Potassium - ORAL

Newborn use only

2021

Alert	High risk medication in A PINCH Medicines list under New South Wales Clinical Excellence Commission. Perrigo brand contains 1 mg of methyl hydroxybenzoate/1 mL. Uricosal brand also contains hydroxybenzoate. Avoid exposure of >99 mg/kg/day of sodium benzoate in neonates.(1) Oral potassium chloride and potassium citrate solutions are high in osmolality with a reported osmolality of 2200 mOsm/kg (Cytra-K, Cypress Pharmaceuticals, NJ). Therefore, it is recommended to be given with feeds.(4)
Indication	Potassium chloride: • Treatment and prevention of hypokalaemia Potassium citrate and citric acid: • Treatment of hypokalaemia in the presence of simultaneous metabolic acidosis
Action	Intracellular cation. Essential in the maintenance of body fluid composition and electrolyte balance.
Drug type	Electrolyte
Trade name	1. Potassium chloride oral mixture 10% w/v by Perrigo 2. Potassium citrate and citric acid oral mixture (Uricosal) 3. Potassium citrate mixture APF
Presentation	1. Potassium Chloride oral mixture 10% w/v by Perrigo – 500 mL bottle. Potassium content: 20mmol/15mL = **1.33 mmol/1 mL.** 2. Potassium citrate and citric acid oral mixture (Uricosal): Potassium content: **1.9 mmol/1 mL** and citrate monohydrate component**:** 40mg/1 mL. 3. Potassium citrate mixture Australian Pharmaceutical Formulary (APF) - compounded in-house by pharmacy – Refer to local hospital policies.
Dose	0.5-1.5 mmol/kg/dose 6-12 hourly (1-6 mmol/kg/day)* *Always prescribe as millimol (mmol) of elemental potassium.
Dose adjustment	Adjust dose based on serum potassium concentrations. Renal impairment- increased risk of hyperkalaemia. Avoid in severe renal impairment.
Maximum dose	
Total cumulative dose	
Route	Oral
Preparation	No preparation required.
Administration	Give oral doses with feeds to minimise gastric irritation.
Monitoring	Close monitoring of serum potassium concentrations is needed to avoid hyperkalaemia. Clinical status including urine output, creatinine, electrolytes.
Contraindications	**Potassium chloride:** Hypersensitivity to any component of the formulation, hyperkalaemia, renal failure, cardiac disease, conditions in which potassium retention is present. **Potassium citrate:** Hypersensitivity to any ingredient of the formulation, severe renal insufficiency with oliguria or azotaemia, potassium restricted diet, untreated Addison's disease, acute dehydration, anuria, severe myocardial damage, hyperkalaemia.
Precautions	Use with caution in patients with renal impairment, cardiac disease, acid/base disorders, or potassium-altering medicines/conditions/disorders.
Drug interactions	Use with caution in patients receiving potassium-sparing diuretics (e.g. spironolactone), medications known to increase risk of hyperkalaemia (e.g. ACE inhibitors) and medications that contain potassium.
Adverse reactions	Vomiting, abdominal pain, flatulence, GI bleeding, GI obstruction, skin rash, hyperkalaemia.
Compatibility	Not applicable.
Incompatibility	Not applicable.
Stability	Refer to the product label.
Storage	Store below 25°C. Protect from light.
Excipients	Potassium chloride oral mixture 10% w/v by Perrigo – contains glycerol (126 g/100 mL), methyl hydroxybenzoate (100 mg/100 mL), citric acid (0.25 g per 100 mL)(5) Uricosal and APF mixture contains 0.5 mg/1 mL of hydroxybenzoate.(6) Uricosal brand also contains sucrose.

Special comments	
Evidence	**Efficacy** Treatment of hypokalaemia There are no reported trials on the efficacy and safety of potassium therapy in hypokalaemia in neonates. Limited evidence in infants and children suggests enteral potassium replacement may be an equally efficacious alternative first-line therapy in treating hypokalaemia.(2) (LOE II GOR C) Merchant et al (2) performed an open-label randomised trial to study the serum potassium changes with enteral versus IV potassium in hypokalaemic infants and children (aged 1 month to 15 years). In the oral potassium chloride group, the concentration used was 2.66 mmol/1 mL. The parenteral/enteral dose used was 0.1-0.3 mmol/kg dose for serum potassium of 3.5-4.4 mmol/L; 0.5 mmol/kg/dose for serum potassium of 3.0-3.4 mmol/L and 0.7-1.0 mmol/kg/dose for serum potassium of <3.0 mmol/L. There was no statistically significant difference in change in potassium levels after either enteral or parenteral route. **Safety** In Merchant's trial of enteral and intravenous potassium, no mortality was reported in either arm. A few episodes of vomiting were reported in enteral route (2) **Pharmacokinetics** Almost all of potassium ingested through diet is absorbed. The kidneys excrete more than 90% of daily intake and are the organs primarily responsible for the elimination of potassium.(3)
Practice points	The preferred administration of K^+ is via the oral/enteral route. However, in the presence of severe symptomatic hypokalaemia and gastrointestinal problems such as ileus, the intravenous route may be used.(3) The normal daily required intake of K^+ is 1–2 mEq/kg/day. The choice of the type of K^+ salt depends on the clinical situation. Potassium chloride is usually appropriate if hypovolemia is present. In the presence of simultaneous metabolic acidosis, other K^+ salts producing K^+ bicarbonate, K^+ citrate, and K^+ acetate may be given. The correction of total body K^+ deficit may take days and even weeks. In cases of treatment resistant hypokalaemia, hypomagnesemia should be considered. In these cases, K^+ levels normalise following magnesium treatment.(3)
References	1. Meyers RS, Thackray J, Matson KL, McPherson C, Lubsch L, Hellinga RC, Hoff DS. Key Potentially Inappropriate Drugs in Pediatrics: The KIDs List. The Journal of Pediatric Pharmacology and Therapeutics. 2020;25(3):175-91. 2. Merchant Q, Hasan BS, Rizvi A, Amanullah M, Rehmat A, ul Haq A. Comparison of enteral versus intravenous potassium supplementation in hypokalaemia in paediatric patients in intensive care post cardiac surgery: open-label randomised equivalence trial (EIPS). BMJ open. 2017;7(5):e011179. 3. Sarici D, Sarici SU. Neonatal hypokalaemia. Research and Reports in Neonatology. 2012;2:15-9. 4. Shah DD, Kuzmov A, Clausen D, Siu A, Robinson CA, Kimler K, Meyers R, Shah P. Osmolality of Commonly Used Oral Medications in the Neonatal Intensive Care Unit. The Journal of Pediatric Pharmacology and Therapeutics. 2021;26(2):172-8. 5. Potassium chloride oral mixture 10% w/v by Perrigo. Product Info. Accessed from the manufacturer via email on 3 June 2021. 6. Australian Pharmaceutical Formulary (APF) Handbook 23. Pharmaceutical Society of Australia 2015. Potassium citrate mixture and methyl hydroxybenzoate solution formularies.

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