HERPC

Hull & East Riding Prescribing Committee

Guideline Management of hyperkalaemia in community

1. BACKGROUND

Hyperkalaemia is commonly detected in the community and the patient groups most at risk are those with CKD, diabetes mellitus and heart failure. Hyperkalaemia may also occur in the context of an AKI triggered by acute illness, initiation or titration of RAASi medications, or worsening of heart failure. Hyperkalaemia develops in approximately 10% of out-patients within one year after initiation of RAASi drugs, thereby limiting treatment in the patients who receive the greatest benefit from this therapy.

2. MONITORING

Patients known to have CKD, heart failure and/or diabetes, who are at risk of hyperkalaemia should undergo regular blood monitoring at a frequency (2-4 times per year) dependant on level of renal function.

Severity of Hyperkalaemia	**Clinically well (no AKI)**	**Unexpected result**	**Clinically unwell or AKI**
MILD K_+ 5.5 – 5.9 mmol/l	Repeat within 14 days	Repeat within 3 days	#Consider if hospital referral is indicated
	Assess for cause (drugs, diet) and address in community		
MODERATE K_+ 6.0 – 6.4 mmol/l	Repeat within 1 working day*	Repeat within 24 hours	Refer to hospital
	Assess for cause (drugs, diet) and address community or hospital		
SEVERE $K_+ \geq$ 6.5 mmol/l	**Refer to hospital for immediate assessment and treatment**		
	Assess for cause and address during hospital admission		

#Need for hospital referral will be guided by clinical circumstance and risk of further deterioration.

*Routine bloods tests unavailable at weekends and out of hours from community.

3) MANAGEMENT OF HYPERKALAEMIA IN COMMUNITY

See appendix 1

a. Renin Angiotensin Aldosterone inhibitor (RAASi) medicines

RAASi drugs have become the standard of care to slow progression of CKD and in the management of patients with diabetes and heart failure. However, hyperkalaemia frequently limits use or titration of RAASi drugs. Sub-optimal treatment for patients with heart failure and renal disease also affects patient outcome.

Drugs that potentiate risk of hyperkalaemia in patients receiving RAASi and/or MRAs

- Trimethoprim/co-trimoxazole
- Potassium supplements
- Potassium sparing diuretics
- Salt substitutes (lo-salt)

- NSAID
- Non-selective beta-blockers
- Digoxin toxicity

b) Ion exchange resins

New ion exchange resins Patiromer and Sodium Zirconium Cyclosilicate the NICE guidelines, adverse effects and monitoring are listed below. These are however, RED drugs and are not available for prescribing in primary care.

Patiromer is a non-absorbed, sodium free, K+-binding polymer. Calcium is used, rather than sodium, as the counter ion for K+ exchange. This avoids the potential for excessive sodium absorption and volume overload. The drug is active throughout the gastrointestinal tract but mostly in the colon. The onset of action is slow at 4-7 hours. Patiromer has the potential to bind to some co-administered oral medication (e.g. metformin, levothyroxine and ciprofloxacin); therefore, administration needs to be separated from other oral medications by ≥3 hours.

Summary of side effects for patriomer

System Organ Class	Common	Uncommon	Management
Metabolism and nutrition disorders	Hypomagnesaemia		Replace magnesium and monitor.
Gastrointestinal disorders	Constipation Diarrhoea Abdominal pain Flatulence	Nausea Vomiting	May resolve spontaneously, not dose related. Treat if appropriate. Refer back to specialist team.

Instructions for oral administration of patriomer:

- The complete dose should be poured into a glass containing approximately 40 mL of water, then stirred. Another approximately 40 mL of water should be added, and the suspension stirred again thoroughly. The powder will not dissolve. More water may be added to the mixture as needed for desired consistency.
- The mixture should be taken within 1 hour of initial suspension. If powder remains in the glass after drinking, more water should be added and the suspension stirred and taken immediately. This may be repeated as needed to ensure the entire dose is administered
- Can be taken with or without food. It should not be heated (e.g. microwaved) or added to heated foods or liquids. It should not be taken in its dry form

Monitoring:

Serum K+ should be monitored as clinically indicated. In general, this will weekly for the first month and then 1-2 weeks after any dose changes either of patriomer or RAASi. Magnesium should be monitored at each blood test and should be supplemented if required.

A rebound in serum K+ occurs on cessation of patiromer, therefore withdrawal should be undertaken cautiously. The serum K+ may rise as early as two days after cessation of patiromer, especially if RAASi therapy is continued, therefore monitor serum K+ within one week after drug cessation.

NICE TA 623 summary
Patiromer is recommended as an option for treating chronic hyperkalaemia in adults only if used:

• CKD stages 3b to 5 chronic kidney disease OR heart failure,
AND
◦ serum K+ >6mmol/l
AND
◦ Receiving a sub-optimal dose or not taking RAASi due to hyperkalaemia
AND
◦are not on dialysis.
AND patiromer must be stopped if RAAS inhibitors are no longer suitable.

Sodium Zirconium Cyclosilicate (SZC) is a non-absorbed potassium binder that preferentially exchanges H+ and Na+ for K+ and ammonium ions throughout the entire gastrointestinal tract. SZC selectively entraps monovalent cations (i.e. K+ and ammonium) compared with divalent cations (Ca2+ and Mg2+). Therefore, unlike patiromer, SZC does not affect Mg2+ levels. SZC binding of ammonium ions increases serum bicarbonate levels, which is favourable in the context of hyperkalaemia. SZC is generally well tolerated. The most common adverse effects are oedema and hypokalaemia. SZC exchanges Na+ for K+, accounting for the potential risk of worsening oedema, hypertension and heart failure.

Summary of side effects for SZC

System Organ Class	Common	Uncommon	Management
Metabolism and nutrition disorders	Hypokalaemia		Adjust dose or stop if serum K_+ < 4.0 mmol/l) Titrate up to 10g once daily or down to 5g alternate days guided by serum K+ levels. Refer back to specialist team for advice.
General disorders and administration site conditions	Oedema related events		Refer back to specialist team

Instructions for oral administration of SZC:
The contents of the sachet should be emptied into a glass containing approximately 45mL of water and stirred well. The powder will not dissolve.

- Advise patient to drink the tasteless liquid while still cloudy.
- If the suspension settles - it should be stirred again.

The suspension can be taken with or without food.

- Administer at least 2 hours before or 2 hours after oral medications with clinically meaningful gastric pH dependent bioavailability.

Monitoring:
Blood monitoring should be performed weekly for the first month, then monthly thereafter.
Serum K+ should also be assessed one week after drug cessation.

NICE TA599 has approved the use of SZC in the treatment of persistent hyperkalaemia in the out-patient setting under these circumstances:

- Patients with CKD Stage 3b-5 OR Heart Failure

AND

- Serum K_+ confirmed to be ≥ 6.0 mmol/l

AND

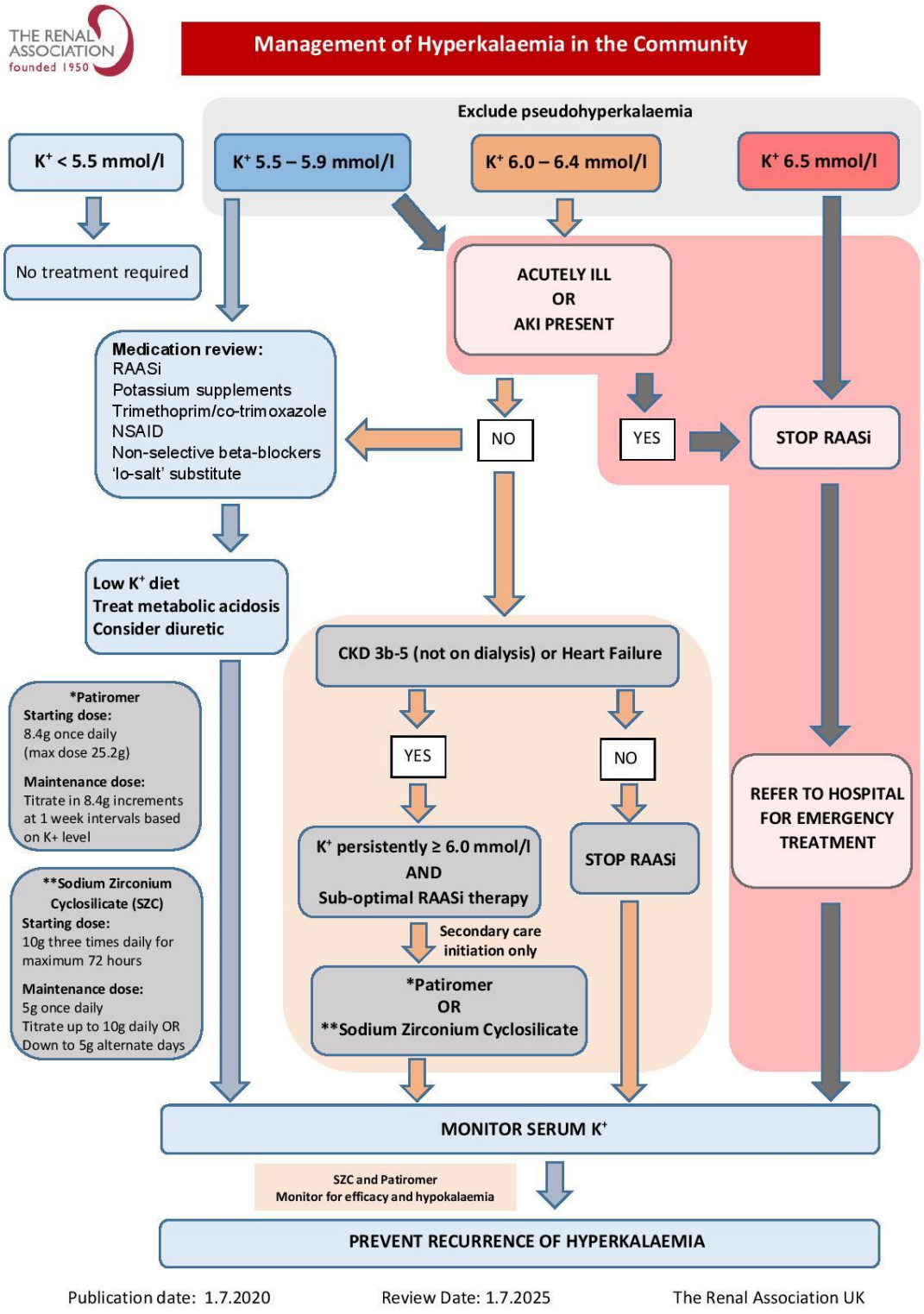
- Patient is receiving a sub-optimal dose of RAASi due to hyperkalaemia

AND

- Not on dialysis

Stop SZC if RAASi therapy is discontinued.

Appendix 1


THE RENAL ASSOCIATION
founded 1950
Management of Hyperkalaemia in the Community
Exclude pseudohyperkalaemia
K+ < 5.5 mmol/l
K+ 5.5 – 5.9 mmol/l
K+ 6.0 – 6.4 mmol/l
K+ 6.5 mmol/l
No treatment required
ACUTELY ILL
OR
AKI PRESENT
Medication review:
RAASi
Potassium supplements
Trimethoprim/co-trimoxazole
NSAID
Non-selective beta-blockers
'lo-salt' substitute
NO
YES
STOP RAASi
Low K+ diet
Treat metabolic acidosis
Consider diuretic
CKD 3b-5 (not on dialysis) or Heart Failure
*Patiromer
Starting dose:
8.4g once daily
(max dose 25.2g)
Maintenance dose:
Titrate in 8.4g increments at 1 week intervals based on K+ level
YES
NO
REFER TO HOSPITAL FOR EMERGENCY TREATMENT
**Sodium Zirconium Cyclosilicate (SZC)
Starting dose:
10g three times daily for maximum 72 hours
Maintenance dose:
5g once daily
Titrate up to 10g daily OR
Down to 5g alternate days
K+ persistently ≥ 6.0 mmol/l
AND
Sub-optimal RAASi therapy
STOP RAASi
Secondary care initiation only
*Patiromer
OR
**Sodium Zirconium Cyclosilicate
MONITOR SERUM K+
SZC and Patiromer
Monitor for efficacy and hypokalaemia
PREVENT RECURRENCE OF HYPERKALAEMIA
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The Renal Association UK

APPROVAL PROCESS

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Ratified by:	
Review date:	

References: NICE TA 623 (Feb 2020) Patiromer for treating hyperkalaemia; NICE TA 599 (Sept 2019) Sodium zirconium cyclosilicate for treating hyperkalaemia; Dr A Alfonzo *et al* (July 2020), Renal Association Treatment of acute hyperkalaemia in adults. https://renal.org/health-professionals/guidelines/treatment-acute-hyperkalaemia-adults