Drug Guideline  Suxamethonium

Summary: Suxamethonium is a short acting neuromuscular blocking agent.

Approved by: ICU Medical Director

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Next Review Date: June 2016

Replaces Existing Drug Guideline: suxamethonium

Previous Review Dates: 2002, 2004

1. Introduction contains:
   The risk addressed by this drug guideline:

   Patient safety

   The Aims / Expected Outcome of this drug guideline:

   Suxamethonium will be administered safely and appropriately with minimal adverse effects.

Related Policies
   • C3.00 Drug prescribing
   • C3.01 Drug administration
   • C3.01 Administration of IV Medications
   • Nerve Stimulator Guideline

2. Policy Statement
   • All care provided within Liverpool Hospital will be in accordance with infection prevention/control, manual handling and minimisation and management of aggression guidelines.
   • Medications are to be prescribed and signed by a medical officer/authorised nurse practitioner (NP) unless required during an emergency.
   • All drugs administered during an emergency (under the direction of a medical officer/authorised nurse practitioner) are to be documented during the event, then prescribed and signed following the event.
   • Medications are to be given at the time prescribed (as close to the time as is possible when multiple drugs require ‘same time’ administration and when the nurse is caring for more than one patient, recognition is given to a possible short delay to administration – antibiotics and other lifesaving drugs are to be prioritised) and are to be signed by the administering nurse.
   • Parenteral medication prescriptions and the drug are to be checked with a second registered or endorsed enrolled nurse prior to administration. The “rights of drug administration” must be followed: right: patient, drug, dose, route, administration, time, reason for the drug, documentation, education and evaluation/outcome.
• Adverse drug reactions are to be documented and reported to a medical officer.
• Medication errors are to be reported using the hospital electronic reporting system: IIMS.
• Guidelines are for adult patients unless otherwise stated.
• Patients are to receive concurrent sedation/anaesthesia when a neuromuscular blocking agent is in use, unless their neurological state does not require it.
• Equipment for intubation and ventilation must be available.
• Suxamethonium should not be mixed with any drugs in the same syringe.
• Suxamethonium is stored in the ‘fridge.

3. Guideline

Actions
Suxamethonium is a short acting depolarising neuromuscular blocking agent (NMB).

It combines with cholinergic receptors on the motor end plate to produce depolarisation.
• Neuromuscular transmission is inhibited as long as adequate concentration of suxamethonium remains at the receptor site.
• There may be some slowing of the heart rate due to vagal stimulation.

Rapid onset occurs with IV injection with complete relaxation within 30 seconds lasting for 2-3 minutes and dissipating within 10 minutes. The duration of action is prolonged in patients with low plasma pseudocholinesterase concentration.

Indications
• Skeletal muscle relaxation for procedures that require brief periods of relaxation, such as:
  ⇒ Endotracheal intubation.
  ⇒ Endoscopic examination.
  ⇒ Orthopaedic manipulations.
  ⇒ Short surgical procedures.

Contraindications
• Personal or familial history of malignant hyperthermia and/or pseudocholinesterase deficiency.
• Myopathies associated with a raised creatinine phosphokinase (CK).
• Denervating conditions such as Duchenne's muscular dystrophy, Guillain-Barré syndrome, recent paraplegia or quadriplegia and severe sepsis (due to the risk of severe hyperkalaemia and cardiac arrest).
• Hyperkalaemia (Potassium > 6.5mmol/L).
• After the acute phase of injury following major burns or multiple trauma with major muscle degeneration.
• Penetrating eye injuries or acute narrow angle glaucoma – as suxamethonium increases intraocular pressure.
• Hypersensitivity.

Precautions
• Equipment for intubation and ventilation must be available. It should only be given when a person experienced in endotracheal intubation is present.
• Suxamethonium has no effect on consciousness, pain threshold or cerebration. Adequate sedation and anesthesia is to be used in conjunction with suxamethonium.
• Abrupt onset of malignant hyperthermia can be triggered by suxamethonium. Muscle rigidity, tachycardia, increased oxygen requirements, rising temperature,
increased EtCO₂ on intubation and metabolic acidosis are signs of impending malignant hyperthermia.

- Management of hyperthermia includes ceasing suxamethonium, administering oxygen, sodium bicarbonate and lowering temperature with restoration of fluid and electrolyte balance, maintenance of adequate urinary output and administration of intravenous dantrolene.

- Use in caution with patients with pre-existing hyperkalaemia and other electrolyte imbalances. Suxamethonium causes an immediate rise in potassium; this may be further exaggerated for patients receiving beta-blocker agents.

- Recovery from suxamethonium may occasionally be delayed due to low serum pseudocholinesterase levels; this is associated in patients with severe liver disease, cancer, malnutrition, severe dehydration, collagen diseases, severe anaemia, myxoedema, burns, and abnormal body temperature. Pregnancy may result in delayed recovery from suxamethonium administration.

- Exposure to neurotoxic insecticides or weed killers, antimalarial or anticancer drugs, MAOIs, contraceptive pills, pancuronium, chlorpromazine, ecothiopate or neostigmine may result in low levels of pseudocholinesterase.

### Significant Interactions

- Drugs which enhance or prolong the effects of suxamethonium include:
  - lidocaine, procaine, oxytocin, oral contraceptives, some nonpenicillin antibiotics, beta-adrenergic blockers, phenothiazines, magnesium salts, quinine, high dose corticosteroids and cytostatic agents.
  - amphotericin B and thiazide diuretics may increase the effects of suxamethonium if these are associated with electrolyte imbalances.
  - Diazepam may reduce the duration of neuromuscular blockade produced by suxamethonium.
  - Patients with hypokalaemia or hypocalcaemia require reduced doses of suxamethonium.
  - Inhibitors of plasma cholinesterases, e.g. neostigmine can prolong the depolarising action of suxamethonium.
  - Administration of suxamethonium prior to or with a nondepolarising muscle relaxant, e.g. pancuronium, can alter the intensity and/or duration of neuromuscular blockade.
  - Simultaneous administration of atracurium and suxamethonium significantly reduces the duration of suxamethonium.

### Adverse Effects

- Apnoea, bronchospasm, increased bronchial secretions.
- Prolonged apnoea if the patient has pseudocholinesterase deficiency.
- Hyperkalaemia, with dysrhythmias and possible cardiac arrest.
- Bradycardia, particularly in repeated doses.
- Hypotension.
- Raised intracranial pressure.
- Malignant hyperthermia.
- Raised intraocular pressure.
- Raised intra-abdominal pressure, which may precipitate regurgitation.
- Postoperative muscle pain, muscle fasciculation, rhabdomyolysis, myoglobinuria, myoglobinemia, elevated creatinine phosphokinase, hypertonia, trismus.

### Presentation

Suxamethonium 100mg in 2mL ampoule (refrigerated).

### Administration Guidelines

**Dose:**

- 1 to 1.5 mg/kg, administered as a rapid intravenous bolus.
• Flush the line well post administration of suxamethonium, to prevent precipitation with other drugs.
• Observe the patient for cessation of fasciculations which is an indicator that paralysis has occurred.

Intramuscular administration:
When the intravenous route is not available, intramuscular dose for adults and children may be up to 2.5 mg/kg but the total dose should not exceed 150 mg.

Clinical Considerations
• Suxamethonium causes paralysis of the respiratory muscles, requiring the presence of personnel experienced in endotrachael intubation. Mechanical ventilation equipment should be available and ready for use.
• It should not be administered to a conscious patient.
• Suxamethonium should not be mixed with any drugs in the same syringe.
• An assistant should apply cricoid pressure if required during and post administration of suxamethonium, until the airway is protected and the person intubating requests release of cricoid pressure.
• Potassium levels should be closely monitored.
• Adequate sedation and anesthesia is to be used in conjunction with suxamethonium.

4. Performance Measures
All incidents are documented using the hospital electronic reporting system: IIMS and managed appropriately by the NUM and staff as directed.

5. References / Links
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