

## Case Study

Seven San Francisco Bay area hospitals achieve medication error reductions—systematically

Medication errors remain among the most common of medical errors in hospitals, and have been documented in an astonishingly wide range of studies and surveys in health care. One recent (July 2006) estimate from the Institute of Medicine found that medication errors harm at least 1.5 million people a year, and that the extra medical costs of treating drug-related injuries occurring in hospitals amount to \$3.5 billion a year, a figure that does not take into account lost wages and productivity or additional health care costs<sup>1</sup>. An earlier estimate (2001) that appeared in the journal *Pharmacotherapy* found that medication errors occurred in 5.07% of the patients admitted every year to a group of 1,116 hospitals studied by a group of researchers led by C.A. Bond, Pharm.D.<sup>2</sup> The *Pharmacotherapy* article authors further added that “Each hospital experienced a medication error every 22.7 hours (every 19.73 admissions). Medication errors that adversely affected patient care outcomes occurred in 0.25% of all patients admitted to these hospitals/year.”

A number of pioneering hospitals have made inroads in this crucial area. Inevitably, the development of standardized processes around medication administration, and adherence to those standardized processes, is one element in overall medication management success stories.

One innovative grant-based program that ran for 18 months, concluding in March 2008, among seven San Francisco Bay area hospitals, and focused exclusively on the medication administration aspects of medication management, is offering important clues as to how medication administration can be optimized. The program, funded by a \$5.8 million grant from the Gordon and Betty Moore Foundation (through its Betty Irene Moore Nursing Initiative) to the University of California, San Francisco’s Center for the Health Professions, achieved strong outcomes among the seven participating hospitals (Kaiser Permanente-Fremont, Kaiser Permanente-Hayward, Novato Community Hospital, San Francisco General Hospital, St. Rose Hospital (Hayward), Stanford Hospital and Clinics (Palo Alto), Sequoia Hospital (Redwood City)).

The program was developed by the Integrated Nurse Leadership Program (INLP), one of the core research and professional development programs of UCSF’s Center for the Health Professions. The INLP’s 18-month program trained front-line clinicians, primarily nurses, to take a leadership role in developing clinical protocols, reporting tools and metrics, and administrative procedures, in the medication administration area. Each of the seven hospitals

INLP director Julie Kliger, M.P.A., B.S.N., the INLP’s program director, reports that the participating hospitals, adhering to six process steps identified by the California Nursing Outcomes Coalition (CalNOC) as best practices for medication administration, improved medication administration accuracy from a baseline rate of 83.8% at the start of the program to 93.0% after 18 months. What’s more, that 93.0% rate is based on documented, or “observed” accuracy, as the program made use of shadow observers who followed nurses as they administered medications to patients and then documented the results, rather than being based on self-reported accuracy rates.

The six CalNOC best-practices process steps for medication administration to which program participants adhered were:

- The nurse is required to compare a medication to the medical record for the patient to whom the medication will be administered
- The nurse must not be distracted or interrupted from the time the medication is taken in hand until it is administered to the patient
- The medication must be labeled from the time it is taken in hand to the time it is delivered to the patient

- The nurse must check two forms of identification on the patient; and, when appropriate, the nurse must explain the medication to the patient at the time of administration
- The nurse must document the administration of the medication to the patient in the chart immediately after it is administered

In addition, nurses were required to check for the classic “five rights” of medication administration: right patient, right time and frequency of administration, right dose, right route, right drug. As a result, medication administration errors dropped by 56.8% during the course of the program’s 18 months. In addition, adherence to the six best practices, which started out at 79.5% at the outset of the program, increased to 91.8% at its conclusion. All these improvements took place across an average of 55 to 80 medication administrations per nurse per eight-hour shift at participating hospitals.

What accounts for the jump? “You have to employ front-line clinicians to solve front-line problems,” Klinger says. “And, having worked as a nurse, I really think that it was very critically important to me to have a large component of professional efficacy taught throughout the program,” she adds. Though she says she hesitates to use the oft-banded-about term “nurse empowerment,” she does believe that giving the nurses responsibility and authority to help design and implement changes, and to exert their authority as clinicians, was one of the keys to the success of the program, along with systemic thinking and process improvement.

For example, Klinger reports, in order to maintain strict adherence to the second of the six core best-practice process steps, around non-interruption of nurses during the medication administration process, participating hospitals instituted new procedures that Klinger herself had derived from the “sterile cockpit” concept in the aviation industry. The core concept, she says, comes from the idea that “From pushback to taking off the tarmac, you do not interrupt the pilot unless it’s safety- or procedure-related. So,” she says, “I translated that idea to the concept that from the moment the nurse walks into the meds room to obtain the medication, until administration to the patient at the bedside, the nurse should not be interrupted.” As a result, participating hospitals instituted a new process in which, if a nurse were paged during the time that nurse was administering medications, the nurse would allow the page to be answered by another party, sometimes a special “resource nurse” who was specifically assigned to that duty. Sometimes, the unit secretary or resource nurse was even given a detailed script to follow in responding to pages from doctors, the laboratory, or family members, indicating essentially that the nurse was in the middle of a very important patient care process.

One of the underlying problems in this whole area, Klinger says, is that nurses end up shouldering so many of the responsibilities of the patient safety and quality mandates being imposed on hospitals externally by such organizations as the Joint Commission. Only when floor nurses are released from the web of constant distractions at critical moments can processes like medication administration be improved, she says.

Another underlying issue that the program exposed, Klinger says, was reflected in a study she recently read, in which researchers “went in and did something like an ethnography of nurses, and studied their flow and work patterns. And they identified different nurse characteristics, and one is that nurses deal with whatever the situation is, and accomplish the task at hand. So the knowledge that nurses have that a process is broken, and the understanding of how to fix that process, never go anywhere.” It is only through systems thinking, and the application of performance improvement methodologies and formal strategies at a systemic level that many of the broken processes in hospitals are finally fixed, she says, since when processes contain problems that bedevil nurses’ work, those problems are inevitably seen as trivial.

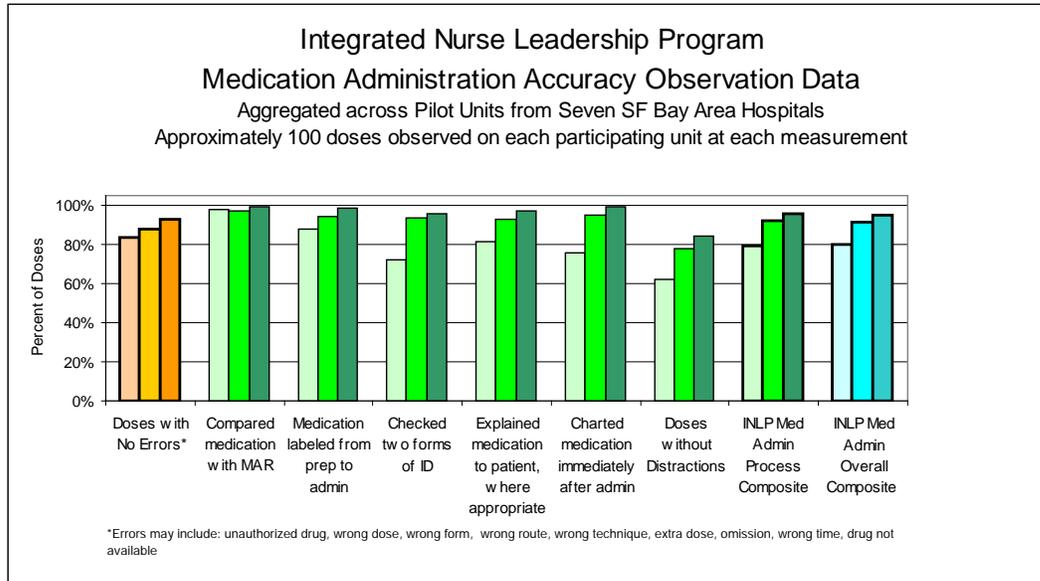
As a result, Klinger says, the INLP’s training regimen for this program focused on skills development to support nurses’ new role in the program, in the following areas: role identification,

delegation, initiating change, conflict resolution, effective communication, dealing with informal authority, and lateral-level management.

In addition to the critical success factors of empowering and training nurses, applying systems thinking and concepts from other industries to the medication administration process, and strongly emphasizing adherence to consensus-driven best practices in this area, Kliger says there was one additional critical success factor. “Having an external driver like what we are as the sponsoring agent, where our priorities are always the program, was really important” to the success of the program, she says, “because of the fact that there are always competing priorities in hospitals, and everything always seems to trump quality and safety. But we’re on the outside of those pressures, so we can be the external pressuring force that compels change.”

One testimonial that she thinks speaks volumes about the value of initiatives such as the INLP’s medication administration program came in March 2008 when the INLP held a recognition day for the clinicians involved in the program from the seven participating hospitals. “We held an event day to outline the results,” she reports, “and had all the clinical teams there, along with executives from the participating hospitals. And one executive stood up and said, ‘I’ve been a quality director in previous jobs for 15 years, and the nurse executive at my hospital for seven years, and without a doubt, this has been the most transformational experience I’ve ever had.’ And that sentiment was not uncommon” that day, Kliger says. “Why? Because people were engaged; and they were fixing their own problems, and being recognized for doing so.”

Figure 1



source: *Integrated Nurse Leadership Program. Used by permission.*

1. “Medication Errors Injure 1.5 Million People and Cost Billions of Dollars Annually.” <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=11623>

2. "Medication Errors in United States Hospitals." *Pharmacotherapy*. Pharmacotherapy 21(9):1023-1036, 2001. <http://www.medscape.com/viewarticle/409777>