

Medication Alert

Concentrated Potassium Chloride Injection can be FATAL if incorrectly administered!

Updated Alert 1 July 2008

For the attention of: Chief Executives of District Health Boards
For action by: Chief Pharmacists
For information to: Chief Medical Officers, Directors of Nursing, Chair's of Pharmacology and Therapeutics Committees/ Medicines Advisory Committees, Quality Managers

Purpose of this alert

To highlight and reduce the risk of accidental overdose of intravenous potassium resulting from the use of concentrated potassium chloride injections

Background to this Safe Use of Medicines Alert

- Concentrated potassium chloride injection can be fatal if injected
- Potassium chloride is widely used and administered intravenously in diluted solutions to treat low potassium levels
- Potassium chloride concentrate ampoules can look very similar to a number of other injectable medicines including sodium chloride (used to flush intravenous lines) and water for injection (used to prepare other injections). There have been a number of incidents where concentrated potassium chloride injection has been accidentally administered to patients with fatal results

Action Points

1. **Storage**
 - Potassium chloride concentrate injection should be restricted to pharmacy departments and those critical care areas where the concentrated injections are needed for urgent use such as ICU, CCU and other nominated areas
 - In those specific areas where potassium chloride concentrate injection is stocked it must be stored in a separate locked cupboard/container/automated medicine storage unit away from common diluting solutions such as sodium chloride injection at all times
 - Only one strength of potassium chloride concentrate injection should be stored in any one hospital
 - Consider the storage method for potassium pre-mixes, especially if a range of concentrations and diluents are to be stored in the same area
2. **Prescribing of intravenous solutions containing potassium**
 - Commercially prepared standardised pre-mixed diluted solutions containing potassium should be prescribed and supplied when ever possible
3. **Checking preparation and use of concentrated potassium injections in clinical areas**
 - Where there is a requirement for non-standard diluted potassium intravenous solution that is not available as a pre-mix, a second practitioner (nurse, pharmacist or doctor) must always check for correct product, dosage, dilution, mixing and labelling during preparation and again prior to administration

Definition

Concentrated potassium chloride injections are defined as:

- 10mmol in 10mL (750mg of potassium chloride in 10mL)
- 20mmol in 10mL (1.5g of potassium in 10mL)

Premixed intravenous potassium solutions available in New Zealand

- 10mmol Potassium Chloride in 500ml Glucose 4% Sodium Chloride 0.18%
- 20mmol Potassium Chloride in 1000ml Sodium Chloride 0.9%
- 20mmol Potassium Chloride in 1000ml Glucose 5%
- 20mmol Potassium Chloride in 1000ml Glucose 4% Sodium Chloride 0.18%
- 30mmol Potassium Chloride in 1000ml Sodium Chloride 0.9%
- 30mmol Potassium Chloride in 1000ml Glucose 4% Sodium Chloride 0.18%
- 40mmol Potassium Chloride in 1000ml Sodium Chloride 0.9%
- 10mmol Potassium Chloride in 100ml Sodium Chloride 0.29%

Additional suggested action

1. **Potassium chloride concentrate injection/ intravenous solutions**
 - Clear therapeutic guidelines for the use of potassium chloride should be developed within each DHB/healthcare provider
2. **Pre-mixed intravenous potassium solutions**
 - Store pre-mixed potassium chloride solutions separately from plain intravenous solutions
 - Prescribing practices should take into consideration the premixed potassium chloride solutions that are available
 - Consider limiting the strengths of pre-mixed intravenous potassium solutions that are kept within your District Health Board e.g. standardise on 30mmol of potassium in a range of diluents
3. **Potassium chloride concentrate injection and dihydrogen potassium phosphate injection**
 - Potassium chloride concentrate injection should not be transferred between clinical areas and all supplies should be made from a pharmacy
 - Risks associated with the storage, prescribing, preparation and administration of potassium chloride concentrate injection should be highlighted in patient safety induction training and IV training for all staff involved in the medication process
 - Consideration should also be given to the storage and use of dihydrogen potassium phosphate injection because inadvertent undiluted injection of this product has the same risk potential

For further action by Safe and Quality Use of Medicines Group

Evaluation: an evaluation of compliance with the recommendations in the alert is planned six months after publication

To ensure that this alert has had the desired effect key performance targets are:

- Only one strength of potassium chloride concentrate injection is stocked within one hospital
- Potassium Chloride Concentrate injection is stored in permitted clinical areas in a locked container
- Only one strength of pre-mixed solution in the one litre bag volume is stocked within one hospital
- Education about the risks associated with potassium chloride concentrate injection is carried out as part of the IV training
- Potassium Chloride Concentrate injection has been removed from non-essential ward areas

For an electronic version of this alert download from the website, www.safeuseofmedicines.co.nz or contact Beth Loe at Beth.Loe@waitematadhb.govt.nz

If you require any further information or wish to provide feedback on this alert, please go to www.safeuseofmedicines.co.nz

These recommendations are based on a review of the currently available information in order to assist practitioners. The recommendations are general guidelines only and are not intended to be a substitute for individual clinical decision making in specific cases