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By LAURA LANDRO



## Hospitals Tackle High-Risk Drugs To Reduce Errors

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Hospitals are taking steps to prevent errors in the use of so-called high-alert medications -- those that, when given in the wrong dose or used incorrectly, have the highest risk of seriously harming or even killing a patient.

Many of the high-alert medications are the most essential to hospitals. Among them are drugs to prevent blood clots, sedate patients, relieve pain and stabilize diabetics. But incorrect use of these drugs can lead to disasters, such as the accidental overdoses of heparin, an anticlotting drug, that killed three infants at an Indiana hospital in 2006 and threatened the newborn twins of actor Dennis Quaid this past November.



Baxter International

High-dose heparin was repackaged (right) to make errors less likely.

While there are 19 categories of high-alert medications, according to the Institute for Safe Medication Practices, studies show that about eight medications, including heparin, account for 31% of all medication errors that harm patients.

Now, amid growing awareness of medication mistakes and pressure from safety groups, hospitals are scrambling to overhaul their safety practices. They are working with drug makers to redesign confusing packages and eliminating multiple concentrations of the same drug from supply cabinets. They are also investing in bar coding and systems that let staffers check the accuracy of medication orders at patients' bedsides and see other information, such as allergies, that

could cause adverse reactions.

In perhaps the most challenging step, hospitals are tackling the "grab and go" culture in busy hospitals that evidence increasingly shows causes errors. Doctors, nurses and pharmacy staffers often give out medications without fully reading the labels, evaluating patients' risks, or checking one another's work. "For each one of these errors to reach a patient, six to eight slip-ups have occurred somewhere in the system, and each one of those steps is an opportunity for someone to intervene," says Kerry Butler, quality and medication-safety officer at Saint Thomas Health Services in Nashville, Tenn., a unit of nonprofit health-care system Ascension Health.

Saint Thomas is one of a number of hospitals establishing "behavioral accountability" standards for staffers, with acronyms like STAR -- for Stop, Think, Act, Review. Hospitals are also adding strict new policies, such as requiring two staffers to check before certain drugs are given to patients and creating new training programs to help staffers intercept errors and respond faster when mistakes do occur.

The Institute for Healthcare Improvement, a Cambridge, Mass., nonprofit that sponsors health-care quality programs, has created a guide for hospitals on how to prevent harm from high-alert medications, focusing on four categories of medications that it says are most frequently used and have the greatest potential for harm: anticoagulants, narcotics, insulin and sedatives.

The Joint Commission, which accredits hospitals, is requiring that hospitals have programs in place by the end of this year to reduce the likelihood of harm from anticoagulation therapy using drugs like heparin.

But Mike Cohen, president of the Institute for Safe Medication Practices, which monitors and analyzes errors and maintains an updated list of high-alert medications, says that safety efforts are largely voluntary and that too few hospitals have invested in technologies such as bar coding that could sharply reduce errors.

Hospitals are also calling on patients and families to act as a final line of defense, keeping a watchful eye on medications and asking nurses to verify their accuracy -- especially when infants and children are involved. "Kids are changing every day, and administering medications in doses according to size and weight adds a new level of complexity," says Charles Homer, a professor at Harvard University and chief executive of the National Initiative for Children's Healthcare Quality.

While hospitals have always had to deal with potentially dangerous medications, the introduction of thousands of new drugs in a growing range of doses, concentrations and packages has increased the likelihood of error, Mr. Cohen says.

For example, nurses often flush the tubes used to deliver intravenous medications to infants with a low-dose heparin product to keep the catheters from clotting. But at Methodist Hospital in Indianapolis, three infants that were treated in the neonatal intensive-care unit died in 2006 after a technician accidentally replaced 10-unit-per-milliliter vials in a medicine dispenser with vials containing 10,000 units per milliliter. Six different nurses took out the medications, assuming them to be the correct dose because of their placement in the cabinet, and flushed the infant's catheters. By the time the mistake was discovered, it was too late.

Methodist, facing investigations and lawsuits tied to the deaths, acted quickly to publicly disclose the errors and retrained its staff in rigorous prevention policies. It installed a system to bar-code medications, as well as an automated refilling system for medication storage cabinets and a scanner for verifying medication at the bedside. It also replaced the 10,000-unit heparin vial with a heparin-filled syringe that can't be confused with the smaller dose, and two health-care workers must now look at a dose of heparin before it is administered to a newborn.

The hospital is sharing its strategy for dealing with the errors with other hospitals, including a teleconference March 10 sponsored by IHI. Says Valerie Shahriari, director of risk management and patient safety for Methodist parent Clarian Health: "If this happened to us, it can happen to other hospitals, and we think people can learn from our experience."

In the case of the Quaid twins, who survived a heparin overdose at Cedars-Sinai Medical Center in Los Angeles in November, the family is suing heparin marketer **Baxter International Inc.**, saying that the error was a result of confusion by hospital staffers over similar packaging used for its low-dose Hep-Lock IV flushing product and a 10,000-unit vial.

Baxter says it hopes to resolve the lawsuit and work with patients and hospitals to further improve safety. In February 2007, the company sent out a safety alert to its customers, warning of the potential for error; in October, it changed its packaging to more sharply set apart different heparin concentrations, adding snap-off caps so that nurses must take an extra step when opening it. It also varied the colors, enlarged the font size, and stamped "Not for Lock Flush," referring to the low-dose flushing product, on large-dose vials. But hospital staffers "still have to read the labels, no matter what we do," says Debra Bello, senior director of global medical and clinical affairs for Baxter's medication-delivery business.

(In an unrelated development, Baxter is recalling heparin vials amid a Food and Drug Administration investigation of reports of allergic reactions and deaths that appear to be linked to manufacturing problems.)

Cedars-Sinai has also taken steps to overhaul safety practices, after an internal investigation concluded that staffers failed to follow any of its policies on verifying medication before dispensing and administering the heparin in the case of the Quaid twins. About 1,800 nurses and all its pharmacy technicians were required to undergo retraining on high-alert-medication policies and pass a written test. It also has replaced heparin with a saline solution for flushing catheters.


Other hospitals are taking steps now to prevent such errors. Duke University Hospital is using "mistake-proofing" strategies such as stocking standardized concentrations of medicines and premixed doses and using "smart pumps" that deliver an alert if a mistake is made in entering a dose. It has also adopted the Six Sigma methodology, used by manufacturers to minimize errors, to identify what could go wrong with high-alert medications and develop prevention plans. The hospital, which already has a computerized system used by doctors to enter medication orders, is now adding a medication-administration system that will let nurses view all the information about a patient and make it easier to avoid errors at the bedside, according to Judy Prewitt, chief nursing officer.

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