# Medication Safety Alerts

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## COST AND RISK: A NEED FOR REBALANCING

Financial constraints in hospitals lead to pressure on pharmacy departments to purchase less expensive medications and dosage forms. In some cases, this may mean eliminating, or simply not taking advantage of, specialized products such as pediatric formulations, premixed parenteral dosage forms, and unit-dose packaging. However, the cost savings achieved through such decisions are often insubstantial and may in fact represent false economies, resulting in increases in cost or complexity elsewhere in the medication use process. In addition, unforeseen risks may be introduced through the need for additional dose calculations and manipulation of dosage forms.

ISMP Canada received a report from a pharmacist who participated in stabilization of a premature neonate in a small community hospital. One of the medication orders for the neonate specified 4 mL of 4.2% sodium bicarbonate IV. The product carried by the hospital was a 50-mL prefilled syringe of 8.4% sodium bicarbonate intended for use in adults. The commercially available pediatric products for emergency use had not been carried for several years because of high cost and infrequent use. The pharmacist and physician performed an independent check of the dose calculation, and the nurse withdrew the required 2-mL volume from the prefilled syringe (although this is not the intended way to administer this product) to administer the correct dose of the medication.

This case did not result in an adverse outcome and could be considered a "success story", in that the staff solved a logistical problem to achieve a positive end result for the patient. However, it is a small reminder of a problem that is endemic to health care, whereby well-intentioned, seemingly "simple" decisions are often made without recognition that they can significantly increase the likelihood of error, especially in critical situations. Health care environments are by nature highly complex, and the addition of unnecessary steps to complicated situations, such as pediatric emergencies, increases the potential for patient harm. When faced with such problems, staff will attempt to create a solution or "work-around" to resolve the dilemma. In this case, staff members had to recalculate the dose and manipulate the dosage form to provide the medication that the patient needed. As these work-arounds become common, they come to be seen as "accepted practices". Once that happens, direct care staff fail to recognize and report the risks in their work environment or perceive them as "unfixable". The term "normalization of deviance" (the acceptance of lower standards for a process or the acceptance of lower levels of quality) has been used to describe this phenomenon. Analysis of the Columbia and Challenger aerospace disasters identified normalization of deviance as a significant contributing factor in those events.[1,2] Hall noted that the Columbia disaster was a "shocking reminder of how seemingly innocuous details play important roles in risky systems and organizations".[1] In an explanation of how the phenomenon of normalization of deviance develops in an organization, Dekker commented that "informal work systems compensate for the organization's inability to provide the basic resources . . . needed for task performance" and that "continued safe outcomes of existing practice give supervisors no reason to question their assumptions about how work is done".[3]

These observations are relevant to health care environments. Where errors are not known to have occurred in a particular process, as in the example described, the risk of adverse events related to the lack of

a specialty product is perceived as low. Unfortunately, it often takes a serious incident to demonstrate that apparently trivial details are important to ensure safe patient care. Specialty products such as pediatric emergency drugs may be perceived as mere "convenience" items—at least until a dosing error results in an adverse event or near miss. Interestingly, 22% of pediatric medication errors reported to the USP MEDMARX program in 2003 were related to improper dose or quantity of medication.[4] Recognition by the health care team that circumstances such as those in the case described here are "disasters waiting to happen" provides an opportunity to take action to prevent future errors.

The oft-quoted Canadian Adverse Events Study estimated that 7.5% of adults admitted to hospital experienced an adverse event as a result of their hospital stay, which translates to as many as 23 750 preventable deaths annually.[5] Importantly, 37% of the adverse events were deemed preventable. A key recommendation of the study was the need to improve communication and coordination among caregivers. Inclusion of direct care staff in consultation and monitoring of decisions related to the purchase of pharmaceutical products is one way to improve interdisciplinary collaboration and hence to enhance patient safety.

The higher profile of patient safety provides new opportunities for pharmacists to take an active role in ensuring safety at all levels of the medication use process. In many settings, pharmacists have moved away from the technical functions related to drug distribution and now use their clinical knowledge to provide pharmaceutical care and improve therapeutic outcomes for patients. However, there are still many hospitals where pharmacists are not active in direct patient care and where pharmacists do not often participate in "emergency care". Given the nature of services provided in emergency departments and operating rooms, medications are typically supplied as ward stock with little pharmacist oversight, despite the common use of high-alert medications (drugs that bear a heightened risk of causing significant patient harm when they are used in error[6]). Pharmacists do not routinely review orders for patients treated in these areas, and opportunities to directly observe the administration of medications are few. In fact, participation of the pharmacist in the scenario described at the beginning of this article was unusual for the hospital in question. Had the pharmacist not been present, it is unlikely that a risk report would have been filed because the staff involved were able to manage the situation and no adverse outcome occurred.

Awareness of latent conditions that can set the stage for errors provides opportunities to take action to prevent future adverse events. Pharmacists possess unique knowledge of drug products and can use this knowledge to enhance pharmaceutical care in situations involving high-alert drugs and vulnerable patient groups. As part of their pharmaceutical care role, pharmacists need to ensure that, for each drug product available in patient care areas, the risks of error and the ages and diagnoses of typical patients being treated with the drug have been considered in product selection. The cost of commercially available products such as premixed parenteral dosage forms and unit-of-use packaging for special populations such as children must be balanced against the potential risks associated with lack of these items.

**References**


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