1. Introduction and Who Guideline applies to

Hyperkalaemia is commonly defined as a serum potassium concentration of **> 5.5mmol/L**.

Even at lower levels, the abnormality is associated with an increase in all-cause mortality: Patients with a potassium of 5.1 to 5.5 have twice the risk of dying in hospital than those with levels between 3.5 and 5.0. [1]

An elevated potassium is seen in up to 10% of hospitalised patients. Patients with CKD are particularly at risk, with the incidence of hyperkalaemia rising from 2 to 42% as glomerular filtration rate drops from 60 to 20 mL min^{-1}. [2]

This document aims at providing practical guidance for the immediate management of acute hyperkalaemia based on the 2020 Renal Association guideline. [3] The current version also reflects recommendations from the recent NICE technology assessment of sodium zirconium cyclosilicate (SZC) as an adjunct to acute hyperkalaemia management. [4]

The guideline applies to all adult patients and covers all clinical staff working within the Emergency and Specialist Medicine (ESM) Clinical Management Group (CMG) of the Trust but may also be used in other CMGs where adult patients with acute hyperkalaemia are managed.

Cautions:

- It is neither intended to provide in-depth information about the many causes of true and spurious hyperkalaemia, nor its long-term management.
- It **DOES NOT** apply to managing hyperkalaemia in diabetic ketoacidosis (DKA).
- Patients with end-stage renal disease often have high potassium levels, especially immediately prior to a dialysis session and this particular scenario is best managed by the renal team. This guideline should nevertheless be used if such patients display ECG changes consistent with hyperkalaemia.

2. Guideline Standards and Procedures

2.1 Overall management

Patients should be managed as per the flowchart shown in Appendix A

2.2 Notes on prescribing polystyrene resins

- Prescribing in the ED is not appropriate
- On the ward, prescribe Calcium Polystyrene Sulphonate (Calcium Resonium) 15g PO QDS in 100mL of water; also prescribe Lactulose 10mL PO QDS to prevent constipation
- If patient also hypercalcaemic, use Sodium Polystyrene Sulphonate (Resonium A) instead
- Monitor K+ at least once daily
- Signs of effect can be delayed by 1-5 days

3. Education and Training

No additional skills are required to follow this guideline.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Appropriate SZC prescribing practice	Audit	Nigel Langford	Annually	ESM CMG Q&S board

5. Supporting References

1. Singer A, Thode HC, Peacock WF. A retrospective study of emergency department potassium disturbances: severity, treatment, and outcomes. Clin Exp Emerg Med 2017;4:73–79.
2. TruhlářA, DeakinCD, SoarJ et al. European Resuscitation Council Guidelines for Resuscitation 2015 Section 4. Cardiac arrest in special circumstances. Resuscitation 2015;95:148–201. Accessed 25Aug21.
3. AlfonzoA, HarrisonA, BainesR et al. Clinical Practice Guidelines Treatment of Acute Hyperkalaemia in Adults. The Renal Association June 2020. Accessed 25Aug21.
4. NICE (2019) Sodium zirconium cyclosilicate for treating hyperkalaemia. TA599. London: National Institute for Health and Care Excellence.
5. Acute Kidney Injury Admissions to the Ron Walls Renal Unit UHL Renal Guideline (Trust reference C237/2016)
6. Electronic Medicines Compendium (2019). Datapharm Communications Ltd. SmPC for Lokelma 10 g powder for oral suspension. Accessed 12Jan20.

6. Key Words

Hyperkalaemia, potassium, emergency, treatment, bicarbonate, sodium zirconium cyclosilicate, SZC, glucose, insulin, salbutamol, renal, failure, acute kidney injury, dialysis, haemofilitration, AKI, ITU, intensive care, ECG, electrocardiogram, resuscitation, cardiac arrest, CPR, mortality, death

CONTACT AND REVIEW DETAILS	
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Details of Changes made during review:

- Format changed to comply with appropriate current Trust template
- Introduction expanded to include paragraphs on the importance of hyperkalaemia as a marker of increased all-cause mortality and the increased risk of hyperkalaemia in CKD patients
- Consideration for haemofiltration or -dialysis and ECMO for hyperkalaemic cardiac arrest added
- Venous blood gas now standard repeat blood test to rule out spurious hyperkalaemia
- Calcium salts also to be given in all patients with life-threatening hyperkalaemia (K ≥6.5)
- Capillary blood glucose (CBG) monitoring period expanded to 12 hours post-insulin glucose infusion
- Recommendation to give 25G of IV glucose over 5h if pre-treatment glucose had been less than 7 added
- Oral sodium zirconium cyclosilicate (SZC) added as an adjunct to emergency hyperkalaemia management
- Use of polystyrene resins restricted to moderate hyperkalaemia
- References updated to include the UHL guideline on AKI admissions to the Renal Unit, the latest version of the ERC guideline on cardiac arrest in special circumstances, the updated Renal Association hyperkalaemia guideline and evidence relating to SZC
- Minor formatting and wording changes to the treatment algorithm, including a better description of how to prescribe the insulin-glucose-sodium chloride infusion, hint box numbering

Appendix A. Hyperkalaemia – emergency management algorithm.