25 mg (not mg/kg) every 2 to 4 hours[1,4]
Preparation	• Draw up 2.5 mg and make up to 5 mL total volume with 0.9% sodium chloride o *Concentration now equal to 0.5 mg/mL*
Administration	• Give 30 minutes before feed[1] • Draw up prescribed dose • Intramuscular injection into thickest part of the vastus lateralis in the anterolateral thigh (maximum 0.5 mL per site)[5]

SUBCUT

Presentation	• Ampoule: 2.5 mg in 1 mL
Dosage (myasthenia gravis)	• 0.05–0.25 mg (not mg/kg) every 2 to 4 hours[1]
Preparation	• Draw up 2.5 mg and make up to 5 mL total volume with 0.9% sodium chloride o *Concentration now equal to 0.5 mg/mL*
Administration	• Give 30 minutes before feed[1] • Draw up prescribed dose • Subcutaneous injection

Special considerations	• For myasthenia gravis o Seek specialist neurologist advice for treatment and dosing[2] o Not usually required beyond 8 weeks of age, therefore gradually reduce dose[1] o If large doses given, atropine sulfate may be required to counteract muscarinic side effects[4] • For neuromuscular reversal o Give with atropine sulfate 0.02 mg/kg to prevent muscarinic effects o Ensure pulse rate at least 80 beats/minute before administering neostigmine[4] o Reversal may be impaired by intensity of neuromuscular block, presence of blockade enhancing drugs (e.g. anaesthetic drugs, antibiotics and antiarrhythmic drugs), electrolyte and acid-base imbalance or renal impairment–may lead to recurarisation after apparently successful reversal • Contraindicated o Mechanical obstructions of intestine or urinary tract[1]
Monitoring	• Cardiorespiratory status[3] • Clinical surveillance until successful reversal assured[1] • Atropine sulfate available (to counteract cholinergic reactions should they occur)[1]

Compatibility	• Fluids o 0.9% sodium chloride[6] • Y-site o Glycopyrronium[6], heparin sodium[6], potassium chloride[6]
Incompatibility	• Fluids o No information[6] • Drugs o Fluorescein[6]
Interactions	• May prolong phase I block of depolarising muscle relaxants (e.g. suxamethonium)[4]
Stability	• Ampoule: store below 25 °C. Protect from light[1]
Side effects	• Adverse effects generally associated with overdose; can cause cholinergic crisis[4] • Circulatory: bradycardia[3], hypotension[3] • Digestive: increased peristalsis[7], diarrhoea[3], vomiting[7], salivation[3] • Musculo-skeletal: muscle weakness[3] • Nervous: diaphoresis and miosis[7] • Respiratory: increased bronchial secretion[4], respiratory depression[3], bronchospasm[3]
Actions	• Prolongs the action of acetylcholine by inhibiting the action of acetylcholinesterase[7] • IV: onset usually within 1 minute; complete reversal within 5 to 20 minutes[2]
Abbreviations	IM: intramuscular, IV: intravenous,
Keywords	Neostigmine, neuromuscular blocking agent reversal, cholinergic crisis, myasthenia gravis

The Queensland Clinical Guideline *Neonatal Medicines* is integral to and should be read in conjunction with this monograph. Refer to the disclaimer. Destroy all printed copies of this monograph after use.

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