**High Alert**

**succinylcholine** (su-sin-il-ko-leen)

**Note:** Q: Physicians

**Classification**

Neuromuscular blocking agents-depolarizing

**Pregnancy Category C**

**Indications**

Conducting surgical procedures to produce skeletal muscle paralysis after induction of anesthesia and provision of opioid analgesics.

**Action**

Prevents neuromuscular transmission by blocking the effect of acetylcholine at the myoneural junction. Has agonist activity initially, producing fasciculation. Causes the release of histamine.

**Therapeutic Effects:**

Skeletal muscle paralysis.

**Pharmacokinetics**

**Absorption:** Well absorbed after deep IM administration.

**Distribution:** Widely distributed into extracellular fluid. Crosses the placenta in small amounts.

**Metabolism and Excretion:** 90% metabolized by pseudocholinesterase in plasma. 10% excreted unchanged by the kidneys.

**Half-life:** Unknown.

**TIME/ACTION PROFILE (skeletal muscle paralysis)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>0.5–1 min</td>
<td>1–2 min</td>
<td>4–10 min</td>
</tr>
<tr>
<td>IM</td>
<td>up to 3 min</td>
<td>unknown</td>
<td>10–30 min</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**

**Contraindicated in:** Hypersensitivity to succinylcholine or parabens; Plasma pseudocholinesterase deficiency; Children and neonates (continuous infusions); Personal history of malignant hyperthermia.

**Use Cautiously in:** History of anaphylaxis to other neuromuscular blockers; Familial history of malignant hyperthermia; History of pulmonary disease, renal or liver impairment; Major trauma, burns, or underling myopathy (risk of rhabdomyolysis); Children or adolescents (risk of malignant hyperthermia); Geriatric or debilitated patients; Fractures or muscular spasm; Myasthenia gravis or myasthenic syndromes; Patients with chronic obstructive pulmonary disease.

**Adverse Reactions/Side Effects**

Most adverse reactions to succinylcholine are extensions of pharmacologic effects:

**Resp:** Bronchospasm, cough, dyspnea, apnea.

**CV:** Hypotension, arrhythmias, bradycardia, hyperthermia.

**F and E:** Hyperkalemia.

**MS:** Rhabdomyolysis, muscle fasciculation.

**Misc:** Anaphylaxis, malignant hyperthermia, myoglobinemia (rare), myoglobinuria (rare), tachyphylaxis.

**Interactions**

**Drug-Drug:** Intensity and/or duration of paralysis may be prolonged by pretreatment with general anesthesia, aminoglycosides, polymyxin B, polymyxin E, clindamycin, lidocaine, propranolol, procainamide, beta blockers, lithium, cyclophosphamide, phenytoin, potassium-losing diuretics, and magnesium salts.

**Route/Dosage**

IV route is preferred, but deep IM injection may be used in children and patients without vascular access.

**Test Dose**

IV (Adults): 5–10 mg (0.1 mg/kg), then assess respiratory function.

**Short Procedures**

IV (Adults): 0.6 mg/kg (range 0.3–1.1 mg/kg) up to 150 mg total dose; additional doses depend on response, maintenance: 0.04–0.07 mg/kg q 5–10 min as needed.

IV (Children): 1–2 mg/kg, up to 150 mg; additional doses depend on response, maintenance: 0.3–0.6 mg/kg q 5–10 min as needed, (continuous infusion not recommended in children or neonates because of the risk of malignant hyperthermia).

**Prolonged Procedures**

IV (Adults): 2–5 mg/min (maximum: 150 mg total dose).

**Notes**

CAUSES, INDICATIONS, AND CLASSIFICATIONS indicate most frequent. Underlines indicate emergent. Strikethrough indicates discontinued.
Intramuscular Dosing

IM (Adults and Children): Up to 3—4 mg/kg (total dose not to exceed 150 mg).

NURSING IMPLICATIONS

Assessment

- Assess respiratory status continuously throughout use of succinylcholine. Succinylcholine should be used only by individuals experienced in endotracheal intubation, and equipment for this procedure should be immediately available.
- Monitor neuromuscular response to succinylcholine with a peripheral nerve stimulator intraoperatively. Paralysis is initially selective and usually occurs consecutively in the following muscles: levator muscles of eyelids, muscles of mastication, limb muscles, abdominal muscles, muscles of the glottis, intercostal muscles, and the diaphragm.
- Monitor ECG, heart rate, and BP throughout use of succinylcholine.
- To prevent myocardial ischemia, patients may be premedicated with atropine or scopolamine.
- A small dose of a nondepolarizing agent may be used before succinylcholine to decrease the severity of muscle fasciculations.
- If eyes remain open throughout prolonged administration, protect corneas with artificial tears.
- To prevent excessive salivation, patients may be premedicated with atropine or scopolamine.
- A small dose of a nondepolarizing agent may be used before succinylcholine to decrease the severity of muscle fasciculations.

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. Watch for packaging similarities and double check for correct medication and dose.
- Succinylcholine has no effect on consciousness or the pain threshold. Adequate anesthesia should always be used when succinylcholine is used as an adjunct to surgical procedures or when painful procedures are performed. To avoid patient distress, administer after unconsciousness has been achieved. Beware of hypotension, and sedation should be administered concurrently when prolonged succinylcholine therapy is used for ventilate patients because patient is awake and able to feel all sensations.
- If eyes remain open throughout prolonged administration, protect corneas with artificial tears.
- To prevent myocardial ischemia, patients may be premedicated with atropine or scopolamine.
- A small dose of a nondepolarizing agent may be used before succinylcholine to decrease the severity of muscle fasciculations.
- When used prior to electroconvulsive therapy, shock should be administered 1 min after administration.

Potential Nursing Diagnoses

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

IV Administration

- IV: A test dose of 5–10 mg or 0.1 mg/kg may be administered to determine patient’s sensitivity and recovery time.
- Continuous infusions: Diluent: May be administered undiluted. Rate: Administer at a rate of 0.5–10 mg/min; usual rate is 2.5–4.3 mg/min. Titrate dose to patient response and degree of paralysis.
- Y-Site Compatibility: acyclovir, amsacrine, amphotericin B, ampicillin, ampicillin/sulbactam, amphotericin B, amphotericin B lipid complex, anidulafungin, aprotinin, ascorbic acid, atracurium, atropine, aztreonam, benemid, benoxaprofen, benzodiazepines, betamethasone, betaxolol, bevacizumab, bicarbonate, bilirubin, bleomycin, bivalirudin, bleomycin, buprenorphine, bumetanide, butorphanol, calcium chloride, calcium gluconate, capreomycin, carboplatin, carboplatin, carboxypeptidase, cefazolin, cefuroxime, chloramphenicol, chloramphenicol, chlorhexidine, chlorpromazine, cimeti-
sucinylcholine

promethazine, cisplatin, clindamycin, cyco phosphamide, cyclo sporine, cimetidine, dacarbazine, dactinomycin, darganos, desferrioximine, dexpanthenol, dihydroergotamine, dimethasine, doxapram, doxycycline, etoposide, epinephrine, erythromycin, epo totin, ephedrine, ethopropazine, etomidate, esmolol, esopru dine, esmolol, lidocaine, levamisole, levotiroxine, levothyroxine, levofloxacin, lidocaine, lincomycin, lorazepam, lomustine, mephat ryzol, melphalan, methadone, methadone, methicillin, methyldopa, methylprednisolone, methylprednisolone, mifepristone, miconazole, minocycline, mitoxantrone, morphine, multivitamins, mycophenolate, nalbuphine, naloxone, nesiritide, nitroglycerin, nitroprusside, norepinephrine, octreotide, ondansetron, oxaliplatin, oxytocin, paclitaxel, palonosetron, pamidronate, pantoprazole, papaverine, pentamidine, pentazocine, phentolamine, phenylephrine, phytonadione, piperacillin/tazobactam, potassium chloride, procainamide, prochlorperazine, promethazine, propofol, prostaglandin, prostaglandin, protamine, pyridoxine, quinupristin/dalfopristin, ranitidine, sodium acetate, streptokinase, sulindac, sulfamethoxazole, trimethoprim, trimethoprim/sulfamethoxazole.

**Y-Site Incompatibility:** amphotericin B colloidal, azathioprine, diazepam, dexamethasone, dapsone, diazoxide, ganciclovir, indomethacin, nafcillin, oxacillin, penicillin G, phenytoin, sodium bicarbonate, thiopternal, trimethoprim/sulfamethoxazole.

**Patient/Family Teaching**

- Explain all procedures to patient receiving succinylcholine therapy without anesthesia, because consciousness is not affected by succinylcholine alone. Provide emotional support.

- Reassure patient that communication abilities will return as the medication wears off.

**Evaluation/Desired Outcomes**

- Adequate suppression of the twitch response when tested with peripheral nerve stimulation, with subsequent muscle paralysis.

**Why was this drug prescribed for your patient?**