safe use of medicines

Medication Alert

Potassium Chloride Concentrate Injection can be FATAL!

ALERT 1 Monday 5 April 2004

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

Background of the Safe Use of Medicines alert

- Potassium chloride concentrations can be fatal if given inappropriately.
- Potassium chloride is widely used and administered intravenously in diluted solutions to treat low potassium levels in patients who are often seriously ill.
- Potassium chloride concentrate ampoules can look very similar to a number of other injectable medicines including sodium chloride and water for injections. There have been a number of incidents both within New Zealand and overseas where concentrated potassium chloride solutions have been accidentally administered to patients with fatal results. Common causes include staff mistaking potassium chloride solution for sodium chloride when reconstituting a drug for injection and not calculating the correct dilution when preparing diluted solutions for infusion.
- Free flow bags containing potassium chloride have caused the death of patients.

Purpose of alert

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

Definition

Concentrated potassium chloride solutions are defined as the following concentrations:

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

Recommended action - until a range of premixed potassium chloride dilutions are available

1. Storage and handling of potassium chloride concentrate
   - Removal of potassium 20mmol in 10ml concentrate solutions from all hospitals.
   - Potassium chloride concentrate should be stored in a separate locked cupboard/container away from common diluting solutions such as sodium chloride solution.
   - Potassium chloride concentrate solutions should be restricted to pharmacy departments and those critical care areas where the concentrated solutions are needed for urgent use such as ICU, CCU and other nominated specialist areas.

- Once premixed solutions are in place then consultants only, should be able to authorise distribution to other areas within the hospital on a one off named patient basis.

2. Prescribing of solutions containing potassium
   - Commercially prepared ready to use diluted solutions containing potassium must be prescribed where available.

3. Checking preparation and use of concentrated potassium solutions in clinical areas
   - Where there is a requirement for an alternative potassium chloride dilution a second practitioner (nurse, pharmacist or doctor) must always check for correct product, dosage, dilution, mixing and labelling during preparation and again prior to intravenous administration.

Additional suggested action

- Risks associated with the storage, prescribing, preparation and administration of potassium chloride concentrate should be highlighted in patient safety induction training and IV training for all staff involved in the medication process.
- Clear therapeutic guidelines for the use of potassium chloride should be developed within each DHB / healthcare provider.

For further action by Safe Use of Medicines Project Team

The Safe Use of Medicines Project Team that contains PHARMAC representatives, will work with PHARMAC to consult on, and put in place hospital contracts for a specific range of dilutions of potassium chloride infusions so as to minimise the need for staff to use potassium chloride ampoules.

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