



Failure to cap IV tubing and disinfect IV ports places patients at risk for infections

While numerous improvements in patient safety have been on the national agenda, medication errors and healthcare-associated infections (HAIs) top the list. Both of these serious problems have received widespread attention, and rightfully so. In its 2006 report, *Preventing Medication Errors*, the Institute of Medicine reported that medication errors were among the most common medical errors, harming at least 1.5 million people each year and costing more than \$3.5 billion annually for preventable drug-related injuries in hospitals alone.¹ Equally sobering, the Centers for Disease Control and Prevention cites HAIs in the top ten leading causes of death in the US. Each year, HAIs account for 1.7 million infections in hospitals, 99,000 deaths, and \$4.5 to \$5.7 billion in added patient care costs.²⁻³

These two risks—medication errors and HAIs—sometimes converge, particularly when basic handwashing does not occur between patient contact during medication administration (compliance rates have been cited between 25-50%),⁴ and when aseptic technique is not maintained during preparation and administration of injectable medications and solutions. ISMP has previously published reports of hepatitis out-breaks and infectious diseases caused by the improper use of syringes and multiple-dose vials. However, there are several other unsafe medication-use practice habits that place patients in danger of an infection, two in particular that we frequently observe:

■ **IV tubing not capped**—The failure to place a sterile cap (see Figure 1) on the end of a reusable IV administration set that has been removed from a primary administration set, saline lock, or IV catheter hub and left hanging in between use

■ **Port not cleaned**—The failure to properly disinfect the port when accessing needle-free valves on IV sets.

In the first instance, the tip of the IV administration set is exposed to potential contaminants, which could lead to infection if the nonsterile IV set is reconnected to the patient's IV access. In the second instance, the port is

exposed to potential contaminants that can be pushed into the IV line once the port has been accessed by tubing or a syringe.



Figure 1. Sterile caps like the one above should be placed on exposed IV tubing.

These risks are unexpected outcomes associated with needleless IV systems. Before the introduction of needleless systems, nurses typically replaced the needle used to connect the infusion to the IV tubing with a new sterile, capped needle to prevent contamination between uses. Now it appears that some nurses are not considering the risk of contamination and may not be placing a sterile cap on the exposed tubing. A nurse we heard from recently supported this premise when she reported that physicians and nurses caring for her hospitalized mother were offended when she offered them alcohol swabs to disinfect the IV port when it looked like they were not going to follow through on this process. While

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check it out! ✓✓✓✓

Follow these steps to reduce the risk of blood stream infections:

✓ **Follow aseptic technique.** Nurses should be well versed in the use of aseptic technique during the medication-use process. This includes covering the exposed end of IV tubing with a sterile cap between uses, and disinfecting the port before connecting tubing or a syringe to the port.

✓ **Avoid "looping."** While "looping" (attaching the exposed end of the IV tubing to a port on the same tubing) may be considered an acceptable alternative to placing a sterile cap on the exposed end of tubing, this practice is not among those recommended by the Infusion Nurses Society (INS)⁵ and should be brought to the infection control committee for deliberation before being endorsed. The INS standards of practice state, "A compatible sterile covering should be aseptically attached after each intermittent use."

✓ **Limit those who can disconnect.** It has been reported that nursing assistants sometimes disconnect the IV tubing when an intermittent infusion is finished, and then forget to attach a sterile cap. This practice should be prohibited, as unlicensed staff should never connect/disconnect any medical tubing.

✓ **Establish policies.** Organizational policies and procedures for capping the tubing end should make it clear that a new sterile cap must be used every time the tubing is capped. Procedures for disinfecting ports should describe the exact process to be used.

✓ **Assess compliance.** Conduct regular compliance rounds on all patient care units to document current practices regarding capping and disinfection, and to measure improvement.

NurseAdvise-ERR® continues to impact safety

Many thanks to the 812 readers who completed our survey regarding practice site distribution of NurseAdvise-ERR®. Based on the data provided from the survey and information in our subscriber database, a conservative estimate of 1.3 million nurses receive the newsletter after redistribution by primary subscribers!

Nearly all survey respondents said the newsletter increased their understanding of the causes and prevention of medication errors and that the recommendations were practical and helpful. Almost 90% of respondents redistribute the newsletter, most often by email (51%), copying and sending it to individuals or departments (36%), or posting it on bulletin boards (29%) within organizations.

Overwhelmingly, readers told us that they found the real "stories" about errors most useful in driving changes. While there were no topics in particular that respondents found least useful, most respondents also provided specific topics that they would like to see covered in future newsletter editions, including but not limited to:

- Error prevention in settings outside the hospital, including home care, long-term care, and outpatient clinics

- Error prevention with specific medications, including high-alert medications and psychotropic drugs

- Use of technologies, including computerized prescriber order entry, barcoding systems, electronic medication administration records, and automated dispensing cabinets

- Safety issues with new medications

- The National Patient Safety Goals, including medication reconciliation

- Promoting a culture of safety.

Please remember, we can only write about hazardous conditions, adverse drug events, and near misses if we hear the "stories" from YOU! Please send your stories to us at: <https://www.ismp.org/orderforms/reporterrortoISMP.asp>. Your name is optional, but if supplied, rest assured that no reporter or location will be divulged. We also respect the wishes of the reporter regarding the level of detail included in "stories" published in ISMP newsletters.

Full survey results can be found at: www.ismp.org/survey/NurseSurvey200708rnc.asp, and back issues of the newsletter are available at: www.ismp.org/NursingArticles/list.htm.

References: 1) Institute of Medicine. *Preventing Medication Errors*. Aspden P, Wolcott J, Bootman L, Cronenwett LR, Eds. 2006; Washington, DC: National Academies Press. 2) Centers for Disease Control and Prevention. *Healthcare-associated Infection*. At: www.cdc.gov/ncidod/dhqp/healthDis.html. 3) Klevins MR, Edwards JR, Richards CL, et al. Estimating healthcare-associated infections and deaths in US hospitals, 2002. *Public Health Reports* 2007;122(2): 160-66. 4) CDC Healthcare Infection Control Practices Advisory Committee and the Hand Hygiene Task Force. *Guideline for Hand Hygiene in Healthcare Settings*. At: www.cdc.gov/mmwr/PDF/rr/rr5116.pdf. 5) Infusion Nurses Society. *Infusion Nursing Standards of Practice*. 2006; Philadelphia, PA: Lippincott Williams & Wilkins.

IV tubing continued from page 1
needleless systems have dramatically reduced the risk of needlestick injuries, some have speculated that the lack of a needle or cannula on a syringe, or at the end of the tubing, may suggest that protection and disinfection is not required.

See **check/tout!** in the right column on page 1 for actions to reduce the risk of blood stream infections when attaching IV tubing from a secondary set to a port in the primary tubing.

All is not as it seems...

Name watch: Avandia-Prandin. We received a report recently about a medication error that resulted when an order (see copy below) for PRANDIN (repaglinide) was misread as AVANDIA (rosiglitazone). This has been a longstanding problem since ISMP first reported it in 1999. Both drugs are used to treat diabetes, so matching the drug to the patient's diagnosis would not, in itself, help to prevent a mix-up. Avandia helps with glycemic control by improving insulin sensitivity, while Prandin lowers blood glucose levels by stimulating the release of insulin from the pancreas. There are not many variables to help differentiate handwritten prescriptions for these drugs. Both are available in tablet dosage forms in 2 mg strengths,

Prandin 2mg PO before breakfast and 4mg PO before dinner

and individual doses of 4 mg are within the therapeutic range for each drug. Avandia is usually prescribed once or twice daily and may be taken with or without meals, while Prandin doses are usually taken within 15 minutes of a meal, but time may vary from immediately preceding a meal to as long as 30 minutes before a meal. As a precaution, encourage prescribers to include generic names with handwritten orders to help staff differentiate these look-alike brand names.

► Special Announcements

Draft ADC guidelines. In 2007, ISMP held a national forum to develop consensus-driven safe practices for automated dispensing cabinets (ADCs). ISMP is now seeking comments on the guidelines, which can be found at: www.ismp.org/Tools/guidelines/default.asp.

Take our ADC survey. Please participate in our ADC survey on page 3!

ISMP teleconference. Join our last teleconference of the year, **Clinical Pharmacists in the Emergency Department**. For details, visit: www.ismp.org/educational/teleconferences.asp.

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ISMP Automated Dispensing Cabinet (ADC) Survey

Please take a few minutes to help us identify safety measures currently being used with unit-based automated dispensing cabinets (ADCs). Please submit your responses by **November 30** via the Internet at: www.ismp.org/survey/NurseSurvey200711.asp, or fax this form to ISMP (215-914-1492) if you do not have Internet access.

1. Please circle the statement that best describes your current use of ADCs (also know as unit-based cabinets, automated dispensing machines).	
a. Not used b. Used for narcotics/controlled substances only	c. Used for narcotics/controlled substances, floor stock/prn medications d. Used for narcotics/controlled substances, floor stock/prn medications, and first doses e. Used as a primary means of drug distribution

2. Please select the best response to the following statements. If the statement is not applicable, please check N/A.					
	Always	Frequently	Sometimes	Never	N/A
a. Medications stocked in ADCs are specific to patient care units.					
b. Multiple concentrations of the same drug are stored in the same cabinet.					
c. Medications are stocked in ready-to-administer unit doses.					
d. Only the drug selected can be removed from the cabinet drawers/shelves.					
e. Pharmacy staff must review/verify orders before drugs can be removed from the ADC.					
f. The list of drugs that can be obtained by overriding pharmacy order review/verification is specific to each patient care unit.					
g. First-line medications used for emergencies (codes) are stocked in the ADC.					
h. Nurses have to wait in line to access medications from the ADC.					
i. The organization's ADCs are located in areas free from distractions or interruptions.					
j. Drugs removed by overriding pharmacy review/verification are double-checked by another practitioner before administration.					
k. Override reports are routinely analyzed by managers.					
l. Nurses remove one patient's medications at a time (for one dosing schedule) from ADCs, and administer the medications before removing the next patient's medications.					
m. Nurses return drugs that have not been administered to a return bin in the ADC.					
n. Items other than medications and IV solutions are stored in the ADC (excluding ADCs solely used for central supply items).					
o. Maintenance IV infusions and piggyback solutions are contained in ADCs.					
p. Warfarin is stored in ADCs.					

3. Other Questions		Yes	No
a.	Do all of the ADCs in your facility have the capability for pharmacists to review/verify orders before the medication is removed?		
b.	Does the organization have specific written policies, procedures, or guidelines for the following?		
	▶ Criteria for determining the drug products, strengths, and quantities that will be stored in the ADC		
	▶ Criteria for identifying products that are considered inappropriate in ADCs (short expiration dates, high-alert medications, etc.)		
	▶ Periodic review of ADC contents (based on formulary changes, emerging drug safety issues, changes in patient population, etc.)		
	▶ Handling of medications removed from the ADC but not administered		
	▶ Safe methods for transporting medications from the cabinet to the patient's bedside		
	▶ Criteria for the use of overrides		

4. Please select one of the following categories that best describes your organization:		
<input type="checkbox"/> Critical access hospital	<input type="checkbox"/> Hospital with less than 150 beds	<input type="checkbox"/> Hospital with 151-250 beds
<input type="checkbox"/> Hospital with 251-500 beds	<input type="checkbox"/> Hospital with more than 500 beds	<input type="checkbox"/> Other