vecuronium (ve-cur-oh-nee-yum)

High Alert

**Indications**
Indications include muscle paralysis and facilitation of intubation after induction of anesthesia in surgical procedures. Facilitation of compliance during mechanical ventilation.

**Action**
Prevents neuromuscular transmission by blocking the effect of acetylcholine at the neuromuscular junction. Has no analgesic or anxiolytic properties. Therapeutic Effects: Skeletal muscle paralysis.

**Pharmacokinetics**
Absorption: Following IV administration, absorption is essentially complete.
Distribution: Rapidly distributes in extracellular fluid; minimal penetration of the CNS.
Metabolism and Excretion: Some metabolism by the liver (20%), with conversion to at least one active metabolite; 35% excreted unchanged by the kidneys.
Half-life: Infants: 65 min; Children: 41 min; Adults: 65–75 min (near term in pregnant patients, q duration/intensity of paralysis); Significant hepatic impairment; Shock; Extensive burns (may be more resistant to effects); Low plasma pseudocholinesterase levels (may be seen in association with anemia; distribution, cholinesterase inhibitors/insecticides, severe liver disease, pregnancy, or hereditary pseudocholinesterase deficiency). (Should patients: OB: lactation: Safety not established (use only if benefit outweighs potential risk to fetus). Pedi: Children: 7 wk: Safety and effectiveness not established).

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; Hypersensitivity to bromides. Use Cautiously in: Dehydration or electrolyte abnormalities (should be corrected); Fractures or muscle spasm; Hyperthermia (should be corrected); Significant hepatic impairment; Shock; Extensive burns (may be more resistant to effects). Low plasma pseudocholinesterase levels (may be seen in association with anemia, distribution, cholinesterase inhibitors/insecticides, severe liver disease, pregnancy, or hereditary pseudocholinesterase deficiency). (Should patients: OB: lactation: Safety not established (use only if benefit outweighs potential risk to fetus). Pedi: Children: 7 wk: Safety and effectiveness not established).

**Exercise Extreme Caution in:** Neuromuscular diseases such as myasthenia gravis (small test dose may yield excessive response).

**Adverse Reactions/Side Effects**

**Interactions**
Drug-Drug: Intensity and duration of paralysis may be prolonged by pretreatment with succinylcholine, general anesthesia (inhalation), aminoglycosides, vancomycin, inorganic phosphates, polymyxin B, colistin, clindamycin, doxycycline, chloramphenicol, beta-adrenergic blocking agents, potassium-losing diuretics, or magnesium. Higher infusion rates may be required and duration of action may be shortened in patients receiving long-term carbamazepine or phenytoin.

**Route/Dosage**

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<thead>
<tr>
<th>Route</th>
<th>Dosage</th>
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<tr>
<td>IV (Adults and Children ≥10 yr):</td>
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<tr>
<td>Intubation—</td>
<td>0.08–0.1 mg/kg (0.06–0.085 mg/kg if given after steady-state anesthesia achieved or 0.04–0.06 mg/kg after succinylcholine-assisted intubation and anesthesia; wait for disappearance of succinylcholine effects, or 0.05–0.08 mg/kg during balanced anesthesia). Maintenance dose—</td>
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<tr>
<td>IV (Children 1–10 yr):</td>
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<td>0.1 mg/kg q1h as needed.</td>
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<tr>
<td>IV (Infants 7 wk–1 yr):</td>
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<tr>
<td>0.1 mg/kg q1h as needed or as a continuous infusion of 1–1.5 mcg/kg/min.</td>
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**NURSING IMPLICATIONS**

**Assessment**
- Assess respiratory status continuously throughout therapy with vecuronium. Should be used only to facilitate intubation or in patients already intubated.
- Neuromuscular response should be monitored with a peripheral nerve stimulator interoperatively. Paralysis is initially selective and usually occurs sequentially in
The following muscles: levator muscles of eyelids, muscles of mastication, limb muscles, abdominal muscles, muscles of the glottis, intercostal muscles, and the diaphragm. Recovery of muscle function usually occurs in reverse order.

- Monitor ECG, heart rate, and BP throughout administration.
- Observe for residual muscle weakness and respiratory distress during the recovery period.
- Monitor infusion site frequently. If signs of tissue irritation or extravasation occur, discontinue and restart in another vein.

- Toxicity and Overdose: If overdose occurs, use peripheral nerve stimulator to determine the degree of neuromuscular blockade. Maintain airway patency and ventilation until recovery of normal respirations occurs.

- Use anticholinesterase agents (neostigmine, pyridostigmine) may be used to antagonize the action of neuromuscular blocking agents once the patient has demonstrated some spontaneous recovery from neuromuscular block. Atropine is usually administered prior to or concurrently with anticholinesterase agents to counteract the muscarinic effects.

- Administration of fluids and vasopressors may be necessary to treat severe hypotension or shock.

Potential Nursing Diagnoses

- Ineffective breathing pattern (Indications)
- Impaired verbal communication (Side Effects)
- Fear (Side Effects)

Implementation

- High Alert: Unplanned administration of a neuromuscular blocking agent instead of administration of the intended medication or administration of a neuromuscular blocking agent in the absence of ventilatory support has resulted in serious harm and death. Confusing similarities in packaging and insufficiently controlled access to these medications are often implicated in these medication errors.

- Dose is titrated to patient response.

- Vecuronium has no effect on consciousness or pain threshold. Adequate anesthesia/analgesia should always be used when vecuronium is used as an adjunct to surgical procedures or when painful procedures are performed. Benzodiazepines and/or analgesics should be administered concurrently when prolonged vecuronium therapy is used for ventilator patients, because patient is awake and able to feel all sensations.

- If eyes remain open throughout prolonged administration, protect corneas with artificial tears.

- Store in refrigerator.

- Most neuromuscular blocking agents are incompatible with barbiturates and bicarbonate. Do not admix.

- IV Administration
- IV: Reconstitute with bacteriostatic water (may be provided by manufacturer), D5W, 0.9% NaCl, D5/0.9% NaCl, or LR injection. Solution reconstituted with bacteriostatic water is stable if refrigerated for 5 days. If other diluents are used, solution is stable for 24 hr if refrigerated. Discard all unused solution.

- Direct IV: Concentration: Maximum of 2 mg/ml. Infuse dose according to patient response.

- Continuous Infusion: Diluent: Dilute to a concentration of 1 mg/ml in D5W, 0.9% NaCl, or LR. Use sterile water for injection instead of manufacturer-provided diluent (contains benzyl alcohol) when reconstituting for use in neonates. Rate: Titrate rate of infusion according to patient response.

- Y-Site Compatibility: alemtuzumab, alfentanil, alprostadil, amifostine, amikacin, amphotericin B, anidulafungin, argatroban, azithromycin, aztreonam, bivalirudin, bleomycin, bumetanide, buprenorphine, calcium chloride, calcium gluconate, carboplatin, carmustine, cefazolin, cefotetan, cefoxitin, ceftriaxone, ceftazidime, chlorpromazine, ciprofloxacin, cyclophosphamide, daptomycin, dexamethasone sodium phosphate, dexmedetomidine, doxorubicin, doxorubicin liposomal, doxycycline, droperidol, eptifibatide, ertapenem, erythromycin, esmolol, etoposide, etoposide phosphate, famotidine, fenoldopam, fentanyl, fludarabine, fluorouracil, foscarnet, gemcitabine, gentamicin, glycopyrrolate, granisetron, haloperidol, heparin, hydralazine, hydromorphone, idarubicin, ifosfamide, insulin, irinotecan, isoproterenol, levofloxacin, lidocaine, linezolid, lorazepam, magnesium sulfate, mannitol, mechlorethamine, melphalan, melphalan, methotrexate, methyldopate, methylnaltrexone, morphine, methylene blue, meropenem, methotrexate, methyldopate, methicillin, metoprolol, metoclopramide.
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