



medication safety **ADVISORY**

Advisory No. 5 18th August 2009

Subject	Medication incidents involving the administration of liquid oral medications using hypodermic syringes	
Issue	Incidents have occurred locally, nationally and internationally where oral liquid medications have been drawn up into a hypodermic syringe and administered intravenously (IV) in error.	
Issued by	Safe Medication Management Unit	
Issue date	18 th August, 2009	
Authority	Queensland Health Patient Safety and Quality Executive Committee	
Distribution List	<i>Clinical CEOs</i>	<i>Patient Safety Officers</i>
	<i>Directors of Medical Services</i>	<i>District Quality Coordinators</i>
	<i>Directors of Nursing</i>	<i>Directors of Pharmacy</i>
Source Of Problem	The presence of medications in a hypodermic syringe might suggest that the medication is intended for parenteral administration. In many of the incidents below, there were other errors involved; however oral medications drawn up into a hypodermic syringe was identified as the root cause.	
Case Studies (Patient Implications)	<p>Two medication errors: involving the same drug with different patient consequences</p> <p>Oral Phenytoin Liquid</p> <p><i>The following cases highlight that the same medication given by the same (incorrect) route can have dramatically different outcomes for the patient.</i></p> <p>A patient was prescribed oral phenytoin liquid mixture for control of epileptic seizures. The mixture was drawn up in a hypodermic syringe, checked against the medication chart and taken to the patient bedside. The nurse administering the medications became distracted and inadvertently administered the medication into the patient's central line instead of their nasogastric tube. Medical assistance was sought immediately and the patient suffered no clinical harm.¹</p> <p>In another incident, a woman with a complex medical history including epilepsy was hospitalised for gastrointestinal complications. A jejunostomy was performed to facilitate feeding and administration of oral medications, including oral liquid phenytoin. She was later started on total parenteral nutrition after complications and her oral medications</p>	

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	<p>orders were converted to IV. About two weeks later, a nurse who had previously administered oral medications to the patient prepared two IV medications and had these checked. The nurse then obtained the oral phenytoin liquid, measured 5mL into a cup and then drew it into a syringe. She administered the medications to the patient including the oral phenytoin liquid via central venous catheter (CVC). The patient complained of pain at the injection site and commenced dry retching before losing consciousness. Staff commenced resuscitation but the woman could not be revived.²</p> <p>Oral Potassium liquid given via IV route</p> <p>An order for oral liquid potassium chloride (KCl) was drawn up in a syringe to be administered to a patient via an enteral feeding tube. IV medications were also drawn up and taken to the patient's bedside in the same kidney dish. Two nurses prepared and checked the patient's medication. The second nurse was called away. The nurse attending the patient proceeded to give the oral KCl through the IV line instead of the feeding tube. The patient required resuscitation and spent five days in the intensive care unit.²</p>
<p>Statewide Applicability</p>	<p>This risk applies across all Queensland Health facilities for both adult and paediatric patients.</p>
<p>Contributing Factors</p>	<ul style="list-style-type: none"> • Devices designed specifically for accurate measurement of doses of oral liquid medicines may not be readily available on the ward. • Syringes used to prepare oral liquid medicines are easily connected to IV cannulas and IV tubing. • Multiple formulations of the same drug are available for different routes of administration. • Nursing staff being interrupted between preparing a dose and administering it to a patient. • Patients with nasogastric (NG) and IV lines running simultaneously. • Oral and IV medications transported to the patient's bedside in the same container.
<p>Clinical Recommendations</p>	<ol style="list-style-type: none"> 1. The utilisation of oral syringes (hereafter called 'oral dispensers'), designed for the administration of oral liquid medications which do not have a Luer hub (and therefore cannot be pushed into IV Luer ports). 2. Identify devices for measuring oral liquid doses as 'oral dispensers' not oral syringes. 3. Oral dispensers should: <ul style="list-style-type: none"> • be clearly distinguished from IV syringes by colour and shape; • be clearly labelled for ORAL/ENTERAL USE ONLY; • not be able to be connected to IV access devices; • be able to be connected to all enteral tubing (If an adaptor is required, it must not be able to be connected to IV tubing); • be readily available on wards, preferably near oral liquids and away from IV syringes. 4. Oral dispensers should be used for all oral liquid medicines: <ul style="list-style-type: none"> • that are administered via an enteral line; • that are also available in IV formulations; • administered to patients with IV access devices in situ; • where it is not appropriate to use an accurate medicine cup. <p>Note: Oral dispensers may not be appropriate for use with viscous oral liquid medicines or crushed medicines prepared into slurries. Guidelines for alternative methods of preparation should be considered at an organisational level for these oral liquid medicines.</p> 5. Provide a forcing function³, where possible, to ensure nurses and patients use oral dispensers to prepare oral liquid medicines. Specifically designed connection devices, such as bottle adaptor caps and straws which only fit oral dispensers and are fitted to the medicine container, fulfil this function. Consider the practical issues with the following oral liquid medicines: <ul style="list-style-type: none"> • medicines that need to be shaken, for example, suspensions;

<p style="text-align: center;">Clinical Recommendations (cont)</p>	<ul style="list-style-type: none"> • bottles that may leak when inverted; • medicines that require tamper evident seals and childproof lids; • medicines that need to be drawn up from an ampoule for oral administration; • medicines for inhalation, for example, sodium chloride solutions. <p>6. Where implemented the above recommendations should be supported by a local policy/ procedure/ workplace instruction.</p> <p>7. Consider the method and quantity of oral dispensers to be supplied to each ward area.</p> <p>8. Consider whether your facility will require oral dispensers in sterile packaging, for single use or for single patient use.</p> <p>9. Implement a second verification 'at the bedside' for any oral liquid medicines that could potentially be measured in a syringe rather than a measuring cup, for patients with IV access.</p> <p>10. Oral dispensers should be supplied to all patients (or their carers) to enable them to safely administer oral liquid medicines at home if the patient has IV access site in situ.</p> <p>11. Six (6) Rights⁴ checking against the medication chart at the point of administration should be promoted continually within facilities.</p> <p>12. Oral medications should ideally be measured in:</p> <ul style="list-style-type: none"> • an accurate medicine cup; or • an oral dispenser and when appropriate immediately transferred to an accurate medicine cup before approaching the patient. <p>In addition, unit dose nebuliser solutions (e.g. salbutamol 5mg nebule) should be used wherever possible to avoid similar errors.</p>
<p style="text-align: center;">Advisory</p>	<p>"An Advisory communicates 'lessons learned' from serious adverse events to raise awareness"</p>

References:

1. PRIME data
2. Victorian Medicines Advisory Committee, Quality use of medicines alert: 'Wrong route administration of oral liquid medicines', 2008 Vol 1, No. 1
3. Institute of medicine, 2000 'To err is human – building a safer health system', Second print, Kohn, L, Corrigan. J, Donaldson.M (Eds) National Academy Press, Washington DC pp171
4. Queensland Health Safe Medication Practice Unit, 2008 ' 6 Rights for Safe Medication Administration' poster