



VA NCPS Topics in Patient Safety

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Making the Leap: The Story of How the VA NCPS Committed to Simulation as a Technique to Teach and Study Patient Safety

By Douglas E. Paull, M.D., M.S., FACS, FCCP, CHSE, NCPS patient safety curriculum and medical simulation director

Introduction and History: Overcoming Early Challenges

The purpose of this article is to take the reader along on a journey of how the VA National Center for Patient Safety (NCPS) embraced simulation as a technique to address its mission of improving patient safety. The story begins with three drivers:

- The patient safety movement inspired by the Institute of Medicine (IOM) *To Err is Human* in 1999¹
- NCPS's commitment to team training²
- Bold VHA and NCPS leadership that promoted early simulation efforts

The IOM *To Err is Human* is perhaps most notable for pointing out the 98,000 lives lost each year in the United States because of preventable adverse events. This is certainly what made the headlines at the time and focused the public, government, third-party payers, and professional societies on patient safety. But often lost were the IOM's recommendations to help health care pursue high reliability. These recommendations, stated below, included simulation and team training:

"Another example of ways to prevent and to mitigate harm is simulation training. Simulation is a training and feedback method in which learners practice tasks and processes in lifelike circumstances using models or virtual reality, with feedback from observers, other team members, and video cameras to assist improvement of skills. Simulation for modeling crisis management (e.g., when a patient goes into anaphylactic shock or a piece of equipment fails) is sometimes called 'Crew Resource Management,' an analogy with airline cockpit crew simulation. In such simulation, small groups that work together (whether in the operating room, intensive care unit or emergency department) learn to respond to a crisis in an efficient, effective and coordinated manner."

NCPS took these IOM concepts to heart, and by 2003, team training was occurring at VHA facilities across the nation based on Crew Resource Management (CRM) concepts. Team training focused on those non-technical skills such as teamwork, communication and

leadership that often were neglected in professional schools. The results were stunning. Surgical patient morbidity and mortality rates were reduced when patients were cared for by teams who had undergone team training.³ Simulations in the first five years or so of team training were largely confined to role playing. In this model participants read from scripts to re-enact a crisis, provoking a discussion of "what went well" and "what could be improved" from a communication and teamwork perspective. The next step in the evolution of team training required bold leadership.

In 2009, physician and nurse educators presented NCPS leadership with a "white paper" discussing the potential benefits and facilitation of a program utilizing high-fidelity simulation. Dr. James Bagian, then the chief VA patient safety officer, when asked for permission to acquire a single simulator, smiled characteristically, turned to Administrators, and said "Why don't we buy two?" Given the expense of the simulators and the relative unknown future benefits, this was a bold decision that served to strengthen the resolve and morale of the entire NCPS staff to succeed. But there were additional challenges over and above equipment procurement. NCPS was not a simulation center. NCPS educators were on the road constantly training teams at the point of care. Several more pieces of the puzzle were required.

Dr. David Gaba, the father of modern health care simulation, and a Stanford University professor of anesthesiology at the Palo Alto Veterans Administration Medical Center (VAMC) was consulted regarding the advisability of shipping these high-fidelity simulators all over the country to VAMCs and Community Based Outpatient Clinics (CBOCs).⁴ Dr. Gaba not only endorsed the idea (he actually had some previous experience shipping equipment in this manner), but also offered to train prospective NCPS educators in his *Advanced Simulation Instructor Course* at the VA Palo Alto. Dr. Gaba suggested NCPS "teach a man to fish" using a "train the trainer" model (a concept used today at NCPS) and to "walk before you run," where he recommended a pilot program to see if NCPS could deliver on a "swoop and train" model.

The final piece of the puzzle was provided by Caryl Lee, R.N., MSN, who was the

deputy director of NCPS. Caryl put NCPS team training educators in touch with Drs. John Paige and Sheila Chauvin, who had published work on a in situ model of simulation-based team training.⁵ In July of 2009, NCPS educators spent several days with Drs. Page and Chauvin at Louisiana State University (LSU), observing team training both in the operating room and in the simulation center. Among other valuable tools they shared with NCPS were tools for assessing and measuring teamwork and communication skills. The collaboration with LSU mentors continues to this day.⁶ In late 2009, NCPS conducted the first CRM and simulation-based team training learning session at the Detroit VA Medical Center (Figure 1). Soon after, by January, 2010, a formal simulation pilot program began in earnest with 10 volunteer sites across the nation. A new era of team training had begun.

Expansion of Simulation Activities at NCPS

Simulation has come a long way in the last five years at NCPS. There have been augmentations involving:

- Multiple foundational NCPS patient safety education programs, namely Clinical Team Training (CTT), Advanced Patient Safety Fellowship, and the Chief Resident in Quality and Safety (CRQS) Program
- Further certification of NCPS simulation instructors
- NCPS application for accreditation as a simulation center
- Innovative expansions into virtual patient simulation and virtual worlds
- Development of a NCPS simulation research footprint

CTT is the latest and most comprehensive NCPS team training program to date. The simulation team training pilot was conducted during CTT. Since then, simulation has been a permanent part of the CTT program, complementing the didactic knowledge bursts in CRM teamwork and communication techniques with the opportunity for teams to practice these skills in lifelike scenarios. Thousands of physicians, nurses and allied health care professionals have learned CRM techniques using this model since 2010. Moreover, validated, reliable observation tools for evaluating situational awareness during a crisis and speaking up with assertiveness with patient safety concerns have consistently demonstrated improvements for the participating staff.⁷ The acquisition of partial task trainers like the LAP Mentor™ (Symbionix) allow for the creation of hybrid simulation scenarios.⁸ Surgical teams can operate on a simulated patient just as in real life. The LAP Mentor™ is placed under the operating room drapes along with the Laerdal SimMan® 3G. While the team is busy executing the technical aspects of the operation on the disguised



Figure 1. First use of high-fidelity simulator by NCPS, John D. Dingell VAMC, Detroit, Mich., Nov. 18, 2009. Douglas Paull, M.D., M.S. just prior to learning session.

task trainer, the draped simulator patient can suddenly clinically deteriorate. In this way, teams can practice managing a crisis. Likewise, boot camps for fellows and residents in patient safety now routinely include one or more days of simulation instructor training with the hope that these young leaders of the future will include simulation in patient safety improvement efforts in their own VA facilities.⁹ This concept may finally truly satisfy Dr. Gaba's "teach a man to fish" vision.

Several NCPS instructors (four to date) have credentialed with the Society of Simulation in Healthcare (SSH) as Certified Health Simulation Educators (CHSE).¹⁰ This rigorous program focuses on a comprehensive array of topics in health care simulation such as: experience developing, writing and implementing simulations; debriefing learners; and contributing to the increasing body of simulation literature. Of the four certified NCPS instructors, one has re-certified after the completion of an initial three-year accreditation cycle. In addition, NCPS has submitted an application for formal designation as a basic simulation center, a "virtual simulation center" if you will, through the comprehensive VHA Simulation Learning, Education and Research Network (SimLEARN) accreditation program.¹¹ There are also preliminary plans to upgrade the physical layout of the simulation facilities at NCPS in Ann Arbor, Mich.

Perhaps the most surprising innovations have come in the way of virtual patient simulation and virtual worlds for teaching patient safety. High-fidelity simulation (HFS) is quite effective at teaching and improving patient safety for all the reasons discussed above. As well, high fidelity simulation proves affective for vicarious learners. For example, NCPS has demonstrated that learners observing their colleagues in a video-projected live simulation have nearly

equivalent learning when they themselves are then placed in a simulation and asked to demonstrate the skill.¹² The drawback to high fidelity simulation is that it simply does not scale well, meaning it requires a large number of learners to be physically present for participation and observation to occur. This can be logistically difficult as well as costly. For these reasons NCPS has looked towards online alternatives to face-to-face training. Decisionsim™ (Kynectiv) is the licensed platform that the VHA uses to create virtual patient simulations (VPS). The learner logs on and enters these simulations, encountering synthetic patients and caregivers along the way. Learners are exposed to history, physical exam and laboratory results as they make decisions and care for patients. Choose unwisely, and the story will play out, with the patient possibly suffering harm. A synthetic instructor gives valuable feedback during and at the conclusion of each scenario. Preliminary studies have demonstrated that VPS rivals HFS in learning outcomes such as confidence in performing the *Universal Protocol* and time-outs prior to invasive procedures.¹³

Taking a step further, NCPS investigators have entered virtual worlds. Working with virtual world expert Dr. Parvati Dev, president of Innovation in Learning, Inc., NCPS has developed a virtual world where residents can practice the *Universal Protocol* and time-outs.¹⁴ NCPS has recently been awarded a prestigious Department of Defense (DoD) Joint Program (JP)-1 grant to study these advanced technologies for teaching patient safety.

The Future?

NCPS is taking on the future of patient safety with eyes wide-open. The goal of NCPS remains unchanged – the prevention of inadvertent harm to Veterans. Our strategy is to help build a high-reliability health care organization.¹⁵ One part of that strategy is recurrent, CRM and simulation-based clinical team training. A pilot program currently under way in the VHA called the "hospital of the future" project includes such training for all staff as part of a myriad of key leadership actions designed to emulate behaviors found in high-reliability systems. The simulation journey at NCPS has been a gratifying one. Progress was afforded by the bold decisions of VA leaders willing to take the risks necessary for innovation to flourish and to trust in and empower their staff to "swing for the fences."

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“Blueprint for Excellence” Focuses on High Reliability

By Tim Anderson, R.N., B.S., Harry S. Truman Memorial Veterans Hospital supervisory patient safety manager

In September 2014, VHA released its “Blueprint for Excellence,” a series of strategies and actions that will help VA rebuild trust, improve service delivery and set a course for long-term excellence and reform. One element of the “Blueprint” is to focus on transformation that enables the achievement and sustainment of high-reliability results. The Harry S. Truman Memorial Veterans’ Hospital, located in Columbia, Missouri, Director Wade Vlosich has taken this objective to heart and has partnered with NCPS in an endeavor to create a high-reliability hospital or HRH. Called the “Hospital of the Future - HRH” project, Vlosich is making pioneering moves in Missouri. High-reliability organizations focus on failure, and implement strategies to analyze and detect system vulnerabilities before they cause operational problems. High-reliability organizations also invest in the development of a participatory culture that willingly reports errors and safety threats, establish perpetual training in both technical and teamwork skills, and most importantly, have leaders that boldly step in front to lead such initiatives. Last year, Vlosich dedicated then Patient Safety Manager (PSM) Tim Anderson full time to the HRH project and brought on a new PSM to replace him. In March 2015, the Harry S. Truman VAMC and NCPS signed a project charter, and after a series of site reviews, consultation and planning calls, Vlosich has formally embarked on a three-year course for transformation into high reliability. Starting in January 2016, the Truman VAMC will fully engage in a multi-faceted implementation plan which includes the following initiatives:

- Clinical team training – Teamwork and communication training for all clinicians, all areas.

- Just culture – Fair system which balances individual accountability with a systems focus.
- Standardization – Specific efforts to standardize equipment and processes facility wide.
- Leadership walk rounds – Leaders have regular conversations with front-line staff about safety issues and take steps to solve them.
- Root cause analysis (RCA) – Training for front-line staff to serve on RCA teams.
- Error and safety reporting – Emphasis on correct use of event reporting system and “close call” reporting.
- Leadership safety forums – Review of events and “close calls” with front-line staff. Formal rewards and recognition are given for safety reporting.
- High-fidelity simulation – Simulation is incorporated into technical and non-technical skill training.
- Safety review – NCPS conducts yearly patient safety program reviews on-site.
- Care process improvement – Projects such as handoff tools, huddles, debriefings, checklists and strategies to improve situational awareness are implemented facility wide.

Safety culture and specific clinical outcomes will be reviewed for improvement over the three-year period. With the full backing and participation of top leadership, the Harry S. Truman VAMC is poised to offer a glimpse into the “high-reliability hospital of the future.” More to come.

Putting a Face to a Name: Your Patient Safety Team

NEW TIPS FEATURE: Highlighting VA patient safety professionals throughout the system.



Melissa Ball
Central Arkansas
Veterans Health Care
System
Patient Safety Manager
Five Years



Alfreda Johnson
VA North Texas
Healthcare
Patient Safety Assistant
Five Years



Rodney Deaux, MSN, R.N.
Mann-Grandstaff VAMC
Spokane, Washington
Patient Safety Manager
Eight Years



Darr "Neil" Sigler
Minneapolis
Healthcare System
Program Support Assistant
Five Years

Human Factors as a Root Cause: Back to Blaming People?

By Jonathan D. Stewart, M.S., J.D., R.N., CPHRM, VISN 20 patient safety officer

The Joint Commission recently reported that “human factors” has consistently been the most commonly identified root cause of reported sentinel events for the past three years, surpassing both communication and leadership.¹ In the early 2000s, root cause analysis (RCA) in health care was commended for shifting organizational response from blaming individuals to identifying unsafe systems in the aftermath of adverse events.² Does this shift toward attributing adverse events to “human factors” represent a return to blaming individuals?

The origins of RCA can be traced back to the *five whys* method developed by Sakichi Toyoda, the founder of Toyota. The health care industry began experimenting with RCA in the 1990s, and by 1999 the Joint Commission began requiring accredited health care organizations to perform a *thorough and credible* RCA of all sentinel events.² The VHA’s RCA program was fully implemented the following year, in 2000.³ Some commentators have noted that while countless person-hours have been spent on RCA, risk analysis alone does little (if anything) to improve safety, and that the strength of risk controls proceeding from RCAs is uneven.^{3,4}

The quality of risk controls – the RCA action plan – depends to a large extent upon whether or not an RCA team has successfully identified the root causes and contributing factors of an adverse event. Blaming individuals at the sharp end of an adverse event for conditions beyond their control is not merely unfair; it prematurely forecloses discussions about the unreliable systems in which the adverse events had their genesis. Root causes are said to lie buried within those unreliable systems, to be unearthed and exposed by the insights of the RCA team.

While human error is not itself a root cause, mistakes, lapses and slips frequently occur at pivotal moments in the narratives of adverse events.^{5,6,7} For this reason, patient safety expert Bob Wachter urges RCA teams “not [to] shy away from identifying human error” in their zeal to identify system factors.⁸ But how should RCA teams acknowledge the role of human error in adverse events? Is “human factors” merely a euphemism for human error?

While there may be examples of novice RCA teams conflating the two terms, human factors is a term of art that invokes a rich body of interdisciplinary scientific knowledge. The scientific discipline of human factors and ergonomics (HFE) is “concerned with the understanding of interactions among humans and other elements of a system.”⁹ One of the key precepts of HFE is the local rationality principle: People do what makes sense to them at the time, given their point

of view, understanding of the situation, focus of attention, and efforts to prioritize objectives.¹⁰ To expose root causes and develop risk controls, the RCA team must come to an accurate understanding of *why* an error occurred. There is extensive HFE literature that can help an RCA team with:

- Sense-making
- Describing limitations on normal human ability to hold things in working memory and multi-task
- Recall and correctly applying rules and heuristics
- Fatigue and its effects on perceiving changes in one’s environment

Patient safety professionals are well-advised to study this literature to bring increased sophistication to their RCAs.

Once root causes – including human factors – are identified, the RCA team turns its attention to crafting risk controls (action planning). The solutions should be, as Laura Lin Gosbee advises, “As much as possible, *design solutions* ... In extreme cases this might mean getting rid of an error-prone piece of equipment. Other times, it may mean redesigning or modifying the equipment, the work environment, or the task/job, so that the risk is eliminated. This could be a matter of ... redesigning labels printed in the pharmacy, reorganizing a work area, or changing the sequence of activities for a particular task.”¹¹ The 5S methodology (sort, straighten, shine, standardize, and sustain) familiar to those who have studied Lean principles is one example of how human factors may be applied to the work space to improve efficiency and reduce the risk of error.

Identifying human factors as root causes of adverse events is not a return to scapegoating individuals for the outputs of unsafe systems. It is to recognize that the convergence of equipment and technology, the built environment, human workers, organizational culture, and prescribed work processes can – and frequently does – generate the unexpected. The RCA process remains a process that is uniquely able to identify ways to capitalize on human strengths, anticipate human weaknesses, and to make the human contribution to complex systems as reliable as possible.

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Report: VA Outperforms Private Sector on Key Measures

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