

ISMP Canada Safety Bulletin

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Inadvertent Administration of Oral Solutions by Injection

ISMP Canada has received a report describing an incident in which an oral dose of a medication was administered subcutaneously. The oral solution had been withdrawn into a parenteral syringe (1 mL "TB" syringe). A needle was inadvertently added to the syringe (an action that was attributed to a "lapse of attention"). The contents of the syringe were then injected subcutaneously. Fortunately, the patient encountered no harm.

Similar incidents have been reported in the United States and in England, including cases in which the patient died when an oral solution was administered intravenously. An analysis of medication error reports received by the FDA¹ identified 'incorrect route' as the third most prevalent type of medication error. Their data includes eight reported patient deaths as a result of patients receiving an oral product intravenously.

A commonly identified contributing factor in such errors reported to ISMP in the US, was the use of a parenteral syringe to withdraw a medication dose for oral use. This occurred when syringes specifically designed for oral use were not available in the patient care areas. In most hospitals, syringes for oral use are available only in the inpatient and outpatient pharmacies.

Two reported deaths in the United States occurred when oral nimodipine intended for administration through a nasogastric feeding tube was inadvertently administered intravenously². Nimodipine is indicated for improvement of neurological deficits due to cerebral artery spasm after subarachnoid hemorrhage. The manufacturer suggests that if the patient cannot swallow, the contents of the nimodipine capsule be aspirated with a needle and syringe. The syringe contents can then be administered through a nasogastric tube. Although this procedure seems reasonable, the use of a parenteral syringe does add a risk of inadvertently administering the contents by injection.

Recommendations to reduce the risk of inadvertently administering oral solutions by injection include the following:

1. Ensure that syringes especially designed for oral administration are made available in *ALL* patient care areas. The design of the oral syringe eliminates the possibility of adding a needle to the syringe. The design also eliminates the possibility of connecting the syringe to IV tubing or an IV administration port.
2. Require all hospital staff to administer oral solutions from a medication cup or an oral syringe.
3. Dispense oral doses of medications in unit-dose oral cups or in specially designed syringes for oral administration
4. Purchase and use amber colored oral syringes. The color will help to set them apart from the clear parenteral syringes. This color difference affords an additional layer of safety.
5. Educate hospital staff about the risks of using parenteral syringes to withdraw oral medications.
6. Ensure that a mechanism is in place to identify those unavoidable circumstances in which an oral medication must be administered by parenteral syringe. Recognition and communication of such situations will help identify areas for additional system improvements.
7. Instead of suggesting nurses withdraw the contents of capsules with a needle and syringe, have the pharmacy extract the liquid contents and provide the doses in unit-dose oral syringes.
8. Ensure that the nasogastric feeding tubes used within the hospital are compatible with the oral syringes. This will facilitate administration of oral solutions by the nasogastric route.
9. Remind nurses to always include the route of administration on the medication administration record and to bring the record to the patient's bedside.
10. Ensure that labels on oral syringes clearly state "FOR ORAL USE". It may also be advisable to add an auxiliary label to the plunger of the oral syringe, as an added precaution.

A preliminary version of this information appeared in the Canadian Journal of Hospital Pharmacy, volume 54, issue 3, page 204 (Autumn 2001).

References

1. Phillips J. et al. Retrospective Analysis of Mortalities Associated with Medication Errors. *Am J Health-Syst Pharm*. Vol 58 Oct 1, 2001.
2. Cohen M. Medication Errors. *Nursing96*, December p15.