

## NEW ZEALAND DATA SHEET

### **1. PRODUCT NAME**

SUXAMETHONIUM CHLORIDE INJECTION B.P. 50 mg/mL

### **2. QUALITATIVE AND QUANTITATIVE COMPOSITION**

Each 2 mL of solution contains 100 mg of suxamethonium chloride BP

For a full list of excipients, see section 6.1.

### **3. PHARMACEUTICAL FORM**

Injection solution: a clear, colourless, particle-free solution containing 50 mg/mL suxamethonium chloride.

### **4. CLINICAL PARTICULARS**

#### **4.1 THERAPEUTIC INDICATIONS**

For the production of skeletal muscle relaxation in anaesthesia. Suited for procedures requiring only brief relaxation such as endotracheal intubation, endoscopic examinations, orthopaedic manipulations, short surgical procedures and electro-convulsive therapy.

#### **4.2 DOSE AND METHOD OF ADMINISTRATION**

Dosage is individualised and its administration should be determined after careful assessment of the patient. The dose of suxamethonium is dependent on bodyweight, the degree of muscle relaxation required and the response of individual patients. Suxamethonium causes paralysis of the respiratory muscles, therefore after administration, respiration must be controlled. It should not be administered to a conscious patient.

Suxamethonium should not be mixed with any neuromuscular blocking agent, nor with general anaesthetics such as short acting barbiturates, nor any other therapeutic agent in the same syringe.

Suxamethonium Chloride contains no antimicrobial agent. It should be used only once and any residue discarded.

An initial test dose of 0.1 mg/kg may be given intravenously to determine the patient's response.

#### **ADULT**

For short procedures, such as endotracheal intubation the usual adult dose is 0.6 mg/kg (range 0.3-1.1 mg/kg) administered IV over 10 to 30 seconds. This dose produces muscle relaxation in about 60 seconds and has a duration of approximately 4 to 6 minutes. Larger doses produce more prolonged muscle relaxation.

For more prolonged surgical procedures in an adult, suxamethonium is commonly given by IV infusion at a rate of 2.5 - 4.3 mg/minute. When given by intravenous infusion suxamethonium should be diluted to 0.1 to 0.2% (1-2 mg/mL) in 5% dextrose solution or sterile isotonic saline.

## **CHILDREN**

Neonates and premature infants may be relatively resistant to suxamethonium.

The usual paediatric IV dose is 1 to 2 mg/kg. If necessary, additional doses may be administered in accordance with patient's response. Continuous IV infusions of suxamethonium are considered unsafe in neonates and children because of the risk of inducing malignant hyperthermia.

Intravenous bolus in children may result in profound bradycardia or on occasion asystole. This tends to be more common after a second dose. Pre-treatment with atropine can reduce the risk of bradycardia.

When a suitable vein is inaccessible, suxamethonium may occasionally be given by intramuscular injection. A suggested IM dose for adults and children may be up to 2.5 mg/kg but the total dose should not exceed 150 mg.

Diluted solutions of suxamethonium must be used within 24 hours of preparation. Discard unused solutions.

## **4.3 CONTRAINDICATIONS**

Patients with a personal or familial history of malignant hyperthermia, genetically determined disorders of pseudocholinesterase, myopathies associated with elevated creatinine phosphokinase (CPK) values, Duchenne's muscular dystrophy, known hypersensitivity to suxamethonium, severe hyperkalaemia, acute narrow-angle glaucoma, and the presence of penetrating eye injuries (suxamethonium may cause a slight transient increase in intraocular pressure).

It is also contraindicated in patients after the acute phase of injury following major burns, multiple trauma, renal impairment with a raised plasma-potassium concentration, or in those with extensive muscle degeneration such as recent paraplegia and severe long-lasting sepsis because such patients may become severely hyperkalaemic when given suxamethonium, resulting in cardiac arrhythmia or arrest.

## **4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE**

Suxamethonium should only be administered under strict supervision of an anaesthetist familiar with its actions, characteristics and hazards who is skilled in the management of artificial respiration and only when facilities are instantly available for endotracheal intubation and for providing adequate ventilation of the patient, including the administration of oxygen under positive pressure. Be prepared to assist or control respiration.

Suxamethonium has no effect on consciousness, pain threshold or cerebration. It should therefore only be used with adequate anaesthesia.

## **MALIGNANT HYPERTHERMIA**

The abrupt onset of malignant hyperthermia, a very rare hypermetabolic process of skeletal muscle, 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.

On evidence of these symptoms the anaesthetic and suxamethonium should be discontinued and supportive measures implemented including administration of oxygen, sodium bicarbonate, lowering of temperature, restoration of fluids and electrolyte balance, maintenance of adequate urinary output and administration of IV dantrolene according to a standard protocol.

## **HYPERKALAEMIA**

Administration of suxamethonium causes an immediate rise in serum potassium. This rise is normally small but may be prolonged and exaggerated in patients taking beta-blockers.

Great caution should also be observed in patients with pre-existing hyperkalaemia or electrolyte imbalance, uraemia, hemiplegia, paraplegia, extensive burns, massive trauma, diffuse intracranial lesions (head injury, encephalitis, ruptured cerebral aneurysm), tetanus, acute anterior horn cell disease, extensive denervation of skeletal muscle due to disease or injury of the CNS, or who have degenerative neuromuscular disease and in severe long-lasting sepsis. Such patients may become severely hyperkalaemic when given suxamethonium, resulting in cardiac arrhythmia or arrest (See section 4.3).

With burns or trauma the period of greatest risk is from about 10-90 days after the injury, but may be prolonged further if there is delayed healing or persistent infection. These patients may still react abnormally to suxamethonium 2 years after the injury. In neuromuscular disease the greatest risk period is usually from 3 weeks to 6 months after onset, but severe hyperkalaemia may occur after 24 to 48 hours or later than 6 months. Patients with severe sepsis for more than a week should be considered at risk of hyperkalaemia and suxamethonium should not be given until the infection has cleared.

## **HYPERKALAEMIA RHABDOMYOLYSIS**

There is a risk of cardiac arrest from hyperkalaemia due to rhabdomyolysis, particularly in male patients with muscular dystrophy.

## **LOW PLASMA PSEUDOCHOLINESTERASE**

Recovery from suxamethonium may occasionally be delayed possibly due to a low serum pseudocholinesterase level; this may occur in patients suffering from severe liver disease, cancer, malnutrition, severe dehydration, collagen diseases, severe anaemia, myxoedema, burns, pregnancy and the puerperium, severe infections, myocardial infarction, renal impairment and abnormal body temperature.

Also exposure to neurotoxic insecticides or weed killers, antimalarial or anti-cancer agents, monoamine oxidase (MAO) inhibitors, the contraceptive pill, pancuronium, chlorpromazine, ecothiopate or neostigmine may result in low levels of pseudocholinesterase.

Suxamethonium should be administered with extreme caution and in reduced doses in such patients. If low pseudocholinesterase concentration is suspected slow administration of a small test dose of suxamethonium (5 to 10 mg as a 0.1% solution) should be considered.

## **ANTIDYSRHYTHMIC AGENTS**

Suxamethonium should be administered with great caution in patients receiving quinidine and those who have been digitalised or who may have digitalis toxicity. In these circumstances the rise in serum potassium due to suxamethonium may possibly cause arrhythmias.

## **DELAYED RECOVERY**

When recovery from suxamethonium is delayed, assisted respiration sufficient for full oxygenation, yet avoiding excessive elimination of carbon dioxide, should be maintained until paralysis ceases. This should be combined with light narcosis, e.g. nitrous oxide/oxygen mixture.

Neostigmine should not be given when prolonged apnoea follows a single dose of suxamethonium. Neostigmine and other anticholinesterase agents may have the effect of intensifying the depolarisation block caused by suxamethonium.

## **NONDEPOLARISING BLOCKADE**

If suxamethonium is given repeatedly or over a prolonged period the depolarising block may change to one with characteristics of a nondepolarising block. This may be associated with prolonged respiratory depression and apnoea. Following a positive diagnosis of a nondepolarising blockade the administration of neostigmine preceded by atropine may be considered.

## **DEBILITATED PATIENTS**

Use with caution in patients who are hypoxic or those who have cardiovascular, hepatic, pulmonary, metabolic or renal disorders or myasthenia gravis. The action of suxamethonium may be altered in these patients. Its use is not advisable in patients with phaeochromocytoma. As suxamethonium produces muscle contractions before relaxation it should be used with caution in patients with bone fractures.

Suxamethonium should be avoided in patients with myotonias, as response is unpredictable.

## **USE IN EYE SURGERY**

Suxamethonium causes a slight transient increase in intraocular pressure immediately after injection and during the fasciculation phase. It should therefore be used cautiously if at all during intraocular surgery and in patients with glaucoma.

## **4.5 INTERACTION WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTION**

Co-administration of inhaled anaesthetics (cyclopane, diethylether, halothane and nitrous oxide) may increase the incidence of dysrhythmias (especially bradycardia), apnoea and the occurrence of malignant hyperthermia in susceptible persons. Inhaled anaesthetics have little effect on the usual depolarising neuromuscular blockade of suxamethonium but may enhance the Phase II block (nondepolarising) that may be produced by repeated dosage of suxamethonium. Severe bradycardia and asystole have occurred when suxamethonium is used in anaesthetic regimens with propofol and opioids such as fentanyl.

Medicines which may enhance or prolong the effects of suxamethonium include lignocaine, procaine, oxytocin, oral contraceptives, some non-penicillin antibiotics (streptomycin, neomycin, kanamycin, capreomycin, tobramycin, framycetin, amikacin, gentamicin, colistin and polymyxins), tacrine, beta-adrenergic blockers, trimetaphan, phenezine, aprotinin, quinidine, promazine, lithium carbonate, phenytoin, carbamazepine, magnesium salts, quinine, chloroquine, cimetidine, terbutaline sulfate, high dose corticosteroids and cytostatic agents such as cyclophosphamide, thiotepa and azathioprine, and selective serotonin reuptake inhibitors. Diazepam may reduce the duration of neuromuscular blockade produced by suxamethonium.

Amphotericin B and thiazide diuretics may increase the effect of suxamethonium secondary to induced electrolyte imbalance. Patients with hypokalaemia or hypocalcaemia require reduced doses of suxamethonium.

Inhibitors of plasma cholinesterases such as neostigmine, pyridostigmine bromide, rivastigmine, donepezil, metoclopramide, physostigmine and phospholine iodide can considerably prolong the depolarising action of suxamethonium. It is recommended that long-acting anticholinesterase inhibitor (ecothiopate) eye drops, should be discontinued several months prior to administration of suxamethonium.

Administration of suxamethonium prior to or with a nondepolarising muscle relaxant, e.g. pancuronium, mivacurium can alter the intensity and/or duration of neuromuscular blockade.

Simultaneous administration of suxamethonium and atracurium significantly reduces the duration of suxamethonium.

Concomitant digoxin or verapamil, and suxamethonium therapy has been reported to result in cardiac arrhythmias.

## **4.6 FERTILITY, PREGNANCY AND LACTATION**

### **PREGNANCY**

Category A

Safety of the use of suxamethonium in pregnancy has not been established with respect to effects on foetal development. Therefore suxamethonium should not be administered to pregnant women unless the potential benefit outweighs the possible hazards.

Plasma pseudocholinesterase levels are decreased in pregnancy and several days postpartum by approximately 25%, therefore a high proportion of these patients may be expected to show prolonged apnoea.

Suxamethonium crosses the placenta, but generally only in small amounts. Residual neuromuscular blockade may occasionally occur in the neonate after repeated high doses of suxamethonium to the mother during delivery by caesarean section.

## **4.7 EFFECTS ON ABILITY TO DRIVE AND USE MACHINES**

Not relevant

## 4.8 UNDESIRABLE EFFECTS

The following adverse reactions have been reported following administration of suxamethonium:

<b>Neuromuscular:</b>	Post-operative muscle pain, muscle fasciculation, rhabdomyolysis, myoglobinuria, myoglobinaemia, elevated creatine phosphokinase, hypertonia, trismus.
<b>Cardiovascular:</b>	Bradycardia, tachycardia, arrhythmias, cardiac arrest, hypertension, hypotension, tachyphylaxis, ventricular fibrillation as a result of hyperkalaemia.
<b>Respiratory:</b>	Apnoea, prolonged respiratory failure, bronchospasm, increased bronchial secretions, pulmonary oedema in infants.
<b>Endocrine, metabolic:</b>	Malignant hyperthermia, porphyria, hyperkalaemia, excessive salivation.
<b>Gastrointestinal:</b>	Increased intragastric pressure, increased bowel movements, increased gastric secretions, possible aspiration.
<b>Special senses:</b>	Increased intraocular pressure.
<b>Other:</b>	Rise in intracranial pressure, renal failure, precipitation or exacerbation of myasthenia gravis.  Hypersensitivity reactions including circulatory collapse, flushing, rash, urticaria, bronchospasm and shock, which may lead to death.

## REPORTING OF SUSPECTED ADVERSE REACTIONS

Reporting suspected adverse reactions after authorisation of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Healthcare professionals are asked to report any suspected adverse reactions <https://nzphvc.otago.ac.nz/reporting/>.

## 4.9 OVERDOSE

The most serious effects of overdosage are apnoea and prolonged muscle paralysis. It is essential to maintain the airway and adequate ventilation until spontaneous respiration is fully restored.

The use of neostigmine to reverse a nondepolarising block is a clinical decision which depends on the subject, the experience, and the judgment of the clinician. If neostigmine is used, its administration should be accompanied by an appropriate dose of atropine.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 PHARMACODYNAMIC PROPERTIES

Suxamethonium is an ultra short-acting depolarising type neuromuscular blocking agent.

Suxamethonium combines with the cholinergic receptors of the motor end plate to produce depolarisation. Neuromuscular transmission is inhibited so long as an adequate concentration of suxamethonium remains at the receptor site. Suxamethonium has no direct action on smooth muscle structures, including the uterus. Suxamethonium may produce slowing of heart rate via vagal stimulation.

When suxamethonium is administered over a prolonged period the characteristics of the neuromuscular block may change from the characteristic depolarising type to one resembling a nondepolarising block.

## **5.2 PHARMACOKINETIC PROPERTIES**

### **Absorption**

Suxamethonium has a rapid onset and a short duration of action. Following intravenous (IV) administration of a single therapeutic dose in healthy adults, complete muscle relaxation occurs within ½ to 1 minute, persists for about 2-3 minutes, and gradually dissipates within 10 minutes.

Following intramuscular (IM) administration the onset of action occurs in about 2-3 minutes, with a duration ranging from 10-30 minutes.

The duration of action is prolonged in patients with low plasma pseudocholinesterase concentration.

### **Distribution**

Suxamethonium crosses the placenta, generally in small amounts.

### **Elimination**

Plasma pseudocholinesterases hydrolyse suxamethonium to succinylmonocholine (relatively inactive) and choline. Approximately 10% of drug is excreted unchanged in the urine.

Patients with impaired renal function may occasionally experience prolonged apnoea due to accumulation of succinylmonocholine.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 LIST OF EXCIPIENTS**

Hydrochloric acid  
Sodium Hydroxide  
Water for injection

### **6.2 INCOMPATIBILITIES**

Suxamethonium should not be mixed with any neuromuscular blocking agent, nor with general anaesthetics such as short acting barbiturates, nor any other therapeutic agent in the same syringe.

### **6.3 SHELF-LIFE**

15 months

**6.4 SPECIAL PRECAUTION FOR STORAGE**

Store between 2°- 8°C. REFRIGERATE - DO NOT FREEZE.

**6.5 NATURE AND CONTENTS OF CONTAINER**

50 x 2 mL Polyamp® Duo Fit®.

**6.6 SPECIAL PRECAUTIONS FOR DISPOSAL**

Any unused medicine or waste material should be disposed of in accordance with local requirements.

**7. MEDICINE SCHEDULE**

Prescription Medicine.

**8. SPONSOR**

Juno Pharmaceuticals NZ Limited  
P O Box 76261  
Manukau City  
Auckland 2241

**9. DATE OF FIRST APPROVAL**

19 December 1991

**10. DATE OF REVISION OF THE TEXT**

01 May 2019

API: 24 September 2014

**SUMMARY TABLE OF CHANGES**

<b>Section changed</b>	<b>Summary of new information</b>
8	Update sponsor details.