Drug Administration Guidelines for the Treatment of Acute Hyperkalaemia in Adults

Drug	*Dose – repeat as necessary*	*Admini-stration*	*Mechanism of action and expected result*	*Onset* *Duration*	*Magnitude*	*Comments*
Calcium Gluconate	1g/10mL (2.2mmol calcium)	Inject 10mL undiluted into a large vein over 2-3 min*	Raises threshold potential and reestablishes cardiac excitability. Stabilises myocardium and antagonises neuromuscular effects.	1-5 min 30-60 min	Does not affect serum potassium concentrations.	Cautions: digoxin (increases digoxin effect); hypercalcaemia. Avoid extravasation. Monitor ECG. Dose may be repeated if no change in ECG seen after 5-10 mins.
Frusemide	20-40 mg IV	Inject over 1-5 mins	Increased renal K^+ elimination.	Variable Variable	Variable	May be a useful adjunct, should not be used alone for the treatment of acute hyperkalaemia. Ineffective in anuric patients. Caution: hypovolaemia.
Insulin regular **PLUS Glucose**	5-15 units ***together with*** 25g (add 50mL of glucose 50% to a 50mL glucose 5% or saline minibag)	IV push ***together with*** Admin via pump over 15-20 mins, flush line afterwards	Increases intracellular K^+ uptake with temporary redistribution of K^+ into cells. Counteracts hypoglycaemic effect of insulin.	15-30 mins 2-6 hrs	Decrease in serum K^+ of approx. 0.5-1.5 mmol/L within 15-30 mins. Maximal effect at 30-60 mins; persists for 2-6 hrs.	Glucose requirements vary - may be unnecessary if blood sugar level elevated. BSL should be monitored for several hours as delayed hypoglycaemia can occur, particularly in renal failure. Measure BSL 15-30 mins after insulin treatment, then hourly for up to 6 hrs (or 12 hrs in renal impairment).
Salbutamol (Nebulised)	<u>10-20 mg</u> (2 to 4mL of the 5mg/mL solution)	Nebulise over 10 mins (use NaCl 0.9% to make up to 4mL if required)	Increases intracellular K^+ uptake with temporary redistribution of K^+ into cells.	15-30 mins 2 – 6 hrs	Decrease in serum potassium of 0.5 to 1 mmol/L after 30 mins.	May be associated with a transient *increase* in serum K^+ in the first 15 mins after admin. Has an additive effect with insulin. Caution in IHD (tachycardia). Some patients relatively resistant to salbutamol. Ineffective in patients on β-blockers.
Sodium or Calcium polystyrene sulphonate (Resonium®)	15-30 g	Rectal preferred as more rapid onset, see RPH protocol	Exchanges resin Na^+ or Ca^{2+} for K^+. Increased K^+ elimination.	Rectal: 1-2 hrs Oral: Depends on GI transit time Variable, 6-24 hrs (rectal)	Serum potassium expected to decrease by 0.5mmol/L after a single dose, but highly variable.	Cease when serum K^+ falls to 5 mmol/L. May cause constipation, faecal impaction or bowel obstruction (see Resonium® protocol for ways to reduce risk). Contraindicated in bowel obstruction or ileus. Caution with Na^+ in cardiac or renal failure.
Sodium Bicarbonate	IV: 25-100 mmol	Inject over 5-15 mins*	Alteration of the acid/base balance. Redistribution of K^+ into cells.	Variable	Variable; inconsistent effects.	Should not be used alone in acute hyperkalaemia. Adjunctive therapy in acidosis. Caution: sodium overload.
Sorbitol	20 mL, repeated until diarrhoea	Oral	Diarrhoea	Variable; dose-dependent	Variable	Indicated where there is no urine output and insufficient effect with other treatments.

** Rates are faster than those recommended in the standard RPH guidelines for IV drug administration.*

These guidelines were produced by Naomi Kelly, Ann Berwick and Michelle Sweidan, Dept of Pharmacy, RPH, and approved by the Drug Subcommittee, June 2001.