

# How We Think About Medication Errors

*A model and a charge for nurses.*

By Victoria L. Rich, PhD, RN

A 2000 Institute of Medicine report drew national attention to the fact that medical errors are the eighth-leading cause of death and that medication errors alone account for more than 7,000 deaths annually in the United States.<sup>1</sup> The seminal studies of Leape and colleagues and Classen reported that 56% of medication errors were attributable to the wrong prescription and that 44% of errors involved the administration of medication.<sup>2,3</sup> More recently, in an evaluation of 36 facilities, Barker and colleagues found that 19% of administered medication doses involved errors, classified as wrong time of administration in 43% of cases, omission of administration in 30%, wrong dose administered in 17%, and administration of an unauthorized drug in 4%.<sup>4</sup>

## NURSING RESEARCH NEEDED

Physicians, pharmacists, sociologists, and psychologists have conducted and published extensive research on medication safety, but the nursing profession lags in the publishing of research on patient safety, a matter of particular concern because the administration of medication, which accounts for more than 40% of medication errors, predominantly involves nurses.<sup>3</sup>

A computerized database search that spanned the years 1954 through 2003 was performed using Ovid and the key terms "medication errors," "nursing," and "research." The aim of the search was to identify patient-safety research involving nurse-related errors. Analysis revealed that nurse researchers participated in fewer than 25% of the studies. The nursing literature that does exist focuses primarily on "macro-level factors," such as the impact of the nursing shortage on patient outcomes.<sup>5,6</sup> Nurse researchers could contribute to patient-safety research at a variety of other levels, including group culture (the reluctance to report errors and those nearly made, for example), system communications (medical records, for exam-

ple), professional transactions (interaction among physician, pharmacist, and nurse), and clinician-patient (medication administration, patient education, and discharge instructions).

Because of this lack of nursing research, no evidence-based review of the state of the science of patient safety has been undertaken in the nursing arena. As several authors have indicated,<sup>3,7-10</sup> physicians and pharmacists are generally the ones defining practice as it relates to preventing medication errors, without involving nurses. It's imperative that nurses develop theoretical models, undertake research, and incorporate the findings into practices and processes that improve patient safety. It's also paramount in the nursing profession that investment be made in both independent and multidisciplinary research. Nurses must investigate why so many medical errors involve medication administration and determine what can be done about it.

Research into the state of the science on patient safety presents a relatively uncharted course to nurses. From the nursing perspective, models can be developed that explore medication actions and interactions as well as outcomes. The role of the patient and the nurse-patient interaction in medication error, such as compliance with discharge instructions, should be investigated as well. Patient-safety research that is directed by nurses would afford opportunities to investigate various age-specific populations, disease states, and medical settings.

In the National Quality Forum a number of factors associated with a greater risk of medication errors were identified, any of which would serve as an excellent subject of nursing research, including the impact of diagnostic technologies, patient acuity, and clinical environments on patient safety.<sup>11</sup>

## CORKSCREW MODEL OF ERROR REDUCTION

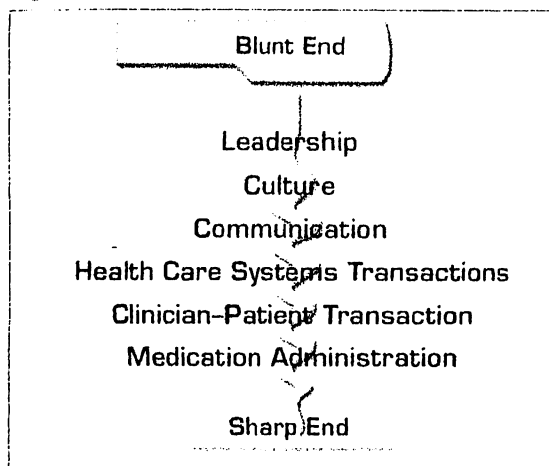
I have developed what I call a "corkscrew model" of error reduction (Figure 1, page 11), a model derived from chaos theory.<sup>12</sup> At the top (or blunt end) of the corkscrew is leadership, and at the bottom (or sharp end) is medication administration.

The movement, or direction, of influence between levels of the corkscrew is complex, circular, and con-

*Victoria L. Rich is chief nursing officer at the Hospital of the University of Pennsylvania in Philadelphia. Contact author: victoria.rich@uphs.upenn.edu.*

## State of the Science on Safe Medication Administration

Figure 1. The Corkscrew Model



The corkscrew model of error reduction, a complex circular model. At the blunt end are nurse leaders. At the sharp end are nurses who administer medications.

tinuous.<sup>13</sup> Furthermore, such complex circularity is by nature interdisciplinary in medical systems, in which critical safety systems are embedded in each turn, rendering each turn of the corkscrew an appropriate field of study for the researcher. For example, at the turn between the level of communication and health care systems transactions, it's necessary that there be research conducted on the process of obtaining and documenting a complete list of a patient's current medications upon admission and on the means by which the contents of that list are communicated to subsequent providers as the patient is transferred between settings and the care of practitioners, extending all the way to patient discharge.

At the top (or blunt) end of the corkscrew lies leadership—the chief nursing administrator and nurse managers. We cannot reach our patient safety goals unless people in positions of leadership believe in the patient-safety process, but where is the research that defines the impact of leadership on that process? Which kinds of systemic processes are necessary to ensure that a culture of patient safety is maintained when current nursing leadership changes?

Leadership defines culture, and in the matter of medication safety, it must be a culture in which nurses are empowered to speak out, to report errors committed and those nearly made, to want to find out why errors occur, and to change systems so that mistakes do not recur. We need research that demonstrates that we can change the culture when leadership empowers nurses to improve patient safety.

Communication is bidirectional; those at the blunt end share with those at the sharp end, who also have a say. What are the most effective communication tools that managers can use to decrease medication errors? Which are the ones that staff nurses can use to interact with managers? These are great research questions.

Remember, the corkscrew is circular and interdisciplinary—health care system transactions don't involve

only nurses and physicians. What are the roles of admissions, pharmacy, laboratory, respiratory, and even maintenance personnel in ensuring patient safety?

The clinician-patient transaction is proximal to the sharp end of the corkscrew. Where are the studies on discharge instructions? Is there adequate time for this important communication between nurse and patient?

Finally, at the sharp end, is medication administration. It's there that pharmacy and nursing personnel must function together. Is there nursing research that has demonstrated that a close relationship between pharmacy and nursing makes a favorable impact on patient care?

In an Institute of Medicine publication, *Crossing the Quality Chasm: A New Health System for the 21st Century*, patient safety is identified as one of the six areas in the 21st-century health care system that must be improved.<sup>14</sup> Nurse leaders must focus on it vigorously. And nursing research findings that can be incorporated into evidence-based clinical practice are of vital importance. ▼

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