

# Providing maximal patient care, improving patient safety

*Being good isn't always good enough.*

Scott Evans

## About the Prescott Award

Albert B. Prescott was a maverick in the late 1800s because of his advocacy of an academic basis for pharmaceutical education. Founder and dean of the College of Pharmacy at the University of Michigan, Prescott nurtured his idea for nearly 40 years before the rest of the profession caught up with his vision.

In 1900, Prescott was the first president of the American Association of Colleges of Pharmacy. This chemist, educator, and leader of pharmacists was also instrumental in founding Phi Delta Chi Pharmacy Fraternity at the University of Michigan in 1883, and he was the advisor to the Alpha Chapter and the first Honorary Brother of the fraternity.

The Albert B. Prescott/Glaxo-SmithKline Leadership Award was established by Phi Delta Chi in 1987 to honor young pharmacists who lead their field. Now administered by the Pharmacy Leadership & Education Institute, this annual award is bestowed on a pharmacist who is no more than 10 years into his or her career and who has demonstrated exemplary leadership qualities as a student and young pharmacist. The recipient delivers a scholarly lecture on issues such as pharmacy as a profession, leadership, or future trends in pharmacy practice or education.

I have been very fortunate to work in organizations that value pharmacists and utilize quality as a business model over the last 10 years. As such, I have spent the last 5 years studying performance improvement through the use of multidisciplinary focus groups and then translating study into practice. As a pharmacist rooted in quality improvement, I naturally gravitated toward the study and prevention of medication-related errors. As a pharmacist, the call to action was compelling. However, as a parent of a child with frequent hospitalizations, the call has become my purpose. My son, Christopher, was diagnosed with cancer in April 2008, requiring many hospitalizations for chemotherapy, ultimately leading to an autologous bone marrow transplant. I am very sensitized to the fact that I competently monitor my son's hospitalizations because of my training. With that in mind, I am also very saddened that our health care system is so problem prone that parents with lesser clinical experience will navigate the same journey armed with much less defense.

It has been 10 years since the breaking Institute of Medicine (IOM) report titled *To Err Is Human* and the quality initiative in which the state of our nation's health care was examined. They found a pervasive and staggering quality problem in our health care system in which as many as 98,000 Americans died each year from preventable medical errors that cost upwards of \$17 billion to \$29 billion per year.<sup>1</sup>

This report awakened the medical community and public to this significant problem in the health care industry. It also detailed, however, that it was not the individual providers to blame but rather processes within the health care

system that were conducive to providing poor-quality, error-prone practices. The concept was to shift the focus from a punitive one to that of transforming the system to promote global patient safety.

The results of these errors are significant. When they occur, it is not only the 100,000 people killed each year that suffer. There are also the 100,000 families in despair from losing their loved ones. There are also 100,000 "second victims"—well-intentioned medical professionals that have mistakenly committed a medical error that led to the death of a patient. The second victim—a nurse, a physician, a pharmacist who is devoted to taking care of patients—will have to live with this mistake for the rest of his or her life. This is what is known as the 100,000 trio.

## Why do errors occur?

The more complex the process, the more prone the process is to error. This may seem to be a very simple statement, but think about how many procedures in the pharmacy are done a certain way "because they've always been done that way." Might there be a better, simpler, or less error-prone method by which to perform it? Oftentimes, we get comfortable in our habits. A quote by Benjamin Franklin may sum it up best: "The definition of insanity is doing the same thing over and over and expecting different results."

Each of us, as health professionals, is responsible for working together to recognize potential errors and prevent them from occurring. This concept was put into action by Toyota and their "lean management" principles. For Toyota, this generally means that if an abnormal situation arises, the machine automatically stops and the worker will stop the

production line. Toyota calls it “stop the line”; however, the ideas behind it may be able to be translated into workable concepts that may be used in our health care system.<sup>2</sup>

To illustrate, we can look at an example where there would be multiple opportunities to stop the line, but the failure to do so may result in a severe medical error. A patient was admitted to the ICU for postsurgical recovery. A single blood glucose reading was greater than 300 mg/dL. An insulin drip was initiated with dosing assistance from an automated insulin drip software program. The following day, blood glucose readings were within goal. Four hours later, fingerstick glucose readings were still elevated, and the insulin drip rate was increased from 7 to 23 units/hour. Labs were drawn 2 hours later, with fingerstick reading showing elevated levels again. The insulin drip was again increased to 38 units/hour. Meanwhile, a secondary check using a different instrument showed blood glucose of less than 20 mg/dL, but this was not addressed. Fifteen minutes later, this was repeated with the same resulting value—again not addressed. Several hours later, the nurse called the lab to ask about the blood draw but was told that the specimen was contaminated. The insulin drip rate was further increased to nearly 50 units/hour in response to continued elevated fingerstick readings. NPH and regular insulin continued to be ordered by physicians and were given to the pa-

tient. The lab redrew the specimen and reported that the blood glucose was less than 20. Two hours later, the patient had a CT scan suggesting global hypoxic/ischemic injury. The patient never recovered and was removed from life support several days later per family request.

How could the “stop the line” principle be applied here? When the first abnormal blood glucose reading was taken, a secondary check could have been taken. The secondary instrument checks that were taken could have been acknowledged and acted upon. The pharmacy staff could have been aware of multiple insulin drips being sent for the same patient and questioned the high drip rate. Stat labs could have been drawn instead of waiting for regular labs to be redrawn. Even though an external device was calculating the rate at which to change the drip, the staff did not follow protocol, letting the machine think for them instead of utilizing their clinical training and experience. Nurse managers should get involved, and nurses should get a new set of eyes to assess the situation when it just doesn't make sense.

Multiple opportunities for interventions were present, but none were taken before it was too late to make a clinical impact. Here, our primary victim is the patient who succumbed to the injuries caused by the medical errors. There is the family of the patient, who will need to deal with the grief of the patient's death. The trio is completed by all of the medi-

cal professionals that could have recognized a problem but failed to do so.

## How to begin to effect change

Perhaps the first step is to determine how we define quality. IOM defines quality as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”<sup>1</sup> This is a shift from prior ideations of standardized care being restrictive to medical practice to now being the model for medical care.

The world of health care has been defined as a dysfunctional culture.<sup>3</sup> In such a culture, employees will continue to utilize old methods to try to solve new problems, blaming individuals and external causes for failures rather than change the culture. To truly effect change, we must break down this culture and instead move toward establishing a culture of safety. When an error occurs, many institutions are more interested in ensuring that the information does not reach the public and tarnish their reputation rather than learn from the mistake to install safeguards and make sure it doesn't recur. Physicians have been told for years by attorneys that they should not admit a mistake so it cannot be used against them in court. A dysfunctional culture does not break down easily. It requires a profound alteration in the way individuals think about themselves and their workplace.

### Scott Evans, PharmD



Scott Evans, PharmD, is currently the Chief Operating Officer at the University of Southern California (USC) University Hospital and Norris Cancer Hospital in Los Angeles. Evans is a health care executive with an exceptional clinical and operations record of achievement, encompassing the implementation of quality outcomes and safety initiatives and the mentorship of clinical professionals and managers. He graduated from the USC School of Pharmacy in 1998. Subsequently, he did postgraduate residency training at the Department of Veterans Affairs Outpatient Clinic and USC School of Pharmacy. Following residency, he secured a job at Hollywood Presbyterian as a Critical Care Pharmacist Specialist. At Hollywood Presbyterian, Evans developed a student teaching program and, under his leadership, an American Society of Health-System Pharmacists-accredited residency program with USC affiliation was implemented. In 2004, he joined USC University Hospital as the Director of Pharmacy Services and Residency Program Director for USC School of Pharmacy Acute Care Residencies. On the heels of many successful program implementations, he accepted an Associate Administrator position, increasing his scope of responsibility to include many ancillary and quality departments. In 2007, Evans was promoted to Chief Operating Officer for both USC University Hospital and USC Norris Cancer Hospital.

## How to reduce errors

Accepting that errors occur due to systematic problems, not individual human carelessness, requires us to apply a systematic approach to error reduction. We need to design the medical system so that harm does not reach the patient. An initial step may be to borrow concepts from industries that are doing a good job at safety and quality. A strategy utilized by Motorola in the 1990s aimed to reduce error rates but utilized by many different fields is known as “six sigma.” Six sigma strives to reach 99.9997% efficiency or better, where less than 3.44 errors per million opportunities would occur.

Analyzing system errors in service industries in comparison to a typical health care organization show that service industries have 159,000 to 308,000 errors per 1 million opportunities, or statistically at a 2- to 2.5-sigma level performance. A typical health care organization has 67,000 to 309,000 errors per 1 million opportunities, or statistically a 2- to 3-sigma level performance.<sup>4</sup>

But being good just isn't good enough. If 99.9%, or 3.8 sigma, were good enough, then 12 newborns would be given to the wrong parents every day, 2 million documents will be lost by the IRS this year, 2.5 million books would be shipped with the wrong covers, 315 entries in Webster's dictionary would be misspelled, 880,000 credit cards in circulation would have the wrong information coded on the magnetic strip, and 20,000 wrong drug prescriptions would be written each year.<sup>5</sup>

The airline industry fosters a culture in which teamwork and respect are expected. The industry has been striving for “zero defects” and accepts perfection as the goal. They typically operate at a 7-sigma standard. Baggage handling, however, operates at only 2 to 3 sigma—about the same as health care.

The business principle of six sigma has been applied to health care with the goal of producing measurable outcomes. Five main steps are inherent to six sigma<sup>6</sup>:

(1) Define: Identify your products/service

es and your customer requirements.

- (2) Measure/analyze: Diagnose the frequency/source of errors.
- (3) Design: Design the process/simulation model.
- (4) Optimize: Error-proof the process; install control points and measurements.
- (5) Verify: Measure performance; continually improve.

## Utilize the pharmacist

In our culture of safety, there are multiple expanded roles for pharmacists. Staff pharmacists should be engaged in proactive surveillance and increase monitoring for adverse drug events. Pharmacists should be the leaders in medication reconciliation across the continuum of care. Each facility should also have a medication safety officer to identify potential errors and help find solutions for medication-related events.

Multidisciplinary medication error reduction teams should be formed to implement evidence-based recommendations, discuss adverse events, and focus on methods for change. Peer review processes should also be implemented for each discipline, with focus on education, competency training, and skills development. Facilities can also implement proactive monitoring of drug use, which are computerized methods for detecting adverse drug events to increase their detection rate. Near misses should be reviewed and trends identified. While the initial error rate may increase as a result of heightened awareness, error analysis should be performed on trends to improve overall safety.

Pharmacists are in the unique position to assist in the implementation of evidence-based medicine. We are trained in applying best-practice models and are the ideal partners to ensure that patients receive proper, safe, and appropriate medical care in collaboration with other health professionals.

Evidence-based practices have consistently been shown to improve patient outcomes, and the pharmacist is the perfect person to lead the application of

the approaches. Implement “bundles” to reduce infection rates, including ventilator-associated pneumonia, central-line infections, and sepsis bundles. The pharmacist must lead the employment of strict protocols, strong commitment, and multidisciplinary teamwork.

## So ... what is our 10-year grade?

We, as a health care team, are more aware than ever about medication and patient safety. Although we have been implementing evidence-based treatments and attempting to identify and solve errors, the goal of near zero-defect delivery of care remains elusive. Now is the time for us, as a profession, to expand our roles and take the opportunities to provide maximal patient care and improve patient safety. By the way, Christopher is doing well and enjoying life—I intend to keep it that way.

doi: 10.1331/JAPhA.2008.09527

## References

1. Institute of Medicine. Crossing the quality chasm: the IOM Health Care Quality Initiative. Accessed at [www.iom.edu/CMS/8089.aspx](http://www.iom.edu/CMS/8089.aspx), May 1, 2009.
2. Hyde, K. Toyota chairman sees local interaction the path toward global success. Accessed at [www.japansociety.org](http://www.japansociety.org), May 1, 2009.
3. Institute for Healthcare Improvement. Creating a culture of safety: a conversation with Lucian L. Leape, MD, Patient Safety Expert Host. Accessed at [www.ihl.org/IHI/Topics/PatientSafety/MedicationSystems/ImprovementStories/Creating+a+Culture+of+Safety+A+Conversation+with+Lucian+Leape.htm](http://www.ihl.org/IHI/Topics/PatientSafety/MedicationSystems/ImprovementStories/Creating+a+Culture+of+Safety+A+Conversation+with+Lucian+Leape.htm), May 1, 2009.
4. Trusko B, Harrington J. The prescription for health care excellence: take six sigma as needed. Accessed at [www.qualitydigest.com](http://www.qualitydigest.com), May 1, 2009.
5. AndyTolbert.com. Is 99% good enough? Accessed at [www.andytolbert.com/home/blogs/is-99-good-enough.php](http://www.andytolbert.com/home/blogs/is-99-good-enough.php), May 1, 2009.
6. Six sigma methodology. Accessed at [www.tutorialspoint.com/six\\_sigma/six\\_sigma\\_methodology.htm](http://www.tutorialspoint.com/six_sigma/six_sigma_methodology.htm), May 1, 2009.