



Three neonates die from heparin overdoses How will your organization respond?

News media from around the country have recently published stories about the tragic deaths of three infants at a Midwestern hospital who received overdoses of heparin. Apparently, a pharmacy technician accidentally placed 1 mL vials of heparin containing 10,000 units/mL into a unit-based automated dispensing cabinet (ADC) in the drawer where 1 mL vials of heparin 10 units/mL were normally kept. The vials were the same size, and they looked similar, although their caps and labels were a different shade of basically the same color (see the photo). Several nurses had requested heparin 10 units/mL vials from the ADC and were directed to that drawer, but the nurses did not notice that the vials contained the wrong concentration. Three other infants also received a heparin flush using the wrong concentration, but the adverse effects of the drug did not result in death.



macy technician had accidentally stocked it with look-alike heparin vials containing 10,000 units/1 mL (both were from American Pharmaceutical Partners). The vials were the same size and had labels and caps of similar colors. The patient inadvertently received 20,000 units of heparin. Fortunately, the nurse quickly noticed the mistake and the patient received protamine, thus averting serious harm.

All hospitals need to respond now to the tragic deaths of these infants, which forever changed the lives of their families as well as the lives of the healthcare providers involved with their care. Please schedule time to explore your vulnerability to similar errors, and take the necessary steps to avoid another tragedy with heparin or another high-alert drug available in ADCs (or unit stock), especially in neonatal and pediatric units.

Several organizations have already told us about the steps they have taken in response to this error, which are included in the following recommendations:

- If possible, eliminate the 10,000 units/mL concentration of heparin vials stocked in the hospital (including in the pharmacy). If this concentration remains in the pharmacy, keep the vials sequestered from all other strengths.
- Store vials of heparin in concentrations greater than 100 units/mL in separate areas in the pharmacy to keep them away from concentrations typically used for flush solutions.

No doubt there is more to the story, and many might argue that the vials do not look so much alike. But for now, please recognize that an error like this could happen in most hospitals! In fact, reports from the USP-ISMP Medication Errors Reporting Program reveal that ADC filling errors are not uncommon.

For example, in another hospital, an adult patient received a heparin overdose due to similar circumstances. A physician asked for heparin 2,000 units during a procedure. A nurse retrieved two vials of heparin from an ADC. The cabinet was supposed to be stocked with 1,000 units/1 mL vials, but a phar-

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nicecatch



Margins for prescriptions.

A prescription for a cystoscopy patient with a prosthetic heart valve was faxed to a clinic (figure 1) and then scanned and sent to the pharmacy (figure 2). The pharmacist read the gentamicin dose as "5 mg/kg," believing the amount was within range for a single daily dose. However, she did not recognize that a lower dose, 1.5 mg/kg, was appropriate for subacute bacterial endocarditis prophylaxis. The higher dose was dispensed and the infusion was started. Minutes later, a nurse noticed the error and called the pharmacy. The pharmacist realized that the number "1" and decimal point had been cut off during scanning. In a similar case, an order for milk of magnesia (magnesium hydroxide) 30 mL BID prn was scanned, but "prn" had been written very close to the right edge of the order form and was not visible. The patient received two doses each day until the error was noticed at discharge during medication reconciliation. Order forms and prescriptions should have margin lines to indicate areas beyond which writing is not permissible, taking into account holes that may be punched in forms for placement in the medical record. Prescribers should also be made aware of the problem using examples like the one below.

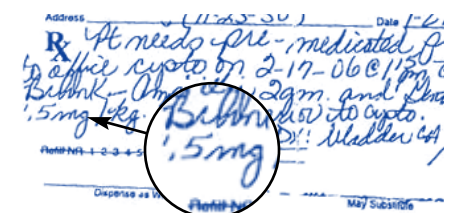


Figure 1. Faxed prescription has part of the number "1" and the decimal point visible.

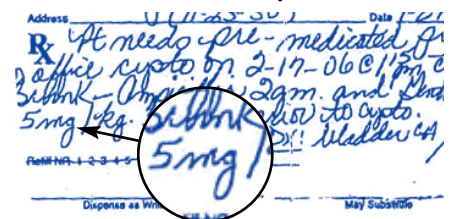


Figure 2. The number "1" and decimal point have been cut off the scanned prescription.

Heparin overdoses continued

■ *Have pharmacy dispense flush solutions that are not commercially available in the required concentration.*

■ *Require an independent double-check of products pulled for restocking ADCs before they leave the pharmacy.*

■ *Reduce look-alike potential of products by purchasing different strengths from different manufacturers.*


■ *Employ bar-code technology when stocking and removing drugs from ADCs (and also when administering medications).*

■ *Frequently assess the medications, strengths, sizes, and available dosage*

forms (e.g., multiple-dose vs. single-dose vials or prefilled syringes) stocked in ADCs, remove any medications or dosage forms considered unnecessary or unsafe, and have pharmacy dispense these medications as prescribed.

We would appreciate hearing how your organization is responding to these widely publicized errors. Please send a description of your actions to ismpnursing@ismp.org so we can share your ideas with others. Do not let these medication-related tragedies go unanswered; instead, let them serve as the impetus for a renewed effort to protect patients from harmful, but preventable, medication errors.

safetywire

 **A case for oral syringes.** After a physician prescribed **REGLAN** (metoclopramide hydrochloride) liquid 5 mg/5 mL for a nauseated child, a nurse received a unit-dose cup of Reglan liquid, 10 mg/10 mL, from the pharmacy. The nurse administered the correct dose, but rather than discard the extra 5 mL, she saved it in a par-enteral syringe in case another dose was prescribed. She applied the original pharmacy label to the syringe, which listed the patient's dose of 5 mg/5 mL. A pharmacy technician discovered the syringe during rounds and returned it to the pharmacy for disposal. If the syringe had not been discarded, the drug might have been given IV by a different nurse if another dose had been prescribed. Oral syringes should be used for all oral liquid medications. Optimally, pharmacy should dispense the exact dose in a labeled oral syringe. As in this case, leftover medication from unit-dose supplies should be discarded.

► Special Announcements

► **ADC teleconference.** Please join us for our next teleconference, **Strategies for Safe Use of Automated Dispensing Cabinets** (ADCs), on **November 15, 2006**, from 1:30 to 3:00 p.m. EST. Used appropriately, ADCs have the potential to improve efficiency and safety. Unfortunately, variations in design and functionality of ADCs have sometimes impeded the safe delivery of medications to patients. This teleconference will identify the causes of errors related to ADCs and present the components of a well-designed ADC system that can significantly reduce the risk of errors. Visit www.ismp.org/teleconferences/default.asp?teleconferenceID=21 to register.

► **ISMP welcomes new staff.** **Charlotte Huber**, RN, MSN, has joined our staff as managing editor and will be supporting the publication of ISMP **Nurse Advise-ERR®** and **SAFE Medicine®** (a newsletter for consumers). Before joining ISMP, Ms. Huber served as a clinical nurse specialist at Temple University Hospital - Episcopal, in Philadelphia, PA. Ms. Huber brings to ISMP diverse experiences in clinical care, staff development, risk management, and performance improvement in various settings.

researchshows...



Read-back works.

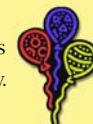
At the 2006 Pediatric Academic Societies' annual meeting, results were presented from a 2-part study on error rates related to verbal orders, with and without reading back the orders for verification. In part one of the study, 70 consecutive verbal orders were given and entered into the computer, resulting in a 9.1% error rate—mostly wrong drug dosages or incorrect medications. In part two of the study, 75 consecutive orders were given, transcribed, and read back before they were entered into the computer, adding only seconds to each encounter. The results revealed a **zero** error rate!

To maximize the read-back process, write the verbal order in the patient's record immediately. Then, read the entire order as documented back to prescriber for confirmation. Spell entire drug and patient names, remembering that letters like "m" and "n" can sound similar when pronounced. Confirm numbers using single digits (e.g., "one-four" for 14 because 14 can sound like 40). Ask for the drug's indication or communicate an understanding of its intended purpose. Ensure that the drug makes sense in the context of the patient's condition.

Read-back is one of the Joint Commission's National Safety Goals for verbal orders and critical test results. The above cited study lends further evidence of its importance to patient safety. Visit Cincinnati Children's Hospital Medical Center Web site (www.cincinnatichildrens.org/about/news/release/2006/5-verbal-order-errors.htm) for results of the complete study, which will soon be published.

Newsletter funding in 2007

We are very pleased to announce that **McKesson** will continue to provide ISMP with an educational grant to sponsor **free** distribution of **Nurse Advise-ERR®** to US hospital nurses in **2007**. The newsletter is now read by more than 2 million nurses! We appreciate McKesson's ongoing support for patient safety.



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