

## Transport Guideline Immediate Management of Acute Hyperkalaemia

<b>SETTING</b>	Wales and West Acute Transport for Children (WATCh) Service
<b>FOR STAFF</b>	All clinical staff working for the WATCh team
<b>PATIENTS</b>	Patients with acute hyperkalaemia (serum potassium > 6.5mmol/L*)

### DEFINITION

Hyperkalaemia is defined as a serum potassium level > 5.5mmol/L in children\* and >6mmol/L in newborns\*. At levels > 7mmol/L, there is a possibility of life threatening cardiac conduction abnormalities and arrhythmias occurring but these may occur with lower levels if the rise has been very acute.

This guideline is a summary of the Bristol Royal Hospital for Children [Hyperkalaemia in Children: Diagnosis and Treatment](#) guideline available via the Document Management Service.

It is the recommendation of the above guideline authors that the treatment threshold is a serum potassium level >6.5mmol/L however ECG changes with a serum potassium level below this threshold also require treatment.

**NB: This guideline is not for use in patients with Diabetic Ketoacidosis**

### HIGH RISK SITUATIONS

Impaired potassium excretion	<ul style="list-style-type: none"> <li>• Acute Kidney Injury (AKI)</li> <li>• Dehydration / Hypovolaemia</li> <li>• Drugs e.g. ACE inhibitors / Spironolactone / NSAIDs</li> <li>• Aldosterone deficiency e.g. Congenital Adrenal Hyperplasia</li> </ul>
Increased potassium intake	<ul style="list-style-type: none"> <li>• High potassium load e.g. TPN / IV Fluids / oral supplements</li> <li>• Blood transfusion</li> </ul>
Tissue destruction	<ul style="list-style-type: none"> <li>• Necrotising Fasciitis</li> </ul>
Movement of potassium from intracellular to extracellular spaces	<ul style="list-style-type: none"> <li>• Severe acidosis</li> <li>• Cell breakdown e.g. tumour lysis / severe haemolysis / GI bleed / rhabdomyolysis</li> <li>• Drugs e.g. Suxamethonium / Digoxin / beta-blockers</li> <li>• Insulin deficiency</li> </ul>

### CLINICAL SIGNS

1. ECG changes – may be simultaneous or progressive
  - Peaked T waves; long PR interval; loss of P wave; decreased R wave amplitude; widened QRS; ST depression
  - Complete heart block; VT and or VF; sine wave; asystole
2. Other – muscle weakness; ileus

## MANAGEMENT

1. STOP ALL EXTERNAL SOURCES OF POTASSIUM E.G. TPN / BLOOD / DRUGS
2. EXCLUDE HAEMOLYSED SAMPLE – SEND URGENT LAB AND BLOOD GAS SAMPLES
3. CONTINUOUS ECG MONITORING (**PLUS 12 LEAD ECG BUT DO NOT DELAY TREATMENT**)

**NO ECG CHANGES  
POTASSIUM 6.5-7MMOL/L**

**ECG CHANGES AND / OR  
POTASSIUM > 7MMOL/L**

**SALBUTAMOL\***  
Nebulised 2.5-5mg  
(repeat after 20 minutes)  
**OR**  
IV 4mcg/kg over 5 minutes  
(maximum concentration 50mcg/ml in  
0.9% NaCl)  
Minimum interval between IV doses = 2hrs

**10% CALCIUM GLUCONATE**  
(0.5mls/kg) over 5-10 minutes  
(Maximum 3 doses)  
**PLUS**  
**SALBUTAMOL\***  
Nebulised 2.5-5mg  
(repeat after 20 minutes)  
**OR**  
IV 4mcg/kg over 5 minutes  
(maximum concentration 50mcg/ml in  
0.9% NaCl)  
Minimum interval between IV doses = 2hrs

1. Continue Salbutamol therapy
2. Repeat lab / blood gas samples

Potassium remains > 6.5mmol/L despite above therapies

**INSULIN (ACTRAPID) AND DEXTROSE**  
**IN CARDIAC ARREST ONLY: 0.1 UNITS/KG INSULIN WITH 10MLS/KG 10% GLUCOSE AS A BOLUS  
(FOLLOWED BY INFUSION AS BELOW)**

### Under 1 month of age

0.5unit/kg/hr IV infusion for 30 minutes

Dilute 0.25 unit/kg in 5ml/kg 10%  
glucose and give over 30 minutes

**OR**

Dilute 0.25 unit/kg in 1ml/kg 50%  
glucose and give over 30 minutes  
(**must be given via central /IO access**)

Repeat after 30 minutes  
(Monitor blood glucose levels every 15 minutes for at  
least 6 hrs from start of infusion)

### 1 month and over

0.1unit/kg/hr IV infusion for 30 minutes  
(**max 10 units**)

Dilute 0.05unit/kg in 5ml/kg 10%  
glucose and give over 30 minutes

**OR**

Dilute 0.05unit/kg in 1ml/kg 50%  
glucose and give over 30 minutes  
(**must be given via central /IO access**)

Repeat after 30 minutes  
(Monitor blood glucose levels every 15 minutes for at  
least 6 hrs from start of infusion)

\* No evidence of a difference in reduction of potassium levels between the use of nebulised and IV salbutamol.

## OTHER THERAPIES

Sodium Bicarbonate	1mmol/kg (maximum dose 50mmols)		<ul style="list-style-type: none"> <li>• Give over 10-15minutes</li> <li>• Dose may be repeated</li> </ul> Avoid if hypocalcaemic – give Calcium Gluconate instead
	Needs to be diluted if giving peripherally		
Furosemide	1mg/kg (maximum dose 40mg)		Avoid in patients with renal failure
Calcium Resonium Resonium A Sodium Polystyrene Sulfonate	Oral/NGT	500mg-1g/kg/day in 3 divided doses  (maximum dose 60g/day)	Oral / NG administration – mix with water to give (not juice / squash)
	Rectal	500mg-1g/kg/day in 3 divided doses  (maximum dose 30g/day)	Rectal administration – dilute to 200mg/ml with water or 10% glucose  Irrigate colon 8-12hrs post dose to ensure removal of resin

**RELATED DOCUMENTS**      Hyperkalaemia in Children: Diagnosis and Treatment (BRHC Clinical Guideline) available via DMS

**AUTHORISING BODY**      WATCH Governance Group

**SAFETY**

**QUERIES**                  WATCH – 0300 0300 789