

Royal Hospital for Women (RHW)
BUSINESS RULE
COVER SHEET



Health
South Eastern Sydney
Local Health District

Ref: T25/49339

NAME OF DOCUMENT	Management of Hyperkalaemia in Adults
TYPE OF DOCUMENT	Clinical Business Rule
DOCUMENT NUMBER	RHW CLIN168
DATE OF PUBLICATION	August 2025
RISK RATING	High
REVIEW DATE	August 2027
FORMER REFERENCE(S)	RHW Hyperkalaemia - Management of LOP
EXECUTIVE SPONSOR	Midwifery Clinical Co-Director - Maternity Services Medical Clinical Co-Director – Maternity Services
AUTHOR	Professor S Lowe, Obstetric Medicine Physician E Peirson, CNC Close Observation Unit
SUMMARY	Outline the safe management and monitoring of adult patients with hyperkalaemia
Key Words	ECG, blood serum potassium, calcium gluconate, insulin, glucose, sodium polystyrene sulfonate

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Within this document we will use the term woman, this is not to exclude those who give birth and do not identify as female. It is crucial to use the preferred language and terminology as described and guided by each individual person when providing care.

1 BACKGROUND

The aim of this CBR is ensure the safe management of adult patients with hyperkalaemia.

- Acute hyperkalaemia is a potentially life-threatening medical emergency and is defined as a serum potassium level of 5.5mmol/L or greater, which requires urgent treatment to avoid serious consequences such as arrhythmias and cardiac arrest¹.
- Hyperkalaemia is classified as following¹:

Mild	5.5-5.9 mmol/L
Moderate	6-6.4 mmol/L
Severe	≥ 6.5 mmol/L

- A woman with a serum potassium ≥ to 6.0mmol/L OR patients with hyperkalaemia and ECG changes must be transferred to the Close Observation Unit (COU) for cardiac monitoring and treatment.
- Treatment aims are:
 - Cardiac membrane stabilisation
 - Correct volume depletion
 - Move potassium intracellularly
 - Eliminate potassium from the body

2 RESPONSIBILITIES

Medical, Midwifery and Nursing Staff:

Identify, escalate, monitor and initiate time appropriate treatment and management for any woman with hyperkalaemia.

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3 PROCEDURE

3.1 Clinical Practice

Monitoring

- Complete a 12-Lead ECG (see Education Notes 3.3)
For moderate to severe hyperkalaemia or mild hyperkalaemia with ECG changes
 - Commence continuous cardiac monitoring if potassium ≥ 6.0 mmol/L
 - Document observations a minimum of 2nd hourly
 - Ensure strict fluid balance is maintained
 - Check serum potassium level every 2 hours until the level is < 5.5 mmol/L
- Obtain blood sampling of a venous/arterial blood gas and process this through the blood gas analyser on Birth Unit or SEALS pathology for an immediate result. A formal EUC must also be taken, requested as life threatening and sent to SEALS for rapid results.
- Repeat the serum potassium and ensure results are followed up as essential to determine the effectiveness of treatment and to monitor for rebound hyperkalaemia which may occur once the effects of treatment have worn off.¹

Management

SERUM POTASSIUM GREATER THAN (>) 6 mmol/L OR if ECG CHANGES PRESENT

- Ensure continuous ECG monitoring throughout treatment period
- Administer calcium to stabilise cardiac membranes and prevent arrhythmias
 - Anaesthetics to administer 10 mL of Calcium gluconate 0.22mmol/ml (previously called calcium gluconate 10%) IV over 2 to 3 minutes into a large vein with ECG monitoring²
 - Note: this will not reduce serum potassium but may prevent life-threatening arrhythmias and cardiac arrest¹
 - Repeat the 12 lead ECG 5-10 minutes following calcium gluconate administration to confirm reversal of any ECG changes
 - The effect of intravenous calcium is short-lived. The dose may need to be repeated in 30 to 60 minutes, while undertaking specific measures to reduce potassium if persistent abnormal ECG changes are present³
 - Monitor the cannula site for phlebitis as vein irritation may occur. Extravasation can cause tissue necrosis due to the high osmolality of calcium⁴

Correct Volume Depletion

- Consider if hyperkalaemia is associated with metabolic acidosis and/or volume depletion, then this requires treatment to optimise renal function.

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Insulin and Dextrose

- Administer an intravenous insulin and glucose infusion to shift potassium into the cells.
CAUTION: HYPOGLYCEMIA MUST BE RULED OUT BEFORE COMMENCING INSULIN
 - Administration of insulin will temporarily lower the plasma concentration. This causes the serum potassium to decrease by 0.5 to 1.5 mmol/L over 30 minutes²
 - PERIPHERAL (PIVC) access: Add 10 units of short- acting insulin (ACTRAPID®) to 50mLs of glucose 50% and infuse over 30 minutes via a syringe driver
 - CENTRAL (CVC) access: Short-acting insulin (ACTRAPID®) 10 units IV bolus PLUS glucose 50% 50mLs IV over 5 minutes⁴
 - Note: Due to adherence to PVC insulin cannot be added directly to a glucose bag
 - This dose may need to be repeated in 30 – 60minutes as the effects are short-acting²
 - Glucose 50% has a high osmolality, monitor the cannula site carefully as administration into a peripheral vein may result in pain, vein irritation and thrombosis⁵
- Ensure a 2nd independent check occurs by an RN/RM at all stages of preparation and administration, including programming of the syringe driver as Insulin is a high-risk medication
- Monitor blood glucose levels (BGL) closely as insulin infusions may cause hypoglycaemia.
 - Baseline BGL pre-dose
 - 30 min BGLs for 2 hours
 - Then if stable, 1 hourly BGL for 4 hours
 - If hypoglycaemia occurs give additional dextrose IV or oral glucose/sweet drink and seek expert advice (anaesthetics or obstetric medicine)

Eliminate potassium from the body

- Administer ion exchange resins to remove potassium from the GI tract
 - Sodium ions (Na⁺) of the resin are exchanged for potassium ions (K⁺) in the lumen of the large intestine & then excreted, thereby reducing the body's overall potassium load.
 - Each gram of resin removes around 1 mmol of potassium and delivers 2 to 3 mmol of sodium².
 - This treatment lowers the serum potassium concentration by 0.5 to 1 mmol/L over 1 to 6 hours and requires repeat doses².

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- Sodium polystyrene sulfonate (RESONIUM A®) 15 g (suspended in 45 to 60 mL of water) orally, 3 or 4 times daily
OR
- Sodium polystyrene sulfonate (RESONIUM A®) 30 to 50 g (suspended in 150 mL of water or 10% glucose) rectally as a retention enema, daily
 - The enema should be retained, if possible, for at least 9 hours after which the colon should be irrigated to remove the resin.
- Consider appropriate method for administration
 - Oral administration of Resonium A® is not suitable for patients who may require theatre under general anaesthetic, as permanent fibrosis of the lungs can occur if Resonium A® is aspirated.
 - Avoid rectal use in patients with reduced GI motility (e.g. postoperative ileus/ bowel obstruction/ constipation) due to the risk of intestinal necrosis³
- Cease Resonium A® administration once the potassium is less than 5 mmol/L to prevent overtreatment and hypokalaemia²

Intravenous Sodium Bicarbonate

- Consider a sodium bicarbonate infusion only if severe and persistent acidosis is present after appropriate treatment for volume depletion and assessment of the cause of the metabolic acidosis.
- Administer Sodium Bicarbonate 8.4% (= 1 mmol/mL) 50mL IV over 5 to 10 minutes via an infusion pump (with ECG monitoring)²
 - Can be repeated in 60 to 120 minutes
 - **Note:** Sodium Bicarbonate is incompatible with calcium, ensure a 20mL sodium chloride 0.9% flush is administered between doses and administer via separate IV lines to prevent precipitation⁷.
 - Fluid replacement may need to be continued with sodium chloride 0.9%.

Dialysis

- Consider dialysis when hyperkalaemia is not responsive to the above measures, e.g. in extensive tissue breakdown due to rhabdomyolysis

SERUM POTASSIUM 5.5–6.0 MMOL/L, WITH NO ECG CHANGES

- Perform a medication review and cease drugs which may cause or aggravate hyperkalaemia.
- Review diet for high potassium intake (e.g. bananas, fruit juice, potatoes, spinach, chicken, turkey, beef).

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- Consider administration of sodium polystyrene sulfonate (RESONIUM A®) if persistent > 12hours as described above

Referral

- Seek specialist advice early from the following medical staff if further support is required and for all patients with severe hyperkalaemia.
 - Obstetric Medicine Registrar Pager #46748 (Mon-Fri 08:00- 17:00)
 - Obstetric Medicine Physician (24/7 check on- call roster)
 - Intensive Care Registrar Pager #44648
 - Renal Registrar (page through POW switch)

3.2 Documentation

- Electronic Medication Administration Record eMR
- Powerchart

3.3 Education Notes

- Severe hyperkalaemia can lead to lethal cardiac dysrhythmias. ECG changes are not always present even with severe hyperkalaemia, but they are predictive of adverse events⁹.
- Clinical features of hyperkalaemia demonstrated through ECG changes include:
 - Tall, peaked T waves
 - Widened QRS complex
 - Prolonged PR interval
 - Flattened / absent P waves
 - Bradycardia
 - Sine wave
 - Ventricular fibrillation/asystole (associated with potassium >7 mmol/L)
- Signs and symptoms of hyperkalaemia:
 - Muscle weakness
 - Flaccid paralysis
 - Palpitations
 - Bradycardia
 - Hypotension
 - Nausea
 - Oliguria

Common causes of hyperkalaemia include^{2,6,7,8}:

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Pseudohyperkalaemia	A spurious result due to a haemolysed sample during the phlebotomy procedure or specimen processing causing the mechanical release of potassium from cells. Consider rechecking specimen if normal ECG and no risk factors for hyperkalaemia.
Medications	• Potassium supplements • Potassium sparing diuretics e.g. amiloride, spironolactone • ACE Inhibitors e.g. Ramipril, Lisinopril • Angiotensin II Blockers e.g. Irbesartan, Candesartan • NSAIDS • Trimethoprim • Ciclosporin • Tacrolimus
Acute/Chronic Renal Failure	• Reduced potassium excretion • Dialysis patients
Fluid Volume Depletion	• Reduced potassium excretion secondary to reduced distal tubular water and sodium delivery
Metabolic Acidosis	• Hyperkalaemia is a common manifestation of acidosis and will often resolve with correction. Consider and treat common causes: Diabetic Ketoacidosis, lactic acidosis, liver/renal failure, diarrhoea/ dehydration.
Severe Tissue Damage e.g. trauma, burns, haemolysis, rhabdomyolysis	• Results in shift of potassium from inside the cells into the blood because of the traumatic disruption of cell membranes

3.4 Related Policies/procedures

[RHW Close Observation Unit: Admission, Escalation, Transfer and Discharge](#)

3.5 References

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9. Durfey N, Lehnhof B, Bergeson A, Durfey SNM, Leytin V, McAteer K, Schwam E, Valiquet J. Severe Hyperkalemia: Can the Electrocardiogram Risk Stratify for Short-term Adverse Events? *Western Journal of Emergency Medicine*. 2017 Aug;18(5):963-971

4 ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for an Aboriginal and/or Torres Strait Islander woman or family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal Liaison Officers, health workers or other culturally specific services

5 CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017 044-Interpreters Standard Procedures for Working with Health Care Interpreters.

6 NATIONAL STANDARDS

Standard 4 – Medication Safety

Standard 8 – Recognising and Responding to Acute Deterioration

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7 REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
1/5/2025		Draft of updated CBR
28/5/2025		Endorsed by RRAD committee
17/6/2025		Endorsed by RHW Medication Safety Committee
18.08.25		RHW BRGC