Guideline for the Management of Hypokalaemia in Adults

SIGNS & SYMPTOMS: [1-4]

- mild to moderate hypokalaemia may be asymptomatic
- weakness
- constipation
- leg cramps
- respiratory difficulties
- ECG changes (U waves, T wave flattening, ST segment changes)
- cardiac arrhythmias, especially in patients who are ischaemic, on digoxin or in heart failure
- rhabdomyolysis (severe hypokalaemia)
- ascending paralysis (severe hypokalaemia)

CAUSES: [1-4]

Increased potassium loss

- drugs: diuretics (thiazides, loop diuretics), laxatives, glucocorticoids, fludrocortisone, penicillins, amphotericin, aminoglycosides
- GI losses: diarrhoea, vomiting, ileostomy, intestinal fistula
- renal causes, dialysis
- endocrine disorders: hyperaldosteronism (Conn's syndrome), Cushing's syndrome

Trans-cellular shift

- insulin/glucose therapy
- salbutamol and other beta-agonists
- theophylline
- metabolic alkalosis

Decreased potassium intake

Magnesium depletion (associated with increased renal potassium loss)

General Principles for the Treatment of Hypokalaemia

- Remove causes (see above)
- Gradual replacement of potassium (via oral route) is preferred, if clinically appropriate[5]
- An ECG is strongly recommended in patients with severe/symptomatic hypokalaemia, cardiac disease or renal impairment[5,6]
- Potassium must be replaced cautiously in patients with renal impairment (risk of hyperkalaemia secondary to impaired potassium excretion). Contact the Renal Team if patient is on dialysis or has severe renal impairment
- Oral potassium should be taken with plenty of fluid, with or after meals[5]
- Use IV route in patients with severe nausea, vomiting or abdominal distress[5]
- 0.9% sodium chloride is the preferred infusion fluid as 5% glucose may cause trans-cellular shift of potassium into cells
- Use pre-mixed IV infusions[7]
- Check magnesium levels - repletion of magnesium stores will facilitate more rapid correction of hypokalaemia[2]

1. Rastergar A, Soleimani M. Hypokalaemia and hyperkalaemia. Postgrad Med j 2001;77:759-64
2. Alfonzo AVM, Isles C, Geddes C, Deighan C. Potassium disorders- clinical spectrum and emergency treatment. Resuscitation 2006;70:10-25
3. Cohn JN, Kowey PR, Whelton PK, Prisant LM. New guidelines for potassium replacement in clinical practice. Arch Intern Med 2000;160:2429-36
4. Gennari FJ. Current concepts: hypokalaemia. NEJM 1998;339:451-8
5. Potassium. Sweetman S. Martindale: The Complete Drug Reference. Accessed online via www.medicinescomplete.com on 21/12/2020
6. Bailey A. How should intravenous potassium chloride be administered in adults Medicines Q&A 186.2. Welsh Medicines Information Centre. Cardiff July 2008
7. NPSA Patient safety alert. Potassium chloride concentrate solution Alert 01. 2002. London: National Patient Safety Agency

Hypokalaemia	Treatment	Comments
MILD 3.0 – 3.4 mmol/L	Oral replacement **Sando-K effervescent tablets: 2 tablets TDS** (72mmol/day) Or, as long as patient is able to swallow tablets, could instead use: **Potassium chloride 600mg (potassium 8mmol) modified release tablets: 3 tablets TDS** (72mmol/day) – *Note: must be swallowed whole, with an adequate amount of fluid, while patient is sitting upright (to avoid oesophageal ulceration)*	– usually asymptomatic – monitor K^+ daily and adjust treatment accordingly – consider IV if patient cannot tolerate PO
MODERATE 2.5 – 2.9 mmol/L No or minor symptoms	Oral replacement **Sando-K effervescent tablets: 2 tablets QDS** (96mmol/day) Or, as long as patient is able to swallow tablets, could instead use: **Potassium chloride 600mg (potassium 8mmol) modified release tablets: 3 tablets QDS** (96mmol/day) – *Note: must be swallowed whole, with an adequate amount of fluid, while patient is sitting upright (to avoid oesophageal ulceration)*	– monitor K^+ daily and adjust treatment accordingly – consider IV if patient cannot tolerate PO
SEVERE <2.5 mmol/L or symptomatic	Intravenous replacement **40mmol KCl in 1L* 0.9% NaCl BD or TDS** (glucose 5% may be used but see notes above) Standard infusion rate 10mmol/hr **Maximum infusion rate 20mmol/hr** Check Mg^{2+} level (reported automatically if K <2.8mmol/l) If patient hypomagnesaemic, correct hypomagnesaemia as per hypomagnesaemia policy (generally give magnesium first; do not combine magnesium and potassium in the same bag).	– monitor K^+ level after each 40mmol and adjust treatment accordingly[5] – *In exceptional circumstances (e.g. patient fluid overloaded, severe heart failure etc.) it may be appropriate to give a higher concentration of potassium. The following areas are authorised to administer higher concentrations of potassium: DCC, CCU, Ward 7B Concentrations greater than 40mmol/L are painful and may cause severe phlebitis; give via a central line. If a central line cannot be inserted, administer via the largest suitable peripheral vein using an infusion pump and monitor the infusion site very closely - seek senior guidance first. Monitor patient's fluid status.
UNSTABLE ARRHYTHMIAS	Resuscitation team call 2222	