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ASHP Recommends Hospitals Take Key Steps to Improve Safety

A recent medication error involving inappropriate doses of heparin to six infants led to the tragic deaths of three neonates in an Indiana hospital. Our hearts go out to the infants' families and the hospital staff involved in this terribly sad event. The details regarding this event remain under investigation, however the hospital has taken steps to prevent future occurrences by requiring double-checks by pharmacists for all pulled inventory and validation of heparin doses for NICU and PICU patients by a minimum of two nurses. This unfortunate incident reemphasizes the need for reporting, quantification, classification, root causes, and the development of strategies for prevention of adverse medical events as mentioned in IOM reports. We encourage you to share the information provided in the link below with your hospital administrator, your pharmacy department, and others in your organization.

Recommendations

Medication use in hospitals and health-systems is highly complex and often includes more than a hundred distinct steps, each of which offers numerous possibilities for error and patient harm. Methods of reporting, analysis, and follow up should emphasize process improvement, establish a culture of safety, and avoid blame. Only through the coordination of medication-use processes and error-reduction strategies can we improve safety for our patients. The following points describe ASHP's positions on medication errors in hospitals and health-systems.

- Assign a pharmacist to lead an ongoing, interdisciplinary medication safety team comprised of health care professionals to conduct a proactive and structured analysis of the medication-use process in pediatric and neonatology settings to identify high-risk areas where mistakes could harm patients. ASHP has developed a [task analysis](#) for such a safety strategy.
- Perform a thorough analysis of all drug preparation activities in NICU and PICU with an acute review of processes where staff manipulate the concentration of manufacturer-ready packages before administration. This is especially critical when the manufacturer-ready package is 10% greater than normal dose ranges administered.
- Minimize the number of available concentrations of intravenous medications. This should be done through organizational policy developed by the P&T Committee. (JCAHO National Patient Safety Goal 3B.)
- Dispense medications used in pediatrics and neonates in ready-to-use (unit dose) form prepared by the pharmacy. For critical care beds, 64.3% of hospitals dispensed 75% or more of injectable medications in unit dose form.¹ Ideally, all medications used in the hospital should be prepared and dispensed by the pharmacy in unit dose form.

¹Pedersen, C., Schneider, P., Scheckelhoff, D. ASHP national survey of pharmacy practice in hospital settings: Dispensing and administration—2005. *Am. J. Health Syst. Pharm.*, Feb 2006; 63: 327 - 345.

- Implement barcode bedside scanning technology. Barcode medication administration is increasing, with 9.4% of hospitals reporting implementation in 2005, compared with just 1.5% in 2002.¹
- Develop a standardized process, train staff, and routinely assess competency of staff on performing independent checks (double-checks) for all high-risk medications. This process should be used even if barcode bedside scanning is in place.
- Seek and use knowledge from other institutions that have solved similar problems.
- Always label medications with the drug name and strength. No exceptions should be made to this rule especially if there are any intervening steps or interruptions between medication preparation and administration. This step also reinforces the need to read the drug label.
- Avoid placing look alike/sound alike products in the same matrix drawer of the automated dispensing devices (ADD).
- A reported 71% of hospitals use ADD for drug distribution, but it is vital that the judgment of educated and trained health care professionals serves as the initial and final authority regarding the safety of the patient. Never assume technology alone will prevent all errors and solve all problems in inherently highly complex medication-use processes.
 - Of those hospitals with automated dispensing cabinets, 82.6% have pharmacists check the accuracy and integrity of medications contained in the automated dispensing cabinets either before or after medications are replenished. In addition, 32% of hospitals required a two-pharmacist check before dispensing medication to high-risk groups (e.g., pediatric patients).¹

Most errors and patient harm occur as a result of poorly designed and managed processes in which medications are stored, prescribed, prepared, dispensed, and administered. Diligent and ongoing efforts to continually identify and improve error-prone aspects of these highly complex and changing processes can drastically minimize potential patient harm. Many process improvements require substantial financial investments, which have a high rate of return if calculated in terms of avoided patient morbidity and mortality. Payers and insurers should give hospitals direct incentives to make these investments.

Pharmacists, administrators, and other health care professionals should act immediately to ensure all hospitals and health care facilities take steps to prevent deaths such as these from happening again. For questions or additional information, please contact ASHP at quality@ashp.org.

Additional Resources

1. [ASHP Best Practices for Medication Misadventures.](#)
2. Barker KN, Pearson RE, Helper CD et al. Effect of an automated bedside dispensing machine on medication errors. *Am J Hosp Pharm* 1984;41:1352-8
3. Barker KN. Research on drug use system errors. *Am J Health-Syst Pharm.* 1995;52:400-403
4. Bates DW. [Using information technology to reduce rates of medication errors in hospitals.](#) *BMJ* 2000; 320(7237): 788-791.
5. Borel JM, Rascati KL. Effects of an automated, nursing unit-based drug dispensing device on medication errors. *Am J Health-Syst Pharm.* 1995;52:1875-9
6. Buchanan EC. Ethics of automated compounding and dispensing. *Pharm. Pract Manage Q* 1995;15(3):1-6
7. Barker KN. Assuring safety in the use of automated medication dispensing systems. *Am J Health-Syst Pharm* 1995;52:2445-7
8. Cummings J, Bush P, Smith D, Matuszewski. [Bar-coding medication administration overview and consensus recommendations.](#) *Am J Health-Sys Pharm.* 2005 Dec; 62(24): 2626-29.
9. Hutchinson D. Getting to the bottom of a sentinel event. *Am J Health-Syst Pharm.* 1999;56(30):2031-2032.
10. Larrabee S, Brown MM. [Recognizing the institutional benefits of bar-code point-of-care technology.](#) *Joint Commission Journal on Quality and Safety.* 2003 July; 29: 345-53
11. Levine, S., et al. Guidelines for preventing medication errors in pediatrics. *J Pediatr Pharmacol Ther.* 2001 6:426-42.
12. Magnus GH. Frontline pharmacist. Preparing for automated dispensing devices. *Am J Health-Syst Pharm* 1995;52:2406-08.
13. Manasse HR. Medication use in an imperfect world: drug misadventuring as an issue of public policy. part 1. *Am J Hosp Pharm.* 1989;46:929-944.
14. Manasse HR. Medication Use in an Imperfect World: Drug Misadventuring as an Issue of Public Policy. Part 2. *Am J Hosp Pharm.* 1989;46:1141-1152.
15. McCarthy ID, Cohen MR, Kateiva J, McAllister JC, Ploetz PA. What should a pharmacy manager do when a serious medication error occurs? A panel discussion. *Am J Hosp Pharm.* 1992;49(16):1405-1412.
16. Means BJ, Derewicz HJ, Lamy PP. Medication errors in a multidose and a computer-based unit dose drug distribution system. *Am J Hosp Pharm.* 1975;32(2):186-91.
17. Neuenschwander M. Limiting or increasing opportunities for errors with dispensing automation. *Hosp Pharm.* 1996;31:1102-1106.
18. Smetzer JL, Cohen MR. Lessons from the Denver medication error/criminal negligence case: Look beyond blaming individuals. *Hosp Pharm.* 1998;33:640-657.