

Purpose of this procedure:

A National Patient Safety Agency Alert, July 2002, [NPSA alert](#) was developed following several incidents of inappropriate administration of concentrated potassium chloride solutions. They occurred due to mistaken use for reconstitution or dilution of intravenous injections, and due to inadequate mixing during addition to infusion solutions.

The Procedure

- 1.0 The alert sets out action required by the NHS to reduce the risk of accidental overdose arising from the use of concentrated potassium solutions.
- 2.0 Concentrated potassium solutions are solutions that contain -
 - 10% potassium chloride (approximately 1.3mmol potassium per mL)
 - 15% potassium chloride (approximately 2.0mmol potassium per mL)
 - 20% potassium chloride (approximately 2.6mmol potassium per mL)
 - Potassium hydrogen phosphate solutions in ampoules and vials
 - Potassium dihydrogen phosphate solutions in ampoules in vials.
 - Potassium acid phosphate (13.6%) 10mls
- 3.0 Wherever possible, intravenous potassium solutions should be prescribed in concentrations that are available from the pharmacy in ready-to-use solutions, i.e. requiring no further dilution before administration.
- 4.0 More than one ready to use preparation may be able to be administered consecutively to avoid using concentrated potassium solutions.
- 5.0 Concentrated potassium solutions should only be stored in wards, theatres, and other clinical areas where their use is justified because:
 - the ready-to-use diluted solutions that are available from pharmacy are not appropriate, and
 - they need to be available for urgent use

- 6.0 Concentrated potassium solutions should be stored and handled in wards, theatres and other clinical areas in the same way as controlled drugs, that is:
- they are ordered from pharmacy using a controlled drug order form
 - they are stored in the controlled drug cupboard
 - records of receipt, administration and destruction are maintained in the controlled drug record book (register)
 - stocks are checked and reconciled on a daily basis by nurses
 - records are checked every 4 months by a pharmacist or pharmacy technician
- 7.0 Concentrated potassium solutions should not be borrowed or transferred between wards, theatres and other clinical areas. They must always be obtained directly from the pharmacy.
- 8.0 Concentrated potassium solutions should only be handled by appropriately trained registered practitioners who are competent in their use. [Practitioners authorised to administer medicines \(nhslothian.scot\)](http://nhslothian.scot)
- 9.0 Infusions involving the addition of concentrated potassium solutions should be prepared using a procedure that:
- avoids the risk of pooling and incomplete distribution, and
 - incorporates an independent check by a second practitioner for all aspects of the preparation, set up and start of administration.
- 10.0 Infusions prepared in wards, theatres and other clinical areas should be used immediately and not stored for use later.
- 11.0 Procedure for adding concentrated potassium solution to an infusion fluid.
- Processes must always be in place to check if a ready-to-use potassium preparation is available. More than one ready to use preparation may be able to be administered consecutively to avoid using concentrated potassium solutions.
 - Ensure that an independent practitioner checks the following before the concentrated potassium solution is added to the infusion bag.
 - i. the calculation is correct to produce the final concentration required
 - ii. the correct infusion fluid has been selected
 - iii. the correct additive solution has been selected
 - iv. the correct volume has been drawn up
 - v. the additive label has been completed correctly.
 - vi. the route of administration, peripheral versus central administration is appropriate for the concentration of the potassium solution prepared.
 - Never inject concentrated potassium solution into a hanging bag.
 - Hold the additive port of the infusion bag uppermost.
 - Place the bag on a flat surface and inject the concentrated potassium downwards into the bag.

- Mix the contents by inverting the bag at least 5 times. Do not attempt to mix the contents by repeated squeezing of the bag – this is not effective.
- Administer the infusion to the patient immediately. Do not store it for use later. If it is not used immediately, dispose of the contents and prepare a fresh bag when required.
- Ensure that an appropriately trained independent registered practitioner checks.
 - i. the prescription to ensure that it is correct for the patient
 - ii. the infusion label to ensure it matches the prescription
 - iii. the identity of the patient
 - iv. the set-up of the infusion device
 - v. that administration is commenced correctly.
 - vi. the administration guidance is followed correctly.

Associated materials/references:

[Safe Use of Medicines Policy \(nhslothian.scot\)](#)

[Practitioners authorised to administer medicines \(nhslothian.scot\)](#)

[Administration of medicines in hospital and NHS Lothian Healthcare Premises Procedure.pdf](#)

[NPSA alert](#)