

Paediatric Hyperkalaemia Management

CATEGORY:	Clinical Guidelines
CLASSIFICATION:	Clinical
PURPOSE:	This guideline provides advice on management of hyperkalaemia in children, which is potentially life-threatening.
Controlled Document Number:	CG712
Version Number:	1
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Approved By:	Clinical Guidelines Group <i>(Additional groups as appropriate e.g. Medicines Management group, Patient Safety)</i>
On:	June 2019
Review Date:	January 2022
Distribution: <ul style="list-style-type: none">• Essential Reading for: Information for:	This guideline applies to all children who have a raised serum potassium. Paediatric ST1-8 trainees, Foundation doctors undertaking a paediatric placement, Advanced nurse practitioners in the paediatric department, Paediatric consultants

1. Executive Summary & Overview

This guideline provides advice on management of hyperkalaemia in children, which is potentially life-threatening.

2. Flow Chart – see next page

HYPERKALAEMIA - EMERGENCY MANAGEMENT

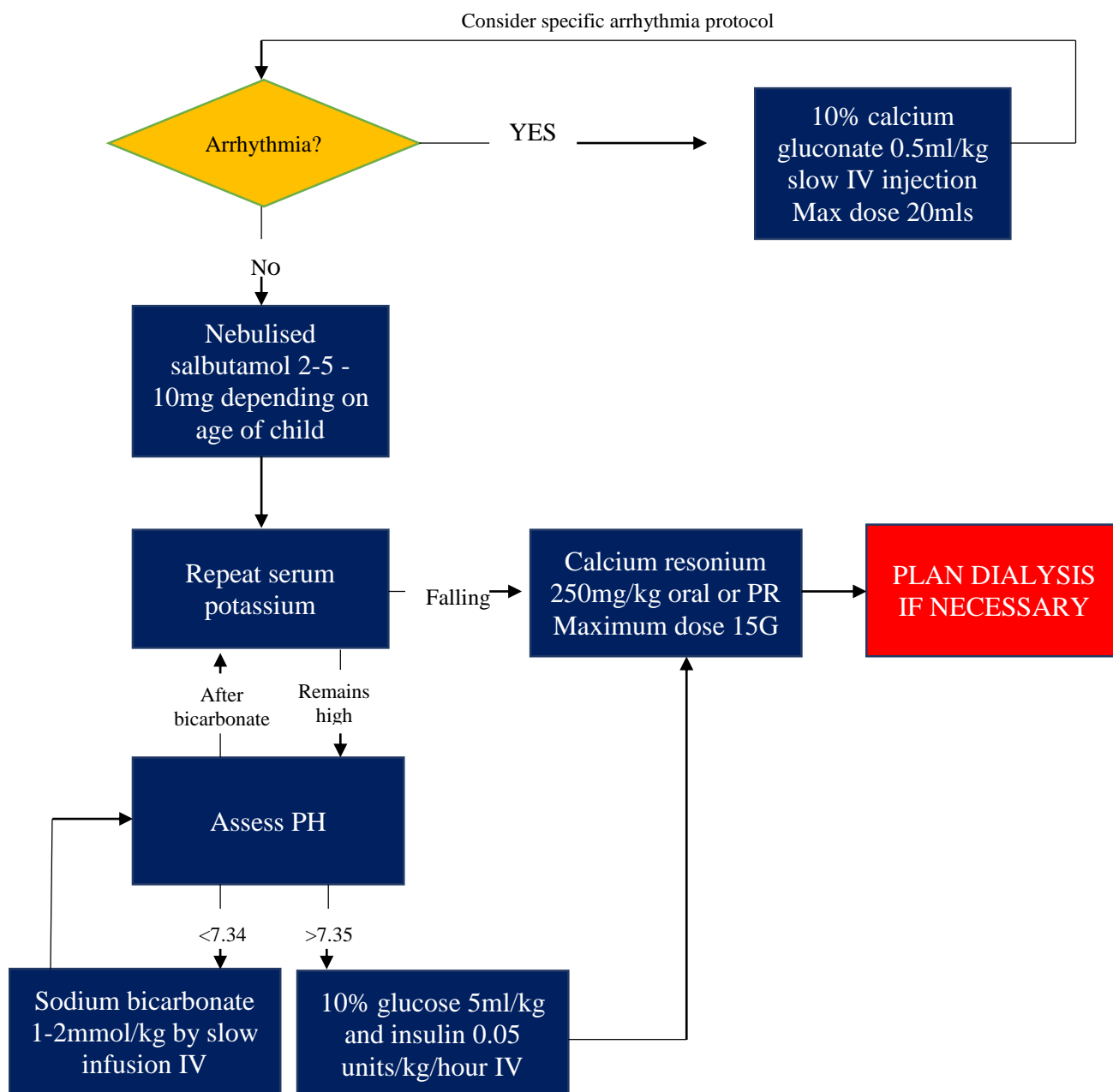


Diagram modified from APLS guidelines

NEVER GIVE CALCIUM SALTS THROUGH SAME LINE AS SODIUM BICARBONATE

3. Body of Guideline

The normal serum level of potassium (K^+) is 3.5 to 5.5 mmol/l. Neonates tolerate higher potassium levels quite well. If serum K^+ level is high, ascertain that it is not due to haemolysed sample, repeat sample if unsure. It is unusual to get an arrhythmia if the potassium is less than 7.5 mmol/L.

a) **Serum K^+ level 5.5 to 6.5 mmol/L:**

- Monitor strict fluid balance including urine output
- Check serum urea and electrolytes
- Remove extraneous sources of K^+ in feeds and/or fluids

b) **Serum K^+ level 6.5 to 7.5 mmol/L:**

- As above; perform ECG looking for T-wave changes (tall, peaked T-waves and ST segment depression).
- Discuss further management with consultant
- Consider treatment with calcium resonium at the dose of 250mg/kg/dose (max 15g) given via NG/PR route 6 hourly until the serum K^+ level returns to less than 6.5

c) **Serum K^+ level greater than 7.5 mmol/L: see algorithm on previous page and text below**

- Urgent continuous ECG monitoring (look for changes above as well as prolonged PR, diminished P waves, widening of QRS complexes, sine waves. VT, VF or asystole may ensue unless treated).

Treatment of hyperkalaemia:

1. If ECG changes and hyperkalaemia, administer **10% calcium gluconate** 0.5-1 ml/kg (0.11-0.22mmol/kg) (max 20ml = 4.5mmol) over 5 minutes to stabilise myocardium. Give undiluted. Effect occurs within minutes and duration of action is around one hour. Repeat within 5-10 minutes as necessary.
2. Other emergency measures:
 - **Nebulised salbutamol** 2.5-10mg depending on age of child
 - **Calcium resonium** at 250 mg/kg/dose (maximum 15g) given via NG/PR route. Repeat if expelled from the rectum within 30 minutes. By mouth it is unpalatable. Aims to remove potassium from the body. Takes 4 hours for full effect. Always repeat the potassium after initial therapy and continue calcium resonium 6 hourly if falling but if not plan dialysis. Total daily dose of calcium resonium is 1g/kg (maximum dose 60G per day) by mouth and by rectum but maximum dose is 30G per day PR. Continue until K^+ is less than 5.5 mmol/L
 - **If PH less than 7.34 give Sodium bicarbonate** 1-2mmol/kg (1mmol = 1ml of 8.4% solution, dilute 1:5 in 5% dextrose) as a slow infusion over 30 minutes. Works best in acidotic patients. Remember to check the serum calcium as hyperkalaemia can be accompanied by hypocalcaemia particularly if sepsis or renal failure. If bicarbonate is used then the ionised calcium fraction is lowered rapidly and may lead to tetany, convulsions, hypotension and arrhythmias. Monitor calcium regularly

- **If PH above 7.35 Commence a glucose insulin infusion** If peripheral access: 10% glucose 5-10ml/kg/hour; central access: 20% glucose 2.5-5ml/kg/hour. Keep blood glucose at 10-15mmol/l. Physiological homeostasis should increase endogenous insulin production. **Add insulin after an hour if blood sugar greater than 15mmol/l.** Put 50 units of Novorapid (soluble insulin) in 50 ml of 0.9% sodium chloride (1unit/ml) and commence infusion at 0.05ml/kg/hour. Keep blood glucose at 10-15mmol/l by adjusting infusion rate in 0.05ml/kg/hour steps. Can cause hypoglycaemia so measure blood sugar 15 minutes after the start and then every 30 minutes until stable.

4. Methodology

The guideline is based on Expert opinion; limited trial data is available for children.

5. Monitoring & Suggested Quality Standards

Audit of guideline use. This should be annually at least for the next 3 years. It is possible that no cases of hyperkalaemia are seen in the next 3 years and monitoring will be an ongoing process.

6. References, Related Documents and Other Guidance

APLS guidelines. 6th Edition

BNFc 2018-9

Revision History

Version No	Date of Issue	Author	Reason for Issue/key points
1	01/04/2019	Helen Goodyear	Extract guideline from previous paediatric handbook.