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Unnecessarily Dilution and Repackaging of IV Medications Put Patients at Risk

Horsham, Pa—A recent survey by the Institute for Safe Medication Practices (ISMP) suggests that nurses frequently repackage pharmacy-dispensed prefilled syringes after diluting the contents—an unnecessary practice that can lead to unlabeled or mislabeled syringes, potential contamination of sterile IV medications, dosing errors, and other types of drug administration errors.

ISMP fielded the survey in the April 2014 issue of *Nurse Advise-ERR*, its newsletter for nurses, to gather information about the administration of IV push medications to adult patients. The survey was completed by 1,773 respondents, mostly registered nurses (97%). Most respondents were staff-level nurses (82%).

The majority (83%) of nurses responding reported that they further dilute certain IV push medications for adult patients prior to administration, when they are available in vials or ampuls. But when the pharmacy dispenses a prefilled syringe containing a patient-specific dose, as many as 20% or more respondents further dilute these medications.

Opioids and antianxiety/antipsychotic medications were most frequently diluted. More than a quarter of respondents reported always diluting opioid drugs before administration, and another 21% diluted them often. Almost half reported they often or always dilute antianxiety/antipsychotic medications, and more than 1 in 3 often or always dilute antiemetics.

According to respondents, the factors that most frequently influenced their decision to further dilute a medication included: the anticipated discomfort at the injection site; irritant nature of the medication; high risk of extravasation with drug or delivery device; need to administer drug very slowly via IV push; viscosity of the medication; and difficulty in measuring a very small dose.

Respondents indicated they are more likely to dilute a medication administered through a peripheral venous access site than a central venous access device. They also were more likely to dilute a medication administered via a saline lock or intermittent access site rather than via an access port with a continuous infusion.

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In light of the survey findings, and to limit the need to dilute medications outside the pharmacy, ISMP recommends the following actions to reduce the risk of medication errors or other adverse patient outcomes, especially those associated with dilution and repackaging of prefilled syringe (by pharmacy or commercial) medications prior to IV push administration:

Poll the nursing staff. Conduct a nursing survey to learn the extent and variability of dilution of IV push medications. Use the results to inform staff about unsafe practices and establish standard practice expectations and guidelines for drugs that require dilution based on the manufacturer's instructions.

Consider risk-benefit ratio. For drugs that may improve patient comfort or the accuracy of measuring the dose if diluted, have pharmacy research dilution safety if there are no manufacturer recommendations. If appropriate, seek approval for dilution from the pharmacy and therapeutics committee.

Pharmacy dilution. Wherever possible, have pharmacy prepare any IV push medications that must be diluted according to the manufacturer's guidelines or hospital policy.

Nursing dilution. If stability requires drug dilution immediately prior to IV push administration, provide exact directions to nurses via written or electronic guidelines or checklists that provide standard diluent volumes and resulting concentrations. Also provide dilution instructions on the medication administration record or other document readily accessible during drug administration. Reinforce safe practices for labeling any diluted medications.

Educate nurses. If the nursing survey in your organization identifies episodes of dilution not supported by the official drug labeling or other reliable source, conduct educational programs to dispel myths and help nurses see the risks associated with these practices.

For a copy of an ISMP newsletter article that provides more detailed information on the survey results and ISMP's recommendations, go to: http://www.ismp.org/newsletters/acutecare/showarticle.aspx?id=82

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