MONOGRAPH

SUXAMETHONIUM

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	ED, Theatre and Critical Care Areas Only

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

⚠ HIGH RISK MEDICINE ⚠

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

- Ultrashort acting depolarising neuromuscular blocker.[1]
- Suxamethonium is a High Risk Medicine.

INDICATIONS AND RESTRICTIONS

Skeletal muscle relaxation in anaesthesia for procedures requiring only brief relaxation (e.g. endotracheal intubation, endoscopic examinations, orthopaedic manipulations, short surgical procedures and electro-convulsive therapy).[1, 2]

CONTRAINDICATIONS

- Should NOT be administered to a conscious patient; must be given following adequate anaesthesia.[1]
- Hypersensitivity to suxamethonium or any component of the formulation[1, 3]
- Known or suspected genetic susceptibility to malignant hyperthermia[1, 3]
- Skeletal muscle myopathies, genetically determined disorders of pseudocholinesterase and Duchenne's muscular dystrophy[1, 3]

- Acute phase of injury following major burns or multiple trauma, extensive muscle degeneration, or severe long lasting sepsis due to risk of hyperkalaemia[1, 3]
- Renal impairment with raised plasma potassium concentration[1]

PRECAUTIONS

Suxamethonium should only be given under strict supervision of an anaesthetist/doctor skilled in advanced airway management and only when facilities are instantly available for endotracheal intubation and for providing adequate ventilation of the patient.[1]

- Malignant hyperthermia - may be triggered by suxamethonium. Early premonitory signs include muscle rigidity, tachycardia, tachypnoea unresponsive to increased depth of anaesthesia, evidence of increased oxygen requirement and carbon dioxide production, rising temperature and metabolic acidosis.[1] Risk increases with concomitant administration of volatile anaesthetics.[3]
- Hyperkalaemia – suxamethonium causes an immediate rise in serum potassium. Observe great caution in patients with pre-existing hyperkalaemia or electrolyte imbalance, severe trauma, extensive burns, uraemia, degenerative neuromuscular disease or extensive denervation of skeletal muscle due to disease or central nervous system injury.[1, 2]
- Risk of cardiac arrest from hyperkalaemia due to rhabdomyolysis.[1, 4] This has been rarely reported in seemingly healthy children, especially males and children ≤ 8 years, who were subsequently found to have undiagnosed skeletal muscle myopathy (most frequently Duchenne's muscular dystrophy) after administration of suxamethonium.[4, 5]
- Acute narrow angle glaucoma, penetrating eye injury – suxamethonium may increase intraocular pressure[1, 3]
- Low or abnormal plasma cholinesterase activity – prolonged paralysis may occur in patients with severe liver disease, cancer, malnutrition, severe dehydration, collagen diseases, severe anaemia, myxoedema, burns[1, 3]
- Patients with bone fractures or muscle spasms – initial muscle fasciculations may cause additional injury[1, 3]
- Use with caution in patients who are hypoxic or those who have cardiovascular, hepatic, pulmonary, metabolic or renal disorders or Eaton-Lambert syndrome or myasthenia gravis – suxamethonium action may be altered[1, 3]
- Phaeochromocytoma – muscle fasciculations may provoke catecholamine release[1]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 100 mg/2 mL ampoule
- 10 mg/2 mL prefilled syringe

Imprest location: Formulary One

DOSAGE, ADMINISTRATION & DOSAGE ADJUSTMENTS

Neonates: Refer to Neonatal Medication Protocols

Dosing in Overweight and Obese Children: Suxamethonium should be dosed on Measured Body Weight (MBW)[3]

IV bolus: For intubation

Infants (4 weeks to <12 months) 2 – 3 mg/kg[6]

Children (1 year to 18 years) 1 – 2 mg/kg[2, 6]

- Inject diluted or undiluted over 10 to 30 seconds. Flush line after each dose to avoid re-paralysis during recovery.[7, 8]
- Complete muscle relaxation occurs within 30 – 60 seconds, persists for 2 – 5 minutes and gradually dissipates within 10 minutes.[1, 2]
- Pre-treatment with anticholinergics (atropine) may reduce the occurrence of bradyarrythmias[4, 9]

IV Infusion:

- Not recommended in children and neonates due to the risk of malignant hyperthermia, rhabdomyolysis and life-threating hyperkalaemia.[4, 9]

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Infants (4 weeks to <12 months) up to 5 mg/kg[2]

Children (1 year to 18 years) 2 – 4 mg/kg, maximum 150 mg.[2]

- Only suitable when unable to obtain IV access. Inject into a large muscle, preferably the deltoid.[2]
- Complete muscle relaxation occurs in 2 – 3 minutes and lasts 10 – 30 minutes. Larger doses produce more prolonged muscle relaxation.[1]

Renal impairment:

- No dosage adjustments required[3]. Avoid if patient has hyperkalaemia.[2]

Hepatic impairment:

- No dosage adjustments required[3]. Use with caution in end stage hepatic failure as reduced plasma cholinesterase activity can cause prolonged apnoea.[10]

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

Glucose 5%, sodium chloride 0.9%, sodium chloride in glucose solutions, Hartmann's, Ringer's, Plasma-Lyte 148 via Y-site.[7]

Compatible at Y-site:

Only commonly used drugs are listed below. This is not a complete list of incompatible drugs. Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

- Giving other drugs at Y-site with neuromuscular blockers in not recommended.[7]

Suxamethonium 2 mg/mL:

Palonosteron[7]

Suxamethonium 8 mg/mL:

Amikacin, aztreonam, buprenorphine, calcium chloride, calcium gluconate, cefazolin, cefotaxime, cefoxitin, ceftazidime, ceftriaxone, ciclosporin, clindamycin, dexamethasone, digoxin, dobutamine, dopamine, ephedrine sulfate, erythromycin, esmolol, fentanyl, fluconazole, furosemide, gentamicin, glyceryl trinitrate, hydrocortisone sodium succinate, labetalol, lidocaine, magnesium sulfate, methylprednisolone sodium succinate, metoclopramide, midazolam, morphine sulfate, noradrenaline, ranitidine, sodium nitroprusside, tobramycin, vancomycin, verapamil.[7]

Suxamethonium 20 mg/mL:

Heparin sodium.[7]

INCOMPATIBLE drugs:

Azathioprine, benzylpenicillin, ganciclovir, phenobarbital, potassium chloride, quinine, sodium bicarbonate, thiopental sodium.[7]

MONITORING

Pre-operative: creatine kinase[5]

During therapy: heart rate, respiratory rate, blood pressure, oxygen saturation, temperature, end-tidal carbon dioxide (if available), degree of muscle paralysis, serum potassium and calcium, ECG for peaked T-waves (early sign of potential cardiac arrest secondary to acute rhabdomyolysis with hyperkalaemia).[3-5]

ADVERSE EFFECTS

Common: muscle fasciculations, postoperative muscle pains, bradycardia (particularly with repeated dosing), excessive salivation, increased intraocular, intracranial and intragastric pressures.[2]

Infrequent: Tachycardia, arrhythmias, hypertension, hypotension, bronchospasm, jaw rigidity, prolonged neuromuscular blockade, hyperkalaemia.[2]

Rare: malignant hypothermia, anaphylactic reactions, myoglobinaemia, myoglobinuria, rhabdomyolysis.[2]

STORAGE

Store ampoules at 2 to 8˚C (preferred storage conditions)[7]

Ampoules are stable for 30 days below 25˚C. Do not return to fridge.[7]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **suxamethonium**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

References

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