Preventable Harm: Medication Misuse

To err may be human, but when it comes to medication mistakes, the consequences can be deadly. Remedying the problem will require coordinated interventions across all sectors of the healthcare system.

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The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) defines a medication error as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer."

With as many as three billion prescriptions written annually, and most with no adverse consequences to the patient, you might assume that medication mistakes are a rare occurrence. But a 2006 study conducted by the Institute of Medicine turned up some stark statistics: The error rate in administering medication in U.S. hospitals averages one patient per day, and nearly 1.5 million people per year are harmed by medication mistakes. The report went on to state that although the vast majority of errors do not lead to fatalities, at least 7,000 deaths were attributed to drug overdoses and other medication mishaps. And, while hospital-based errors are the easiest to trace and document, hospitals are certainly not the only setting in which this problem exists. Medication errors can occur in any place that medication is administered or dispensed: physicians' offices, outpatient surgery centers, nursing homes, urgent care centers and even pharmacies.

Most Common Medication Errors

According to the American Hospital Association, the most common types of medication errors include:

- incomplete patient information (not knowing about patient allergies, other medicines they are taking, previous diagnoses and lab results);
- unavailable drug information (such as lack of up-to-date warnings);
- miscommunication of drug orders stemming from poor handwriting, confusion concerning drugs with similar names, misuse of zeroes and decimal points, confusion of metric and other dosing units and inappropriate abbreviations;
- lack of appropriate labeling as a drug is prepared and repackaged into smaller units; and
- environmental factors, such as lighting, heat, noise and interruptions, that can distract health professionals from their medical tasks.

Clearly, medication mistakes can occur at many junctures in the pharmaceutical supply chain for a variety of reasons. Some mix-ups are fairly benign while others result in unnecessary loss of life. All are troubling.

"When my 19-year-old son broke his leg, the drugstore pharmacist typed the incorrect dosage information on his codeine prescription," recalls Temecula, Calif., resident Kevin Vaughn. "Instead of prescribing one to two tablets every four hours, the label said to take 11 tablets every four hours. My son had taken nine tablets by the time I discovered the error. I immediately had him throw them up and took him to the emergency room, where they pumped his stomach. He's fine now, but the doctor said the mistake could have severely damaged his liver."

Another error took place when staff members at a Wellesley, Mass., school went to get H1N1 vaccinations in early January. But, instead of the H1N1 vaccine, they received a shot of insulin. While the staffers suffered no long-term damage, the potential for serious complications clearly existed. It was determined that a school nurse was responsible for giving patients the wrong injection.

In another well-publicized case last fall, actor Dennis Quaid's newborn twins were accidentally given 1,000 times the intended dosage of heparin, a medication used to prevent blood clots around intravenous catheter sites. News reports stated that nurses at a Los Angeles hospital mistakenly administered heparin with a concentration of 10,000 units per milliliter instead of ➤

the prescribed 10 units per milliliter. The twins survived, but not all families are as fortunate.

A lawsuit is currently pending against Rite Aid drugstores claiming pharmacists were negligent in issuing a lethal dose of a chemotherapy drug. The deceased patient's family says the prescription instructed the patient to take 14 capsules of the medication by mouth daily, 10 times the usual dose and almost double what is known to be fatal.

Minimizing "At-Risk Behaviors" by Healthcare Professionals

A white paper issued by NCC MERP acknowledges that it is human nature to look for faster and easier ways to accomplish tasks. A problem arises, however, when physicians, pharmacists and other healthcare professionals engage in such behavior, as it can put patients at risk. The report identifies rushing to complete tasks as one of several "at-risk behaviors" practitioners may engage in because the rewards are immediate and the risk of patient harm seems remote. The report goes on to say that at-risk behaviors and shortcuts that do not immediately result in patient harm have the potential of becoming standard practice, escalating the odds that eventually someone will get hurt. The white paper lists the most common at-risk behaviors among healthcare professionals as:

- engaging in "grab and go" without fully reading the label of a medication before it is dispensed, administered or restocked;
- being intimidated or reluctant to ask for help or clarification;
- failing to educate patients;
- using medications without complete knowledge of the medication;
- failing to double-check high-alert medications before dispensing or administering; and
- failing to communicate important information (e.g., patient allergies, diagnosis/co-morbid conditions, weight, etc.).

While each situation where medication misuse occurs is unique, NCC MERP makes several recommendations to help practitioners establish an organizational culture that minimizes at-risk behavior among staff. These recommendations, titled Reducing Medication Errors Associated with At-Risk Behaviors by Healthcare Professionals, can be accessed on its website at vwww.nccmerp.org/council/council2007-06-08.html.

FDA Launches Safe Use Initiative

Tens of millions of people in the United States depend on prescription and over-the-counter medications to maintain their health. Without a doubt, countless patients are helped by these medications. But there also are millions who are accidentally harmed by their improper use. To address this growing concern, the Food and Drug Administration (FDA) has launched a new program titled the Safe Use Initiative. The program is aimed at lowering the likelihood of preventable harm from the use of various medications. "Too many people suffer unnecessary injuries from avoidable medication misuse, errors and other problems," says FDA Commissioner Margaret A. Hamburg, MD. "The FDA is launching the Safe Use Initiative to develop targeted solutions for reducing these injuries."

Recognizing that collaboration is a key to the initiative's success, the FDA is reaching out to healthcare providers and other stakeholders to identify which drugs and drug classes are most often associated with preventable harm. The next steps in the initiative are slated to include a list of specific problems and the identification of cross-sector interventions for reducing harm. "Only through coordinated interventions across all sectors of the healthcare system can we substantially reduce preventable injuries from using medications," says Janet Woodcock, MD, director of the FDA's Center for Drug Evaluation and Research.

Meanwhile, the FDA has released new requirements for manufacturers of over-the-counter liquid products that are packaged with calibrated cups, droppers, syringes and spoons. According to the agency, some dosage-delivery devices are unclear or are inconsistent with the labeled dosing instructions. "Many accidental overdoses result from confusion about exactly how much of a drug to take. Better measuring devices will help patients, parents and other caregivers use the right amount of these medications ... especially for children," Woodcock adds. ➢

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The FDA initiative also proposes an evaluation of patient education materials on medications; communication about the risk of inadvertent overexposure to acetaminophen; putting safeguards in place to prevent surgery fires caused by alcohol-based surgical preps; and avoiding contamination of multiple-use medication vials. The FDA plans to work with the healthcare industry and the public as it develops new guidelines intended to prevent harm from medication use.

Systematic Safeguards: Using Bar Codes, Computerized Prescriptions and Other Methods to Improve Patient Safety

Leading hospitals across the country are already utilizing various programs to improve patient safety. A story published by ABC News and World News Tonight compiled information obtained from top hospitals to highlight some of their best practices and strategies:

- Electronic Tracking: Johns Hopkins Hospital in Baltimore, Md., uses electronic tracking of patient medications, called medical reconciliation, when patients are transferred from the intensive care unit (ICU) to another area of the hospital. If the medicine patients were given in the ICU does not match the medicine they receive in the new unit, the doctor is alerted of the error.
- Creating a Safe Culture: The Mayo Clinic in Rochester, Minn., has systems in place that encourage, support and reward the reporting of errors.
- E-Warnings: Cleveland Clinic has a system that warns doctors of possible drug interactions with other medications already taken by the patient when a new prescription is entered into the system.
- Smart Infusions: Massachusetts General Hospital in Boston uses smart infusion devices that have built-in drug libraries to ensure that patients are given the correct dosage of IV medication.
- Larger Lettering: UCLA Medical Center in Los Angeles found simply using a larger font on IV bag labels and patient wristbands makes it less likely that a nurse will give the patient an incorrect drug.
- X-Ray Technology: University of Michigan Hospitals and Health System in Ann Arbor, Mich., boasts a system called ValiMed that uses ultraviolet light to check the concentration and chemical makeup of IV solutions mixed by pharmacists, a process prone to error especially while dosing medications for kids.
- Bar Codes: Stanford Hospital and Clinics in California ensures all pill packages are barcoded, allowing nurses to match the barcode on a patient's wristband to that on the pill.
- Robotic Assistance: University of Pittsburgh Medical Center features a robotic arm in the pharmacy that sorts out the patients' pills. An actual robot then delivers the medications to the various floors.

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