

Oral Syringes: Making Better Use of a Crucial And Economical Risk-Reduction Strategy

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PROBLEM: The Institute for Safe Medication Practices (ISMP) has repeatedly emphasized that parenteral syringes should never be used to prepare or administer oral or enteral products; instead, an oral syringe should always be used. Over the years, this advice has appeared in numerous ISMP newsletters and educational presentations. However, many organizations have still not followed this simple but critical safety measure.

Using parenteral syringes—which have a Luer lock that can be attached to a needle-less intravenous (IV) system—to give oral and enteral liquids presents a serious danger of misadministration. After filling a parenteral syringe with an oral or an enteral medication, it takes only a momentary mental lapse to connect the syringe to an IV line and inject it.¹ To prevent this misstep, oral syringes have specially engineered hubs that cannot be easily or securely connected to standard IV lines and that cannot accommodate a needle attachment.

Although some health care practitioners are confident that they might never make this type of error, most events occur when knowledgeable staff members, intending to administer the product orally or enterally, inadvertently administer it by the wrong route or access port or when they mistake the contents of a syringe—often unlabeled—as a parenteral product.

Such errors continue to occur far too often. Here are a few cases that were reported to the ISMP.

One error claimed the life of a newborn infant. The baby was born to a woman who died after she contracted the swine flu. The premature infant was delivered via cesarean section 1 day before his 20-year-old

mother died. A week later, the infant died after an intermittent feeding, which had been prepared in a parenteral syringe, was administered intravenously instead of via a nasogastric tube.

In another case, a new graduate nurse prepared yogurt in a parenteral syringe and then accidentally administered it to an adult patient intravenously through a peripherally inserted central catheter (PICC) line. The nurse then flushed the line with water. The yogurt was to have been given via an enteral tube to help treat diarrhea. The distal ends of the enteral and PICC lines, all unlabeled, looked similar. The outcome was not reported.

A pharmacy dispensed niMODipine (Nimotop, Bayer) capsules to nursing units, unaware that these were being used for patients who could not swallow. In one instance, a nurse softened the gelatin capsule in hot water and subsequently withdrew the medication into a parenteral syringe. In the chaos of the day, the dose was administered intravenously instead of by feeding tube. The nurse immediately noticed the error and tried unsuccessfully to withdraw the drug from the IV tubing. Unfortunately, the patient's condition deteriorated almost immediately and the patient subsequently died. A boxed warning has now been added to the niMODipine label to caution about this type of administration error with this product.

Midazolam syrup (Versed, Roche) 15 mg and acetaminophen (Tylenol, Janssen) liquid 650 mg were drawn into a parenteral syringe and administered via the IV route to an 11-year-old child being prepared for surgery. A nurse and a fourth-year student nurse had prepared the doses, but the nurse was called away momentarily. While she was gone, the student nurse administered the drugs intravenously, believing the child was to have nothing by mouth before surgery. The child remained unconscious for 50 minutes and required several days of antibiotics, but he recovered fully.

Some practitioners assume that they have sufficiently reduced the risk of giving an oral liquid medication intravenously by

having the pharmacy dispense doses in either an oral syringe or a commercially available unit-dose cup. Sometimes a nurse might withdraw a portion or all of the liquid from a unit-dose cup into a parenteral syringe in order to administer the dose. As the following error shows, all patient-care units and procedure areas should be supplied with oral syringes, even if they are used infrequently; further, all nurses should understand the safety features of oral syringes and the importance of using them.

A physician wrote an order for hydrocodone/chlorpheniramine (Tussionex, UCB) suspension but did not specify the oral route of administration. A unit dose of Tussionex suspension was dispensed in an oral syringe, but the pharmacy label covered the manufacturer's warning on the syringe stating, "For oral use only." A nurse who was not familiar with oral syringes transferred the drug into a parenteral syringe, diluted it with saline, and administered it intravenously. The error was quickly recognized; the IV catheter was removed, and no harm occurred.

In general, not all nurses are familiar with oral syringes; some nurses might mistake a liquid medication in an oral syringe as a parenteral product.

SAFE PRACTICE RECOMMENDATIONS: The consistent use of oral syringes for preparing and administering small-volume oral and enteral liquids is an effective and economical risk-reduction strategy that is appropriate in all health care settings. Patients are subjected to a substantial and unjustifiable risk of harm when oral and enteral products are prepared and given in parenteral syringes. The use of oral syringes should become a standard of practice in every health care organization.

Following are safeguards for reducing mistakes involving syringes.

1. Check the connectivity of the medical equipment. All ports on nasogastric, enteral, and parenteral tubing

and catheters should be examined to determine which type of connectors they accommodate. Some needle-less IV system connection ports accommodate oral syringes (with some manipulation), thereby allowing oral solutions to be injected intravenously. Although some enteral tubes have a port compatible with parenteral syringes, others are available with a port that accommodates only oral syringes.

To reduce the risk of wrong-route errors, parenteral tubing should have ports that are totally incompatible with oral syringes and enteral devices should accommodate only oral syringes and catheter tip connectors.

2. Provide oral syringes in all clinical areas. All areas should be supplied with appropriately sized 1-mL, 5-mL, or 10-mL oral syringes. If possible, the oral syringes should differ in appearance from the parenteral syringes. The judicious use of color and design can help the staff distinguish oral and enteral syringes from parenteral syringes.² The staff should be warned to avoid associating a particular color with the oral or enteral route, because no standard exists among products from various manufacturers.

Although some facilities use amber oral syringes to differentiate them from parenteral syringes, amber hides the color of liquids and makes the volume more difficult to see. Some facilities use amber only when the product is light-sensitive.

3. When possible, the pharmacy should dispense oral liquid medications in oral syringes. The pharmacy should be required to dispense all oral liquid medications in patient-specific or unit-of-use oral syringes or in commercially available dosing cups. When appropriate, batch supplies can be prepared and used to stock automated dispensing cabinets. Even niMODipine liquid can be extracted from capsules, stored in amber oral syringes, placed in light-protected bags, and stored for up to 31 days.³

4. Notify the pharmacy if liquid medications are required. The nurse or physician should inform the pharmacy if patients cannot swallow solid medications so that liquid doses can be provided in oral syringes or dosing cups.

5. Reduce the tolerance of risk. Emphasize the potential danger of inadvertently injecting IV oral or enteral

liquids prepared in parenteral syringes. Point out to the staff that external (and internal) errors have occurred even if the errors did not affect the patient; convey the idea that mistakes can happen; and identify the risks of wrong-route errors in policies and procedures about oral and enteral liquids and enteral feeding.

6. Require the staff to use only oral syringes when they are preparing and administering oral or enteral liquids. All small-volume oral and enteral solutions should be prepared and given in oral syringes to avoid placing any non-parenteral products in parenteral syringes. Topical products should not be placed in oral syringes. A warning on the medication administration record (MAR) for liquid agents should state, "Use oral syringe only."

7. Apply auxiliary labels. Oral syringes dispensed from the pharmacy should be labeled as "Oral Only" on the tip or on the plunger so that the label must be removed before the solution is given. Do not cover the manufacturer's label warning.

8. Label all access lines. Place labels on all distal ports and tubing of the access lines. The labels should indicate what the port or line is being used for; this instruction applies to peripheral lines, central IV lines, and feeding tubes.

9. Improve staff awareness. All health care professionals involved in medication prescribing, dispensing, and administration should be familiar with the design and purpose of oral syringes and their safety features, especially their inability to be connected to IV (or other male Luer) ports or parenteral needles. The importance of using oral syringes should be emphasized consistently. A simple poster stating "Only use oral syringes for liquids" in each medication room can help with this step.

10. Establish training programs. All orientation and training programs intended for staff members who administer oral liquids and who use enteral feeding systems should include the proper use of oral syringes.³ Senior staff members should supervise new personnel to ensure that they are using oral syringes consistently.

Additional training should be provided for staff members when changes are made to the tubing, the catheters, or the oral syringes.

REFERENCES

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The reports described in this column were received through the ISMP Medication Errors Reporting Program (MERP). Errors, close calls, or hazardous conditions may be reported on the ISMP Web site (www.ismp.org) or communicated directly to ISMP by calling 1-800-FAIL-SAFE or via e-mail at ismpinfo@ismp.org. ■