Medication Alert

Intravenous Infusion Practices

Alert 9 December 2009

For the attention of: **Medicines Safety /Medicines Advisory /Pharmacy & Therapeutic Advisory Committees, Pharmacy Managers, Quality and Risk Managers**
For action by: **Directors of Nursing**
For information to: **Chief Executives, Biomedical Engineers, Purchasing Managers, Chief Medical Officers**

Background to this Safe Use of Medicines Alert

Intravenous (IV) therapy is a complex process usually requiring the preparation of medicine in a clinical area before administration to the patient, and frequently including the use of an infusion device. Up to 90% of patients admitted to hospital receive IV therapy. Intravenous medication errors have led to considerable patient harm and these errors are the least likely to be intercepted.

Intravenous infusion pumps and accessories are high cost items (see DHBNZ Safe and Quality Use of Medicines Intravenous Infusion Practice Baseline audit report) and when errors occur in intravenous infusion therapy they can be fatal.

Examples of medication errors involving IV therapy are:

- **Programming errors e.g. setting up a morphine infusion and not being clear who is responsible for setting the infusion rate. The pump is left to run at the rate it was programmed on when it was returned from servicing - 50 times the required infusion rate**
- **Concentration errors e.g. potassium chloride prescribed as 14mmol in 100ml 0.9% sodium chloride given peripherally - causes local pain and vein irritation, phlebitis**
- **Administration rate e.g. Dextrose 4% Sodium Chloride 0.18% with 30mmol potassium chloride prescribed as 100ml/hour but administered at 40ml/hr, using a controlled regulator giving set, patient remains dehydrated**

This alert recommends the introduction of SMART pump technology : smart pumps are intravenous pumps equipped with software that checks pre-programmed doses against preset limits specific to the drug and the clinical location. The clinician may either override an alert (soft limit) or not be allowed to continue at all (hard limit), depending on preset limits.

For further action by Safe and Quality Use of Medicines Group

- **SQM group will encourage the development of non-luer connectors to prevent the occurrence of tube misconnections**
- **Consider re-auditing in the future**

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

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

quality safe use of medicines

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Purpose of this alert

To highlight a number of strategies that should be implemented to minimise the clinical risk associated with the preparation and administration on intravenous (IV) medicines

Recommended Action

Infusion Devices

- Standardise and limit the range of infusion devices used within an organisation to maximise staff competencies but ensure they are suitable for all patient populations
- Discard all free-flow infusion pumps
- All consumables must be compatible and not adversely affect pump performance
- Regularly service and validate all mechanical IV infusion devices using an accredited biomedical engineer and maintain service records
- When purchasing new pumps, it is essential that the purchasing procedure in Australian/New Zealand Standard 3551 (available from Standards New Zealand) -Technical Management Programs for Medical Devices is followed. This should include receiving complete technical documentation
- Include clinicians in consultations before purchasing decisions are made
- Develop a central equipment register or centralise equipment storage
- Introduce smart pump technology
- Develop an education and training programme for clinical staff using infusion devices and ensure their competency is verified before they are permitted to operate a device and re-validate competency at regular intervals

Intravenous Infusions

- Standardise and limit the number of drug concentrations available in the hospital
- Always trace a tube from the patient to the point of origin before connecting a device or infusion to reduce the risk of possible misconnection
- Consider the use of syringe drivers for high risk medicines so that they are easily distinguishable
- When available use pre-mixed preparations to reduce the risk of preparation related errors
- Standardise administration guidelines and policies for loading and bolus doses
- Implement explicit multi-professional standards for the assembly and preparation of parenteral products in clinical settings