

OPERATIONAL CIRCULAR

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Subject: POLICY FOR USE OF INTRAVENOUS POTASSIUM CHLORIDE

In response to the National Medication Safety Alert issued in December 2003¹ regarding the potential risks of intravenous potassium chloride ampoules in general ward areas, the following policies have been developed and shall apply at all Western Australian public hospitals.

Health Service Managers and Clinical Directors are advised to bring this Circular to the attention of all medical, pharmacy and nursing staff, and to be fully accountable for the comprehensive and prompt implementation of this policy within their jurisdiction, and any change management that this entails.

The policy document was developed by an expert working group of the WA Medication Safety Group (WAMSG) and has been endorsed by the WA Therapeutics Advisory Group (WATAG). WAMSG recommends that this policy be implemented at each hospital under the authority of the most senior hospital executive, with practical implementation occurring under the direction of a project leader working in conjunction with a multidisciplinary team to ensure effective and safe transition at each site. Implementation of this policy will be subject to a follow-up audit.

The purpose of this policy is to reduce life-threatening patient harm associated with the use intravenous potassium solutions. Within the policy document, mandatory items are shown in bold typeface. Items in normal font should not be regarded as unimportant and their expeditious implementation is strongly recommended. The policy specifies the type of intravenous potassium products to be used in Western Australian hospitals, where and how these products must be stored, how they are to be prescribed, the maximum concentrations that should be used and maximum hourly rates to be administered. The policy does not include recommendations on the therapeutic use of potassium.

This policy document provides for the storage of potassium chloride ampoules in critical care areas, but standard pre-mixed solutions should be used whenever possible. Similarly, while ampoules of potassium chloride may be obtained from the pharmacy for infusion of individual patients, the use of standard pre-mixed solutions is strongly encouraged. Each hospital must have additional protocols for potassium supplementation outside the conditions of this policy wherever this is required in areas such as high-dependency or intensive care or invasive sub-specialty care areas.

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ACTING CHIEF MEDICAL OFFICER

¹ High Risk Medication Alert – Intravenous potassium chloride. Medication Safety Task Force of the Australian Council for Safety and Quality in Health Care. October 2003. www.safetyandquality.org

Western Australian Policy for Use of Intravenous Potassium Chloride

Prescribing aspects

1. Intravenous potassium chloride will only be prescribed when the oral route is unavailable or clinically inappropriate.
2. **Intravenous potassium chloride must be prescribed in millimoles (mmol) of potassium, and must specify the dose, fluid and volume. The rate of administration should also be prescribed and expressed as millilitres per hour (mL/h).**
3. All other prescriptions will be considered incomplete and must be clarified with the prescriber.
4. **Bolus intravenous potassium chloride should only be prescribed in exceptional circumstances under the direction of the consultant in charge.**
5. **Standard pre-mixed potassium chloride solutions are to be prescribed whenever possible in all areas of the hospital. (Point 16)**
6. Prescription of non-standard potassium chloride solutions is permitted with the concurrence of the consultant in charge.
7. **All hospitals should have protocols for potassium supplementation. These should be readily available throughout the hospital.**

Storage and supply aspects

◆ Potassium chloride ampoules

8. **Only one strength and size of potassium chloride ampoules will be stocked within hospitals. This will be 10mL ampoules containing 10 mmol potassium chloride.**
9. **Potassium chloride ampoules must not be stored on general wards.**
 - 9.1. **Other forms of concentrated injectable potassium should not be stored on the general wards, eg potassium acetate concentrated solutions.**
10. **Potassium chloride ampoules should not be placed or stored on resuscitation trolleys.**
11. **Potassium chloride ampoules should not be borrowed from other areas unless in accordance with local guidelines.**
12. **In those areas permitted to store potassium chloride ampoules, they must be stored in sealed clearly marked red containers and isolated from all other ampoules stored on imprest.**
13. **If potassium concentrations other than those available in pre-mix solutions are required in general ward areas for a specific order for a specific patient,**
 - 13.1. **The Pharmacy Department will dispense the exact number of potassium chloride ampoules required;**
 - 13.2. **Alternatively the solution will be made up in the Pharmacy Department;**
 - 13.3. **Where potassium chloride ampoules are dispensed to a general ward any unused ampoules should be returned to Pharmacy.**
14. **All hospitals should have in place local guidelines governing the provision of potassium chloride ampoules to general wards, including outside normal pharmacy hours.**

◆ Pre-mixed intravenous potassium chloride products

15. **Pre-mixed potassium solutions will have red outer packaging and red printed labels.**
16. **Standard pre-mixed solutions of potassium chloride to be stocked by WA hospitals are:**
 - 16.1. **10 mmol in 500 mL in glucose 2.5% and sodium chloride 0.45% (for paediatric use only);**
 - 16.2. **20 and 40 mmol in 1000 mL – available in an isotonic solution of either glucose or saline;**
 - 16.3. **10 mmol potassium chloride in 100 mL mini-bags of isotonic saline.**

Preparation aspects

17. Preparation of infusions using potassium chloride ampoules should follow a safe on-site preparation protocol, which is compliant with all the existing standards for the preparation and labelling of intravenous solutions.
18. **Where potassium chloride solutions are prepared using potassium chloride ampoules, the solution must be inverted at least 10 times to ensure potassium chloride is thoroughly mixed throughout the solution. *Unshaken bags are prone to layering of added concentrate and are extremely hazardous.***
19. **Extra potassium must not be added to pre-mixed solutions containing potassium.**
20. Potassium chloride ampoules must never be added to a hanging bag.

Administration aspects

◆ Peripheral intravenous administration

21. **The treating specialist must approve administration of intravenous potassium chloride regimens that differ from these administration guidelines.**
22. **When using standard bags (500 or 1000mL), a rate-limiting device must be used to prevent unintentional bolus doses of solutions containing potassium chloride.**
 - 22.1. For infusion concentration ≤ 20 mmol per 1000 mL, a rate controlled pump is preferred, however an infusion burette is an acceptable alternative;
 - 22.2. **For concentrations > 20 mmol per 1000 mL, an infusion pump must be used.**
23. The **maximum rate** of potassium chloride administration via peripheral lines is 10 mmol per hour.
24. The maximum potassium chloride **concentration** for administration via peripheral lines is 40 mmol/L, except when using 10 mmol /100 mL pre-mixed mini-bags. This is because the 10 mmol/100 mL mini-bags are isotonic and because the quantity of potassium in each mini-bag is relatively small.

◆ Central administration

25. Higher doses and faster rates of administration should be infused via a central line (CVC) using 10 mmol/100mL mini-bags.
 - 25.1. This must conform with safe local guidelines for high dependency areas;
 - 25.2. In this case the patient should have continuous ECG monitoring.