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# PHARMACY DEPARTMENT NOTTINGHAM CITY HOSPITAL NHS TRUST

# PROCEDURE FOR HANDLING OF STRONG POTASSIUM ON DESIGNATED WARDS / DEPTS WITHIN NOTTINGHAM CITY HOSPITAL NHS TRUST

## OBJECTIVES

- 1. To ensure that the Trust implements the actions listed in the NPSA alert on potassium issued July 2002.
- 2. To ensure that the Trust has safe systems in place for:
  - 2.1. The storage and handling of potassium chloride concentrate and other strong potassium solutions.
  - 2.2. The prescribing of solutions containing potassium.
  - 2.3. The preparation of dilute solutions containing potassium.
  - 2.4. The checking of strong potassium solution in clinical areas.

## **PROCEDURE:**

# 1. ORDERING & RECEIPT OF POTASSIUM CHLORIDE CONCENTRATE & OTHER STRONG POTASSIUM SOLUTIONS

- 1.1. Potassium chloride concentrate solutions and other strong potassium chloride solutions will only be supplied to the following areas within the Trust:
  - 1.1.1. Adult Intensive Care (AICU)
  - 1.1.2. High Dependency Unit (HDU)
  - 1.1.3. Cardiac Intensive Care (CICU)
  - 1.1.4. Coronary Care Unit (CCU)
  - 1.1.5. Cardiac Theatres (Theatre 4)
  - 1.1.6. Barclay Thoracic Unit (BTU)
  - 1.1.7. Neonatal Intensive Care (NNU)
  - 1.1.8. Paediatric Intensive Care (Linby)
  - 1.1.9. Labour Suite are authorised to request potassium chloride 15% injection (2mmol/ml) on a named patient basis for intra-cardiac terminations only.

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- 1.1.10. Lambley ward are authorised to request potassium chloride 15% injection (2mmol/ml) on a named patient basis for addition to peritoneal dialysis bags.
- 1.2. The transfer of stock between clinical areas is not allowed. Out of hours supplies may be obtained through the 'oncall' pharmacist (bleep via switchboard.
- 1.3. All supplies for potassium concentrate solutions (strong potassium chloride injection) and other strong potassium chloride solutions (potassium dihydrogen phosphate) must be requested through the **MAIN PHARMACY DISPENSARY** located on the North Corridor. Orders for potassium can no longer be processed through the Pharmacy Store.
- 1.4. All wards and departments who are authorised to stock strong potassium solutions (refer to section 1.1) will be given an official Potassium Order Book. Further order books can be obtained through the Main Pharmacy.
- 1.5. Potassium Chloride concentrate solutions will only be supplied from pharmacy against a correctly completed order written in an official Potassium Order Book (denoted by red label on front cover) signed by a registered nurse. The ward CD book must <u>not</u> be used for ordering potassium.
- 1.6. The quantity of potassium ordered for stock should be in multiples of 'original packs'. Sufficient stock should be ordered at one time to avoid repeat ordering of small quantities, especially over weekends.
- 1.7. Potassium Chloride concentrate solutions will either be delivered from the pharmacy by a porter or collected by a messenger from the ward or department, who is aware of the extra responsibility. The messenger must sign the 'accepted for delivery' section on the potassium order requisition and any other record required by the pharmacy dept.
- 1.8. Upon receipt a Registered nurse must:
  - 1.8.1. Ensure the supply matches the order and sign to confirm receipt on the requisition. Report any discrepancies to the Pharmacy Department immediately.
  - 1.8.2. Record the receipt of the potassium on the designated 'potassium' page in the ward CD register. This entry must be witnessed by an appropriate checker. Those wards that have a high usage of potassium e.g. AICU may wish to have a separate register solely for recording potassium. This can be arranged through their ward pharmacist.

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1.8.3. Store the potassium in the ward CD cupboard and lock it immediately in the presence of a witness.

# 2. CHECKING USE OF STRONG POTASSIUM SOLUTIONS IN CLINICAL AREAS

- 2.1. All intravenous & dialysis solutions prepared from potassium chloride concentrate solution and other strong potassium solutions must be checked by **two persons**, one of whom must be a registered nurse. Refer to the current edition of the Nottingham City Hospital Drug Custody and Administration Code of Practice. Another practitioner must also second check all potassium solutions prepared by a Doctor
  - 2.1.1. In cardiac theatres, potassium solutions may be prepared by a Clinical Perfusionist and checked by an Anaesthetist
- 2.2. The second practitioner should check both during the preparation and again prior to administration for:
  - 2.2.1. Correct product
  - 2.2.2. Dosage dilution
  - 2.2.3. Mixing
  - 2.2.4. Labelling

# 3. TRANSFER OF PATIENTS TO WARDS THAT DO NOT STOCK POTASSIUM CONCENTRATE SOLUTIONS

- 3.1. Potassium chloride concentrate solutions and other strong potassium chloride solutions are restricted within the Trust to the areas listed in section 1.1.
- 3.2. The Pharmacy department at Nottingham City Hospital does **NOT** provide an IV additive service. Potassium additions to infusion bags should be avoided and commercially prepared ready to use, diluted products should be used wherever possible.
- 3.3. Before a patient is transferred to another ward, any prescription for solutions containing potassium must be reviewed to ensure that the receiving ward can continue the appropriate care using standard potassium infusion bags. Refer to list in Appendix 1

# FURTHER INFORMATION FROM:

Director of Pharmacy ext 47198

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## **GLOSSARY**

# 1. NPSA

National Patient Safety Agency

# 2. Potassium Chloride concentrate solutions

Potassium Chloride Injection 15% 1.5g in 10ml (2mmol/ml)

Potassium Chloride Injection 20% 1g in 5ml (2.7mmol/ml)

# 3. Other strong potassium solutions

potassium dihydrogen phosphate 13.6% 50ml (1mmol/ml)

Written b	y: Rache	el Medcalf	Title: Senior Pharmacist				
Date produced: Oct 2002							
Checked	by: Sarah	n Pacey	Title: Senior Pharmacist Medicine's Management				
Review date: Oct 2005							
<b>References (if appropriate):</b> NPSA Alert July 2002 Policy on use of Strong Potassium Solutions at Nottingham City Hospital 10/02							
REVIEW RECORD							
DATE	ISSUE NUMBER	REVIEWED BY	DESCRIPTION OF CHANGES (IF ANY)				

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## DISTRIBUTION RECORD for: PROCEDURE FOR HANDLING OF STRONG POTASSIUM ON DESIGNATED WARDS / DEPTS WITHIN NOTTINGHAM CITY HOSPITAL NHS TRUST

DATE	NAME	DEPT	RECEIVED
10/02	Procedure file	Main Dispensary	
10/02	Procedure file	Satellite Dispensary	
10/02	Procedure file	Medicines Information	
10/02	Procedure file	Clinical Pharmacy	
10/02	Procedure file	Residents	
10/02	Procedure file	Risk Management	
10/02	Sarah Pacey	Senior Pharmacist, Medicines Management	
10/02	Ward Manager	AICU	
10/02	Ward Manager	HDU	
10/02	Ward Manager	CICU	
10/02	Ward Manager	CCU	
10/02	Ward Manager	Theatre 4	
10/02	Ward Manager	BTU	
10/02	Ward Manager	NNU	
10/02	Ward Manager	Linby	
10/02	Ward Manager	Labour Suite	
10/02	Ward Manager	Lambley Ward	
10/02	Director of Nursing		
10/02	Divisional Nurses		

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## POTASSIUM REPLACEMENT IN HYPOKALAEMIA

**Hypokalaemia is defined as a serum potassium below 3.5mmol/Litre**. A low serum potassium can affect neuromuscular, cardiovascular and renal function. Symptoms usually become apparent once serum potassium levels fall below 2.5mmol/Litre. However, dysrhythmia can develop when serum potassium falls below 3.5mmol/Litre especially in post-surgery patients.

## Oral replacement

Whenever possible, potassium replacement should be by the oral route. In cases of established potassium depletion, **dose of up to 100-200mmol per day may be required**, soluble formulations being the most suitable (Sando K contains 12mmol potassium per tablet). The modified release forms of potassium (slow K), should be avoided at they possess a lower potassium content and have been associated with a risk of oesophageal ulceration. Extreme caution should be exercised in providing potassium replacement in any patient taking potassium-sparing agents (e.g. amiloride).

The dose of oral potassium intake is usually governed by patient acceptability, rather than a maximum daily ceiling. Sando K 2 tablets tds (72 mmols) is a commonly employed regimen in cases of proven depletion.

## Parenteral replacement

If the oral route is not suitable (e.g. strict NBM, extreme depletion), the parenteral (IV) route may be employed. The usual recommended peripheral rate of intravenous potassium administration is 10-20mmol/hr, but in urgent cases, 40mmol/hr may be given. It is advisable to use ECG monitoring if rates in excess of 10mmol/hr are given, but this measure may only be appropriate if the ward personnel possess ECG interpretation skills. The serum potassium should be checked after every 80mmol of potassium has been delivered.

The maximum daily replacement should not generally exceed 200-300mmol, (3mmol/kg/day).

The maximum recommended infusion concentration peripherally is 40mmol/Litre but patients may be able to tolerate up to 80mmol/Litre without undue phlebitis occurring.

NB: Care must be taken not to overload the patient with fluid when attempting parenteral potassium replacement. Excessive use of dextrose solutions should be avoided to reduce the risk of dilutional hyponatraemia.

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## Availability

The pharmacy department does not provide an IV additive service. **Potassium** chloride 15% (2mmol/ml), 10ml ampoules are only stocked in restricted specialist areas (stored in CD cupboards). Whenever potassium is added to an infusion bag, the contents must be thoroughly agitated to prevent pooling of potassium at the base of the bag. The transfer of stock between wards is not allowed. In all other areas of the hospital, potassium solutions for intravenous administration or dialysis must be prescribed as standard, ready diluted bags. The following standard infusion bags containing potassium are stocked in pharmacy:

Fluid	Potassium	Mmol	volume
Sodium Chloride 0.9%	Potassium Chloride	10	500ml
Sodium Chloride 0.9%	Potassium Chloride	20	1000ml
Sodium Chloride 0.9%	Potassium Chloride	40	1000ml
Sodium Chloride 0.9%	Potassium Chloride	60	1000ml
Sodium Chloride 0.9%	Potassium Chloride	80	1000ml
Sodium Chloride 0.9%	Potassium Chloride	40	500ml
Sodium Chloride 0.9%	Potassium Chloride	40	100ml
Dextrose 5 %	Potassium Chloride	10	500ml
Dextrose 5 %	Potassium Chloride	20	1000ml
Dextrose 5 %	Potassium Chloride	40	1000ml
Dextrose 5%	Potassium Chloride	40	500ml
Dextrose 5%	Potassium Chloride	40	100ml
Dextrose 10%	Potassium Chloride	10	500ml
Dextrose 4%Saline 0.18%	Potassium Chloride	10	500ml
Dextrose 4%Saline 0.18%	Potassium Chloride	20	1000ml
Dextrose 4%Saline 0.18%	Potassium Chloride	40	1000ml
Dextrose 4%Saline 0.18%	Potassium Chloride	20	500ml
Dextrose 5%Saline 0.45%	Potassium Chloride	20	500ml
Dextrose 5%Saline 0.45%	Potassium Chloride	10	500ml

The above guidelines are applicable to the routine ward setting and it should be emphasised that specialist units may employ alternative administration methods, especially when central IV access is available.

Pharmacy Department,

Date produced: Oct 2002

**Review Oct 2005**