Potassium Supplementation Procedure

1. Purpose

This procedure establishes the minimum practice standards and requirements to safely care for and manage patients requiring potassium supplementation throughout the WA Country Health Service (WACHS). This procedure is part of the suite of policy documents related to high-risk medications in WACHS. Refer to the WACHS High Risk Medications Procedure for further information.

Refer to the following for additional clinical guidance for specific patient populations:

- WACHS Adult Diabetic Ketoacidosis Guideline
- For neonates, refer to the Women and Newborn Health Service, Neonatal Medication Protocols - Potassium Chloride - Neonatal.
- For paediatric patients, refer to Perth Children's Hospital Potassium Chloride Monograph – Paediatric – Medication Management Manual.
- For obstetric patients, refer to the Women and Newborn Health Service, Obstetrics and Gynaecology Medication Guidelines - Potassium Chloride - Obstetric.

2. Policy

ATTENTION

- INTRAVENOUS potassium is a HIGH RISK medicine.
- Hyperkalaemia can develop rapidly, asymptomatically and is potentially fatal.
- If intravenous (IV) potassium is required, premixed infusion bags are to be used unless in special circumstances as outlined in Section 2.6 Non-Standard Solutions.
- If diluting ampoules/vials mix the infusion bag thoroughly by inverting and shaking several times to avoid toxicity from a large bolus dose.
- Extravasation may cause severe complications**.**

Key safety considerations:

- oral/enteral is the preferred route of potassium administration
- the **maximum rate** of potassium administration via a **peripheral line** is **10 mmol/hour** for adults, unless in special circumstances as outlined in Section 2.6 Non-Standard Solutions
- **maximum rate** via a **central line** is **20 mmol/hour** (rates more than 20 mmol/hour are potentially hazardous)
- **continuous cardiac monitoring** is required when rate is faster than 10 mmol/hour
- the **maximum concentration** of potassium for administration via a **peripheral line** is **40 mmol/L,** the exception is 10 mmol in 100 mL sodium chloride 0.29% premixed mini bags (isotonic solution)
- storage of highly concentrated IV potassium products must be restricted to pharmacy departments and clinical areas with continuous cardiac monitoring equipment (as approved by the regional Medicines and Therapeutics Committee (MTC)).

2.1 Potassium Products

As a minimum, all sites should have an oral potassium product and an intravenous premixed potassium infusion option available via imprest. Availability of the products indicated in the tables below may vary in each region. Refer to Statewide Medicines Formulary (Formulary One) for site specific imprest.

Oral

ORAL		
Product	**Strength (mmol)**	**Notes**
Potassium chloride slow release 600 mg tablets	8 mmol potassium per tablet	Do not crush or chew.
Potassium chloride effervescent tablets (Chlorvescent®)	14 mmol potassium per tablet	Dissolve each tablet in at least 120 mL water. Suitable for enteral feeding tubes.
Potassium chloride 10% oral mixture 500 mL	20 mmol potassium in 15 mL of solution	Dilute in 50 -100 mL fluid before administration. Suitable for enteral feeding tubes.

Table 1: Common oral potassium products

Intravenous – Standard Premixed Bags

Premixed potassium bags are preferred to reduce preparation errors and are identifiable by pink outer packaging. While alternative potassium IV products may be stocked, they must be clearly labelled, stored and administered according to this procedure, with regional MTC approval. Most premixed products are not isotonic, except potassium chloride 10 mmol in 100 mL, which uses a lower concentration of sodium chloride (0.29%).

INTRAVENOUS PREMIXED BAGS			
Product	**Diluent**	**Volume**	**Notes**
Potassium chloride 10 mmol	Sodium chloride 0.29%	100 mL mini bag	**ISOTONIC** Suitable for peripheral lines.
Potassium chloride 20 mmol	Sodium chloride 0.9%	1000 mL bag	
Potassium chloride 20 mmol	Glucose 5%	1000 mL bag	
Potassium chloride 20 mmol	Sodium chloride 0.9% and glucose 5%	1000 mL bag	Recommended for paediatric patients.
Potassium chloride 20 mmol	Sodium chloride 0.18% and glucose 4%	1000 mL bag	
Potassium Chloride 30 mmol	Sodium Chloride 0.9% infusion	1000 mL	
Potassium Chloride 30 mmol	Hartmann's Solution (modified)	1000 mL bag	

Potassium chloride 40 mmol	Sodium chloride 0.9%	1000 mL bag	
Potassium chloride 40 mmol	Sodium chloride 0.9% and glucose 5% infusion	1000 mL bag	
Potassium chloride 40 mmol	Sodium chloride 0.18% and glucose 4%	1000 mL bag	
Potassium dihydrogen phosphate (10 mmol potassium, 10 mmol phosphate, 37.5 mmol sodium)	Sodium chloride 0.9%	250 mL bag	*Sodium* dihydrogen phosphate is preferred for phosphate replacement. See the WACHS Phosphate Supplementation Guideline for more information.

Table 2: Intravenous potassium products

Intravenous – High Concentration Products

Additional restrictions apply to the storage, access, prescribing, administration, monitoring of high-concentration intravenous potassium products as listed below.

HIGH CONCENTRATION INTRAVENOUS PRODUCTS (Restricted)			
Product	**Diluent**	**Volume**	**Notes**
Potassium chloride 10 mmol	-	10 mL ampoule	MUST be diluted before use. Exception applies to medical emergencies (see section 2.3) and in critical care settings that have WACHS/regional MTC endorsed guidelines supporting safe administration of undiluted potassium.
Potassium chloride 40 mmol	Sodium chloride 0.9%	100 mL pre-mixed bag	Critical care use only
Potassium dihydrogen phosphate 10 mmol	-	10 mL vial	MUST be diluted before use See the WACHS Phosphate Supplementation in Adults Guideline for more information
Potassium acetate 25 mmol	-	5 mL ampoule	MUST be diluted before use

Table 3: High concentration intravenous potassium products

2.2 Storage

Storage of high concentration potassium products:

- is restricted to the Pharmacy Department or any location approved by the regional MTC
- must be stored separately from other vials/ampoules/bags in an appropriately secure location (e.g. in a sealed, clearly marked, red container)

- must never be stored on imprest in a non-MTC approved clinical area/location, including resuscitation trolleys, or borrowed from other areas of the hospital unless on the direction of a pharmacist or nurse manager
- if a high concentration potassium product is required for a patient in a non-MTC approved clinical area, see section 2.6: Non-Standard Solutions for approval and supply requirements.

2.3 Prescribing requirements

Potassium supplements are to be administered **orally or enterally** wherever possible. Intravenous potassium replacement is indicated in patients who cannot receive it orally (e.g. nil by mouth), or when rapid replacement is required. Premixed potassium bags must be prescribed and used preferentially to diluted ampoules/vials.

In accordance with WACHS Medication Prescribing and Administration Policy, the minimum prescribing requirements are as follows:

- **Oral potassium** supplements are prescribed on the WA Hospital Medication Charts:
  - MR170A WA Hospital Medication Chart – Adult Short Stay
  - MR171 WA Hospital Medication Chart – Adult Long Stay
  - MR170D National Inpatient Medication Chart – Paediatric Short Stay
- **Intravenous potassium** orders must be prescribed on the fluid chart (MR176 Adult Intravenous Fluid Treatment Chart or MR176P WACHS Neonatal / Paediatric Intravenous Fluid Treatment Form) or other WACHS approved specialised chart. The medication order must specify the following:
  - **potassium formulation** – potassium salt (e.g. potassium chloride) must be specified and written in full (abbreviations not permitted)
  - **millimoles (mmol)** of potassium required (not grams)
  - **volume** and type of diluent required
  - the **rate** of administration expressed as millilitres per hour (mL/hour)
  - prescriber signature and printed name
  - date and time to start treatment
  - the medication order must never contain the words ‘stat’ or ‘bolus.’

2.4 Intravenous administration requirements

All infusions containing potassium must be administered via an infusion pump and continuous cardiac monitoring is required when the infusion rate is faster than 10 mmol/hour.
The minimum requirements are as follow:

- the **maximum rate** of potassium administration is:
  - 10 mmol/hour via a peripheral line (except in critical care areas under the direction of a consultant/senior medical practitioner)
  - up to 20 mmol/hour may be administered peripherally when required for treatment of specific conditions as instructed by a senior medical practitioner (e.g. for management of diabetic ketoacidosis)
  - 20 mmol/hour via a central line (rates more than 20 mmol/hour are potentially hazardous and are not permitted unless a medical emergency)
  - Potassium dihydrogen phosphate is usually given more slowly – refer to the Phosphate Supplementation Guideline for requirements.
- the **maximum concentration** of potassium for administration via a peripheral line is 40 mmol/L, except if using the 10 mmol potassium chloride in 100 mL mini bag.

For a concentration greater than 30 mmol/L, a central line is preferred to prevent phlebitis and patient discomfort.

2.5 Medical Emergencies

Intravenous potassium chloride prescribed as a rapid IV push or bolus, or > 20 mmol/hour must only be administered in **exceptional circumstances** (e.g. cardiac arrest) under the direction of the most senior medical practitioner available.

2.6 Non-Standard Solutions (non-premixed bag)

Under exceptional circumstances, the prescription and preparation of a non-standard solution of potassium is permitted after consultation with the **most senior** medical practitioner available. The name of the most senior medical practitioner must be documented on the medication chart order.

If the required potassium formulation is not imprested in the clinical area, supply must be arranged through the pharmacy or after-hours nurse manager by providing a copy of the medication chart order. Only the exact number of ampoules or vials required for the prescribed dose is to be supplied, with documentation of supply recorded (e.g. on a tracking sheet – refer to the High Concentration Potassium Product Tracking Sheet). Any unused ampoules/vials must be immediately returned.

To reduce the risk of adverse events due to prescribing and preparation errors:

- dilute with sodium chloride 0.9% when appropriate as it is the preferred diluent, and glucose may decrease serum potassium levels
- the solution must be fully inverted at least 10 times to ensure that the potassium is thoroughly mixed throughout the solution, unmixed bags have the potential of being extremely hazardous
- extra potassium must never be added to premixed bags
- potassium must not be added to an infusion bag once it has been hung for administration.

2.7 Clinical Monitoring

Oral/Enteral

All patients being treated with oral/enteral potassium for acute hypokalaemia should have at least daily serum potassium levels until they are stabilised within the normal therapeutic range.

Intravenous

The following monitoring and safety requirements must be observed when administering intravenous potassium:

- continuous cardiac monitoring is required when rate is faster than 10 mmol/hour
- monitor serum potassium daily as a minimum
- observe the intravenous site closely for signs of extravasation or phlebitis, especially when using hypertonic solutions, refer to:
    - WACHS Peripheral Intravenous Cannula (PIVC) Guideline

- WACHS Central Venous Access Device (CVAD) and Long Peripheral Venous Catheter (PVC) Management – Clinical Practice Standard
- MR179A WACHS Central Venous Access Device (CVAD) Insertion and Assessment Record
- MR179B WACHS Central Venous Access Device (CVAD) Insertion Site Assessment Continuation Sheet
- MR179C WACHS Central Venous Access Device (CVAD) Access/Dressings Continuation Sheet

3. Roles and Responsibilities

Regional Medicine and Therapeutics Committees are responsible for endorsing relevant storage requirements and guidelines supporting safe administration of undiluted potassium within critical care settings.

Pharmacists are responsible for providing clinical review of medicines per this guideline.

Pharmacy staff and **after hours nurse managers** are responsible for facilitating supply of high concentration potassium products in accordance with this procedure.

Prescribers are responsible for appropriate prescribing, monitoring and review of patients per this guideline.

Nurses/midwives are responsible for appropriate preparation and administration of medicines/therapies and monitoring of patients per this guideline.

All staff are required to comply with the directions in WACHS policies and procedures as per their roles and responsibilities. Guidelines are the recommended course of action for WACHS and staff are expected to use this information to guide practice. If staff are unsure which policies procedures and guidelines apply to their role or scope of practice, and/or are unsure of the application of directions they should consult their manager in the first instance.

4. Monitoring and Evaluation

Adverse events and clinical incidents relating to medications are to be reported via the approved clinical incident management system (CIMS) e.g. DATIX, and managed as per the WACHS Medication Prescribing and Administration Policy and the MP0122/19 Clinical Incident Management Policy. The WACHS Medication Safety Committee and regional Medicines and Therapeutics Committees reviews clinical incident data relevant to medications. CIMS involving potassium supplementation/management will be used to monitor and evaluate the effectiveness of this procedure.

This procedure will be reviewed as required to determine effectiveness, relevance and currency. At a minimum it will be reviewed every five years by the WACHS Medication Safety Committee.

5. References

Australian Commission of Safety and Quality in Health Care. High Risk Medication Resources Sydney 2023 [Accessed 26 September 2023].

Australian Commission on Safety and Quality in Health Care. Recommendation for terminology, abbreviations and symbols used in medicines documentation. A Rapid Literature Review. Sydney: ACSQHC; 2023.

Department of Health. Mandatory Standard of Intravenous Potassium. Western Australia 2020.

The Society of Hospital Pharmacists of Australia 2023. The Australian Injectable Drugs Handbook 9th Ed.

Yu A, Stubbs J. Hypophosphatemia: Evaluation and treatment. UpToDate. Updated Apr 27, 2022. Accessed September 26 2023. Hypophosphatemia: Evaluation and treatment – UpToDate (health.wa.gov.au)

6. Definitions

Term	Definition
Central line	A central line, also known as central venous catheter (CVC), is a long, flexible tube inserted into a large vein in the neck, chest, arm, or groin, to administer medications, fluids, blood products or nutrition directly into the central circulation.
Critical care areas	Critical care areas are high-acuity areas providing advanced medical care, such as Emergency Departments, High-Dependency Areas/Units, Intensive Care Units, Operating Theatres, and Post-Anaesthetic Care Units.
Extravasation	Extravasation refers to the accidental administration of intravenously infused medications into the extravascular space/tissue around the infusion sites, either by leakage, previous venipuncture or direct leakage from a mispositioned venous cannula.
Peripheral line	A peripheral line, also known as Peripheral Intravenous Catheter (PIVC), is a thin, flexible tube inserted into a peripheral vein, typically in the hand, arm or foot, to allow for the administration of fluids, medications or blood products directly into the bloodstream.
Prescribers	A prescriber is a health professionals authorised and competent to complete a medication order for administration.
Senior Medical Practitioner	A senior medical practitioner is a medical officer practising at a level of registrar, general practitioner (GP) (for district sites) or higher.

7. Document Summary

Coverage	WACHS-wide
Audience	Clinical staff
Records Management	Clinical: Health Record Management Policy
Related Legislation	*Health Services Act 2016* (WA) *Medicines and Poisons Act 2014* (WA) *Medicines and Poisons Regulations 2016 (WA)*
Related Mandatory Policies / Frameworks	• MP 0130/20 High Risk Medication Policy • Clinical Governance, Safety and Quality Policy Framework • Public Health Policy Framework
Related WACHS Policy Documents	• Adult Diabetic Ketoacidosis Guideline • Central Venous Access Devices (CVAD) and Long Peripheral Venous Catheter (PVC) Management - Clinical Practice Standard • High Risk Medications Procedure • Peripheral Intravenous Cannula (PIVC) Guideline • Phosphate Supplementation in Adults Guideline • Medication Prescribing and Administration Policy • Medication Handling and Accountability Policy
Other Related Documents	• High Concentration Potassium Product Tracking Sheet • WNHS Neonatal Medication Protocols - Potassium Chloride - Neonatal. • PCH Potassium Chloride Monograph - Paediatric. • WNHS Obstetrics and Gynaecology Medication Guidelines - Potassium Chloride - Obstetric
Related Forms	• MR170A WA Hospital Medication Chart – Adult Short Stay • MR170D National Inpatient Medication Chart - Paediatric Short Stay • MR171 WA Hospital Medication Chart – Adult Long Stay • MR176 Intravenous Fluid Treatment • MR176P WACHS Neonatal / Paediatric Intravenous Fluid Treatment Form • MR179A WACHS Central Venous Access Device (CVAD) Insertion and Assessment Record • MR179B WACHS Central Venous Access Device (CVAD) Insertion Site Assessment Continuation Sheet • MR179C WACHS Central Venous Access Device (CVAD) Access/Dressings Continuation Sheet
Related Training	Available from MyLearning: • High Risk Medications: Introduction (HRMINT EL2
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 2649

National Safety and Quality Health Service (NSQHS) Standards	1.03, 1.07, 1.27, 4.01, 4.04, 4.10, 4.13, 4.14, 4.15
Aged Care Quality Standards	Nil
Chief Psychiatrist's Standards for Clinical Care	Nil
Other Standards	Nil

8. Document Control

Version	Published date	Current from	Summary of changes
3.00	27 November 2025	27 November 2025	• change of title including change from policy to procedure • preference for potassium dihydrogen phosphate as a premixed bag for safety • maximum recommended rate and concentration specified • procedure for storage and ordering concentrated potassium products (ampoules/vials) and new tracking sheet to track movement of these products

9. Approval

Policy Owner	Executive Director Clinical Excellence
Co-approver	Executive Director Nursing and Midwifery
Contact	WACHS Chief Pharmacist
Business Unit	Pharmacy Services
EDRMS #	ED-CO-19-741

This document can be made available in alternative formats on request.