BRIEF ADMINISTRATION GUIDE

(For more detailed guideline information please see the following pages)

Indications:
- Treatment of hypokalaemia[1,2]
- Daily maintenance[2,3]

Route: Intravenous or oral[1-5]

Dose:

Treatment of hypokalaemia
- 0.5 – 1 mmol/kg/dose administered via intravenous infusion[1-3]
- Dose may be repeated if required based on serum potassium level[1-3]

Daily maintenance
- 2 – 4 mmol/kg/day[2,3,6]. Doses up to 6 mmol/kg/day may be required for severe depletion[1]
- Daily dose can be given orally in divided doses every 6 hours with feeds, or by intravenous infusion[3,7]
- Adjust dosage based on monitoring of serum potassium levels[3]

Supplied as:
- Potassium chloride 1 mmol/ml, 10 ml injection[4]
- Potassium chloride 2 mmol/ml oral liquid, 25 ml[5]

Preparation and administration:

- Potassium must be diluted prior to parenteral administration[1]
- Solution must be diluted to a maximum concentration of 1 mmol/25 ml (40 mmol/L) for a peripheral line[1-3,6,8]
- Solution must be diluted to a maximum concentration of 1 mmol/12.5 ml (80 mmol/L) for a central line[1,3,6,7]
- When adding potassium chloride to an IV fluid bag, mix well by inverting the bag at least 10 times. Do not add potassium chloride to a bag that is already hanging[9]
- Infuse at a rate not exceeding 0.2 mmol/kg/h[6,9]

Monitoring:

- Monitor serum potassium regularly with frequency determined by clinical situation[1,3]
- Monitor renal function, electrolytes, urine output at baseline and periodically throughout treatment[1,10]
- Continuous cardiac monitoring for intravenous infusion[1-3,10]
- Monitor blood pressure, heart rate, respiratory rate and temperature periodically during treatment[2]
- Monitor injection site for irritation, extravasation[3]
  Assess for signs of anaphylaxis or adverse reactions

1. Purpose and scope

To facilitate the safe and effective use of potassium chloride in the neonatal intensive care unit (NICU).

Note:
Potassium is a ISMP high alert medication that has an increased risk of causing significant harm if used in error[1,2]. Extreme caution is necessary when administering potassium chloride as overdose or rapid administration can cause cardiac arrest[9].

2. Drug

Drug	Potassium chloride
Drug action	Potassium is the major cation of intracellular fluid and is essential for the conduction of nerve impulses in the heart, brain and skeletal muscle, contractions of cardiac, skeletal and smooth muscles; maintenance of normal renal function, acid-base balance, carbohydrate metabolism and gastric secretion[1,10]. Serum potassium levels can be a poor marker of total body stores of potassium, and a low serum potassium level in the neonatal period more often reflects redistribution than true deficit[6,8].
Indications	• Treatment of hypokalaemia[1,2] • Daily maintenance[2,3]
Presentation	• Potassium chloride 1 mmol/ml, 10 ml injection[4]. Clear colourless solution[11]. Excipients include water for injection[10] • Potassium chloride 2 mmol/ml oral liquid, 25 ml[5].
Route	Intravenous or oral[1-5]
Dose	**Treatment of hypokalaemia** • 0.5 – 1 mmol/kg/dose administered via intravenous infusion[1-3] • Dose may be repeated if required based on serum potassium levels[1-3] **Daily maintenance** • 2 – 4 mmol/kg/day[2-3,6]. Doses up to 6 mmol/kg/day may be required for severe depletion[1] • Daily dose can be given orally in divided doses every 6 hours with feeds, or by intravenous infusion[3,7] • Adjust dosage based on monitoring of serum potassium levels[3]
Contraindications	• Hypersensitivty to potassium or any component of the preparation[1] • Hyperkalaemia[1,4,5,10] • Severe renal impairment[1-3,10] • Untreated Addison's disease[1,10] • Severe tissue trauma[1,10]
Precautions	• Cardiac disease and/or renal disease[1,2,10] • Concurrent use of drugs which increase the risk of hyperkalaemia e.g. potassium sparing diuretics[1,2], ACE inhibitors, NSAIDs, cyclosporine, tacrolimus, digoxin[6,7,10] • Acute acidosis or alkalosis[5,10] • Sickle cell disease[2,10]

Incompatibilities	• Compatible with sodium chloride 0.9%, glucose 5%, glucose 10%, Lactated Ringer's (Hartmann's), glucose and sodium chloride combinations[9,11] • Avoid glucose during initial replacement – may cause transient hypokalaemia[11] • Incompatible with amikacin, amphotericin B, amoxicillin, benzylpenicillin, diazepam, dobutamine, mannitol, methylprednisolone, phenytoin, promethazine[3,10,11]
Adverse effects	• Hyperkalaemia[1] • Cardiac arrhythmias (heart block, peaked T waves), hypotension[3,10] • Abdominal pain, diarrhoea, flatulence, nausea, vomiting[1,5,10] • Gastrointestinal bleeding, obstruction, or perforation with oral use (may be reduced by administering with feeds)[1] • Signs of potassium toxicity include paraesthesia of the extremities, weakness, mental confusion[3,10] • Injection site reactions including thrombophlebitis, pain and tissue necrosis due to extravasation[2,3,8,10]

3. Administration

Competency for administration	This procedure is carried out by, or under, the direct supervision of a registered nurse/registered midwife who holds current Waikato DHB Generic Medicine Management and IV certification as well as Neonatal specific competency NCV/NAC.
Preparation & Administration	• Potassium must be diluted prior to parenteral administration[1] • Solution must be diluted to a maximum concentration of 1 mmol/25 ml (40 mmol/L) for a peripheral line[1-3,6,8] • Solution must be diluted to a maximum concentration of 1 mmol/12.5 ml (80 mmol/L) for a central line[1,3,6,8] • When adding potassium chloride to an IV fluid bag, mix well by inverting the bag at least 10 times. Do not add potassium chloride to a bag that is already hanging[9] • Clearly label all bags, syringes, pumps and lines that contain potassium to avoid inadvertent flushing[9] • Infuse at a rate not exceeding 0.2 mmol/kg/h[6,9]
Observations and management	• Monitor serum potassium regularly with frequency determined by clinical situation[1,3] • Monitor renal function, electrolytes, urine output at baseline and periodically throughout treatment[1,10] • Continuous cardiac monitoring for intravenous infusion[1-3,10] • Monitor blood pressure, heart rate, respiratory rate and temperature periodically during treatment[2] • Monitor injection site for irritation, extravasation[3] • Assess for signs of anaphylaxis or adverse reactions
Special considerations (audit, funding, storage)	• Potassium chloride injection has a pH of 4 to 8[11] • Potassium ampoules and oral solution should be stored at room temperature below 25 °C[11] • Diluted potassium chloride solutions should be prepared immediately before use, but is stable if refrigerated between 2 to 8 °C for up to 24 hours[11] • Discard any unused solution

Rescue medication	Discontinue immediately and seek urgent medical assistance if anaphylaxis or severe adverse reactions occur. Administer adrenaline and maintain airway as appropriate.

4. Guardrails

Potassium Chloride is not Guardrails profiled for NICU.

5. References

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5. New Zealand Formulary for Children (NZFC). 2018. Potassium salts (oral). Accessed 21st May 2018. Available from: http://www.nzfchildren.org.nz/nzf_5021.
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8. Ainsworth SB. Neonatal Formulary: Drug Use in Pregnancy and the First Year of Life 7th ed. John Wiley & Sons Incorporated; 2014.
9. The Royal Children's Hospital Melbourne. Paediatric Injectable Guidelines. Accessed 21st May 2018. Available from: https://pig.rch.org.au.
10. Astra Zeneca Ltd. Potassium Chloride Data Sheet. 13 October 2017. Available from: http://www.medsafe.govt.nz/profs/datasheet/p/PotassiumChlorideInj.pdf
11. New Zealand Hospital Pharmacists Assoc. Inc. Notes on Injectable Drugs 7th ed, 2015.