Hypokalaemia Management v1
Author: Medicines Information, CGH
Approved by Drug & Therapeutics Committee June 2014. Review date: June 2017

SIGNS & SYMPTOMS:
- 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:
- 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
- An ECG is strongly recommended in patients with severe/symptomatic hypokalaemia, cardiac disease or renal impairment
- 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
- Use IV route in patients with severe nausea, vomiting or abdominal distress
- 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
- Check magnesium levels - repletion of magnesium stores will facilitate more rapid correction of hypokalaemia

References:
<table>
<thead>
<tr>
<th>Hypokalaemia</th>
<th>Treatment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0 – 3.4 mmol/l</td>
<td>Oral replacement</td>
<td>- usually asymptomatic&lt;br&gt;- monitor K⁺ daily and adjust treatment accordingly&lt;br&gt;- consider IV if patient cannot tolerate PO</td>
</tr>
<tr>
<td></td>
<td>Sando-K 2 tablets TDS (72mmol/day), or if not tolerated: Kay Cee L 25ml TDS (75mmol/day)</td>
<td></td>
</tr>
<tr>
<td><strong>MODERATE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 – 2.9 mmol/l</td>
<td>Oral replacement</td>
<td>- monitor K⁺ daily and adjust treatment accordingly&lt;br&gt;- consider IV if patient cannot tolerate PO</td>
</tr>
<tr>
<td></td>
<td>Sando-K 2 tablets QDS (96mmol/day), or if not tolerated: Kay Cee L 25ml QDS (100mmol/day)</td>
<td></td>
</tr>
<tr>
<td><strong>SEVERE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2.5 mmol/l or symptomatic</td>
<td>Intravenous replacement</td>
<td>- monitor K⁺ level after each 40mmol and adjust treatment accordingly⁵</td>
</tr>
<tr>
<td></td>
<td>40mmol KCl in 1L* 0.9% NaCl BD or TDS (glucose 5% may be used but see notes above)</td>
<td>- *In exceptional circumstances (e.g. patient fluid overloaded, severe heart failure etc.) it may be appropriate to give a higher concentration of potassium (e.g. 40mmol KCl in 500ml). Concentrations greater than 40mmol/L are painful and may cause severe phlebitis; give via the largest suitable peripheral vein using an infusion pump and monitor the infusion site very closely - seek senior guidance first. Alternatively, considered giving via a central line. Monitor patient’s fluid status.</td>
</tr>
<tr>
<td></td>
<td>Standard infusion rate 10mmol/hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum infusion rate 20mmol/hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check Mg²⁺ level (reported automatically if K &lt; 2.8mmol/l)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If patient hypomagnesaemic: initially give 4ml MgSO₄ 50% (8mmol) diluted to 10ml with NaCl 0.9% over 20min, then start first 40mmol KCl infusion, followed by magnesium replacement as per hypomagnesaemia policy</td>
<td></td>
</tr>
<tr>
<td><strong>UNSTABLE ARRHYTHMIAS</strong></td>
<td>Resuscitation team call 2222</td>
<td></td>
</tr>
</tbody>
</table>