

First, Do No Harm

By Kathleen Dracup, RN, DNSc, and Christopher W. Bryan-Brown, MD. From the School of Nursing, University of California, San Francisco, San Francisco, Calif (KD), and the Department of Anesthesiology, Albert Einstein College of Medicine, Bronx, NY (CWB-B).

A middle-aged woman with a history of metastatic cancer arrived at the emergency room of a small community hospital in acute distress and with sudden-onset gastric bleeding. Laboratory results showed that she was severely anemic, and the attending physician in the emergency department ordered 2 units of blood. The woman's blood was quickly typed and cross-matched, and the blood units arrived just as she was being transferred to one of the medical units.

It was an unusually busy day in the emergency room; there were several trauma patients who were accompanied by anxious, sometimes hostile, families. Gurneys were stacked up in the hallways, as emergency department staff waited for radiograph and laboratory results. Staff members were eager to get the blood unit started and transfer this particular patient, as well as several other patients, before the change of shift. One of the nursing staff started the first unit of blood, and the nurse assigned to the patient prepared the paperwork for transfer—all while juggling multiple interruptions.

Moments after the woman's husband was sent to the admitting office, she became anxious and said that she was having difficulty breathing. She clung to her nurse's hand, refusing to let the nurse leave her side and begging the nurse to help her. Her breathing became increasingly rapid, and she began to panic. She complained of chest pain and nausea. The nurse, a new graduate, wondered if the patient was having a heart attack. The nurse had never seen a patient in such acute distress. Vital signs indicated that the patient was going into shock. The only physician in the emergency room was busy suturing a difficult wound, and the other nurses were busy elsewhere. What should the nurse do?

Within seconds, the patient went into cardiac arrest; during the code, one of the staff discovered that the patient was being given the wrong unit of blood, a

unit meant for another patient. The transfusion was stopped immediately and resuscitation was initiated, but the patient died. Although this incident happened many years ago, the nurse (KD) responsible for that patient will never forget the patient's look of desperation. It was a sad glimpse into the huge responsibility that every nurse and physician has to "First, do no harm."

Assessing the Landscape of Patient Safety

We were reflecting on this tragic incident and the sea of change related to medical errors that has occurred during the past few years. Between the 2 of us, we have accumulated a half century of clinical experience. We each have witnessed unfortunate (and avoidable) tragedies, as well as many "near misses." The tragedies often involved incidents in which, despite the best intentions of knowledgeable clinicians, patients were harmed and sometimes died. It is these types of occurrences that the Institute of Medicine (IOM) wrote about 5 years ago.¹

The IOM has published 234 reports, many highly relevant to the nursing and medical professions, and yet we doubt if the public—or even most nurses and physicians—has noticed. What is remembered is the now-famous phrase from the report that the number of medical errors committed annually in hospitals results in 44 000 to 98 000 deaths per year, which is equivalent to a jumbo jet crashing every day and leaving no survivors. The IOM report and its attendant press did an excellent job of frightening the lay public by alerting them to their vulnerability if and when they become patients in an American hospital. But what have we learned during the past 5 years? What has changed in our hospitals and intensive care units? Has the intense spotlight on safety (including the Joint Commission's new emphasis on patient safety goals) changed the deadly course of the jumbo jet?

In some ways, nothing seems to have changed. The number of hemolytic transfusion reactions from ABO incompatibility has not decreased. Although rare, they occur in the same number that they did 3 decades ago and are usually the result of a clerical error.² Errors still occur every day in every hospital. The potential of these

To purchase reprints, contact The InnoVision Group, 101 Columbia, Aliso Viejo, CA 92656. Phone, (800) 809-2273 or (949) 362-2050 (ext 532); fax, (949) 362-2049; e-mail, reprints@aacn.org.

errors to be serious and even life threatening has increased each year as the nature of our diagnostic tests and treatments has become more invasive and the work environment has become more complex.

Despite our lack of progress on many fronts in the battle for patient safety, a dramatic change has occurred in the way we all think about patient safety. Three decades ago, the case described in this editorial would have been (and was) reviewed as an error made by a single individual. Now most of us recognize that errors in patient care are the result of the system of care and not solely caused by a specific individual. We've evolved from the blame game (fueled by medical malpractice) to root cause analysis, an approach offered by a system's theory in which many factors are identified as contributing to medical errors, and solutions are based on reorganization and cultural change.^{3,4}

Recently, Robert Wachter⁵ reviewed our progress to date on the patient safety initiative. He gave hospitals high marks in the degree to which they have changed regulations to enforce standardization and create redundancies in clinical care. He also evaluated the current work environment rather positively, noting the changes that have occurred regarding workforce issues.

Nurses have complained about the safety of their work environment for years, particularly during the years of managed care when decisions were frequently made on the basis of a business case. We now know that patients are harmed when patient-staff ratios are too high,⁶ when nurses are working shifts that are too long,⁷ and when nurses are not prepared for their roles.⁸ California has already legislated staffing ratios and is now grappling with meeting those legislated ratios during a severe nursing shortage. Four states (California, Maine, New Jersey, and Oregon) have banned mandatory overtime.

A Question of Fatigue

The average age of the critical care nurse who is a member of AACN is about 45 years. If a recent national study of hospital nurses applies to us, nurses working a 12-hour shift had a total break time averaging 26 minutes, an increase of a mere 3 minutes from the average total break time (23 minutes) of nurses working an 8-hour shift.⁷ How feasible is it for nurses to stay at the top of their game for 12 hours straight with less than 30 minutes away from the unit? Taking a reasonable amount of time away from the unit for meals is an important strategy for staying focused and not making errors.

A recent study showed that nurses who worked more than 12.5 consecutive hours were 3 times more likely to make an error.⁷ This finding suggests that

nurses are most susceptible to making an error at the end of a shift and when trying to finish a multitude of tasks, complete charting, and report to the incoming nurse. Since most nurses (80% in one study⁷) work longer than a 12-hour shift, we know that the end of the shift may be the time when we are most vulnerable to making a mistake. Working overtime increases the risk of error, and the longer the shift, the greater the number of errors.

Similar findings have been published about the direct relationship between the number of hours worked by medical residents and medical errors.⁹ These findings led to the 2003 regulations by the Accreditation Council for Graduate Medical Education (the organization that reviews and accredits residency programs) to limit residents' hours on duty to a maximum of 80 hours per week, or 24 hours per continuous shift, to reduce the errors that occur because of fatigue. Residents also must have 1 day off every 7 days and 10 hours of rest between scheduled clinical or educational obligations. Anyone who has watched a surgical resident doze off while holding a retractor or a medical resident fall asleep on his or her feet at morning rounds knows the wisdom of limiting work hours. A recent study¹⁰ of medical interns that compared groups who worked more than and less than 80 hours per week reinforced the importance of sleep in reducing errors in decision making.

Restrictions on residents' work hours, easily dictated by common sense, are an example of the difficult challenges presented in attaining patient safety. Although residents may commit fewer errors when not fatigued, compliance with the regulation increases the number of patient handoffs between medical residents and lessens residents' familiarity with patients. Residents who have fewer nights on call and more days off are less likely to know their patients as well as they did when they worked longer hours. Thus, the jury is out on whether reducing residents' hours will result in fewer errors in patient care.

The Patient Safety Report Card

In his review of our progress to date, Wachter⁵ gives low marks to various patient error reporting systems, information technology (including electronic order entry), and the malpractice system—the dimensions often touted to the public as making the critical difference in patient safety. Each is beset with unique problems, and none has been the magic bullet for patient safety. For example, most error reporting systems have not made a difference in patient safety. The systems have been a huge waste of time and money, while promoting the wrong paradigm. Also, the transi-

tion from individual culpability to system reform has not helped us figure out how to deal effectively with the incompetent or recalcitrant physician or nurse. Sometimes, it's not a systems problem! How can we create a philosophy that emphasizes problems in the systems of care while still compensating the patient who experiences a serious mistake by an uncaring or incompetent professional and taking appropriate steps to remediate the source of the problem?

The current way we educate healthcare professionals, particularly nurses and physicians, is also important in the patient safety formula. How can we create a team culture in the intensive care unit when medical and nursing curricula remain so independent of each other? In today's schools, it is rare to have a medical and nursing student sit together in the same classroom. Poor communication—nurse-to-nurse, physician-to-nurse, and physician-to-physician—is at the heart of many errors in patient care. Good communication and teamwork must be taught in both medical and nursing curricula.

Maps for the Future

Two organizations have tackled the patient safety challenge from different perspectives. On December 14, 2004, the Institute for Healthcare Improvement¹¹ announced a national campaign to save 100 000 lives in the next 18 months and every year thereafter. Hospitals across the United States are being asked to commit to a number of changes to prevent unnecessary deaths and keep that jumbo jet in the air. The changes are as follows:

- Deploy a rapid response team with any member of the staff allowed to call a specialty team to examine a patient at the first sign of decline.
- Deliver evidence-based care for acute myocardial infarction by consistently following clinical guidelines (eg, aspirin and β -blockers) to prevent deaths.
- Prevent adverse drug events by compiling a list of all the medications, including dosages, prescribed for a patient at admission, discharge, and transfer to another unit.
- Prevent central line infection by using 5 steps collectively termed “the central line bundle” derived from research.

- Prevent surgical site infections by maintaining appropriate glucose levels, giving antibiotics at the time of surgery, and *not* shaving hair at the surgical site.

- Prevent ventilator-associated pneumonia by implementing the evidence-based nursing care practices known to minimize this complication (eg, maintaining the head of the bed at 30 degrees).

The American Association of Critical-Care Nurses has developed a new set of standards to guide nurses and other healthcare professionals in creating an environment that promotes patient safety and health for the professionals working in critical care. AACN Standards for Establishing and Sustaining Healthy Work Environments: A Journey to Excellence, which will appear in the May issue of the Journal, provides a vision for nurses who want to create a safe environment. More importantly, it provides the detailed strategies to get us there.

“It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm.”¹² Florence Nightingale knew it long before the IOM.

EDITORS' NOTE

AACN Standards for Establishing and Sustaining Healthy Work Environments: A Journey to Excellence, written by the American Association of Critical-Care Nurses, will appear in the May 2005 issue of the Journal.

REFERENCES

1. Institute of Medicine. Kohn L, Corrigan J, Donaldson M, eds. (Committee on Quality of Health Care in America.) *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
2. Bryan S. Hemolytic transfusion reaction: safeguards for practice. *J Perianesth Nurs*. 2002;17:399-403.
3. Reason JT. *Managing the Risks of Organizational Accidents*. Aldershot, England: Ashgate; 1997.
4. Leape LL, Bates DW, Cullen DJ, et al. Systems analysis of adverse drug events. *JAMA*. 1995;274:35-43.
5. Wachter RM. The end of the beginning: patient safety five years after ‘To Err Is Human.’ *Health Aff*. 2004; W4-534-545.
6. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;288:1987-1993.
7. Rogers AE, Hwagun WT, Schott LD, Aiden LH, Dinges DF. Hospital staff nurse work and patient safety. *Health Aff*. 2004;23:1-11.
8. Aiken LH. Educational levels of hospital nurses and surgical patient mortality. *JAMA*. 2003;290:1617-1623.
9. Gaba DM, Howard SK. Fatigue among clinicians and the safety of patients. *N Engl J Med*. 2002;347:1249-1255.
10. Lockley SW, Cronin JW, Evans EE, et al. (The Harvard Work Hours, Health and Safety Group). Effect of reducing interns' weekly work hours on sleep and attentional failures. *N Engl J Med*. 2004;351:1829-1837.
11. The Institute for Healthcare Improvement. The 100,000 lives campaign. Available at: <http://ihi.org/IHI/Programs/Campaign/Campaign.htm>. Accessed January 24, 2005.
12. Nightingale F. *Notes on Hospitals*. London, England: John W. Parker and Sons; 1859.