

E-Prescribing First Step to Improved Safety

Change doesn't come without pain, but the suffering caused by medication errors is justification enough to embark on the type of sweeping institutional reforms called for by an Institute of Medicine panel, several experts said.

Electronic prescribing, electronic health records, and computerized treatment protocols are indispensable tools for reducing medication errors, according to the IOM report called *Preventing Medication Errors*. But successfully incorporating these tools into practice requires strong leadership and a commitment to an often difficult culture change, said physicians and cancer professionals who have been through the process.

The landmark report found that there is one avoidable medication error per hospitalized patient per day; more than half a million errors occur each year among Medicare patients alone. The report cites some noteworthy progress in patient safety, but it concludes that too often these efforts don't come about until an institution experiences a mistake that causes patient harm or even death.

Although medication errors may be no more common among cancer patients, the report's authors noted that the toxic effects of chemotherapy means that mistakes can be more severe in oncology. However, it is also often difficult to distinguish between the expected toxic reaction to cancer drugs and unnecessary suffering due to incor-

rect doses or improper administration, they said.

Dana-Farber Fix

In 1994, Betsy Lehman received a fatal overdose of the chemotherapy drug cyclophosphamide, which is just an example "of the failure of the care delivery system to catch and mitigate a medica-

tion error," according to the IOM report. While being treated for breast cancer as part of a clinical trial, Lehman was accidentally prescribed 4,000 mg/m² a day for 4 days instead of the appropriate dosage of 4,000 mg/m² spread over 4 days, a mistake that wasn't discovered until 10 weeks after she died.

For the Dana-Farber Cancer Institute, where Lehman was being treated, the accident sparked an immediate push to improve the institute's patient safety measures, said Saul Weingart, M.D., Ph.D., director of the center for patient safety at Dana-Farber.

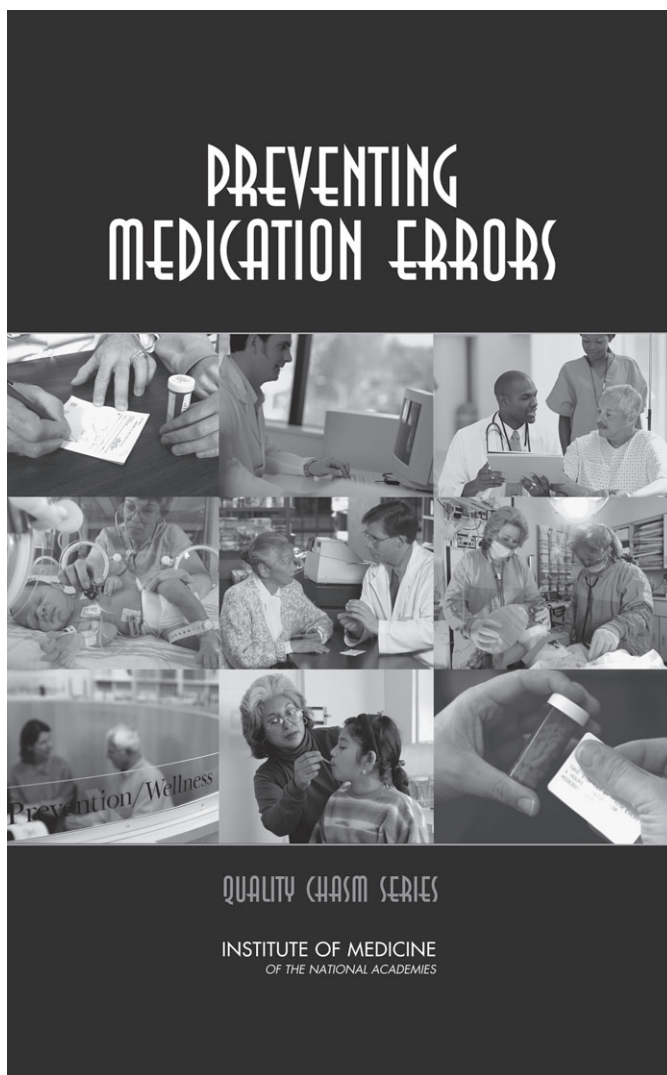
"The institute had always had an interest in providing safe care, but that was a wake-up call," he said.

That wake-up call soon led to changes in the way Dana-Farber protects patients. But even more important than the immediate reaction was the challenge of sustaining the effort over the long term, a job that fell to a few members of the institute's leadership, Weingart said.

"A lot of the credit has to go to key personnel who kept up the pressure," he said.

These include James Conway, who was chief operating officer of Dana-Farber at the time. He served on the IOM committee on identifying and preventing medication errors, which drafted the recent report.

"Once you kill a patient, it shouldn't take you long to mobilize," Conway said. Every cancer center has a patient who has been harmed by a medication error, he said. That is an opportunity for



The Institute of Medicine report on drug errors says that electronic drug tracking systems could help alleviate the problem.

change, but it takes a culture willing to shine a bright light on its mistakes for that change to last.

“It is the responsibility of everybody, every day,” Conway said. “We have all had to become experts at looking for trouble.”

For Dana-Farber that meant going from a system in which the physician was seen as the “captain of the ship” to one in which the physician is part of a team that includes nurses, pharmacists, patients, and their families. Each member of the team is responsible for checking up on the others and working to avert mistakes.

The IOM report particularly recommends that patients become actively involved in tracking their medications and that physicians ask regularly about any drugs that may have changed. At Dana-Farber, patients are given a card listing their medications, which they can update as they receive treatment at different sites. Physicians are instructed to ask about medications at every visit. These measures not only make patients more aware of what medications they are supposed to be on but also act as a check against what is in their medical records.

Keeping track of medications is especially important in oncology, where patients are often receiving multiple drugs both as part of their therapy and to mitigate their side effects. They also have doctor’s appointments at other sites where drugs may be added to or subtracted from that list. Those factors make it difficult to maintain an accurate and up-to-date list without the patient’s help.

“Just because you work hard to maintain the list doesn’t mean they are not still frequently wrong,” Conway said.

An Electronic Age

During some of the preliminary research conducted by Dana-Farber staff, Conway and his colleagues found that the medications listed on file were accurate only about half the time, he said. Electronic prescribing can help physicians keep better track of what medications their patients are on while helping

to avert mistakes due to misread prescriptions or miscalculated dosages.

For that reason, the IOM report recommends that medical centers switch from paper to electronic prescribing systems to help avoid many of the prescribing mistakes that remain so common despite the findings of years of research.

“Paper-based prescribing is associated with high error rates. Electronic prescribing is safer because it eliminates handwriting and ensures that the key fields (for example, drug name, dose, route, and frequency) include meaningful data,” according to the report.

Computerization also enables clinical decision support tools—automated checks on drug doses, identification of possible adverse interactions, and suggestions for patient counseling—to be incorporated into the prescribing process, including checks for drug allergies, drug-drug interactions, and potential overdoses.

At Dana-Farber, electronic prescribing has been integrated with digital treatment protocols designed to ensure that the institute’s physicians don’t stray from standards of care. The protocols were developed by experts from both inside and outside the institute and are updated at least once a year.

“It makes it very difficult to do the wrong thing and very easy to do the right thing,” Weingart said.

Children’s Hospital and Regional Medical Center in Seattle has implemented similar protocols as part of ongoing efforts to prevent errors.

“To give chemotherapy, there must be an accompanying roadmap,” said Douglas Hawkins, M.D., a hematologist-oncologist at the hospital.

There are now more than 100 of the roadmaps, which are considered “the law” when it comes to treating patients, Hawkins said. All staff members have access to the documents so that they can check to make sure a patient’s treatment is correct.

Integrating patient care decisions into computer systems has proven practical enough that both institutions have taken automation a step further. Dana-Farber has added a barcoding system that

matches patients to their medications, acting as another check against mistakes. Children’s has standardized its medication ordering system with electronic forms and created new steps requiring nurses and pharmacists to double-check that the correct drugs are being administered.

But it’s not always easy to take this step to oncology practices. Existing electronic prescribing systems rarely take the particular needs of cancer care into account.

“It’s a big problem,” said Weingart. “There are no off-the-shelf applications you can just turn on and use.”

Computers Not the Full Answer

However, experts at both institutions emphasize that those steps, although important to preventing common errors, are only part of the ongoing process of improving patient safety. With more and more cancer medications being taken by patients outside the clinic, both institutions have begun to look at what types of problems can arise in the ambulatory setting.

In a recently published study conducted at the Children’s Hospital, Hawkins and his colleagues detected one or more problems with nearly 10% of the medications prescribed to 69 children undergoing treatment for leukemia. Many of the problems identified were not clinically significant, but the study has drawn attention to some potential issues that are unique to at-home cancer treatments.

“It’s part of a very deliberate process to make sure that patients are getting what we think they are getting,” Hawkins said.

A few of the cases were troubling, including three patients who didn’t receive their medications at the right time, risking relapse, and one who was given an overdose of drug, risking a dangerous degree of immune suppression. On the positive side, Hawkins’ study also found that there were no dispensing errors by the pharmacy.

The problems come in part because treatment schedules for cancer drugs are often very complicated, involving several drugs given at different intervals.

“It’s not surprising that families would get confused,” Hawkins said.

The IOM report found that the trend in home-based cancer treatments posed many pitfalls. They cited the report of a pediatric leukemia patient who was sent home with a peripherally inserted central catheter after developing an infection. When the line clotted, the patient’s mother was preparing to clear it with ginger ale when she was stopped by a home-care nurse.

“Having been taught to clear the child’s feeding tube with ginger ale,

the mother thought the same could be done with the PICC line. She is just one example of the many caretakers who do not receive adequate discharge counseling,” according to the report.

Cancer centers seeking to reduce medication errors are likely to face other unique challenges, and methods for detecting medical errors are pivotal to preventing them.

Although averting errors is an important goal, cancer specialists may have to focus on a more subtle endpoint:

preventing unnecessary patient suffering, Weingart said.

“We think that the care we provide is safe, but it may be hard to document,” he said.

And after all this effort, the question is whether the effort is worth it, he said.

The effort has worked at Dana-Farber, which on the 10th anniversary of the Betsy Lehman case, released data showing that the number of medications errors has declined steadily over the past 7 years.

—**Joel B. Finkelstein**

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