

## Nursing Morbidity and Mortality Conferences

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A 50-year-old male patient presented to the emergency department with a diagnosis of new onset atrial fibrillation with rapid ventricular response. He was started on a diltiazem drip to control his heart rate and was subsequently transferred to the intensive care unit (ICU). Upon arrival, he experienced a severe bout of hypotension that was to be treated with a saline bolus. The nurse caring for the patient asked another nurse, who was helping with the admission, to get a bag of saline while she left to obtain an intravenous pump for the diltiazem infusion. Upon her return, the nurse proceeded to rapidly infuse what she thought was saline. However, the patient received an inadvertent bolus of diltiazem, causing a severe bradycardia that required multiple doses of calcium and a temporary pacemaker.

The above vignette actually happened. The error occurred despite adequate staffing, experienced nurses, a correct diagnosis, and appropriate therapy. In this case, the mistake occurred because the nurse caring for the patient made the decision to leave the bedside to get a necessary piece of equipment, the intravenous fluid with the diltiazem was not clearly marked, and communication was inadequate between the 2 nurses caring for the patient. The situation, like thousands that occur in hospitals every day, illustrates the vulnerability of critically ill patients and the dire consequences that can occur when communication breaks down. The current realities documented in many hospitals (inadequate nurse staffing, inexperienced medical and nursing staff, fatigued physicians and nurses, and outdated technology) make unfortunate errors all too likely to occur. But even when all of these problems are adequately addressed, errors will still occur. The care of critically ill patients is an all too human enterprise.

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### Alerting the Public

The landmark white paper from the Institute of Medicine (IOM), "To Err Is Human: Building a Safer Health System," exposed the challenges that exist to patient safety in today's hospital environment.<sup>1</sup> Among other things, the authors noted that errors are often the result of a multitude of contributing factors that are difficult to envision or predict in advance. Preventable adverse events are a leading cause of death in the United States. In any 1 year, deaths from medical errors exceed those due to motor vehicle accidents, breast cancer, or AIDS. Extrapolating results from previous studies, the IOM report estimated (and possibly underestimated!) that somewhere between 44 000 and 98 000 Americans die annually in hospitals as a result of medication errors alone. The total costs of these errors in terms of lost income, lost household production, disability, and healthcare costs is staggering. And the problem extends beyond the hospital into other healthcare venues not examined as rigorously as hospitals, such as outpatient surgery centers, physician offices, and pharmacies.

More than 70% of adverse events are preventable, with the most common types being technical or treatment errors (44%), diagnosis-related errors (17%), failure to prevent injury (12%), and errors in the use of a drug (10%).<sup>1</sup> What types of errors do nurses and physicians commit? Transfusion errors, wrong-site surgery, restraint-related injuries, falls, and infections from intravenous lines are among the most frequently cited nonmedication-related errors.

Medication errors have been examined most closely as a cause of preventable adverse events. They can occur during prescribing, dispensing, administration, or monitoring, as well as be the result of systems failure. Factors influencing medication administration are often defined as the "right" drug, to the "right" patient, at the "right" time, in the "right" dose, and via the "right" route. However, these "5 rights" fall short in addressing the more global picture of medication error because they focus on the nurse's individual perfor-

mance and fail to address the fact that the responsibility for accurate drug delivery lies with many individuals—physicians, pharmacists, central supply personnel, and others—and not just nurses. Systems, too, can be at fault. The way care is organized or drugs are prescribed and labeled can set the stage for errors to occur.

A recent FDA report<sup>2</sup> grouped the causes of errors in medication administration as due to human factors (performance deficit, knowledge deficit, miscalculation, and drug preparation), communication factors (misinterpretation of orders or miscommunication of oral orders), name confusion, labeling, or packaging and design. Human factors accounted for 65% of all errors, with most of those being related to performance or knowledge deficits.

### **Does Staffing Make a Difference?**

We know from the research of Aiken and colleagues<sup>3</sup> that patient-staff ratios have an impact on error rates and patient mortality. It is really true that having too few nurses leads to adverse patient events, including death and also a number of complications that delay recovery.

In their study of over 10 000 nurses and 232 000 surgical patients, the number of patient deaths increased by 7% for each additional patient added to a safe patient-staff ratio of 4 to 1. As nurses were assigned more patients, mortality increased and, by implication, errors increased. Our ability as nurses to protect our patients from harm is at the heart of the nursing role, and it is an ability that is clearly affected by high patient-staff ratios.

Patient-staff ratios are affected by administrative decisions to manage costs by reducing staff positions (a phenomenon that deserves no comment here!) and by the current nursing shortage. The shortage has hit specialty areas such as critical care the hardest and leaves units vulnerable to unfilled positions. The American Association of Critical-Care Nurses reports that, although the extent of the critical care nurse shortage has not been quantified, the number of requests for temporary and traveling critical care nurses has increased 45% for adult coronary care units, 50% for pediatric and neonatal ICUs, and 140% for emergency departments ([www.aacn.org/AACN/practice](http://www.aacn.org/AACN/practice)).

Not only does the nursing shortage make it difficult to staff critical care units adequately, it also has other serious implications with respect to patient safety. In the past, ICUs rarely accepted nurses without substantive clinical experience. Now, this requirement is often reduced or waived altogether to meet current staffing needs. New graduates participate in most ICU training programs across the country, but

the learning curve is steep and it is easy for new nurses to become overwhelmed. Do we have the programs in place (eg, residency programs, mentorship, CCRN certification preparation) to support these new practitioners as they gain the special knowledge and expertise required in the ICU?

### **The ICU: A Place of Safety or Harm?**

Because the critical care environment is highly complex and has a high patient acuity and a large number of nurse-patient interactions, the ICU is particularly susceptible to error. In one study comparing medication-related errors that occurred in the ICU with errors that occurred outside of the ICU, preventable adverse drug events were twice as common in the ICU. However, when the number of drugs used or ordered was taken into consideration, ICU errors were comparable, illustrating that errors in patient care are more likely to occur in the ICU because of the high number of drugs that critically ill patients require.<sup>4</sup> In another study of ICUs, researchers observed that the likelihood of a patient experiencing an adverse event increased about 6% for each day of hospital stay.<sup>5</sup>

### **Developing Solutions**

Can technology play a role in improving safety? We have hardly begun to gather the data required to answer this question, but we can be hopeful. In a recent article, Bates and Gawande<sup>6</sup> examined the role of information technology and its use in improving patient safety. Their high-tech strategies for prevention of errors included incorporating tools that improve communication, make knowledge more accessible, provide key information, assist with calculations, perform checks in real time, assist with monitoring, and provide decision support. For example, clinical pharmacists can be key members of the ICU team and play a role that currently exists in few institutions, participating in patient care conferences, going on daily rounds, and implementing strategies to reduce medication-related errors. Technical innovations such as computer entry systems that eliminate handwritten medication orders and bar codes on all medications that are matched to patients' arm bands can also reduce errors.

The use of personal digital assistants in hospitals has expanded exponentially in the past few years. Pharmacologic databases, medication calculators, and electronic text libraries are all available in a device the size of a thin wallet. A huge amount of information can now be carried in one's pocket and therefore be readily available at the "point of care." For example, MedCalc Version 2.8 (available at

<http://medcalc.media.net/desc.html>) performs more than 70 calculations that include body mass index and renal calculations, oxygen transport parameters, and red blood cell indices.

Unfortunately, implementation of many strategies to reduce medical and nursing errors faces substantial barriers. First, the financial burden for instituting infrastructure improvements is prohibitive for most hospitals. Currently, reimbursement does not reflect quality of care (ie, absence of errors), but rather numbers of patient diagnoses and procedures. Incentives are needed to bring about a serious commitment in the private and public sectors to changing hospital care. In a recent statement, the U.S. federal government announced their intention to pay bonuses to hospitals that score well on 35 quality measures. Under the provision, hospitals that provide superior care for 5 chronic conditions would be eligible to receive higher Medicare reimbursements. While the amount of the bonuses is small, it is a step in the right direction. Additionally, several funded and unfunded mandates are working their way through federal and state legislatures to promote infrastructure upgrades. However, these efforts are not the total answer to the patient safety issue, as hospitals seek to deal with their own financial crises.

Second, a lack of standards for sharing key clinical data inhibits efficient nationwide sharing of medical information. Standards that are in common use are often privately held (eg, diagnosis codes are licensed by the College of American Pathologists). The federal government recently promulgated the Consolidated Health Informatics standards for messaging, images, and laboratory tests, which should help begin a process of more efficient management of records.

Third, new processes and technologies will meet with strong resistance from clinicians, who are already incredibly overburdened, and therefore must be easy to learn, enhance workflow (rather than creating new work), and be usable in real time. Technology will only be relevant if it improves safety and frees up time for patient care. An infrastructure system that ultimately would improve patient safety is a lofty goal but won't be accepted by nurses and physicians at the bedside if it is cumbersome to learn or time consuming to implement.

Fourth, the inherent culture of healthcare represents a major barrier. In our history, errors committed by nurses have often been met with reprisals and firing. In their report, the IOM recommended advancing the issue of patient safety from a systems approach, conducting a root-cause analysis rather than blaming or

firing individuals.<sup>1</sup> When errors occur, as they will, the critical care team needs to focus on the circumstances that led to the occurrence and change the system.

## Nursing Morbidity and Mortality Conferences

For decades, physicians have used the vehicle of morbidity and mortality conferences to identify problem cases. In these forums, patient complications and deaths are presented and analyzed by one's peers. Current procedures and systems are evaluated with the goal of preventing the same problem from happening in the future. In this setting, a thorough discussion of lapses in patient safety are openly described and systematically analyzed.

An open environment is one in which people who make mistakes are held accountable. But part of that accountability requires that responsible parties review what they did wrong and make suggestions about avoiding the mistake in the future—that is, be part of the solution. Merely blaming individuals does not necessarily prevent the incident from happening again. Collaborative efforts to aid the development of new policies that reduce the chance of an accident happening again are needed. In that vein, regularly scheduled morbidity and mortality conferences for nurses makes sense. Such discussions would allow everyone on a unit the opportunity to examine the organization of care (eg, staff scheduling, equipment retrieval, physical layout) in light of nursing errors. It is the nurse at the bedside who knows best how to protect the patient from harm.

Mistakes do happen. While the global approaches are hammered out at the national and infrastructure levels, critical care nurses have the opportunity to take the high road in promoting and ensuring patient safety. Morbidity and mortality conferences are one approach to help us take better care of our patients.

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