PARENTERAL POTASSIUM USE AND ADMINISTRATION POLICY

POLICY

Reference	CPG-MM/P-PP		
Approving Body	Drugs and therapeutics committee		
Date Approved	16/8/2021		
For publication to external SFH website	**Positive confirmation received from the approving body that the content does not risk the safety of patients or the public:**		
	YES	**NO**	**N/A**
	X		
Issue Date	31st October 2021		
Version	5.0		
Summary of Changes from Previous Version	• New maximum rate for infusing potassium. • No non-standard products to be used at ward level • Emphasis on need for high strength potassium to be administered immediately		
Supersedes	v4.0, Issued 25th November 2017 to Review Date July 2021 (ext2)		
Document Category	• Clinical		
Consultation Undertaken	• Medicine Divisonal governance meeting. • Womens and Childrens Divisional governance meeting • Emails sent out to Admissions and Emergency care division and Surgery division- no reply assumes no issues. • Medicines safety pharmacists • Aseptic dispensing unit lead pharmacists and technician.		
Date of Completion of Equality Impact Assessment	7th June 2021		
Date of Environmental Impact Assessment (if applicable)	7th June 2021		
Legal and/or Accreditation Implications	*List all legal / accreditation implications*		
Target Audience	Trustwide		
Review Date	August 2024		
Sponsor (Position)	Chief Pharmacist		
Author (Position & Name)	v3.0, Thomas Bell – Lead Pharmacist – Surgery and Critical Care v4.0, Updated by Rebecca Parnell – Deputy Divisional Lead Pharmacist – Surgery and Critical Care		
Lead Division/ Directorate	Diagnostics and Outpatients		
Lead Specialty/ Service/ Department	Medicines Management (Pharmacy)		
Position of Person able to provide Further Guidance/Information	Lead Pharmacist, Surgery and Critical Care		

Associated Documents/ Information	**Date Associated Documents/ Information was reviewed**
Guidelines for potassium replacement in adult critical care	
Template control	June 2020

CONTENTS

1.0 INTRODUCTION

In July 2002 the National Patient Safety Agency (NPSA) issued an alert requiring Trusts to address a number of issues relating to the handling of concentrated or strong potassium injections. This follows a number of instances worldwide in which patients have suffered or died as a result of selection, preparation or administration errors.

In 2012 the Department of Health issued a list of Never Events. Never Events are serious incidents that are wholly preventable. All healthcare providers should have implemented the national guidance or safety recommendations available that provide strong systemic protective barriers. Administration errors with concentrated potassium are one of the Never Events. A revised Never Event list was launched by NHS England 1st April 2015 and the definition changed to 'Mis-selection of a strong potassium containing solution'. Mis-selection is defined as 'when a patient intravenously receives a strong potassium solution rather than an intended different medication'.

Strong potassium solutions (including potassium chloride concentrate) are defined as solutions of potassium greater than or equal to 10% potassium (1.3mmol/ml potassium chloride). As such these solutions usually require dilution or manipulation prior to administration. Examples of strong potassium solutions stocked (or potentially stocked) at Sherwood Forest Hospitals NHS Foundation Trust are:

- Potassium chloride 7.5% (0.75g potassium in 10ml) – 1mmol per ml
- Potassium chloride 10% (1g potassium in 10ml)-1.3mmol per ml
- Potassium chloride 15% (1.5g potassium in 10ml) 2mmol per ml
- Potassium chloride 20% (1g potassium in 5ml) 2.6mmol per ml
- Potassium acetate of any concentration.
- Potassium hydrogen phosphate and potassium di-hydrogen phosphate of any concentration.

Ready-to-administer concentrated potassium products are defined as products with potassium content greater than 80mmol/L. They are still considered to be concentrated potassium products but supplied in a presentation suitable for administration without further manipulation. Currently the only ready-to-administer concentrated potassium product available in this Trust is as follows:

- Potassium chloride ready to use syringe 50mmol in 50ml

All other potassium containing infusions used in the Trust are supplied as ready-diluted products. A full list of such commercially available products for use in this trust can be found in Appendix A. These products are not subject to any additional controls in relation to storage or supply.

Further useful information relating to intravenous potassium prescribing can be found in Appendix B. This and other information relating to potassium will be available on the Trust intranet.

2.0 POLICY STATMENT

The purpose of this policy is to ensure the safe and effective handling of potassium containing products within the Trust.

3.0 DEFINITIONS/ ABBREVIATIONS

SFHFT	Sherwood Forest Hospitals Foundation Trust
Staff	SFHFT employees and those managed by a third party
Strong potassium solutions	Strong potassium solutions (including potassium chloride concentrate) are defined as solutions of potassium greater than or equal to 10% potassium (1.3mmol/ml potassium chloride). As such these solutions usually require dilution or manipulation prior to administration
Ready-to-administer concentrated potassium products	Ready-to-administer concentrated potassium products are defined as products with potassium content greater than 80mmol/L. They are still considered to be concentrated potassium products but supplied in a presentation suitable for administration without further manipulation.
ADU	Aseptic Dispensing Unit
CD	Controlled Drug
ODP	Operating Department Practitioner

4.0 ROLES AND RESPONSIBILITIES

All Sherwood Forest Hospitals Staff

All staff involved in the prescribing, supply and administration of intravenous potassium have a responsibility to comply with this policy.

Ward / Department Managers

It is the responsibility of ward / department managers to ensure that their staff are made aware of this policy. It must be included in local induction programmes.

Prescribers

It is the responsibility of medical staff to follow this policy when advising on or prescribing potassium solutions.

Nursing Staff

Nurses administering intravenous potassium solutions as part of their practice in clinical areas are responsible for ensuring that they maintain the necessary skills, knowledge and clinical competence in relation to their area of practice.

Pharmacy Staff
Pharmacy staff supplying, advising or clinically checking prescriptions for intravenous potassium solutions must ensure that prescriptions are compliant with this policy.

5.0 APPROVAL

- Consulted in: Medicine Divisonal governance meeting,
- Consulted in: Womens and Childrens Divisional governance meeting
- Emails sent out to Admissions and Emergency care division and Surgery division- no reply assumes no issues.
- Reviewed by Medicines safety pharmacists- including a search of Datix submitted in last 12 months relating to potassium and also read and reviewed policy.
- Trust DTC approval 13/8/2021

6.0 DOCUMENT REQUIREMENTS (POLICY NARRATIVE)

6.1 Storage

Strong potassium solutions of all types will ONLY be stored in the following areas, at KING'S MILL HOSPITAL:

- Main Dispensary, Pharmacy Department
- Aseptic Dispensing Unit, Pharmacy Department
- Neonatal Unit

Ready-to-administer concentrated potassium syringes 50mmol in 50ml will be stored in the following clinical areas only:

- Integrated Critical Care Unit (ICCU)
- Ward 23 (for Coronary Care beds ONLY)

This ready to use product must be used in line with locally approved protocols.

Both strong potassium solutions and ready-to-administer concentrated potassium syringes must be stored in a controlled drugs cupboard and will be treated as a schedule 2 CD. Hence, ordering, receipt, storage, administration and recording will follow the pattern for CDs. Similarly the Pharmacy Department will treat these injections as CDs for storage, supply and return purposes.

A review of strong potassium solutions use has indicated that there is NO requirement for this product to be available at Mansfield Community Hospital, at Newark Hospital, or other Trust sites serviced by Pharmacy. Specific approval must be obtained from the Chief Pharmacist for storage in other areas.

6.2 Prescription

Ready-prepared commercially available potassium containing solutions for intravenous administration should be used wherever possible (see appendix A)

Ready-to-administer concentrated potassium syringes must be prescribed in line with locally approved protocols.

6.3 Supply

Due to the risk of inadvertent administration of strong potassium solutions due to mis-selection the Trust has introduced ready-to-administer concentrated potassium syringes where possible. Supplies of strong potassium solutions and ready-to-administer concentrated potassium syringes will be made to wards and departments as per the CD procedure i.e. orders will be filled against written requisitions in the appropriate CD requisition book.

Strong potassium solutions will be labelled to indicate that the solution must be diluted prior to administration or, in the case of ready-to-administer concentrated potassium syringes “for central administration only”.

As with other CDs, strong potassium solutions and ready-to-administer concentrated potassium syringes must never be supplied from one ward to another ward.

Supplies to areas that do not routinely stock strong potassium solutions or ready-to-administer concentrated potassium syringes will only be made against a written prescription. A Pharmacist must first screen the prescription before a supply may be made and hence the prescription chart must be seen either at ward level, or within the dispensary. A supply cannot be made in anticipation of potential future use for any patient. Supplies can only be made to fulfil prescriptions already written.

6.4 Return to Pharmacy

In situations where supplies of strong potassium solutions or ready-to-administer concentrated potassium syringes have been made to enable administration in areas where the injections are not normally stocked, the product should be returned promptly to Pharmacy when no longer needed or as soon as the patient leaves that area. The returns process will follow that of CDs as outlined in the Medicines Policy.

6.5 Supply Out of Hours

A Pharmacist can be contacted at all times outside of Pharmacy working hours.

A wide range of potassium-containing infusions are available on wards throughout the Trust. See intranet for selecting a suitable pre-made product.

In out-of-hours emergency situations, the supply of a strong potassium solutions or ready-to-administer concentrated potassium syringes from one ward to another is strictly prohibited. The on-call Pharmacist should be contacted if a supply is required who will assess the request and supply if appropriate as above.

6.6 Preparation of Intravenous Infusions Using Strong Potassium Solutions

Commercially prepared potassium containing solutions should always be used in preference to adding potassium to another infusion bag.

Ideally infusions that require additional potassium chloride will be prepared within the ADU at King's Mill Hospital. This service is subject to capacity limits and may not be readily available, but should be considered in preference to manipulation of strong potassium solutions at ward or department level if capacity allows.

The process of preparing an infusion containing a concentrated potassium injection must include the following steps and a second registered practitioner must check each step:

- A check that the correct product has been selected.
- A check that the correct dosage dilution has been used.
- A check that the mixing of the potassium injection into an infusion bag is adequate.
- A check that the labelling of the prepared injection/infusion is correct.
- A visual inspection to identify foreign bodies.
- Co-signatures on the IV-additive label.
- Once the injection/infusion has been prepared it should be immediately administered and any excess concentrated potassium discarded.

Both practitioners must be registered members of nursing, medical staff, or ODPs and known to be competent to prepare these intravenous infusions.

Both practitioners involved MUST be a permanent member of SFHT staff and, for nurses, is approved to administer intravenous medicines.

The only exception to this is agency staff working on the Critical Care Unit who have been trained in line with the unit procedure for potassium replacement in adults.

6.7 Administration of Solutions Containing Potassium

There are a number of standard checks required for administration of any intravenous medicine; these are described in the Trust policies and procedures for the preparation and administration of intravenous bolus medicines and fluids.

7.0…MONITORING COMPLIANCE AND EFFECTIVENESS

Pharmacists will screen prescriptions to ensure compliance. Any deficiencies will be dealt with on a local basis and reported on the Trust electronic incident reporting system (DATIX).

Checks of storage will be undertaken by Pharmacy staff as part of routine Controlled Drugs audits. Monitoring of the use of strong potassium solutions will also form part of the Medicines Safety Group metrics.

All breaches of this policy MUST be reported on the Trust electronic incident reporting system (DATIX). Mis-selection of a strong potassium containing solution is considered a NEVER EVENT so any occurrence or near miss should be escalated and reported appropriately.

Minimum Requirement to be Monitored **(WHAT – element of compliance or effectiveness within the document will be monitored)**	**Responsible Individual** **(WHO – is going to monitor this element)**	**Process for Monitoring e.g. Audit** **(HOW – will this element be monitored (method used))**	**Frequency of Monitoring** **(WHEN – will this element be monitored (frequency/ how often))**	**Responsible Individual or Committee/ Group for Review of Results** **(WHERE – Which individual/ committee or group will this be reported to, in what format (eg verbal, formal report etc) and by who)**
Medication safety incidents related to strong potassium containing solutions	Medicines Safety Officer	DATIX review and escalation	DAILY review	Pharmacy Clinical Governance (monthly)
Issue of strong potassium solutions	Medicines Safety Officer	Medicines Safety Group metrics	MONTHLY	Medicines Safety Group.

8.0 TRAINING AND IMPLEMENTATION

The risks associated with concentrated potassium injections must be highlighted in "Intravenous Injection Training" for all staff involved in the medication process. The specific areas that must be covered are:

- Storage
- Prescribing
- Preparation
- Administration

The same areas must be covered in any specific staff training for Intravenous Medicine Preparation and Administration.

This guideline must be brought to the attention of all relevant locum and agency staff doctors as part of their core induction schemes.

All Pharmacy staff involved in supplying concentrated potassium injections must be trained on this policy during the induction period.

9.0 IMPACT ASSESSMENTS

- This document has been subject to an Equality Impact Assessment, see completed form at Appendix C
- This document has been subject to an Environmental Impact Assessment, see completed form at Appendix D

10.0 EVIDENCE BASE (Relevant Legislation/ National Guidance) AND RELATED SFHFT DOCUMENTS

Evidence Base:

- NPSA Patient Safety Alert: Potassium Chloride Concentrate Solution July 2002
- Never Events List 2015/2016: NHS England

References:

- https://bnf.nice.org.uk/drug/potassium-chloride.html- accessed 7/6/2021How should intravenous (IV) potassium chloride be administered in adults? – SPS - Specialist Pharmacy Service – The first stop for professional medicines advice

Related SFHFT Documents:

- SFHFT Medicines Policy
- IV medication and fluid therapy administration through a peripheral cannula policy
- IV Fluid therapy management in adult patients in hospital policy

11.0 KEYWORDS

KCL strong potassium

12.0 APPENDICES

Appendix A – Potassium-containing infusions stocked at SFHT
Appendix B – Useful information for prescribing potassium
Appendix C – Equality Impact Assessment Form
Appendix D – Environmental Impact Assessment Form

Appendix A – Potassium-containing infusions stocked at SFHT

The following solutions are available either at ward level or via Pharmacy.

Volume	Sodium Chloride	Glucose	Potassium Chloride	mmol potassium per bag	mmol potassium per litre
500ml	-	10%	0.15%	10	20
1000ml	0.9%	-	0.15%	20	20
500ml	-	5%	0.15%	10	20
500ml	0.45%	5%	0.15%	10	20
500ml	0.9%	5%	0.15%	10	20
500ml	0.9%	-	0.30%	20	40
1000ml	0.9%	-	0.30%	40	40
500ml	-	5%	0.30%	20	40
1000ml	-	5%	0.30%	40	40
500ml	0.18%	4%	0.30%	20	40
1000ml	0.18%	4%	0.30%	40	40
500ml	0.45%	5%	0.30%	20	40
500ml	0.9%	5%	0.30%	20	40
500ml	0.9%	-	0.60%	40	80
500ml	-	5%	0.60%	40	80

Appendix B – Useful information for prescribing potassium

Prescribing for ADULTS

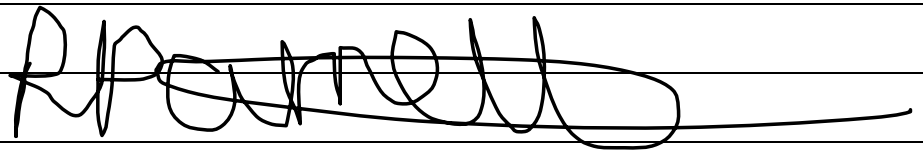
- Always prescribe one of the available solutions of potassium as listed in appendix A.
- Potassium Chloride is **always** given by intravenous infusion, **NEVER** by bolus injection.
- **Usual Maximum Concentration** via a peripheral vein is **40mmol per litre**. However **concentrations up to 80mmol per litre** can be infused peripherally into a large vein. (Higher concentrations are too irritant)
- **The rate of administration should not normally exceed 10mmol per hour**,
- Administration rates above 20mmol per hour require cardiac monitoring and frequent review.
- Higher concentrations but **NOT HIGHER RATES** may be administered via a central line

Prescribing for CHILDREN

- Always prescribe one of the available solutions of potassium as listed in appendix A.
- Potassium Chloride is **always** given by intravenous infusion, **NEVER** by bolus injection.
- **Maximum Concentration** via a peripheral vein is usually **40mmol per litre** (Concentrations of up to 80mmol/litre may be used after discussion with senior medical staff)
- **Maximum rate is 0.2mmol/kg/hour**. Higher rates may be justified in the intensive care setting under specialist advice.
- Higher concentrations but **NOT HIGHER RATES** may be administered via a central line

APPENDIX C – EQUALITY IMPACT ASSESSMENT FORM (EQIA)

Name of service/policy/procedure being reviewed: Parenteral Potassium Use and Administration Policy			
New or existing service/policy/procedure: Existing			
Date of Assessment: 7th June 2021			
For the service/policy/procedure and its implementation answer the questions a – c below against each characteristic (if relevant consider breaking the policy or implementation down into areas)			
Protected Characteristic	**a) Using data and supporting information, what issues, needs or barriers could the protected characteristic groups' experience? For example, are there any known health inequality or access issues to consider?**	**b) What is already in place in the policy or its implementation to address any inequalities or barriers to access including under representation at clinics, screening?**	**c) Please state any barriers that still need to be addressed and any proposed actions to eliminate inequality**
The area of policy or its implementation being assessed:			
Race and Ethnicity	None	None	None
Gender	None	None	None
Age	None	None	None
Religion	None	None	None
Disability	None	None	None
Sexuality	None	None	None
Pregnancy and Maternity	None	None	None
Gender Reassignment	None	None	None
Marriage and Civil Partnership	None	None	None
Socio-Economic Factors (i.e. living in a poorer neighbourhood / social deprivation)	None	None	None
What consultation with protected characteristic groups including patient groups have you carried out? • Not Applicable			
What data or information did you use in support of this EqIA? • Not Applicable			

As far as you are aware are there any Human Rights issues be taken into account such as arising from surveys, questionnaires, comments, concerns, complaints or compliments? • None
Level of impact From the information provided above and following EQIA guidance document Guidance on how to complete an EIA (click here), please indicate the perceived level of impact: High Level of Impact/Medium Level of Impact/Low Level of Impact *(Delete as appropriate)* For high or medium levels of impact, please forward a copy of this form to the HR Secretaries for inclusion at the next Diversity and Inclusivity meeting.
Name of Responsible Person undertaking this assessment: Rebecca Parnell
Signature: 
Date: 7th June 2021

APPENDIX D – ENVIRONMENTAL IMPACT ASSESSMENT

The purpose of an environmental impact assessment is to identify the environmental impact, assess the significance of the consequences and, if required, reduce and mitigate the effect by either, a) amend the policy b) implement mitigating actions.

Area of impact	Environmental Risk/Impacts to consider	Yes/No	Action Taken (where necessary)
Waste and materials	• Is the policy encouraging using more materials/supplies? • Is the policy likely to increase the waste produced? • Does the policy fail to utilise opportunities for introduction/replacement of materials that can be recycled?	No	
Soil/Land	• Is the policy likely to promote the use of substances dangerous to the land if released? (e.g. lubricants, liquid chemicals) • Does the policy fail to consider the need to provide adequate containment for these substances? (For example bunded containers, etc.)	No	
Water	• Is the policy likely to result in an increase of water usage? (estimate quantities) • Is the policy likely to result in water being polluted? (e.g. dangerous chemicals being introduced in the water) • Does the policy fail to include a mitigating procedure? (e.g. modify procedure to prevent water from being polluted; polluted water containment for adequate disposal)	No	
Air	• Is the policy likely to result in the introduction of procedures and equipment with resulting emissions to air? (For example use of a furnaces; combustion of fuels, emission or particles to the atmosphere, etc.) • Does the policy fail to include a procedure to mitigate the effects? • Does the policy fail to require compliance with the limits of emission imposed by the relevant regulations?	No	
Energy	• Does the policy result in an increase in energy consumption levels in the Trust? (estimate quantities)	No	
Nuisances	• Would the policy result in the creation of nuisances such as noise or odour (for staff, patients, visitors, neighbours and other relevant stakeholders)?	No	