

## Guideline for the management of HYPOKALAEMIA in adults

### Definition(s)

LOW serum potassium level

- MILD hypokalaemia - serum potassium **3.0 to 3.5mmol/L**
- MODERATE hypokalaemia - serum potassium **2.5 to 2.9mmol/L** with no or minor symptoms of hypokalaemia
- SEVERE hypokalaemia - serum potassium **less than 2.5mmol/L** or showing symptoms of hypokalaemia

**ANY patient showing more than minor signs of hypokalaemia should be treated as SEVERE**

### Potential Causes

Note that this list is NOT exhaustive

- Chronic diarrhoea
- Glycogenesis during TPN treatment
- Hypomagnesaemia
- Thyrotoxicosis
- Cushing's Syndrome
- Refeeding Syndrome
- Drugs including:
  - insulin
  - antibiotic therapy
  - theophylline
  - diuretics
  - laxatives
  - salbutamol

### Signs and Symptoms

Signs & symptoms may include

- Metabolic Acidosis
- Rhabdomyolysis
- Leg cramps
- Muscle Weakness
- Ascending paralysis

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- Constipation or intestinal paralysis
- Respiratory failure
- Cardiac arrhythmias
- ECG changes
- Kidney Abnormalities

### Initial Actions

- Identify and manage underlying cause if possible.
- Obtain an ECG
- Assess Muscle Strength
- Stop any offending drugs
- Correct any fluid imbalance
- Determine potassium level and use flow diagram below to determine management option
- Measure:
  - urea and electrolytes
  - creatinine
  - magnesium (refer to hypomagnesaemia guideline for information on replacement should this be required)
  - urine electrolytes (as appropriate)

**NOTE that this management plan includes the use of strong potassium solutions (potassium chloride 15%). This can be used in ITU only where it is managed as controlled drug. See Trust Controlled Drugs policy (POL/MM/0010).**

### Monitoring Requirements

- Those with MILD to MODERATE hypokalaemia on oral therapy
  - Repeat U&Es after 24 hours of treatment initiation and adjust treatment as appropriate.
- Those with MODERATE to SEVERE hypokalaemia on oral or intravenous therapy
  - Repeat U&Es at end of infusions (as per flow diagram)

### ECG Monitoring

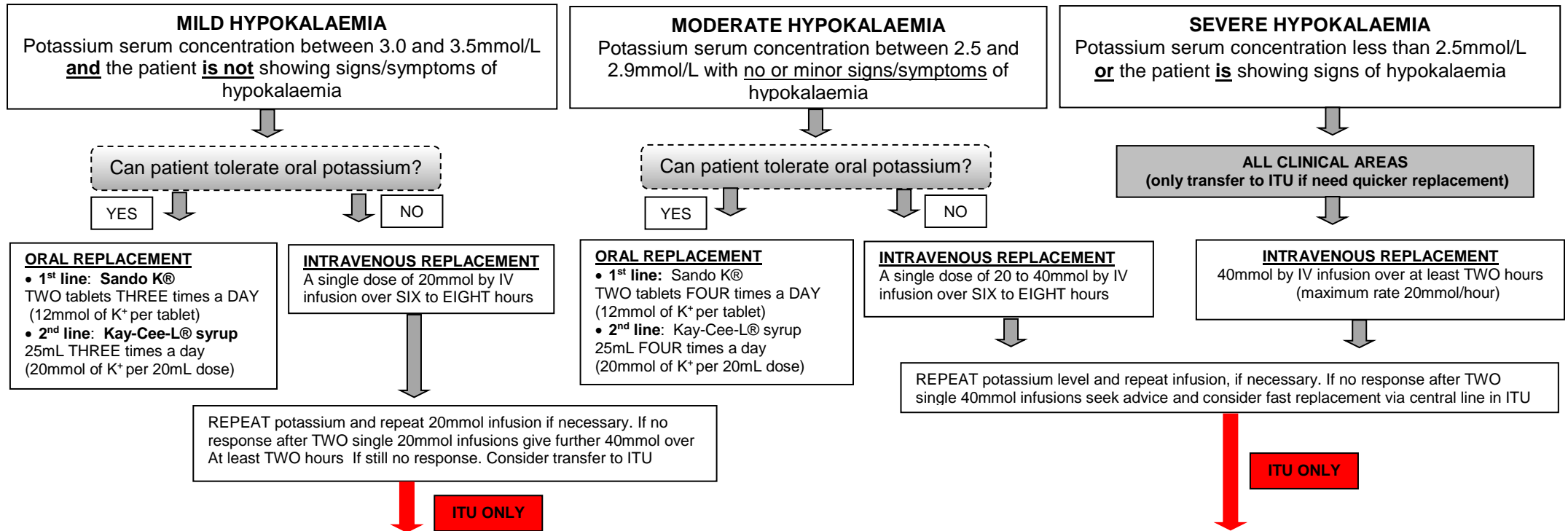
Continuous ECG monitoring or telemetry is warranted in patients receiving IV potassium with:

- Those with SEVERE hypokalaemia (Serum potassium less than 2.5mmol/L)
- Arrhythmias caused by hypokalaemia,
- Prolonged QT and/or other ECG abnormalities attributable to hypokalaemia
- Underlying cardiac issues that predispose to arrhythmia in the setting of hypokalaemia -
  - digoxin toxicity
  - myocardial infarction
  - underlying long QT syndrome
- Intravenous potassium repletion at a rate greater than 10mmol/hour.
- Risk for rebound hyperkalaemia (most often due to thyrotoxic periodic paralysis).

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**Guideline: ADULT**



**ITU ONLY**

SEE ABOVE FOR ADMINISTRATION VIA A PERIPHERAL ROUTE IN ITU  
CENTRAL INTRAVENOUS SUPPLEMENTATION USING STRONG POTASSIUM CHLORIDE 15% AMPOULES (20mmol in 10mL)  
**\*\* DILUTE PRIOR TO USE \*\***

- Administer a dose of 20 to 60mmol of potassium chloride by DILUTING strong potassium chloride 15% ampoules with sodium chloride 0.9% to give a **final concentration of 1mmol per mL**
  - To administer 20mmol of potassium - Dilute ONE ampoule containing 20mmol in 10mL with at least 10mL sodium chloride 0.9%
  - To administer 40mmol of potassium - Dilute TWO 10mL ampoules containing 20mmol in 10mL (total of 40mmol in 20mL) with at least 20mL sodium chloride 0.9%
  - To administer 60mmol of potassium - Dilute THREE 10mL ampoules containing 20mmol in 10mL (total of 60mmol in 30mL) with at least 30mL sodium chloride 0.9%
- Administer VIA INTRAVENOUS INFUSION INTO CENTRAL LINE** via a syringe driver at a usual rate of 10mmol per hour. **In EMERGENCIES a large peripheral vein may be used under guidance of a CONSULTANT only.**
- Maximum Rate:** 40mmol per hour
- Mix thoroughly before administration
- Cardiac monitoring required

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**Other Information**

- Careful monitoring of the physiologic effects of severe hypokalaemia (ECG abnormalities, muscle weakness, paralysis) is essential.
- Once the hypokalaemia is no longer severe, the rate of intravenous potassium replacement should be reduced or changed to oral therapy (see above).
- Sodium chloride 0.9% is the preferred diluent as 5% glucose may cause trans-cellular shifts of potassium into cells

**Main Potassium Formulations Available In The Trust for Replacement****Oral Preparations:**

- Potassium chloride 1mmol of potassium in 1mL (Kay-Cee-L Syrup 500mL)
- Potassium chloride 12mmol of potassium per tablet (Sando-K effervescent tablets)

**IV Preparations:**

- Potassium chloride 0.15% in glucose 10% infusion (500mL) contains 10mmol of potassium
- Potassium chloride 0.15% in glucose 5% infusion (1000mL) contains 20mmol of potassium
- Potassium chloride 0.15% in 0.9% sodium chloride (500mL) contains 10mmol of potassium
- Potassium chloride 0.15% in 0.9% sodium chloride (1000mL) contains 20mmol of potassium
- Potassium chloride 0.3%/sodium chloride 0.18%/glucose 5% (1000mL) contains 40mmol of potassium
- Potassium chloride 0.3%/sodium chloride/0.45% glucose 5% (500mL) contains 40mmol of potassium
- Potassium chloride 0.3%/sodium chloride 0.9%/glucose 5% in 500mL contains 40mmol of potassium
- Potassium chloride 0.3% in glucose 5% infusion (1000mL) contains 40mmol of potassium
- Potassium chloride 0.3% in sodium chloride 0.9% (1000mL) contains 40mmol of potassium
- Potassium chloride 0.3% in sodium chloride 0.9% (500mL) contains 20mmol of potassium

**References**

- British National Formulary <https://bnf.nice.org.uk/>
- Summary of Product Characteristics <https://www.medicines.org.uk/emc/>
- IV guide <https://medusa.wales.nhs.uk/> (user name: **cddward** / password: **ivguide**)
- Up To Date <https://www.uptodate.com/>
- BMJ Best Practice [BMJ Best Practice](#)
- Specialist Pharmacy Service [SPS - Specialist Pharmacy Service – The first stop for professional medicines advice](#)
- Kay Cee L – Summary of Product Characteristics - [Kay-Cee-L Syrup 7.5% w/v \(hpra.ie\)](#)
- JAMA - [JAMA – The Latest Medical Research, Reviews, and Guidelines \(jamanetwork.com\)](#)

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