



# PATIENT SAFETY: THE SYNERGY OF TECHNOLOGY and BEHAVIOR

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**Motivated by studies on the prevalence of adverse drug events (ADE)** and by directives from the Institute for Healthcare Improvement (IHI) initiatives and The Joint Commission, hospitals have turned their focus to patient safety. However, they soon discovered that an awareness of the problem did not necessarily mean compliance with the solution.

Many of us scoffed at the title of author Robert Fulghum's book, *All I Really Need to Know I Learned in Kindergarten* (1989), but recent studies may cause us to humbly rescind our ridicule. Evaluating the cracks in the shaky foundation of our behavior, we find that poor communication is a serious weakness, including communication with our peers, subordinates, and superiors.

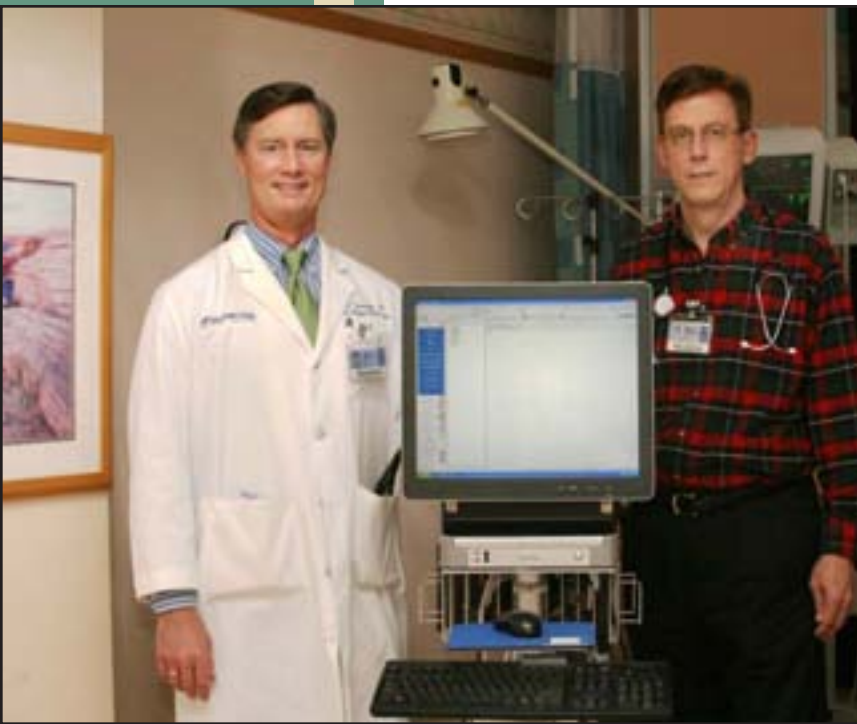
Furthermore, there must be sandbox rules. Without established standards and processes, there will be running with scissors and other dangerous activities. Worst of all, there will be a lack of consistency and uncoordinated efforts in delivering patient care.

Lastly, there should be a team environment with clear leadership that is open to feedback and change for the betterment of the patient community.

### **VA's Real-Life Application**

Since the Institute of Medicine's landmark study *To Err Is Human* (2000), healthcare has begun to make strides in patient care. Encouraged by IHI's 100,000 Lives Campaign, as well as the National Patient Safety Goals established by The Joint Commission, the Veteran Administration (VA) instructed its hospitals in early 2006 to reduce infections in patients connected to ventilators and central venous catheters.

VA North Texas Health Care System in Dallas embraced this challenge. Like all other VA hospitals, it had already implemented a clinical patient-record system (CPRS) to prevent medical errors related to transcription, and barcode medication administration (BCMA) software to address the potential for errors in drug administration. At this stage, the hospital's focus was on its intensive care unit (ICU), where the most at-risk patients were unwittingly exposed to infections. The ICU, which houses approximately 10% of the beds in an average hospital, was faced with frightening mortality rates. If patients contracted an infection while in the ICU, their mortality rate reached 50%. Statistics revealed that infection rates were high in patients connected to ventilators and central venous catheters. Best practices for preventing infection in those situations had been established for over a decade.



**Opposite: VA North Texas Health Care System in Dallas  
Above: Dr. Claibe Yarbrough (left) and Steve Rypkema**

VA photo courtesy of Bruce M. Morris, Medical Media

For example, caregivers understood that patients on ventilators were at risk for pneumonia. Randomized, controlled studies demonstrated that elevating the patient's head significantly reduced the risk of pneumonia. This simple process, however, could be easily thwarted by a night nurse forgetting to elevate the head of the bed after a nightly sponge bath. The day nurse, juggling multiple duties and patients, may or may not notice the lack of incline in the patient's bed. Other risks for that patient would include the level of sedation, the use of drugs to prevent deep vein thrombosis, and the length of time spent on the ventilator.

VA North Texas Health Care System decided to take a new tack to ensure compliance with these best practices. It implemented crew resource management (CRM) techniques, developed by aviation professionals working with NASA and the FAA. The objective was to work as an organized, efficient team that followed accepted standards. This CRM strategy for healthcare demanded that a comprehensive checklist be created for every phase of treatment. Caregivers would have to complete and verify the checklist at every step in the patient care continuum.

Often, the checklist items were relatively simple procedures that delivered significant results, such as caregivers washing their hands, disinfecting the site before inserting a catheter, and using sterile masks, gowns, gloves, and caps. These practices contributed to decreased infection rates.

Many other checklists, however, drew from the streamlined data now available remotely or at the bedside. With the deployment of electronic health records (EHRs) and clinical documentation systems, hospitals such as VA North Texas Health Care System had relevant, timely data available at the point of care. These near-time reports helped ensure that the processes of evidence-based practices were executed. For instance, nurses could easily verify the patient's medical records, dosage, and latest lab results before giving the next dosage, or decide to alert the physician to an identified risk factor or downward trend in the patient's condition.

This strategic shift in roles and processes created many challenges, especially between the nurse and physician. In this new reality, the nurse was responsible for verifying that all items on the checklist were performed, including those that were the physician's responsibility. If the physician did not completely or accurately perform an item, the nurse was empowered to demand that the physician do so. This power shift was uncomfortable for nurses who were unused to challenging a physician's unquestioned authority, as well as for physicians who had to remain open to these reminders of their checklist duties.

VA North Texas Health Care System also recognized that an important aspect of this process was to de-emphasize blame related to errors. Medical missteps are rarely due to one instance or one person's actions, but are usually a result of a series of missed opportunities to correct the situation. Instead, the hospital focused on team building, shared responsibility, expanded communications, and enhanced coordination of departmental care delivery.

Thanks to daily reports and monitoring by the clinical information system supporting this hybrid CRM program, the

## TECHNOLOGY OVERVIEW

VA North Texas Health Care System in Dallas has used the Essentris™ intelligent charting and surveillance solution from CliniComp, Intl. since 1994. VA North's enterprise computerized patient record system and provides comprehensive charting, data analytics and reporting for the ICU. It is installed in their Intensive Care Units (ICUs) including the Medical ICU, Surgical ICU, Thoracic ICU and Telemetry.

nurses and physicians were able to fully appreciate the extensive data collection, delivery and analysis; thus, increasing their rate of adoption and acceptance of the initiative.

The process was a resounding success. On the medicine side of the ICU, infection rates related to central venous catheter insertions plunged from 9.9 per 1,000 patient days in 2005 to 0.6 in 2006. On the surgical side, the infection rate dropped from 5.8 to 2.8 per 1,000 patient days. An additional benefit was accurate tracking of ventilator days, which had been under-reported by 53% using traditional calculations. This corrected calculation allowed the hospital to re-evaluate respiratory therapist staffing to address this realistic usage. Other tangible results included reduced costs related to decreased manual data collection (e.g. less FTEs), decreased expenses due to improved patient outcomes, positive caregiver team interactions and, most importantly, the attainment of optimal patient care.

### Healthcare's Kaizen

The Japanese term *kaizen* is often associated with the workplace quality vision of Toyota. It means "continuous improvement" or "to take it apart and put it back together in a better way." After VA North Texas Health Care System rolled out its patient safety initiative, it continued to evaluate the program in the spirit of continuous improvement. The initial results were greater than expected, but then they realized that new issues were surfacing. By instilling this vital reliance on technology, the role of the caretaker had morphed from strategic decision-maker to a tactical implementer of the prescribed procedures.

For example, a nurse approaches a patient to deliver the next dosage of blood pressure medication. The data supplied by the clinical information system at the point of care tells the nurse the drug name, the dosage, and the timing. The nurse verifies that it is the correct time for the dosage to be given to that patient and proceeds with the medication delivery. The problem is that the patient's current condition is not evaluated at that point in time. In this case, the patient's blood pressure is already low and the medication should not have been provided because it would cause dangerously low blood pressure. If the nurse had known about the latest blood pressure measurement, the incorrect dosing could have been avoided. With the latest advances in clinical information systems, this information is now available via real-time alerting. In the scenario above, the clinical system would have automatically alerted the nurse about the

patient's low blood pressure. Additionally, the system would have reminded the nurse of any other protocol items that still needed to be completed for that patient.

Real-time alerts bring evidence-based practices into a just-in-time environment, providing proactive clinical data at the instant it is needed. This is critical as the patient transitions between different departments during distinct phases of care. For instance, when a patient is admitted to the ICU by the neurology team, the clinical system would alert the nurse if no neurological checks had been charted.

A future application for real-time alerting is the incorporation into Rapid Response Teams, another IHI initiative. By monitoring patients on the floor for a select number of data points such as heart rate, respiratory rate, blood pressure, medications, and level of consciousness, the hospital can quickly identify unstable patients and those who are at high risk for cardiac or respiratory arrest. Once these patients are flagged, the clinicians in the Rapid Response Team bring critical care to their bedside to prevent unnecessary deaths.

### Fast-Track Patient Safety

The latest advancements in patient safety have leveraged technology to provide greater accessibility to medical data, timely analysis, evidence-based practices and real-time alerting. Equally as important, organizations have recognized that tracking caregivers' compliance with best practices—and expecting them to hold each other responsible for compliance—ensures the synergy needed to achieve optimal patient safety and care. This technology-behavioral patient safety initiative has enabled evidence-based practices, which normally take up to 10 years to gain common acceptance. Hospitals then reap the tangible benefits of enhanced patient outcomes; decreased infection-related costs; reduced manual labor and, thus, FTEs; and improvements in integrated team delivery of patient care. **IPSQH**

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- Fulghum, R. (1989). *All I really needed to know I learned in kindergarten*. New York: Ivy Books.

**ANNOUNCEMENT**

**2<sup>ND</sup> INTERNATIONAL PATIENT SAFETY CONGRESS**

25 - 29 March 2008  
Antalya / TURKEY  
WOW Kremlin Palace Hotel

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- Information Technology & Innovation
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