Management of Hyperkalaemia in Adults in Hospital

NHS Lothian

Mild
Serum K^+ 5.5 - 5.9 mmol/L

Identify & treat cause promptly.

Consider long term management (see below)

At this stage, treatment for acute hyperkalaemia is **not** required.

Moderate
Serum K^+ 6.0 - 6.4 mmol/L

Assess rate of change

Is the rise in serum K^+ rapid? (>0.5 mmol/L over 24 hours)

Is a further rise in serum K^+ anticipated? (worsening AKI, oligo-anuria)

NO / YES

Severe
Serum K^+ ≥ 6.5 mmol/L

Urgent medical review including:

ABCDE assessment

Urgent ECG looking for:
- *Prolonged PR*
- *Broad QRS, 'sine' wave*
- *Bradycardia: junctional rhythm, 2nd or 3rd AV block*
- *Tall, tented T-waves*
- *Fast AF, VT*

[Compare with baseline ECG]

Are ECG changes present?

YES / NO

Identify & treat cause promptly

Consider long term management

Long term management

Treat underlying cause(s) of hyperkalaemia as clinically indicated

Review medications which can cause hyperkalaemia

Careful consideration should be given to stopping ACE inhibitors / ARBs in patients with heart failure with reduced ejection fraction & diabetic nephropathy given that these drugs prolong patient & renal survival. Further guidance is available here

Consider a low potassium diet, loop or thiazide diuretics.

Causes of hyperkalaemia

Medications	ACE inhibitors Angiotensin receptor blockers K^+ sparing diuretics Trimethoprim/Co-trimoxazole K^+ supplements (IV/oral) Beta-blockers
Acute conditions	Acute kidney injury Missed dialysis Metabolic acidosis Rhabdomyolysis Tumour lysis syndrome Hypoaldosteronism Type IV renal tubular acidosis
Pseudo-hyperkalaemia	Prolonged tourniquet Marked leukocytosis Thrombocytosis Delay in lab analysis EDTA contamination 'Drip arm' sample

Protect the heart

30 ml of IV calcium gluconate 10% administered over 10 minutes

Monitor cardiac rhythm with ECG or cardiac monitor

Dose can be repeated after 5 minutes if ECG changes persist

Lower serum K^+ by multiple routes

Shift K^+ into cells

IV Actrapid® insulin 10 units over 30 minutes with one of:
- 50 mls of 50% dextrose
- 125 mls of 20% dextrose
- 250 mls of 10% dextrose

If capillary blood glucose (cBG) is <7 mmol/L pre-treatment, administer additional 10% dextrose at 50 ml/hr for next 5 hours to prevent hypoglycaemia

cBG must be monitored every
- 15 minutes for 1st hour
- 30 minutes for 2nd hour
- 60 minutes thereafter for a total of 6 hours minimum (may need to be extended in severe renal impairment)

Consider addition of :
Nebulised salbutamol 10 mg

Caution in unstable tachycardia / symptomatic coronary artery disease

Remove K^+ from the body

Oral sodium zirconium cyclosilicate (Lokelma®) 10 g three times daily for up to 72 hours

Avoid in bowel obstruction

Monitor response

Recheck potassium level at 2 hours and 6 hours after initial treatment & then at least daily

Maintain & assess response to treatment of underlying cause (for example kidney function or urine output)

If hyperkalaemia persists despite treatment, **discuss with senior member of your clinical team first and contact Renal Medicine for additional advice**

IMPORTANT NOTES

Calcium gluconate 10%: Peak effect within 5 minutes. Duration of action is 30-60 minutes. Repeat if required. Calcium gluconate should be administered by medical staff or advanced nurse practitioners. Large bore (18G) IV access preferred, check patency of prior to administration. MUST NOT be administered via IV access containing sodium bicarbonate as it can precipitate as calcium carbonate.

IV insulin: onset of K^+ lowering within 15 minutes. Peak effect within 30-60 minutes. Duration of action up to 2 hours with a **rebound in potassium** thereafter.

Nebulised salbutamol (10mg): onset within 30 minutes of administration. Peak effect at 60-90 minutes with duration of at least 2 hours. Non-selective beta-blockers may blunt effects and 40% of patients with advanced CKD do not respond to salbutamol, thus do not use as monotherapy for hyperkalaemia.

Sodium zirconium cyclosilicate (Lokelma®): a novel oral K^+ gut binder with a better efficacy, safety and tolerability profile than calcium resonium. Onset of action within 1 hour, peak effect at 2 to 4 hours, duration of action of single dose is 12 hours and thus 8 hour dosing leads to sustained reductions of K^+ ~1 mmol/L at 24 to 48 hours. Dosing is 10 g three times daily for **a maximum of 72 hours. If K^+ remains ≥5.5 mmol/L after 72 hours of treatment, discuss with Renal Medicine. If K^+ falls to <5.5 mmol/L within 72 hours of starting treatment, change prescription to 5 g once daily & discuss duration of treatment with Renal Medicine. STOP when K^+ <4.0 mmol/L. Lokelma® is generally for INPATIENT USE ONLY. Select patients managed by ambulatory care or Hospital @ Home may be suitable for outpatient treatment. These must be discussed with Renal Medicine for approval & dispensing.**

Sodium bicarbonate: 1.26% infusion can cause sodium and fluid overload therefore is not a routine treatment but can be of benefit in patients with hyperkalaemia and metabolic acidosis. Can be associated with significant hypocalcaemia and associated complications.

Dialysis patients should be treated as above but the on-call Renal Registrar or Consultant **must** be contacted as urgent dialysis may be required.

Revised by: Dr Tariq Farrah, Specialist Registrar Renal Medicine; Maggie Davidson, Senior Clinical Pharmacist GIRLTV; Dr Robert Hunter, Consultant Nephrologist. Adapted from UK Kidney Association Clinical Practice Guideline Treatment of Hyperkalaemia in Adults, 2020. Revised October 2023; For review March: 2027